PROJECT MANUAL

for

Center High School Modernization

Located at

Center High School
3111 Center Court Lane
Antelope, CA 95843

for

Center Joint Unified School District
8408 Watt Ave.
Antelope, CA 95843

Prepared by:

nacht&lewis

Nacht & Lewis Architects
600 Q Street, Suite 100
Sacramento, California 95811

Nacht & Lewis Project No. Y1826.00

DSA Application No. 02-117487
File No. 34-H9

DSA Approval Set
November 8, 2019

PROJECT MANUAL AND SPECIFICATIONS
FOR
CENTER JOINT UNIFIED SCHOOL DISTRICT

CENTER HIGH SCHOOL
MODERNIZATION

SIGNATURE PAGE

IDENTIFICATION STAMP
DIV. OF THE STATE ARCHITECT
APP. 02-117487 INC:
REVIEWED FOR
SS ☑ FLS ☑ ACS ☑
DATE: 11/08/2019

DSA Application No. 02-117487
DSA File No. 34-H9

Owner:
Center Joint Unified School District
8408 Watt Ave.
Antelope, CA 95843
(916) 338-7580
Craig Deason – Assistant Superintendent, Facilities & Operations

Architect:
Nacht & Lewis Architects
600 Q Street, Suite 100
Sacramento, CA 95811
(916) 329-4000

LICENSED ARCHITECT
BRIAN J. MAYTUM
No. C-26867
RENEWAL DATE:
1/31/2021
STATE OF CALIFORNIA

Brian J. Maytum - AIA California Registration C-26867

Structural Engineer:
Barrish Pelham Degenkolb
3001 E Street
Sacramento, CA 95816
(916) 418-9100

REGISTERED PROFESSIONAL ENGINEER
GREGORY I. RICHARDS
S-4555
STRUCTURAL
STATE OF CALIFORNIA

Greg Richards, SE California Registration S-4555

Mechanical Engineer:
Weston & Associates
601 University Avenue, Suite 260
Sacramento, CA 95825
(916) 482-0820

REGISTERED PROFESSIONAL ENGINEER
ADAM C. DAVIS
M-34869
EXPIRES 06/30/20
MECHANICAL
STATE OF CALIFORNIA

Adam C. Davis, PE California Registration M-34869

Electrical Engineer:
The Engineering Enterprise
1125 High Street
Auburn, CA 95603
(530) 886-8556

REGISTERED PROFESSIONAL ENGINEER
#E015491
Exp.06/30/21
SCOTT WHEELER
ELECTRICAL
STATE OF CALIFORNIA

Scott Wheeler, PE California Registration E-15491

PROJECT MANUAL AND SPECIFICATIONS
FOR
CENTER JOINT UNIFIED SCHOOL DISTRICT

CENTER HIGH SCHOOL
MODERNIZATION

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FOR
CENTER JOINT UNIFIED SCHOOL DISTRICT

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NOTICE INVITING BIDS

CENTER JOINT UNIFIED SCHOOL DISTRICT

NOTICE IS HEREBY GIVEN that the Center Joint Unified School District of Sacramento County, California, acting by and through its Governing Board, hereinafter referred to as the "Owner" or "CJUSD", will receive prior to **2:00pm on Month Date, 2020,** sealed bids for the award of a Contract for the following:

BID NO. 20-xx

Center High School Modernization Project

All bids shall be made and presented only on the forms presented by the Owner. Bids shall be received in the District Facilities Office at ***8408 Watt Ave., Antelope CA 95843*** and shall be opened and publicly read aloud at the above stated time and place. Any bids received after the time specified above or after any extensions due to material changes shall be returned unopened.

The Contract will be awarded to the lowest responsive responsible Bidder based on any combination of Base Bid and Alternates, if applicable, as determined by the District. The lowest bid shall be determined in a manner that prevents any information that would identify any of the Bidders or proposed subcontractors or suppliers from being revealed to the District before ranking of all Bidders from lowest to highest has been determined. All awards will be made in the District's best interest.

The Contract Time is _____ (xxx) calendar days.

CONTRACTOR should consult List of Schedules, General Conditions, Special Conditions, and Division 1 General Requirements regarding Milestones and Liquidated Damages.

Miscellaneous Information

Contract Documents can be obtained at bidder's expense from Signature Reprographics at 620 Sunbeam Avenue, Sacramento, CA 95814, 916-454-0800 or electronically at signaturerepro.com. Documents are also available from the District's website at www.centerusd.org/rfp.

A mandatory pre-bid conference and site visit will be held on (Day of week), **Month Date, 2020**, beginning at **3:00pm**, at 3901 Little Rock Drive, Antelope, CA 95843. All participants are required to sign in at the Administration Building at each site. The Site visit is expected to take approximately two hours combined. Failure to attend any portion of the pre-bid conference and site visit or tardiness will render bid ineligible.

Each bidder shall be a licensed contractor pursuant to the California Business and Professions Code, and be licensed to perform the work called for in the Contract Documents. The successful bidder must possess a valid and active Class B License at the time of bid and throughout the duration of this Contract. The Contractor's California State License number shall be clearly stated on the bidder's proposal

Subcontractors shall be licensed pursuant to California law for the trades necessary to perform the Work called for in the Contract Documents.

Each bid must strictly conform with and be responsive to the Contract Documents as defined in the General Conditions.

In accordance with California Public Contract Code Section 22300, the Owner will permit the substitution of securities for any moneys withheld by the Owner to ensure performance under the Contract.

Prevailing wages are applicable to the Project. These per diem rates, including holiday and overtime work, as well as employer payments for health and welfare, pension, vacation, and similar purposes, are available from the Director of the Department of Industrial Relations. Pursuant to California Labor Code Sections 1720 et seq., it shall be mandatory upon the Contractor to whom the Contract is awarded, and upon any subcontractor under such

Contractor, to pay not less than the said specified rates to all workers employed by them in the execution of the Contract.

A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in the Labor Code, unless currently registered and qualified to perform public work pursuant to Labor Code section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

The Contractor and all subcontractors shall furnish certified payroll records as required pursuant Labor Code section 1776 directly to the Labor Commissioner in accordance with Labor Code section 1771.4 on at least on a monthly basis (or more frequently if required by the CJUSD or the Labor Commissioner) and in a format prescribed by the Labor Commissioner. Monitoring and enforcement of the prevailing wage laws and related requirements will be performed by the Labor Commissioner/ Department of Labor Standards Enforcement (DLSE).

Separate payment and performance bonds, each in an amount equal to 100% of the total Contract amount issued by a California admitted surety as defined in California Code of Civil Procedure Section 995.120, are required, and shall be provided to the Owner prior to execution of the Contract and shall be in the form set forth in the Contract Documents.

Where applicable (including projects receiving funding under the State School Facilities Program), bidders must meet the requirements set forth in Public Contract Code Section 10115 et seq., Military and Veterans Code Section 999 et seq.

It is each bidder's sole responsibility to ensure its bid is timely delivered and received at the location designated as specified above. Any bid received at the designated location after the scheduled closing time for receipt of bids shall be returned to the bidder unopened.

Publish Dates:

_____

_____

END OF DOCUMENT

SECTION 00 21 13

INSTRUCTIONS TO BIDDERS

1. Preparation of Bid Form and Bidding Procedures. Proposals under these specifications shall be submitted on the blank forms furnished herewith including, but not limited to, the forms in the Special Conditions, at the time and place stated in the Notice Inviting Bids. Each bidder shall review and comply with all bidding instructions and requirements set forth in the Special Conditions. All blanks in the Bid Form must be appropriately filled in, and all proposed prices must be stated clearly and legibly in both words and numerals. All bids must be signed by the bidder in permanent ink and submitted in sealed envelopes, bearing on the outside, the bidder's name, address, telephone number, and California Contractor's License number, and the name of the Project for which the bid is submitted. The Owner reserves the right to reject any bid if all of the above information is not furnished. It is each bidder's sole responsibility to ensure its bid is timely delivered and received at the location designated as specified above. Any bid received at the designated location after the scheduled closing time for receipt of bids shall be returned to the bidder unopened.

2. Bid Security. Each bid must be accompanied by one of the following forms of bidder's security: (1) cash; (2) a cashier's check made payable to the Owner; (3) a certified check made payable to the Owner; or (4) a bidder's bond executed by a California admitted surety as defined in Code of Civil Procedure Section 995.120, made payable to the Owner, in the form set forth in the Contract Documents. Such bidder's security must be in an amount not less than **ten percent (10%)** of the maximum amount of such bidder's bid as a guarantee that the bidder will enter into the Contract, if the same is awarded to such bidder, and will provide the required Performance and Payment Bonds, insurance certificates and any other required documents. In the event that a bidder is awarded the Contract and such bidder fails to enter into said Contract or provide the surety bond or bonds within five (5) calendar days after award of the Contract to bidder, said security will be forfeited.

3. Signature. The bid form, all bonds, all designations of subcontractors, the Contractor's Certificate, the Agreement, and all Guarantees must be signed in permanent ink in the name of the bidder and must bear the signature in longhand of the person or persons duly authorized to sign the bid.

If bidder is a corporation, the legal name of the corporation shall first be set forth, together with two signatures: one from the President and one from the Secretary or Assistant Secretary. Alternatively, the signature of other authorized officers or agents may be affixed, if a certified copy of the resolution of the corporate board of directors authorizing them to do so is provided to the Owner. Such documents shall include the title of such signatories below the signature and shall bear the corporate seal.

If bidder is a partnership, the true name of the firm shall first be set forth, together with the names of all persons comprising the partnership or co-partnership. The bid must be signed by all partners comprising the partnership unless proof in the form of a certified copy of a statement of partnership acknowledging the signer to be a general partner is presented to the Owner, in which case the general partner may sign.

Bids submitted as joint ventures must so state and be signed by each joint venturer.

Bids submitted by individuals must be signed by the bidder unless an up to date power- of-attorney is on file in the Owner office, in which case, said person may sign for the individual.

The above rules also apply in the case of the use of a fictitious firm name. In addition, however, where a fictitious name is used, it must be so indicated in the signature.

4. Modifications. Changes in or additions to the bid form, recapitulations of the work bid upon, alternative proposals, or any other modification of the bid form which is not specifically called for in the Contract Documents may result in the Owner's rejection of the bid as not being responsive to the Notice Inviting Bids. **No oral, electronic or telephonic modification of any bid submitted will be considered**.

5. Erasures, Inconsistent or Illegible Bids. The bid submitted must not contain any erasures, interlineations, or other corrections unless each such correction creates no inconsistency and is suitably authenticated by affixing in the margin immediately opposite the correction the signature or signatures of the person or persons signing the bid. In the event of inconsistency between words and figures in the bid price, words shall control figures. In the event that the Owner determines that any bid is unintelligible, inconsistent, or ambiguous, the Owner may reject such bid as not being responsive to the Notice Inviting Bids.

6. Examination of Site and Contract Documents. Each bidder shall visit the site of the proposed work and become fully acquainted with the conditions relating to the construction and labor so that the facilities, difficulties, and restrictions attending the execution of the work under the Contract are fully understood. Bidders shall thoroughly examine and be familiar with the drawings, specifications and all others documents and requirements that are attached to and/or contained in the Project Manual. The failure or omission of any bidder to receive or examine any Contract Documents, Special Conditions, form, instrument, addendum, or other document or to visit the site and become acquainted with conditions there existing shall not relieve any bidder from obligations with respect to the bid or to the contract. The submission of a bid shall be taken as prima facie evidence of compliance with this section. Bidders shall not, at any time after submission of the bid, dispute, complain, or assert that there were any misunderstandings with regard to the nature or amount of work to be done.

7. Withdrawal of Bids. Any bid may be withdrawn, either personally or by written request, at any time prior to the scheduled closing time for receipt of bids. The bid security for bids withdrawn prior to the scheduled closing time for receipt of bids, in accordance with this paragraph, shall be returned upon demand therefor.

No bidder may withdraw any bid for a period of ninety (90) calendar days after the date set for the opening of bids.

8. Agreements and Bonds. The Agreement form which the successful bidder, as CONTRACTOR, will be required to execute, and the forms and amounts of surety bonds which will be required to be furnished at the time of execution of the Agreement, are included in the bid documents and should be carefully examined by the bidder. The number of executed copies of the Agreement, the Performance Bond, and the Payment Bond required is two (2). Payment and Performance bonds must be executed by an admitted surety insurer as defined in Code of Civil Procedure 995.120.

9. Interpretation of Plans and Documents/Pre-Bid Clarification. If any prospective bidder is in doubt as to the true meaning of any part of the Contract Documents, or finds discrepancies in, or omissions, a written request for an interpretation or correction thereof may be submitted to the Owner. The bidder submitting the request shall be responsible for its prompt delivery. No person is authorized to make any oral interpretation of any provision in the Contract Documents, nor shall any oral interpretation be binding on the Owner. If discrepancies on drawings, specifications or elsewhere in the Contract Documents are not covered by addenda, bidder shall include in their bid methods of construction and materials for the higher quality and complete assembly. Each request for clarification shall be submitted in writing, via email, to only the following persons:

TO: Craig Deason, Assistant Superintendent
cdeason@centerusd.org

Each transmitted request shall contain the name of the person and/or firm filing the request, address, telephone and email address, Specifications and/or Drawing number, and document title. Bidder is responsible for the legibility of hand written requests. Pre-bid clarification request shall be filed a minimum of **ten (10)** calendar days prior to bid opening. Requests received less than **ten (10)** calendar days before bid opening shall not be considered or responded to. A written response to timely pre-bid clarifications requests which materially affects the bidders price will be made by Addendum issued by District not less than seventy-two (72) hours prior to bid opening.

10. Award of Contract. The Contract will be awarded to the lowest responsive responsible bidder by action of the governing Board pursuant to the terms and conditions of the Contract Documents including, but not limited to, the Special Conditions. The lowest bid shall be established as the lowest responsive responsible bidder based on the criteria as indicated in the Notice Inviting Bids. The Owner reserves the right to reject any or all bids, or to waive any irregularities or informalities in any bids or in the bidding. In the event an award is made to bidder, and such bidder fails or refuses to execute the Contract and provide the required documents within seven (7) calendar days after award of the Contract to bidder, the Owner may award the Contract to next lowest responsible and responsive bidder or release all bidders**. Each bid must conform and be responsive to the Contract Documents as defined in the General Conditions**.

11. Bid Protest Procedure. Any bidder may file a bid protest. The protest shall be filed in writing with the Owner's representative, not more than three (3) working days after the date of the bid opening. An e-mail address shall be provided and, by filing the protest, protesting bidder consents to receipt of e-mail notices for purposes of the Protest and Protest related questions and Protest Appeal, if applicable. The protest shall specify the reasons and facts upon which the protest is based.

a. Resolution of Bid Controversy: Once the bid protest is received, the apparent lowest responsible bidder will be notified of the protest and the evidence presented. If appropriate, the apparent low bidder will be given an opportunity to rebut the evidence and present evidence that the apparent low bidder should be allowed to perform the Work. If deemed appropriate by the Owner, an informal hearing will be held. Owner will issue a written decision within fifteen (15) days of receipt of the protest, unless factors beyond the Owner's reasonable control prevent such resolution. The Decision on the Bid Protest will be copied to all parties involved in the protest.

b. Finality. The decision concerning the Bid controversy will be final and not subject to any further Appeals.

c. Failure to comply with this Bid Protest Procedure shall constitute a waiver of the right to protest and shall constitute a failure to exhaust the protesting bidder's administrative remedies.

12. Listing Subcontractors. Each bidder shall submit with his bid, on the form furnished with the Contract Documents, a list of the names, license numbers, scopes of work, locations of the places of business, contact information, and Department of Industrial Relations ("DIR") registration numbers of each subcontractor who will perform work or labor or render service to the bidder in or about the project, or a subcontractor who under subcontract to the bidder, specially fabricates and installs a portion of the work, in an amount in excess of one-half of 1 percent of the bidder's total bid as required by the Subletting and Subcontracting Fair Practices Act (Public Contract Code section 4100, et seq.) Pursuant to Labor Code section 1725.5, all subcontractors (of any tier) performing work on this Project must be properly registered with DIR.

13. Workers' Compensation. In accordance with the provisions of Labor Code Section 3700, the successful bidder as the Contractor shall secure payment of compensation to all employees. The Contractor shall sign and file with the Owner the following certificate prior to performing the work under this contract: "I am aware of the provisions of Section 3700 of the Labor Code, which requires every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provisions before commencing the performance of the work of this contract." The form of such certificate is included as a part of the Bid Package.

14. Contractor's License. To perform the work required by this notice, the Contractor must possess the Contractor's License as specified in the Notice Inviting Bids, and the Contractor must maintain the license throughout the duration of the contract. If, at the time of bid, bidder is not licensed to perform the Project in accordance with Division 3, Chapter 9, of the Business and Professions Code for the State of California and the Notice to Contractors calling for bids, such bid will not be considered and the Contractor will forfeit its bid security to the Owner.

15. Preference for Materials and Substitutions.

a. One Product Specified. Unless the Plans and Specifications state that no Substitution is permitted, whenever the Contract Documents indicate any specific article, device, equipment, product, material, fixture, patented process, form, method, construction, or any specific name, make, trade name, or catalog number, with or without the words, "or equal," such specification shall be read as if the language "or equal" is incorporated.

b. Request for Substitution. See Document 00 73 13 Special Conditions.

16. Disqualification of Bidders and Proposals. More than one proposal for the same work from any individual, firm, partnership, corporation, or association under the same or different names will not be accepted; and reasonable grounds for believing that any bidder is interested in more than one proposal for the work will be cause for rejecting all proposals in which such bidder is interested and the bidder will forfeit their bid security to the Owner.

17. Unbalanced or Altered Bids. Proposals in which the prices are obviously unbalanced, and those which are incomplete or show any alteration of form, or contain any additions or conditional or alternate bids that are not called for or otherwise permitted, may be rejected. A proposal on which the signature of the bidder has been omitted may be rejected. If, in the CJUSD's sole discretion, it determines any pricing, costs or other information submitted by a bidder may result in an unbalanced bid, the CJUSD may deem such bid non-responsive. A bid may be determined by the CJUSD to be unbalanced if the bid is based on prices significantly less than cost for some work and prices which are significantly overstated in relation to cost for other work, and if there is a reasonable doubt that the bid will result in the lowest overall cost to the CJUSD even though it may be the low evaluated bid, or if it is so unbalanced as to be tantamount to allowing an advanced payment.

18. Employment of Apprentices. The Contractor and all Subcontractors shall comply with the provisions of California Labor Code including, but not limited to sections 1777.5, 1777.6, and 1777.7 concerning the employment

of apprentices. The Contractor and any Subcontractor under him shall comply with the requirements of said sections, including applicable portions of all subsequent amendments in the employment of apprentices; however, the Contractor shall have full responsibility for compliance with said Labor Code sections, for all apprenticeable occupations, regardless of any other contractual or employment relationships alleged to exist.

19. Non-Collusion Declaration. Public Contract Code Section 7106 requires bidders to submit declaration of non-collusion with their bids. This form is included with the bid documents and must be signed and dated by the bidder under penalty of perjury.

20. Wage Rates, Travel and Subsistence.

a. The Contractor and all subcontractors shall comply with the requirements set forth in Division 2, Part 7, Chapter 1 of the Labor Code. Pursuant to Labor Code Sections 1770 et. seq., the Owner has obtained from the Director of the Department of Industrial Relations the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this work is to be performed for each craft, classification or type of worker needed to execute the contract. Copies are available from the Owner to any interested party on request and are also available from the Director of the Department of Industrial Relations. The Contractor shall obtain copies of the above-referenced prevailing wage sheets and post a copy of such wage rates at appropriate, conspicuous, weatherproof points at the Site.

b. Any worker employed to perform work on the Project and such work is not covered by any classification listed in the published general prevailing wage rate determinations or per diem wages determined by the Director of the Department of Industrial Relations, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to the employment of such person in such classification.

c. Holiday and overtime work, when permitted by law, shall be paid for at the rate set forth in the prevailing wage rate determinations issued by the Director of the Department of Industrial Relations or at least one and one-half (1½) times the specified basic rate of per diem wages, plus employer payments, unless otherwise specified in the Contract Documents or authorized by law.

d. These per diem rates, including holiday and overtime work, and employer payments for health and welfare, pension, vacation, and similar purposes, are on file at the administrative office of the Owner, located as noted above and are also available from the Director of the Department of Industrial Relations. It is the Contractor's responsibility to ensure the appropriate prevailing rates of per diem wages are paid for each classification. It shall be mandatory upon the Contractor to whom the Contract is awarded, and upon any subcontractor under such Contractor, to pay not less than the said specified rates to all workers employed by them in the execution of the Contract.

21. DIR Registration of Contractor and Subcontractors. A contractor or subcontractor shall not be qualified to bid on, be listed in a bid proposal, subject to the requirements of Section 4104 of the Public Contract Code, or engage in the performance of any contract for public work, as defined in the Labor Code, unless currently registered and qualified to perform public work pursuant to Section 1725.5. It is not a violation of this section for an unregistered contractor to submit a bid that is authorized by Section 7029.1 of the Business and Professions Code or by Section 10164 or 20103.5 of the Public Contract Code, provided the contractor is registered to perform public work pursuant to Section 1725.5 at the time the contract is awarded.

This Project is a public works project as defined in Labor Code section 1720. Each contractor bidding on this Project and all subcontractors (of any tier) performing any portion of the Work must comply with the Labor Code sections 1725.5 and 1771.1 and must be properly and currently registered with DIR and qualified to perform public works pursuant to Labor Code section 1725.5 throughout the duration of the Project. For more information and up to date requirements, contractors are recommended to periodically review the DI's website at www.dir.ca.gov. Contractor shall be solely responsible for ensuring compliance with Labor Code section 1725.5 as well as any requirements implemented by DIR applicable to its services or its subcontractors throughout the term of the Agreement and in no event shall contractor be granted increased payment from the CJUSD or any time extensions to complete the Project as a result of contractor's efforts to maintain compliance with the Labor Code or any requirements implemented by the DIR. Failure to comply with these requirements shall be deemed a material breach of this Agreement and grounds for termination for cause. The contractor and all subcontractors shall furnish certified payroll records as required pursuant Labor Code section 1776 directly to the Labor Commissioner in accordance with Labor Code section 1771.4 on at least on a monthly basis (or more frequently if required by the CJUSD or the Labor Commissioner) and in a format prescribed by the Labor Commissioner. The CJUSD reserves the right to withhold contract payments if the CJUSD is notified, or determines as the result of its own investigation,

that contractor is in violation of any of the requirements set forth in Labor Code section 1720 et seq. at no penalty or cost to the CJUSD. Monitoring and enforcement of the prevailing wage laws and related requirements will be performed by the Labor Commissioner/ Department of Labor Standards Enforcement (DLSE).

22. No Telephone or Facsimile Availability. No telephone or facsimile machine will be available to bidders on the Owner premises at any time.

23. Obtaining Bidding Documents. Contract Documents can be obtained at bidder's expense from **Signature Reprographics** at 620 Sunbeam Avenue, Sacramento, CA 95814, 916-454-0800. Documents are also available from the District's website at www.centerusd.org/rfp.

Bidder shall utilize a complete set of Bidding Documents in preparing a bid. The failure or omission of bidder to receive any Bidding Document, form, instrument, Addendum, or other document shall not relieve bidder from any obligations with respect to the bid and/or Contract.

24. Addenda. Clarification or any other notice of a change in the Bidding Documents will be issued only by the District on behalf of Center Joint Unified and only in the form of a written Addendum. Any other purported Addenda are void and unenforceable.

Bidder is responsible for ascertaining the disposition of all Addenda issued regardless of Owner notification and to acknowledge all Addenda in the submitted sealed bid prior to the bid opening. Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for inspection. Each Addendum will be numbered and dated. Oral statements or any instructions in any form, other than Addendum as described above, shall be void and unenforceable. Any Addendum issued by the Owner and not noted as being acknowledged by bidder as required in the Bid Form, may result in the bid being deemed non-responsive.

Checklist of Mandatory Bid Forms

Commented [A1]: Check list to be sure there's everything applicable to project

(For Contractor's use and reference only. Additional documents may be required so bidders should carefully review all Contract Documents and Bid Documents)

- ❑ Bid Form
- ❑ Bid Bond (or Bid Guarantee form if Security is other than Bid Bond)
- ❑ Designation of Subcontractors
- ❑ Contractor's Certificate Regarding Workers Compensation
- ❑ Non-Collusion Declaration
- ❑ Substitution Request Form (if Substitutions are being requested - If Substitution Request Form is not submitted then NO Substitutions will be allowed after the bids are opened)
- ❑ Site Visit Certificate

END OF DOCUMENT

SECTION 00 21 13.1

BIDDER INFORMATION AND FORMS

Information regarding pre-qualification if applicable goes here (or Not Used)

END OF DOCUMENT

SECTION 00 31 19

EXISTING CONDITIONS

1. Summary

This document describes existing conditions at or near the Project, and use of information available regarding existing conditions. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein.

2. Reports and Information on Existing Conditions

(Add, if any)

END OF DOCUMENT

SECTION 00 31 32

GEOTECHNICAL DATA

1. Summary

   This document describes geotechnical data at or near the Project that is in the District's possession available for Contractor's review, and use of data resulting from various investigations. This document is **not** part of the Contract Documents. See General Conditions for definition(s) of terms used herein.

2. Geotechnical Reports

   (Add if any)

END OF DOCUMENT

SECTION 00 41 13

BID FORM

Project No. 20-xx

FOR

CENTER JOINT UNIFIED SCHOOL DISTRICT

FOR

CENTER HIGH SCHOOL
MODERNIZATION PROJECT

At

3901 Little Rock Drive

Antelope, CA 95843

CONTRACTOR NAME: _____

ADDRESS: _____

_____

TELEPHONE: ( ) _____

FAX: ( ) _____

EMAIL: _____

TO: **Center Joint Unified School District**, acting by and through its Governing Board, herein called "Owner".

1. Pursuant to and in compliance with your Notice Inviting Bids and other documents relating thereto, the undersigned bidder, having familiarized himself with the terms of the Contract, the local conditions affecting the performance of the Contract, the cost of the work at the place where the work is to be done, with the Drawings and Specifications, and other Contract Documents, hereby proposes and agrees to perform within the time stipulated, the Contract, including all of its component parts, and everything required to be performed, including its acceptance by the Owner, and to provide and furnish any and all labor, materials, tools, expendable equipment, and utility and transportation services necessary to perform the Contract and complete all of the Work in a workmanlike manner required in connection with the construction of:

Bid No. 20-xx CENTER HIGH SCHOOL MODERNIZATION PROJECT

for the Owner described above, all in strict conformance with the drawings and other Contract Documents on file at the Owner Offices of said Owner for amounts set forth herein.

2. BIDDER ACKNOWLEDGES THE FOLLOWING ADDENDUM:

Number	Number	Number	Number	Number	Number	Number	Number
_____	_____	_____	_____	_____	_____	_____	_____

Acknowledge the inclusion of all addenda issued prior to bid in the blanks provided above. Your failure to do so may render your bid non-responsive.

3. TOTAL CASH PURCHASE PRICE IN WORDS & NUMBERS:

BASE BID _____ DOLLARS
($ _____)

ALTERNATE NUMBER ONE BID: Gas and Water Valve Replacement
_____ DOLLARS
($_____)

ALTERNATE NUMBER TWO BID: Carpet and Rubber Base Replacement
_____ DOLLARS
($_____)

ALTERNATE NUMBER THREE BID: Replace (1) 225 kVA Transformer
_____ DOLLARS
($_____)

TOTAL OF BASE BID, PLUS ALL THREE ALTERNATE BIDS:
_____ DOLLARS
($_____)

4. ALLOWANCES**:** The Bidder's Base Bid shall **NOT** include the following potential Allowance(s). The District will add some or all of the following Allowance(s) amount(s) to the successful bidder's Contract, at the District's discretion. Contractor shall be permitted to invoice for Work under an Allowance in the identical structure as a Change Order.

Allowance #1 Unforeseen Conditions	$xx,xxx
Allowance #2 [Make specific to project]	$xx,xxx

Commented [A2]: Can this be allowed for a financial hardship project?

5. TIME FOR COMPLETION: The Owner may give a notice to proceed within ninety (90) days of the award of the bid by the Owner. Once the Contractor has received the notice to proceed, the Contractor shall complete the work in the time specified in the Agreement. By submitting this bid, Contractor has thoroughly studied this Project and agrees that the Contract Time for this Project is adequate for the timely and proper completion of the Project. Further, Contractor has included in the analysis of the time required for this Project, and the requisite time to complete Punch List.

In the event that the Owner desires to postpone giving the notice to proceed beyond this ninety (90) day period, it is expressly understood that with reasonable notice to the Contractor, giving the notice to proceed may be postponed by the Owner. It is further expressly understood by the Contractor, that the Contractor shall not be entitled to any claim of additional compensation as a result of the postponement of giving the notice to proceed.

It is understood that the Owner reserves the right to reject any or all bids and/or waive any irregularities or informalities in this bid or in the bid process. The Contractor understands that it may not withdraw this bid for a period of ninety (90) days after the date set for the opening of bids.

6. Attached is bid security in the amount of not less than ten percent (10%) of the bid:

Bid bond (10% of the Bid), certified check or cashier's check (circle one)

7. The required List of Designated Subcontractors is attached hereto.

8. The required Contractor's Certificate Regarding Workers Compensation is attached hereto.

9. The required Non-Collusion Declaration is attached hereto.

10. The Substitution Request Form, if applicable, is attached hereto.

11. The Site Visit Certification, if applicable, is attached hereto.

12. It is understood and agreed that if written notice of the acceptance of this bid is mailed, emailed, or delivered to the undersigned after the opening of the bid, and within the time this bid is required to remain open, or at any time thereafter before this bid is withdrawn, the undersigned will execute and deliver to the Owner a Contract in the form attached hereto in accordance with the bid as accepted, and that he or she will also furnish and deliver to the Owner the Performance Bond and Payment Bond, all within seven (7) calendar days after award of Contract, and that the work under the Contract shall be commenced by the undersigned bidder, if awarded the Contract, by the start date provided in the Owner's Notice to Proceed, and shall be completed by the Contractor in the time specified in the Contract Documents.

Commented [A3]: Can we make this ten?

13. The names of all persons interested in the foregoing proposal as principals are as follows:

_____

_____

_____

_____

_____

_____

(IMPORTANT NOTICE: If bidder or other interested person is a corporation, state the legal name of such corporation, as well as the names of the president, secretary, treasurer, and manager thereof; if a co-partnership, state the true names of the firm, as well as the names of all individual co-partners comprising the firm; if bidder or other interested person is an individual, state the first and last names in full.)

14. PROTEST PROCEDURES. If there is a bid protest, the grounds shall be submitted as set forth in the Instructions to Bidders.

15. The undersigned bidder shall be licensed and shall provide the following California Contractor's license information:

License Number: _____

License Expiration Date: _____

Name on License: _____

Class of License: _____

DIR Registration Number: _____

If the bidder is a joint venture, each member of the joint venture must include the above information.

16. Time is of the essence regarding this Contract, therefore, in the event the bidder to whom the Contract is awarded fails or refuses to post the required bonds and return executed copies of the Agreement form within seven (7) calendar days from the date of receiving the Notice of Award, the Owner may declare the bidder's bid deposit or bond forfeited as damages.

Commented [A4]: Ten days

17. The bidder declares that he/she has carefully examined the location(s) of the proposed Project, that he/she has examined the Contract Documents, including the Plans, General Conditions, Supplemental Conditions, Special Conditions, Addenda, Specifications, and all other documents contained in the Project Manual, and read the accompanying instructions to bidders, and hereby proposes and agrees, if this proposal is accepted, to furnish all materials and do all work required to complete the said work in accordance with the Contract Documents, in the time and manner therein prescribed for the unit cost and lump sum amounts set forth in this Bid Form.

I agree to receive service of notices at the e-mail address listed below.

I, the below-indicated bidder, declare under penalty of perjury that the information provided and representations made in this bid are true and correct.

_____
Proper Name of Company

_____
Name of Bidder Representative

_____
Street Address

_____
City, State, and Zip

(_____)_____
Phone Number

(_____)_____
Fax Number

_____
E-Mail

By: _____ Date:_____
Signature of Bidder Representative

NOTE: If bidder is a corporation, the legal name of the corporation shall be set forth above together with the signature of authorized officers or agents and the document shall bear the corporate seal; if bidder is a partnership, the true name of the firm shall be set forth above, together with the signature of the partner or partners authorized to sign contracts on behalf of the partnership; and if bidder is an individual, his signature shall be placed above.

All signatures must be made in permanent blue ink.

END OF DOCUMENT

SECTION 00 43 13

BID BOND FORM

KNOW ALL MEN BY THESE PRESENT that we, the undersigned, (hereafter called "Principal"), and _____ (hereafter called "Surety"), are hereby held and firmly bound unto the Center Joint Unified School District (hereafter called "Owner") in the sum of _____ ($_____) for the payment of which, well and truly to be made, we hereby jointly and severally bind ourselves, successors, and assigns.

SIGNED this _____ day of _____, 20___.

The condition of the above obligation is such that whereas the Principal has submitted to the Owner a certain Bid, attached hereto and hereby made a part hereof, to enter into a Contract in writing for the construction of _____.

NOW, THEREFORE,

a. If said Bid is rejected, or

b. If said Bid is accepted and the Principal executes and delivers a Contract or the attached Agreement form within seven (7) calendar days after acceptance (properly completed in accordance with said Bid), and furnishes bonds for his faithful performance of said Contract and for payment of all persons performing labor or furnishing materials in connection therewith,

Commented [A5]: Ten days

Then this obligation shall be void; otherwise, the same shall remain in force and effect.

Surety, for value received, hereby stipulates and agrees that no change, extension of time, alteration, or addition to the terms of the Contract, or the call for bids, or the work to be performed thereunder, or the specifications accompanying the same, shall in anyway affect its obligation under this bond, and it does hereby waive notice of any such change, extension of time, alteration, or addition to the terms of said Contract, or the call for bids, or the work, or to the specifications.

In the event suit is brought upon this bond by the Owner and judgment is recovered, the Surety shall pay all costs incurred by the Owner in such suit, including without limitation, attorneys' fees to be fixed by the court.

IN WITNESS WHEREOF, Principal and Surety have hereunto set their hands and seals, and such of them as are corporations have caused their corporate seals to be hereto affixed and these presents to be signed by their proper officers, on the day and year first set forth above.

By _____

(Corporate Seal) Principal's Signature

_____

Typed or Printed Name

_____

Principal's Title

By _____

(Corporate Seal) Surety's Signature

_____

Typed or Printed Name

_____
Title

(Attached Attorney in Fact Certificate)

_____
Surety's Name

_____
Surety's Address

_____
Surety's Phone Number

IMPORTANT:

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code Section 105, and if the work or project is financed, in whole or in part, with federal, grant, or loan funds, it must also appear on the Treasury Department's most current list (Circular 570 as amended).

THIS IS A REQUIRED FORM.

Any claims under this bond may be addressed to:

(Name and Address of Surety)

_____

_____

_____

(Name and Address of agent or representative for
service of process in California if different from above)

_____

_____

_____

(Telephone Number of Surety and agent or
representative for service of process in California).

_____

BID GUARANTEE FORM
(Use only when not using a Bid Bond)

Accompanying this proposal is a cashier's check payable to the order of the Center Joint Unified School District or a certified check payable to the order of the Center Joint Unified School District in an amount equal to ten percent (10%) of the base bid and alternates ($_____).

The proceeds of this check shall become the property of said Owner, if, this proposal shall be accepted by the Owner through the Owner's Governing Board, and the undersigned fails to execute a Contract with and furnish the sureties required by the Owner within the required time; otherwise, said check is to be returned to the undersigned.

_____
Bidder

Note: Use this form, in lieu of Bid Bond form, when a cashier's check or certified check is accompanying the bid.

END OF DOCUMENT

SECTION 00 43 36

DESIGNATION OF SUBCONTRACTORS

In compliance with the Subletting and Subcontracting Fair Practices Act (California Public Contract Code Sections 4100 et. seq.,) and any amendments thereof, each Bidder shall set forth below: (a) the name, license number, and location of the place of business of each subcontractor who will perform work or labor or render service to the Contractor, who will perform work or labor or work or improvement to be performed under this Contract, or a subcontractor licensed by the State of California who, under subcontract to the Contractor, specially fabricates and installs a portion of the work or improvements according to detailed drawings contained in the Plans and Specifications in an amount in excess of one-half of one percent of the Contractor's total bid; and (b) the portion and description of the work which will be done by each subcontractor under this Act. The Contractor shall list only one subcontractor for each such portion as is defined by the Contractor in this bid. All subcontractors shall be properly licensed by the California State Licensing Board.

If a Contractor fails to specify a subcontractor, or if a Contractor specifies more than one subcontractor for the same portion of work to be performed under the Contract in excess of one-half of one percent of the Contractor's total bid, the Contractor shall be deemed to have agreed that the Contractor is fully qualified to perform that portion, and that the Contractor alone shall perform that portion.

No Contractor whose bid is accepted shall (a) substitute any subcontractor, (b) permit any subcontractor to be voluntarily assigned or transferred or allow the relevant portion of the work to be performed by anyone other than the original subcontractor listed in the original bid, or (c) sublet or subcontract any portion of the work in excess of one-half of one percent of the Contractor's total bid where the original bid did not designate a subcontractor, except as authorized in the Subletting and Subcontracting Fair Practices Act.

Subletting or subcontracting of any portion of the work in excess of one-half of one percent of the Contractor's total bid where no subcontractor was designated in the original bid shall only be permitted in cases of public emergency or necessity, and then only after a finding, reduced to writing as a public record, of the authority awarding this Contract setting forth the facts constituting the emergency or necessity.

All subcontractors (of any tier) performing any portion of the Work must comply with the Labor Code sections 1725.5 and 1771.1 and must be properly and currently registered with the California Department of Industrial Relations and qualified to perform public works pursuant to Labor Code section 1725.5 throughout the duration of the Project.

NOTE: If alternate bids are called for and bidder intends to use different or additional subcontractors on the alternates, a separate list of subcontractors must be provided for each such Alternate.

DESIGNATION OF SUBCONTRACTORS FORM

Description & Portion of Work	Name of Subcontractor	Location & Place of Business	License Type and Number	E-Mail & Telephone*	DIR Registration Number*

Description & Portion of Work	Name of Subcontractor	Location & Place of Business	License Type and Number	E-Mail & Telephone*	DIR Registration Number*

* This information must be provided at the time of submission of bid or must be provided within 24 hours after the time set for the opening of bids. Bidders who choose to provide this information within 24 hours after the time set for the opening of bids are solely responsible to ensure the CJUSD receives this information in a timely manner. The CJUSD is not responsible for any problems or delays associated with emails, faxes, delivery, etc. Absent a verified fax or email receipt date and time by the CJUSD, the CJUSD's determination of whether the information was received timely shall govern and be determinative. Bidder shall not revise or amend any other information in this form submitted at the time of bid. The information submitted at the time of bid shall govern over any conflicts, discrepancies, ambiguities or other differences in any subsequent Subcontractor Designation Forms submitted by the bidder.

Proper Name of Bidder: _____

Date: _____

Name: _____

Signature of Bidder Representative: _____

Address: _____

Phone: _____

END OF DOCUMENT

SECTION 00 45 01

SITE VISIT CERTIFICATION

PROJECT: **Center High School Modernization Project**

Check whichever option applies:

_____ I certify that I visited the Site of the proposed Work and became fully acquainted with the conditions relating to construction and labor. I fully understand the facilities, difficulties, and restrictions attending the execution of the Work under contract.

_____ I certify that _____ (Bidder's representative) visited the Site of the proposed Work and became fully acquainted with the conditions relating to construction and labor. The Bidder's representative fully understood the facilities, difficulties, and restrictions attending the execution of the Work under contract.

Bidder fully relieves and releases the Center Joint Unified School District, its Architect, its Engineer, its Construction Manager, and all of their respective officers, agents, employees, and consultants from any liability for any monetary or other damage(s), related to conditions that could have been identified during my visit and/or the Bidder's representative's visit to the Site.

I certify under penalty of perjury under the laws of the State of California that the foregoing is true and correct.

Date: _____

Legal Name of Bidder: _____

Signature: _____

Print Name: _____

Title: _____

END OF DOCUMENT

SECTION 00 45 19

NON-COLLUSION DECLARATION

The undersigned declares:

I am the _____ [Title] of _____ [Name of Company], the party making the foregoing bid.

The bid is not made in the interest of, or on behalf of, any undisclosed person, partnership, company, association, organization, or corporation. The bid is genuine and not collusive or sham. The bidder has not directly or indirectly induced or solicited any other bidder to put in a false or sham bid. The bidder has not directly or indirectly colluded, conspired, connived, or agreed with any bidder or anyone else to put in a sham bid, or to refrain from bidding. The bidder has not in any manner, directly or indirectly, sought by agreement, communication, or conference with anyone to fix the bid price of the bidder or any other bidder, or to fix any overhead, profit, or cost element of the bid price, or of that of any other bidder. All statements contained in the bid are true. The bidder has not, directly or indirectly, submitted his or her bid price or any breakdown thereof, or the contents thereof, or divulged information or data relative thereto, to any corporation, partnership, company, association, organization, bid depository, or to any member or agent thereof, to effectuate a collusive or sham bid, and has not paid, and will not pay, any person or entity for such purpose.

Any person executing this declaration on behalf of a bidder that is a corporation, partnership, joint venture, limited liability company, limited liability partnership, or any other entity, hereby represents that he or she has full power to execute, and does execute, this declaration on behalf of the bidder.

I declare under penalty of perjury under the laws of the State of California that the foregoing is true and correct and that this declaration is executed on _____ [Date], at _____ [City], _____ [State].

Signed: _____

Typed Name: _____

END OF DOCUMENT

SECTION 00 45 19.01

IRAN CONTRACTING ACT CERTIFICATION

(Public Contract Code Sections 2202-2208)

(Not Used)

END OF DOCUMENT

SECTION 00 45 26

WORKER'S COMPENSATION CERTIFICATION

Labor Code Section 3700 in relevant part provides:

Every employer except the State shall secure the payment of compensation in one or more of the following ways:

By being insured against liability to pay compensation by one or more insurers duly authorized to write compensation insurance in this State.

By securing from the Director of Industrial Relations a certificate of consent to self-insure, which may be given upon furnishing proof satisfactory to the Director of Industrial Relations of ability to self-insure and to pay any compensation that may become due to employees.

For any county, city, city and county, municipal corporation, public Owner, public agency, or any political subdivision of the state, including each member of a pooling arrangement under a joint exercise of powers agreement (but not the state itself), by securing from the Director of Industrial Relations a certificate of consent to self-insure against workers' compensation claims, which certificate may be given upon furnishing proof satisfactory to the director of ability to administer workers' compensation claims properly, and to pay workers' compensation claims that may become due to its employees. On or before March 31, 1979, a political subdivision of the state which, on December 31, 1978, was uninsured for its liability to pay compensation, shall file a properly completed and executed application for a certificate of consent to self-insure against workers' compensation claims. The certificate shall be issued and be subject to the provisions of Section 3702.

I am aware of the provisions of Labor Code Section 3700 which require every employer to be insured against liability for workers' compensation or to undertake self-insurance in accordance with the provisions of that code, and I will comply with such provision before commencing the performance of the work of this Contract.

_____
(Signature)

_____
(Print)

_____
(Date)

In accordance with Article 5 (commencing at section 1860), Chapter 1, Part 7, Division 2 of the Labor Code, the above certificate must be signed and submitted with the Contractor's bid.

END OF DOCUMENT

SECTION 00 45 46.01

PREVAILING WAGE CERTIFICATION

(Not Used)

END OF DOCUMENT

SECTION 00 45 46.02

DISABLED VETERAN BUSINESS
ENTERPRISE PARTICIPATION CERTIFICATION

Commented [A6]: If applicable, otherwise Not Used

(Not Used)

END OF DOCUMENT

DRUG-FREE WORKPLACE CERTIFICATION

TOBACCO-FREE ENVIRONMENT CERTIFICATION

Commented [A7]: Does Center Have these Board Resolutions?

SECTION 00 45 46.05

HAZARDOUS MATERIALS CERTIFICATION

(Not used)

END OF DOCUMENT

SECTION 00 45 46.06

LEAD BASED MATERIALS CERTIFICATION

(Not used)

END OF DOCUMENT

SECTION 00 45 46.07

IMPORTED MATERIALS CERTIFICATION

(Not used)

END OF DOCUMENT

SECTION 00 45 46.08

CONTRACTOR CERTIFICATION REGARDING BACKGROUND CHECKS

_____ certifies that it has performed one of the following:

❑ Pursuant to Education Code Section 45125.1, Contractor has conducted criminal background checks, through the California Department of Justice, of all employees providing services to the Center Joint Unified School District, pursuant to the contract/purchase order dated _____, and that none have been convicted of serious or violent felonies, as specified in Penal Code Sections 1192.7(c) and 667.5(c), respectively.

Contractor's DOJ Agency ORI # (Originating Agency Identifier) for Authority to Receive Criminal Record Information: _____

As further required by Education Code Section 45125.1, attached hereto as Attachment "A" is a list of the names of the employees of the undersigned who have been cleared to come in contact with pupils.

OR

❑ Pursuant to Education Code Section 45125.2, Contractor will ensure the safety of pupils by one or more of the following methods:

❑ 1. The installation of a physical barrier at the worksite to limit contact with pupils.

❑ 2. Continual supervision and monitoring of all employees of the entity by an employee of the entity whom the Department of Justice has ascertained has not been convicted of a violent or serious felony. . Complete Attachment "A" with name of employee(s) of the undersigned who have been cleared and will supervise employees.

I declare under penalty of perjury under the laws of the United States that the foregoing is true and correct.

Date_____, 20___

_____
[Name of Contractor/Consultant]

_____

By its:_____

ATTACHMENT A:

CONTRACTOR CERTIFICATION REGARDING BACKGROUND CHECKS

(INSERT NAMES OF EMPLOYEES WHO MAY COME IN CONTACT WITH PUPILS)

Name:	**Name of School**

SECTION 00 45 46.09

BUY AMERICAN CERTIFICATION

(Not used)

END OF DOCUMENT

SECTION 00 45 46.10

ROOFING PROJECT CERTIFICATION

(Not used)

END OF DOCUMENT

SECTION 00 52 13

AGREEMENT FORM

THIS AGREEMENT, entered into this____ day of_____, 20__ in the County of Sacramento of the State of California, by and between the **Center Joint Unified School District,** hereinafter called the "Owner" or the "CJUSD", and _____, hereinafter called the "Contractor".

WITNESSETH that the Owner and the Contractor for the consideration stated herein agree as follows:

ARTICLE I - SCOPE OF WORK: The Contractor shall furnish all labor, materials, equipment, tools, and utility and transportation services, and perform and complete all work required in connection with the Project No. 20-xx: **Center High School Modernization Project** in strict accordance with the Contract Documents enumerated in Article 7 below. The Contractor shall be liable to the CJUSD for any damages arising as a result of a failure to comply with that obligation, and the Contractor shall not be excused with respect to any failure to so comply by an act or omission of the Architect, Engineer, Inspector, Division of the State Architect (DSA), or representative of any of them, unless such act or omission actually prevents the Contractor from fully complying with the Contract Documents and the Contractor protests, in accordance with the Contract Documents, that the act or omission is preventing the Contractor from fully complying with the Contract Documents. Such protest shall not be effective unless reduced to writing and filed with the CJUSD Facilities office within seven (7) days of the date of occurrence of such act or omission preventing the Contractor from fully complying with the Contract Documents.

ARTICLE 2 - TIME OF COMPLETION: The Owner may give notice to proceed within ninety (90) days of the award of the bid by the Owner. Once the Contractor has received a notice to proceed, the Contractor shall reach Substantial Completion (See Article 1.1.46) of the Work within written (##) calendar days from receipt of the Notice to Proceed. This shall be called Contract Time. (See Article 8.1.1). It is expressly understood that time is of the essence.

Contractor has thoroughly studied the Project and has satisfied itself that the time period for this Project is adequate for the timely and proper completion of the Project within the Contract time.

In the event that the Owner desires to postpone giving the notice to proceed beyond this ninety (90) day period, it is expressly understood that with reasonable notice to the Contractor, giving the notice to proceed may be postponed by the Owner. It is further expressly understood by the Contractor, that the Contractor shall not be entitled to any claim of additional compensation as a result of the Owner's postponement of giving the notice to proceed.

If the Contractor believes that a postponement will cause hardship to it, the Contractor may terminate the Contract with written notice to the Owner within ten (10) days after receipt by the Contractor of the Owner's notice of postponement. It is further understood by the Contractor that in the event that the Contractor terminates the Contract as a result of postponement by the Owner, the Owner shall only be obligated to pay the Contractor for the work performed by the Contractor at the time of notification of postponement. Should the Contractor terminate the Contract as a result of a notice of postponement, the CJUSD shall have the authority to award the Contract to the next lowest responsible bidder.

ARTICLE 3 - LIQUIDATED DAMAGES: It being impracticable and infeasible to determine the amount of actual damage, it is agreed that the Contractor will pay the Owner the sum of **Five Hundred Dollars ($500) per calendar day** for each and every day of delay beyond the Contract Time set forth in Article 2 of this Agreement as liquidated damages and not as a penalty or forfeiture. In the event Liquidated Damages are not paid, the Contractor further agrees that the Owner may deduct such amount thereof from any money due or that may become due the Contractor under the Contract (See Article 9.6 and 2.2 of the General Conditions).

ARTICLE 4 - CONTRACT PRICE: The Owner shall pay to the Contractor as full consideration for the faithful performance of the Contract, subject to any additions or deductions as provided in the Contract Documents, the sum of _____ DOLLARS ($_____), said sum being the total amount stipulated in the Bid Contractor submitted. Payment shall be made as set forth in the General Conditions.

Should any Change Order result in an increase in the Contract Price, the cost of such Change Order shall be agreed to in advance by the Contractor and the Owner, subject to the monetary limitations set forth in Public Contract Code Section 20118.4. In the event that the Contractor proceeds with a Change in work without an agreement between the Owner and Contractor regarding the cost of a Change Order, the Contractor waives any Claim of additional compensation for such additional work.

ARTICLE 5 - HOLD HARMLESS AGREEMENT: Contractor shall defend, indemnify and hold harmless Owner, Architect, Inspector, the State of California and their officers, employees, agents and independent contractors from all liabilities, claims, actions, liens, judgments, demands, damages, losses, costs or expenses of any kind arising from death, personal injury, property damage or other cause based or asserted upon any act, omission, or breach connected with or arising from the progress of Work or performance of service under this Agreement or the Contract Documents. As part of this indemnity, Contractor shall protect and defend, at its own expense, Owner, Architect, Construction Manager, Inspector, the State of California and their officers, employees, agents and independent contractors from any legal action including attorney's fees or other proceeding based upon such act, omission, breach or as otherwise required by this Article.

Furthermore, Contractor agrees to and does hereby defend, indemnify and hold harmless Owner, Architect, Construction Manager, Inspector, the State of California and their officers, employees, agents and independent contractors from every claim or demand made, and every liability, loss, damage, expense or attorney's fees of any nature whatsoever, which may be incurred by reason of:

(a) Liability for (1) death or bodily injury to persons; (2) damage or injury to, loss (including theft), or loss of use of, any property; (3) any failure or alleged failure to comply with any provision of law or the Contract Documents; or (4) any other loss, damage or expense, sustained by any person, firm or corporation or in connection with the Work called for in this Agreement or the Contract Documents, except for liability resulting from the sole or active negligence, or the willful misconduct of the Owner.

(b) Any bodily injury to or death of persons or damage to property caused by any act, omission or breach of Contractor or any person, firm or corporation employed by Contractor, either directly or by independent contract, including all damages or injury to or death of persons, loss (including theft) or loss of use of any property, sustained by any person, firm or corporation, including the Owner, arising out of or in any way connected with Work covered by this Agreement or the Contract Documents, whether said injury or damage occurs either on or off Owner property, but not for any loss, injury, death or damages caused by the sole or active negligence or willful misconduct of the Owner.

(c) Any dispute between Contractor and Contractor's subcontractors/supplies/ Sureties, including, but not limited to, any failure or alleged failure of the Contractor (or any person hired or employed directly or indirectly by the Contractor) to pay any Subcontractor or Materialman of any tier or any other person employed in connection with the Work and/or filing of any stop notice or mechanic's lien claims.

Contractor, at its own expense, cost, and risk, shall defend any and all claims, actions, suits, or other proceedings that may be brought or instituted against the Owner, its officers, agents or employees, on account of or founded upon any cause, damage, or injury identified herein Article 5 and shall pay or satisfy any judgment that may be rendered against the Owner, its officers, agents or employees in any action, suit or other proceedings as a result thereof.

The Contractor's and Subcontractors' obligation to defend, indemnify and hold harmless the Owner, Architect, Inspector, the State of California and their officers, employees, agents and independent contractors hereunder shall include, without limitation, any and all claims, damages, and costs for the following: (1) any damages or injury to or death of any person, and damage or injury to, loss (including theft), or loss of use of, any property; (2) breach of any warranty, express or implied; (3) failure of the Contractor or Subcontractors to comply with any applicable governmental law, rule, regulation, or other requirement; (4) products installed in or used in connection with the Work; and (5) any claims of violation of the Americans with Disabilities Act ("ADA").

ARTICLE 6 - PROVISIONS REQUIRED BY LAW: Each and every provision of law and clause required to be inserted in this Contract shall be deemed to be inserted herein, and this Contract shall be read and enforced as though it were included herein, and if through mistake or otherwise any such provision is not inserted or is not inserted correctly, then upon application of either party the Contract shall forthwith be physically amended to make such insertion or correction.

ARTICLE 7 - COMPONENT PARTS OF THE CONTRACT: The Contract entered into by this Agreement consists of the following Contract Documents, all of which are component parts of the Contract as if herein set out in full or attached hereto: [Check this list against docs provided in this manual]

Notice Inviting Bids
Instructions to Bidders
Designation of Subcontractors
Non-Collusion Declaration
Bid Bond
Bid Form
Contractor's Certificate Regarding Worker's Compensation
Agreement Form
Payment Bond
Performance Bond
Guarantee
Escrow Agreement for Security Deposit In Lieu of Retention
Workers' Compensation/Employers Liability Endorsement
Contractor's Certification Regarding Background Checks
General Liability Endorsement
Automobile Liability Endorsement
General Conditions
Special Conditions
General Requirements
Exhibits
All Addenda as Issued
Drawings/Plans
Requirements, Reports and/or Documents in the Project Manual or Other Documents Issued to Bidders

All of the above named Contract Documents are intended to be complementary. Work required by one of the above named Contract Documents and not by others shall be done as if required by all.

ARTICLE 8 - PREVAILING WAGES: Wage rates for this Project shall be in accordance with the general prevailing rate of holiday and overtime work in the locality in which the work is to be performed for each craft, classification, or type of work needed to execute the Contract as determined by the Director of the Department of Industrial Relations. Copies of schedules of rates so determined by the Director of the Department of Industrial Relations are on file at the administrative office of the Owner and are also available from the Director of the Department of Industrial Relations. Monitoring and enforcement of the prevailing wage laws and related requirements will be performed by the Labor Commissioner/ Department of Labor Standards Enforcement (DLSE).

The following are hereby referenced and made a part of this Agreement and Contractor stipulates to the provisions contained therein.

1. Chapter 1 of Part 7 of Division 2 of the Labor Code (Section 1720 et seq.)
2. California Code of Regulations, Title 8, Chapter 8, Subchapters 3 through 6 (Section 16000 et seq.)

ARTICLE 9 - RECORD AUDIT: In accordance with Government Code Section 8546.7(and Davis Bacon, if applicable) and Article 13.11 of the General Conditions, records of both the Owner and the Contractor shall be subject to examination and audit for a period of five (5) years after a Final Retention Payment or the Recording of a Notice of Completion, whichever occurs first.

ARTICLE 10 - CONTRACTOR'S LICENSE: The Contractor must possess throughout the Project a Class B Contractor's License, issued by the State of California, which must be current and in good standing.

IN WITNESS WHEREOF, this Agreement has been duly executed by the above named parties, on the day and year first above written.

Center Joint Unified School District	CONTRACTOR:
_____	_____
Typed or Printed Name	Typed or Printed Name

_____
Title

_____
Signature

Dated: _____

_____
Title

_____
Signature

_____
Type or Printed Name

_____
Title (Authorized Officers or Agents)

_____
Signature

Contractor License No._____

Contractor DIR No._____

(CORPORATE SEAL)

SECTION 00 57 00

ESCROW AGREEMENT FOR SECURITY DEPOSITS IN LIEU OF RETENTION

This Escrow Agreement is made and entered into by and between the Center Joint Unified School District, 8408 Watt Avenue, Antelope, California 95843, hereinafter called "Owner", and _____ whose address is _____, hereinafter called "Contractor", and _____ whose address is _____, hereinafter called "Escrow Agent".

For the consideration hereinafter set forth, the Owner, Contractor and Escrow Agent agree as follows:

Pursuant to section 22300 of the Public Contract Code of the State of California, Contractor has the option to deposit securities with Escrow Agent as a substitute for Retention earnings required to be withheld by Owner pursuant to the Construction Contract entered into between the Owner and Contractor for ____ _____in the amount of _____ dated _____ (hereinafter referred to as the "Contract"). Alternatively, on written request of the Contractor, the Owner shall make payments of the Retention earnings directly to the escrow agent. When Contractor deposits the securities as a substitute for Contract earnings, the Escrow Agent shall notify the Owner within ten (10) days of deposit. The market value of the securities at the time of the substitution shall be at least equal to the cash amount then required to be withheld as Retention under the terms of the Contract between the Owner and Contractor. Securities shall be held in the name of the Owner, and shall designate the Contractor as beneficial owner.

The Owner shall make progress payments to the Contractor for such funds which otherwise would be withheld from progress payments pursuant to the Contract provisions, provided that the Escrow Agent holds securities in the form and amount specified above.

When the Owner makes payments of Retentions earned directly to the Escrow Agent, the Escrow Agent shall hold them for the benefit of the Contractor until such time as the escrow created under this Contract is terminated. The Contractor may direct the investment of the payments into securities. All terms and conditions of this Agreement and the rights and responsibilities of the parties shall be equally applicable and binding when the Owner pays the Escrow Agent directly.

Contractor shall be responsible for paying all fees for the expenses incurred by Escrow Agent in administering the Escrow Account and all expenses of the Owner. These expenses and payment terms shall be determined by the Owner, Contractor, and Escrow Agent.

The interest earned on the securities or the money market accounts held in escrow and all interest earned on that interest shall be for the sole account of Contractor and shall be subject to withdrawal by Contractor at any time and from time to time without notice to the Owner.

Contractor shall have the right to withdraw all or any part of the principal in the Escrow Account only by written notice to Escrow Agent accompanied by written authorization from the Owner to the Escrow Agent that Owner consents to the withdrawal of the amount sought to be withdrawn by Contractor.

The Owner shall have a right to draw upon the securities in the event of default by the Contractor. Upon seven (7) days' written notice to the Escrow Agent from the Owner of the notice of default under Article 2.2, Article 9.6 or Article 14, the Escrow Agent shall immediately convert the securities to cash and shall distribute the cash as instructed by the Owner.

Upon receipt of written notification from the Owner certifying that the Contract is final and complete, and that the Contractor has complied with all requirements and procedures applicable to the Contract, Escrow Agent shall release to Contractor all securities and interest on deposit less escrow fees and charges of the Escrow Account. The escrow shall be closed immediately upon disbursement of all moneys and securities on deposit and payment of fees and charges.

Escrow Agent shall rely on the written notifications from the Owner and the Contractor pursuant to Sections (5) to (8), inclusive, of this Agreement and the Owner and Contractor shall hold Escrow Agent harmless from Escrow Agent's release and disbursement of the securities and interest as set forth above.

The names of the persons who are authorized to give written notice or to receive written notice on behalf of the Owner and on behalf of Contractor in connection with the foregoing, and exemplars of their respective signatures are as follows:

On behalf of Owner:

_____
Title

_____
Name

_____
Signature

_____
Address

On behalf of Contractor:

_____
Title

_____
Name

_____
Signature

_____
Address

On behalf of Agent:

_____
Title

_____
Name

_____
Signature

_____
Address

At the time the Escrow Account is opened, the Owner and Contractor shall deliver to the Escrow Agent a fully executed counterpart of this Agreement.

IN WITNESS WHEREOF, the parties have executed this Agreement by their proper officers on the date set forth above.

OWNER	CONTRACTOR
Title	Title
Name	Name
Signature	Signature

SECTION 00 61 13.13

PERFORMANCE BOND

(CALIFORNIA PUBLIC WORK)

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, the CENTER JOINT UNIFIED SCHOOL DISTRICT (sometimes referred to hereinafter as "Obligee") has awarded to _____ (hereinafter designated as the "Principal" or "Contractor"), an agreement for the work described as follows: _____ (hereinafter referred to as the "Public Work"); and

WHEREAS, the work to be performed by the Contractor is more particularly set forth in that certain contract for said Public Work dated _____ _____, (hereinafter referred to as the "Contract"), which Contract is incorporated herein by this reference; and

WHEREAS, the Contractor is required by said Contract to perform the terms thereof and to provide a bond both for the performance and guaranty thereof.

NOW, THEREFORE, we, _____, the undersigned Contractor, as Principal, and _____, a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the CENTER JOINT UNIFIED SCHOOL DISTRICT in the sum of _____ Dollars ($_____), said sum being not less than one hundred percent (100%) of the total amount payable by said Obligee under the terms of said Contract, for which amount well and truly to be made, we bind ourselves, our heirs, executors, administrators, successors, and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH THAT, if the bounded Contractor, his or her heirs, executors, administrators, successors or assigns, shall in all things stand to and abide by, and well and truly keep and perform the covenants, conditions, and agreements in said Contract and any alteration thereof made as therein provided, on his or her part, to be kept and performed at the time and in the manner therein specified, and in all respects according to their intent and meaning; and shall faithfully fulfill guarantees of all materials and workmanship; and indemnify, defend and save harmless the Obligee, its officers and agents, as stipulated in said Contract, then this obligation shall become null and void; otherwise it shall be and remain in full force and effect.

The Surety, for value received, hereby stipulates and agrees that it shall not be exonerated or released from the obligation of this bond (either by total exoneration or pro tanto) by any change, extension of time, alteration in or addition to the terms of the contract or to the work to be performed there under or the specifications accompanying the same, nor by any change or modification to any terms of payment or extension of time for any payment pertaining or relating to any scheme of work of improvement under the contract. Surety also stipulates and agrees that it shall not be exonerated or released from the obligation of this bond (either by total exoneration or pro tanto) by any overpayment or underpayment by the Obligee that is based upon estimates approved by the Architect. The Surety stipulates and agrees that none of the aforementioned changes, modifications, alterations, additions, extension of time or actions shall in any way affect its obligation on this bond, and it does hereby waive notice of any such changes, modifications, alterations, additions or extension of time to the terms of the contract, or to the work, or the specifications as well notice of any other actions that result in the foregoing.

Whenever Principal shall be, and is declared by the Obligee to be, in default under the Contract, the Surety shall promptly either remedy the default, or shall promptly take over and complete the Contract through its agents or independent contractors, subject to acceptance and approval of such agents or independent contractors by Obligee as hereinafter set forth, in accordance with its terms and conditions and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees

and the payment of liquidated damages; or, at Obligee's sole discretion and election, Surety shall obtain a bid or bids for completing the Contract in accordance with its terms and conditions, and upon determination by Obligee of the lowest responsible bidder, arrange for a contract between such bidder and the Obligee and make available as Work progresses (even though there should be a default or succession of defaults under the contract or contracts of completion arranged under this paragraph) sufficient funds to pay the cost of completion less the "balance of the Contract Price" (as hereinafter defined), and to pay and perform all obligations of Principal under the Contract, including, without limitation, all obligations with respect to warranties, guarantees and the payment of liquidated damages. The term "balance of the Contract price," as used in this paragraph, shall mean the total amount payable to Principal by the Obligee under the Contract and any modifications thereto, less the amount previously paid by the Obligee to the Principal, less any withholdings by the Obligee allowed under the Contract. Obligee shall not be required or obligated to accept a tender of a completion contractor from the Surety.

Surety expressly agrees that the Obligee may reject any agent or contractor which may be proposed by Surety in fulfillment of its obligations in the event of default by the Principal. Unless otherwise agreed by Obligee, in its sole discretion, Surety shall not utilize Principal in completing the Contract nor shall Surety accept a bid from Principal for completion of the work in the event of default by the Principal.

No final settlement between the Obligee and the Contractor shall abridge the right of any beneficiary hereunder, whose claim may be unsatisfied.

The Surety shall remain responsible and liable for all patent and latent defects that arise out of or relate to the Contractor's failure and/or inability to properly complete the Public Work as required by the Contract and the Contract Documents. The obligation of the Surety hereunder shall continue so long as any obligation of the Contractor remains.

Contractor and Surety agree that if the Obligee is required to engage the services of an attorney in connection with enforcement of the bond, Contractor and Surety shall pay Obligee's reasonable attorneys' fees incurred, with or without suit, in addition to the above sum.

In the event suit is brought upon this bond by the Obligee and judgment is recovered, the Surety shall pay all costs incurred by the Obligee in such suit, including reasonable attorneys' fees to be fixed by the Court.

IN WITNESS WHEREOF, we have hereunto set our hands and seals this _____ day of _____, 20___.

PRINCIPAL/CONTRACTOR:

_____

By: _____

SURETY:

_____

By: _____
Attorney-in-Fact

The rate of premium on this bond is _____ per thousand.

The total amount of premium charged: $_____ (This must be filled in by a corporate surety).

IMPORTANT: THIS IS A REQUIRED FORM.

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code Section 105, and if the work or project is financed, in whole or in part, with federal, grant or loan funds, Surety's name must also appear on the Treasury Department's most current list (Circular 570 as amended).

Any claims under this bond may be addressed to:

(Name and Address of Surety)	(Name and Address of agent or representative for service for service of process in California)
_____	_____
_____	_____
Telephone:_____	Telephone: _____

A notary public or other office completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
) ss.
COUNTY OF)

On _____, before me, _____, personally appeared _____, who proved on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) as the Attorney-in-Fact of _____ (Surety) and acknowledged to me that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____ (SEAL)
Notary Public in and for said State

Commission expires:_____

NOTE: A copy of the power-of-attorney to local representatives of the bonding company must be attached hereto.

SECTION 00 61 13.16

PAYMENT BOND

(CALIFORNIA PUBLIC WORK)

KNOW ALL MEN BY THESE PRESENTS:

THAT WHEREAS, the CENTER JOINT UNIFIED SCHOOL DISTRICT (sometimes referred to hereinafter as "Obligee") has awarded to _____ (hereinafter designated as the "Principal" or "Contractor"), an agreement for the work described as follows: _____ (hereinafter referred to as the "Public Work"); and

WHEREAS, said Contractor is required to furnish a bond in connection with said Contract, and pursuant to California Civil Code Section 9550;

NOW, THEREFORE, We, _____, the undersigned Contractor, as Principal; and _____, a corporation organized and existing under the laws of the State of _____, and duly authorized to transact business under the laws of the State of California, as Surety, are held and firmly bound unto the CENTER JOINT UNIFIED SCHOOL DISTRICT and to any and all persons, companies, or corporations entitled by law to file stop notices under California Civil Code Section 9100, or any person, company, or corporation entitled to make a claim on this bond, in the sum of _____ Dollars ($_____), such sum being not less than one hundred percent (100%) of the total amount payable by said Obligee under the terms of said Contract, for which payment will and truly to be made, we bind ourselves, our heirs, executors and administrators, successors and assigns, jointly and severally, firmly by these presents.

THE CONDITION OF THIS OBLIGATION IS SUCH that if said Principal, its heirs, executors, administrators, successors, or assigns, or subcontractor, shall fail to pay any person or persons named in Civil Code Section 9100; or fail to pay for any materials, provisions, or other supplies, used in, upon, for, or about the performance of the work contracted to be done, or for any work or labor thereon of any kind, or for amounts due under the Unemployment Insurance Code, with respect to work or labor thereon of any kind; or shall fail to deduct, withhold, and pay over to the Employment Development Department, any amounts required to be deducted, withheld, and paid over by Unemployment Insurance Code Section 13020 with respect to work and labor thereon of any kind, then said Surety will pay for the same, in an amount not exceeding the amount herein above set forth, and in the event suit is brought upon this bond, also will pay such reasonable attorneys' fees as shall be fixed by the court, awarded and taxed as provided in California Civil Code Section 9550 et seq.

This bond shall inure to the benefit of any person named in Civil Code Section 9100 giving such person or his/her assigns a right of action in any suit brought upon this bond.

It is further stipulated and agreed that the Surety of this bond shall not be exonerated or released from the obligation of the bond by any change, extension of time for performance, addition, alteration or modification in, to, or of any contract, plans, or specifications, or agreement pertaining or relating to any scheme or work of improvement herein above described; or pertaining or relating to the furnishing of labor, materials, or equipment therefor; nor by any change or modification of any terms of payment or extension of time for payment pertaining or relating to any scheme or work of improvement herein above described; nor by any rescission or attempted rescission of the contract, agreement or bond; nor by any conditions precedent or subsequent in the bond attempting to limit the right of recovery of claimants otherwise entitled to recover under any such contract or agreement or under the bond; nor by any fraud practiced by any person other than the claimant seeking to recover on the bond; and that this bond be construed most strongly against the Surety and in favor of all persons for whose benefit such bond is given; and under no circumstances shall the Surety be released from liability to those for whose benefit such bond has been given, by reason of any breach of contract between the Obligee and the Contractor or on the part of any obligee named in such bond; that the sole condition of recovery shall be that the claimant is a

person described in California Civil Code Section 9100, and who has not been paid the full amount of his or her claim; and that the Surety does hereby waive notice of any such change, extension of time, addition, alteration or modification herein mentioned.

IN WITNESS WHEREOF this instrument has been duly executed by the Principal and Surety above named, on the_____ day of _____, 20___.

PRINCIPAL/CONTRACTOR:

_____

By: _____

SURETY:

_____

By: _____
Attorney-in-Fact

IMPORTANT: THIS IS A REQUIRED FORM.

Surety companies executing bonds must possess a certificate of authority from the California Insurance Commissioner authorizing them to write surety insurance defined in California Insurance Code Section 105, and if the work or project is financed, in whole or in part, with federal, grant or loan funds, Surety's name must also appear on the Treasury Department's most current list (Circular 570 as amended).

Any claims under this bond may be addressed to:

(Name and Address of Surety)	(Name and Address of agent or representative for service for service of process in California)
_____	_____
_____	_____
Telephone:_____	Telephone: _____

A notary public or other office completing this certificate verifies only the identity of the individual who signed the document to which this certificate is attached, and not the truthfulness, accuracy, or validity of that document.

STATE OF CALIFORNIA)
) ss.
COUNTY OF)

On _____, before me, _____, personally appeared _____, who proved on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies) as the Attorney-in-Fact of _____ (Surety) and acknowledged to me that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) executed the instrument.

I certify under PENALTY OF PERJURY under the laws of the State of California that the foregoing paragraph is true and correct.

WITNESS my hand and official seal.

_____ (SEAL)
Notary Public in and for said State

Commission expires:_____

NOTE: A copy of the power-of-attorney to local representatives of the bonding company must be attached hereto.

SECTION 00 65 36

GUARANTEE

Guarantee for _____. We hereby guarantee that the _____, which we have installed in _____ _____ has been done in accordance with the Contract Documents, including without limitation, the drawings and specifications, and that the work as installed will fulfill the requirements included in the bid documents. The undersigned and its surety agrees to repair or replace any or all such work, together with any other adjacent work, which may be displaced in connection with such replacement, that may prove to be defective in workmanship or material within a period of **two (2) years** from the date of the Notice of Completion of the above-mentioned structure by the Center Joint Unified School District, ordinary wear and tear and unusual abuse or neglect excepted. The guarantee period for corrected defective work shall continue for a duration equivalent to the original guarantee period.

In the event the undersigned or its surety fails to comply with the above-mentioned conditions within a reasonable period of time, as determined by the Owner, but not later than seven (7) days after being notified in writing by the Owner or within forty-eight (48) hours in the case of an emergency or urgent matter, the undersigned and its surety authorizes the Owner to proceed to have said defects repaired and made good at the expense of the undersigned and its surety, who will pay the costs and charges therefor upon demand. The undersigned and its surety shall be jointly and severally liable for any costs arising from the Owner's enforcement of this Guarantee.

	Countersigned
_____	_____
(Proper Name)	(Proper Name)
By: _____	By: _____
_____	_____
(Signature of Subcontract or Contractor)	(Signature of General Contractor if for Subcontractor)

Representatives to be contacted for service:

Name: _____

Address: _____

_____

Phone Number:_____

SECTION 00 72 13

GENERAL CONDITIONS

ARTICLE 1
DEFINITIONS

1.1 BASIC DEFINITIONS

NOTE: The following shall not be construed as a comprehensive list of all definitions in the Contract Documents and there may be other definitions set forth in the Contract Documents. Additionally, any references to any DSA forms, documents or requirements shall be construed to incorporate any updates, supplements, or additions. The Contractor shall be required to meet the latest DSA requirements applicable to the Project.

1.1.1 Action of the Governing Board is a vote of a majority of the Owner's Governing Board.

1.1.2 Approval means written authorization through action of the Governing Board. In no case shall the Assistant Superintendent have authority to approve total change orders or modifications to the Project exceeding 10% of the Contract sum.

1.1.3 Architect means the architect, engineer, or other design professional engaged by the Owner to design and perform general observation of the work of construction and interpret the Drawings and Specifications for the Project. Also see Article 4.

1.1.4 As-Builts are a set of Plans and Specifications maintained by the Contractor clearly showing all changes, revisions, substitutions, field changes, final locations, and other significant features of the Project. The As-Builts shall be maintained continuously throughout the Work for the Project and is both a prerequisite to the issuance of Pay Application and a requirement for Contract Close-Out. See Article 3.17

1.1.5 Beneficial Occupancy is the point in time when a building or buildings are fit for occupancy is fit for occupancy and its intended use. Basic requirements are the building is safe, at or near Substantial Completion, and all life safety is operational. The fact that a building is occupied does not mean that the building is ready for Beneficial Occupancy if there are elements that are unsafe or if life safety items are not operational. Taking occupancy on a structure that is under a fire watch is not considered beneficial occupancy. Further, taking of Beneficial Occupancy is not a point in time when retention is due unless the entire school has obtained a Certificate of Substantial Completion that meets the definition of 1.1.46.

1.1.6 Claims. A Claim is a request for payment, supported by back-up documentation which includes, invoices time sheets, or other documents substantiating legitimacy or entitlement that is submitted during the Project or immediately following the Project made prior to the Final Retention Payment Application and prior to Final Completion of the Project. A "Claim" means a separate demand by the Contractor for (1) time extension, (2) payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the Contract and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (3) and amount the payment of which is disputed by the Owner. See Article 4.6.

1.1.7 Change Order (CO). A CO is a written instrument prepared by the Architect and signed by the Owner (as authorized by the Owner's Governing Board), the Contractor, and the Architect, stating their agreement upon (1) A description of a change in the Work, (2) The amount of the adjustment in the Contract Sum, if any; and (3) The extent of the adjustment in the Contract Time, if any. See Article 7.2.

1.1.8 Change Order Request (COR). A COR is a written request supported by backup documentation prepared by the Contractor requesting that the Owner and the Architect issue a CO based upon a proposed change, or a change that results in an adjustment in cost, time or both, or arising from an RFP, CCD or ICD. (See Article 7.6)

1.1.9 Close-Out means the process for Final Completion of the Project, but also includes the requirements for the DSA Certification that the Project is Complete (See DSA Certification Guide). See Article 9.9.

1.1.10 Construction Change Document (CCD). A Construction Change Document is a DSA term that is utilized to address changes to the DSA approved Plans and Specifications. There are two types of Construction Change Documents. (1) DSA approved CCD Category A (DSA Form 140) for work affecting Structural, Access or Fire-Life Safety of the Project which will require a DSA approval; and, (2) CCD Category B (DSA Form 141) for work NOT affecting Structural Safety, Access Compliance or Fire and Life Safety that will not require a DSA approval (except to confirm that no Approval is required). See Article 7.3.

1.1.11 Complete means that all Work in the Contract Documents is finished, the requirements of the Contract Documents have been met, the Project has been Closed Out, and all Work has ceased on the Project. This may also be referred to as Final Completion. In most cases, the recording of a Notice of Completion shall represent Completion of the Project. Beneficial Occupancy does not mean the Work is Complete.

1.1.12 Completion Date is the date when all Work for the Project shall be Substantially Complete and is the date assigned at the end of the Contract Time for the Project. See Article 1.1.46.

1.1.13 Construction Manager. The Construction Manager is a consultant to the Owner contracted to assist in Project planning, management and construction of the Project. If there is a Construction Manager, they may assist in various aspects of the Project including, but not limited to Monitoring the progress of the construction, reviewing and monitoring the schedule, progress of work, monitoring pay requests, facilitating communications, advising the Owner and its Board of Education on various aspects of the construction process, monitoring the RFI, COR, CCD, ICD, RFP, Claims, Disputes and other Project related processes.

1.1.14 Contract or Agreement when the terms are used in these General Conditions shall be references to the Contract Documents as defined herein.

1.1.15 Contract Documents (sometimes referred to as Construction Documents) consist of the Agreement between Owner and Contractor (hereinafter the Agreement or Contract), Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to bid, instructions to bidders, notice to bidders, and the requirements contained in the Bid Documents, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is a written amendment to the Contract signed by parties, a Change Order, a Construction Change Document, or a written order for a minor change in the Work issued by the Architect. The Contract Documents collectively form the Contract. The Contract represents the entire and integrated Agreement between the parties hereto and supersedes prior negotiations, representations, or agreements, either written or oral. The Contract may be amended or modified only by a written Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind between the Architect and Contractor, between the Owner and any Subcontractor or Sub-subcontractor, or between any persons or entities other than the Owner and the Contractor. The Architect shall, however, be entitled to performance and enforcement of obligations under the Contract intended to facilitate performance of the Architect's duties.

1.1.16 Contract Time is the time period specified in the Contract Documents in which the Project shall be completed. This is sometimes referred to a Contract Duration, or "time in which the Contractor has to complete the Project". See Article 8.1.1

1.1.17 Contractor, Owner, and Architect are those mentioned as such in the Agreement. They are treated throughout the Contract Documents as if they are of singular number and neuter gender. Any reference to "Owner" shall mean "CJUSD" or Center Joint Unified School District.

1.1.18 Cure is the act of remedying a material failure to perform under the terms of the Contract Documents during the time provided to correct Contractor's Default. Specific time periods are provided to Cure and Correct a Contractor Default under Article 14 and for a Partial Default under Article 2.2 as well as elsewhere in the Contract Documents.

1.1.19 Days means calendar days unless otherwise specifically stated.

1.1.20 Default is a material breach of Contract. A Termination for Cause under Article 14 is a declaration of Default of the Contract and shall act as a demand upon the Surety to perform under the terms of the Performance Bond. Partial Defaults may also be tendered to the Surety at Owner's discretion. See Article 2.2.

1.1.21 Dispute. A dispute is a disagreement on terms or conditions of the Project where the Contractor's opinion of the Project, Payment, Change Order or Request for Proposal differs from that of the Owner or Architect. A dispute only rises to the level of a claim once the dispute is assembled with back-up documentation and presented for evaluation. See Article 4.6

1.1.22 CJUSD/Owner Representative is the person designated by the Owner to represent the Owner during the Construction for the Project. This Owner representative shall have the delegated authority. This Owner representative may be an employee of the Owner, and may also include Construction Managers who shall have the authorities as set forth in Article 1.1.13. In some cases, the Owner and its Board may be assisted by a Construction Manager. When a Construction Manager is assisting the Owner, the Contractor, Architect, and Inspector shall have a primary contact with the Owner's Construction Manager who will advise the Owner.

1.1.23 Drawings or Plans are graphic and pictorial portions of the Contract Documents prepared for the Project and approved changes thereto, wherever located and whenever issued, showing the design, location, and scope of the Work, generally including plans, elevations, sections, details, schedules, and diagrams as drawn or approved by the Architect. Sometimes Drawings will also be included in Addenda, Change Orders, and Specifications.

1.1.24 DSA is the Division of State Architect. DSA is the agency that provides design and construction oversight for K-12 Schools, Community Colleges, and State Funded Charter School Projects. DSA is the responsible agency for this Project and Contractor has submitted a bid for the Project since Contractor is familiar with Contractor's responsibilities under the DSA requirements more thoroughly set forth at Title 24 of the California Code of Regulations. Contractor agrees to abide by the jurisdiction of DSA and shall construct the Project to conform with the approved Plans, Specifications, Addenda, and Change Orders (inclusive of approved CCD's and ICD's issued by the Owner pending CCD approval). The DSA website is at http://www.dgs.ca.gov/dsa.

1.1.25 Emergency shall be defined as a sudden, unexpected occurrence, involving a clear and imminent threat to the continuation of school classes, a critical path delay that will result in not being able to occupy the school when students arrive to use the facility, danger from the facility or from outside the facility, Act of God, or other action which requires immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services.

1.1.26 [Reserved]

1.1.27 Immediate Change Directive. (ICD) A written order prepared by the Architect and signed by the Owner and the Architect, directing a change in the Work where the Work must proceed immediately and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. See Article 7.3

1.1.28 Inspector of Record (IOR) or Project Inspector (PI) is the individual retained by the Owner in accordance with Title 24 of the California Code of Regulations and who will be assigned to the Project

1.1.29 Notice of Non-Compliance (DSA Form 154) is a document issued by the Inspector if there is a deviation from the DSA approved Plans, Specifications, and Change Orders. See Article 7.1.2.

1.1.30 Payment Application, Pay Application or Certificate of Payment is the Contractor's certified representation of the actual level of Work performed on the Project. Payment Applications are sometimes also called "Certificate of Payment", "Request for Payment", or similar terms, and shall follow the Schedule of Values that are approved by the Architect, Inspector and Owner. See Article 9.3.

1.1.31 The Project is the complete construction of the Work performed in accordance with the Contract Documents.

1.1.32 The Project Manual is the volume assembled for the Work which may include, without limitation, the bidding requirements, sample forms, Conditions of the Contract, Reports and Specifications.

1.1.33 Provide shall include "provide complete in place," that is "furnish and install complete."

1.1.34 Punch List/ Punch Item/ Incomplete Punch Item is a list of minor repair items, prepared after the issuance of a Certificate of Substantial Completion, by the Inspector and Architect of Work required in order to complete the Contract Documents and ensure compliance with the DSA Approved Plans so the Project may be Closed Out. Issuance of the Retention Payment is dependent of the proper completion of the Punch List. See Article 9.9.

1.1.34.1 *Contractor's List of Punch Items* is a list of minor repair items the Contractor submits when the Contractor considers the Work Substantially Complete. Submission of this List of Incomplete Punch Items is the Contractor's representation that the Project is Substantially Complete. See Article 9.9.1

1.1.35 A Request for Information (RFI) is a written request prepared by the Contractor requesting the Architect to provide additional information necessary to clarify or amplify an item which the Contractor believes is not clearly shown or called for in the Drawings or Specifications, or to address problems which have arisen under field conditions. See Article 7.4.

1.1.36 A Request for Proposal (RFP) is a written request prepared by the Architect (and/or CM) requesting the Contractor to submit to an estimate of the effect of a proposed change on the Contract Price and (if applicable) the Contract Time. See Article 7.5.

1.1.37 Safety Orders are those issued by any city, county, state or federal agency having jurisdiction over the Project.

1.1.38 Schedule is the Contractor's view of the practical way in which the Work will be accomplished. See. Article 8 of the General Conditions.

1.1.39 Schedule of Values is a detailed breakdown of the Contract Price for each Project, building, Phase of Work or Site as determined by the Owner. This Schedule of Values shall adequately detail the price for the Work so Progress Payments Applications can be meaningfully reviewed by the Inspector, Architect of Record, Engineer of Record, and Owner. (See Article 9.2)

1.1.40 Separate Contracts are Contracts that the Owner may have with other Contractors, vendors, suppliers, or entities to perform Work on the Project. This may include, but is not limited to Multi-Prime Trade Contractors, furniture installers, testing agencies, clean-up contractors, or network or low voltage contractors. Contractor shall plan for certain other contractors that may also be working on the Project site and address these other contractors in Contractor's Schedule. See Article 6.

1.1.41 Site refers to the grounds of the Project as defined in the Contract Documents and such adjacent lands as may be directly affected by the performance of the Work.

1.1.42 Specifications are that portion of the Contract Documents consisting of the written requirements for material, equipment, construction systems, instructions, quality assurance standards, workmanship, and performance of related services.

1.1.43 Standards, Rules, and Regulations referred to are recognized printed standards and shall be considered as one and a part of these Specifications within limits specified. Federal, state and local regulations are incorporated into the Contract Documents by reference.

1.1.44 Stop Work Order, or an Order to Comply, is issued when either (1) the Work proceeds without DSA approval; (2) the Work proceeds without a DSA Inspector of Record, or (3) where DSA determines that the Work is not being performed in accordance with applicable rules and regulations, and would compromise the structural integrity of the Project or would endanger lives. If a Stop Work Order is issued, the Work in the affected area shall cease until DSA withdraws the Stop Work Order. Pursuant to Education Code Section 17307.5(b) and Education Code Section 81133.5, the Owner shall not be held liable in any action filed against the Owner for any delays caused by compliance with the Stop Work Order.

1.1.45 Subcontractor, as used herein, includes those having direct or indirect contracts with Contractor and ones who furnished labor, material or services for a special design according to Plans, Drawings, and Specifications of this Work.

1.1.46 Substantial Completion is not reached unless and until each of the following three (3) conditions have been met: (1) all contractually required items have been installed with the exception of only minor and Incomplete Punch Items (See Article 9.9.1.1); (2) All Fire/Life Safety Systems have been installed, and are working and signed off on the DSA Form 152 Inspection Card, all building systems including mechanical, electrical and

plumbing are all functioning; and (3) the Project is fit for occupancy and its intended use. For the purposes of this Contract, any references to Completion Date means Substantial Completion Date.

1.1.47 Substitution is a change in product, material, equipment, or method of construction from those required by the Construction Documents proposed by the Contractor. For this Project, a Substitution is subject to the filing of a Construction Substitution Request Form prior to the time of bid and meeting the requirements of Article 3.10.

1.1.48 Supplementary Conditions/ Supplementary General Conditions or Special Conditions are terms that are sometimes used interchangeably and refer to any additional requirements or changes to the General Conditions as noted. In this set of General Conditions, the term used shall be Supplementary Conditions. However, Specifications or other documents may reference Special Conditions, which shall mean the same and Supplementary Conditions.

1.1.49 Surety is the person, firm, or corporation that executes as a bid bond, payment bond or performance bond guarantor on the Contractor's Bid, Contractor's Performance on the Contract and Payment of the Contractor's Subcontractors, material suppliers, vendors and labor on the Project. The Surety is bound to the same extent as the Contractor is bound once a Default occurs. A default includes a Termination for Substantial Failure to Perform under Article 14, but also includes any breach of Contract and is subject to the requirements and responsibilities as set forth in the Performance Bond.

1.1.50 Work shall include all labor, materials, services and equipment necessary for the Contractor to fulfill all of its obligations pursuant to the Contract Documents. It shall include the initial obligation of any Contractor or Subcontractor who performs any portion of the Work, to visit the Site of the proposed Work (a continuing obligation after the commencement of the Work), to fully acquaint and familiarize itself with the conditions as they exist and the character of the operations to be carried out under the Contract Documents, and make such investigation as it may see fit so that it shall fully understand the facilities, physical conditions, and restrictions attending the Work under the Contract Documents. Each such Contractor and its Subcontractor shall also thoroughly examine and become familiar with the Drawings, Specifications, and associated Contract Documents and bid documents before preparing and submitting any bid.

1.1.51 Workers include laborers, workers, and mechanics.

1.2 EXECUTION, CORRELATION AND INTENT

1.2.1 Correlation and Intent

1.2.1.1 *Documents Complementary and Inclusive*. The Contract Documents are complementary and are intended to include all items required for the proper execution and completion of the Work. All Contract Documents form the Contractor's Contract with the Owner. Any item of Work mentioned in the Specifications and not shown on the Drawings, or shown on the Drawings and not mentioned in the Specifications, shall be provided by Contractor as if shown or mentioned in both. The Contractor is bound to provide the Work complete and is under a legal duty to carefully study plans and schedule operations well ahead of time and identify inconsistencies with the Plans and Specifications and call such inconsistencies to the attention of the Architect or Registered Engineer through the Inspector under Article 4-343(b) of Title 24.

1.2.1.2 *Work to be Complete*. Contractor has thoroughly studied the Contract Documents and understands that the Owner contracted with Contractor to provide a complete Project which means complete systems and buildings. Work includes, but is not limited to materials, workmanship, and manufacture of fabrication of components for the Project.

1.2.1.3 *Coverage of the Drawings and Specifications*. The Drawings and Specifications generally describe the Work to be performed by Contractor. Generally, the Specifications describe Work which cannot be readily indicated on the Drawings and indicate types, qualities, and methods of installation of the various materials and equipment required for the Work. It is not intended to mention every item of Work in the Specifications, which can be adequately shown on the Drawings, or to show on the Drawings all items of Work described or required by the Specifications even if they are of such nature that they could have been shown. All

materials or labor for Work, which is shown on either the Drawings or the Specifications (or is reasonably inferable therefrom as being necessary to complete the Work), shall be provided by the Contractor.

1.2.1.4 *Conflicts*. In the event there is a discrepancy between the various Contract Documents, it is intended that the more stringent, higher quality, and greater quantity of Work shall apply.

1.2.1.5 *Conformance with Laws*. Each and every provision of law required by law to be inserted in this Contract shall be deemed to be inserted herein, and the Contract shall be read and enforced as though it were included herein, even if through mistake or otherwise any such provision is not inserted, or is not correctly inserted.

Before commencing any portion of the Work, Contractor shall check and review the Drawings and Specifications for such portion for conformance and compliance with all laws, ordinances, codes, rules and regulations of all governmental authorities and public and municipal utilities affecting the construction. (See Title 24 Section 4-343)

The Contractor shall bear all expenses of correcting Work done contrary to said laws, ordinances, rules, and regulations if the Contractor performed same (1) without first consulting the Architect for further instructions regarding said Work or (2) disregarded the Architect's instructions regarding said Work.

1.2.1.6 *[Reserved]*

1.2.1.7 *Typical Parts and Sections.* Whenever typical parts or sections of the Work are completely detailed on the Drawings, and other parts or sections which are of the same construction are shown in outline only, the complete or more detailed shall apply to the Work which is shown in outline.

1.2.1.8 *Dimensions.* Dimensions of Work shall not be determined by scale or rule. Figured dimensions shall be followed at all times. If figured dimensions are lacking on Drawings, Architect shall supply them on request. The Architect's decisions on matters relating to aesthetic effect will be final.

1.2.2 Addenda and Deferred Approvals

1.2.2.1 *Addenda* are the changes in Specifications, Drawings, Contract Documents, and Plans which have been authorized in writing by the Owner or Architect, and which alter, explain, or clarify the Contract Documents. Addenda shall govern over all other Contract Documents. Subsequent addenda issued shall govern over prior addenda unless otherwise specified in the addenda.

1.2.2.2 *Deferred Approvals*. Deferred Approvals are Submittals that are reviewed by the Architect (or Engineer of Record) and submitted to DSA for approval based on thorough detailing of manufacturer and Project specific design. See Article 3.9.1 and 3.9.3. Contractor is responsible for all Deferred Approval requirements set forth in the Contract Documents. Contractor is responsible to comply with all laws, building codes, Title 24 and regulations necessary to obtain all necessary approvals, including those required from the Division of the State Architect ("DSA") and the State Fire Marshall. Contractor shall not be granted an extension of time for failure to plan, schedule for and obtain necessary approvals. Contractor shall Schedule all deferred approval items in the Baseline Schedule and Schedule Updates under Article 3.9.6

1.2.2.3 [Reserved]

1.2.3 Rules of Document Interpretation

1.2.3.1 If Contractor observes that Drawings and Specifications are in conflict, Contractor shall, prior to commencing work, notify the Architect in writing for the purposes of obtaining an interpretation of the Contact Documents.

1.2.3.2 In the case of conflict or inconsistencies, the order of precedence shall be as follows:

a. General Conditions take precedence over Drawings and Specifications.

b. Supplemental Conditions and Special Conditions take precedence over General Conditions.

c. The Agreement Form shall take precedence over the Supplemental Conditions and Special Conditions.

d. In the case of disagreement or conflict between or within Specifications, and Drawings, the more stringent, higher quality, and greater quantity of Work shall apply.

e. Addenda shall take precedence over Drawings and Specifications.

f. General Conditions shall take precedence over Addenda.

g. Drawings and Specifications take precedence over the Soils Report.

1.3 OWNERSHIP AND USE OF ARCHITECT'S DRAWINGS, SPECIFICATIONS AND OTHER DOCUMENTS

The Drawings, Specifications, and other Contract Documents for the Project are the property of the Owner and/or Architect pursuant Contract requirements between the Owner and Architect. Neither the Contractor nor any Subcontractor, or material or equipment supplier shall own or claim a Copyright in the Drawings, Specifications, and other documents prepared by the Architect and/or Owner.

1.4 INFORMATION AND SERVICES REQUIRED OF THE OWNER

1.4.1 Utilities

1.4.1.1 *Location of Point of Connection*. The locations shown for the point of connection are approximate. It shall be the responsibility of the Contractor to determine the exact location of all service connections.

1.4.1.2 *Regional Notification Center.* Contractor, except in an emergency, shall contact the appropriate regional notification center at least two (2) working days prior to commencing any excavation if the excavation will be conducted in an area or in a private easement which is known, or reasonably should be known, to contain subsurface installations other than the underground facilities owned or operated by the Owner, and obtain an inquiry identification number from that notification center. See Government Code Section 4216.3. No excavation shall be commenced and carried out by the Contractor unless such an inquiry identification number has been assigned to the Contractor or any subcontractor of the Contractor and the Owner has been given the identification number by the Contractor. Any damages arising from failure to make appropriate regional notification shall be at the sole risk of Contractor. Contractor shall solely be responsible for any fines, penalties or damages for violation of this Article and Government Code Section 4216.6 or 4216.7. Any delays caused by failure to make appropriate regional notification shall be at the sole risk of Contractor and shall not be considered for extension of time pursuant to Paragraph 8.4.

1.4.1.3 *Utilities - Removal and Restoration.* The Owner has endeavored to determine the existence of utilities at the Site of the Work from the records of the Owner of known utilities in the vicinity of the Work. The positions of these utilities as derived from such records are shown in the Contract Documents. Thus, the locations of the Main or Trunklines located on the Drawings are approximate locations and not exact.

No excavations were made to verify the locations shown for underground utilities.

Contractor shall coordinate its Work with all utilities, including, but not limited to electricity, water, gas and telephone and meet with said utilities prior to the start of any work. Contractor shall show timing of all utility coordination activities under the Scheduling requirements of Article 8.

ARTICLE 2
OWNER

2.1 [Reserved]

2.2 OWNER'S RIGHT TO CARRY OUT THE WORK DUE TO PARTIAL DEFAULT IN A SPECIFIC SEGREGATED AREA OF WORK (TWO (2) BUSINESS DAY NOTICE TO CURE AND CORRECT)

If the Contractor Defaults or neglects to carry out the Work in accordance with the Contract Documents, the Owner may provide a two (2) business day written notice to cure (a shorter period of time in the case of Emergency or a critical path delay as defined in Article 2.2.1) Contractor's Partial Default in a specific segregated area of work. The Owner's right to issue a Partial Default of the Contractor's Work and take over that segregated area of Work includes, but is not limited to:

1. Failure to supply adequate workers on the entire Project or any part thereof;
2. Failure to supply a sufficient quantity of materials;
3. Failure to perform any provision of this Contract;
4. Failure to comply with safety requirements, or due to Contractor is creation of an unsafe condition;
5. Cases of bona fide emergency;
6. Failure to order materials in a timely manner;
7. Failure to prepare deferred-approval items or Shop Drawings in a timely manner;
8. Failure to comply with Contractor's Baseline or Update Schedule, meet critical Milestones which would result in a Delay to the Critical Path, or Delay the Contract Time;
9. Failure to comply with the Subletting and Subcontracting Fair Practices, Public Contract Code section 4100, et seq.
10. Failure to meet the requirements of the American's with Disabilities Act;
11. Failure to complete Punch List work;
12. Failure to proceed on an Immediate Change Directive; and/or
13. Failure to correct a Notice of Deviation.

If during the two (2) business day period, the Contractor fails to Cure and correct the deficiency noted in the notice of Partial Default with diligence and promptness, the Owner may correct such deficiencies without prejudice to other remedies the Owner may have, including a Termination for Cause as set forth in Article 14. If there are inadequate funds remaining the Project balance or in the Retention Escrow to address at least 150% of the costs set forth in the Article 2.2 notice, the Owner may copy the Surety on the written notice of Partial Default. If a notice to the Surety is provided, except in the cases of Emergency or Critical Path Delay, the Surety has the option to take over and complete the Work described in the written notice if Surety personally delivers notice to Owner that it intends to perform such work. In the case where written notice has been provided, the Owner shall allow Surety seven (7) days to perform the Work.

2.2.1 Service of Notice of Partial Default with Right to Cure

A written notice of Partial Default and right to Cure under Article 2.2 ("Article 2.2 Notice" or "Notice of Partial Default") shall be served by facsimile (with a copy provided by e-mail to the e-mail address provided on the Bid submitted and copied to the Project Superintendent).

2.2.2 Shortened Time for Partial Default in the Case of Emergencies.

In an Emergency situation, the Owner may correct any of the deficiencies described in Article 2.2 without prejudice to other remedies by providing service of written notice of Emergency requiring a shortened time for Partial Default specifying the time given to Cure, if any.

2.2.3 Shortened Time for Partial Default in the Case of Critical Path Delay

In the case of critical path delay, the Owner may correct any of the deficiencies described in Article 2.2 without prejudice to other remedies providing service of written notice of Critical Path Delay to the Contractor with a specific description of the critical path delay items noting the line item or area of Work that is on the Critical Path and prescribe the length of shortened time to Cure, if any.

2.2.4 Written Notice of Partial Default to be Deducted by Deductive Change Order

The Owner shall have the right to determine the reasonable value of the Article 2.2 Partial Default Work, or if there is an actual value for the Work, shall use that value and issue a Deductive Change Orders under Article 7.7.4.

ARTICLE 3
THE CONTRACTOR

3.1 SUPERVISION AND CONSTRUCTION PROCEDURES

3.1.1 Contractor

The Contractor shall continually supervise and direct the Work using the Contractor's best skill and attention. The Contractor shall be solely responsible for and have control over construction means, methods, techniques, sequences, procedures; and shall coordinate all portions of the Work under the Contract, unless the Contract Documents give other specific instructions concerning these matters. The Contractor shall not perform the Work without utilizing the Contract Documents or, where required, approved Submittals, Shop Drawings, or Samples for any such portion of the Work. If any of the Work is performed by contractors retained directly by the Owner, Contractor shall be responsible for the coordination and sequencing of the work of those other contractors so as to avoid any impact on the Project Schedule pursuant to the requirements of Article 6 and Article 8. Specific duties of the Contractor shall include those set out in Section 43 of Title 21 of the California Code of Regulations and Section 4-343 of Title 24 of the California Code of Regulations. These duties include, but are not limited to the following:

1. *Responsibilities*. It is the duty of the Contractor to complete the Work covered by his or her Contract in accordance with the approved Plans and Specifications. The Contractor in no way is relieved of any responsibility by the activities of the Architect, Engineer, Inspector or DSA in the performance of their duties.

2. *Performance of the Work*. The Contractor shall carefully study the approved Plans and Specifications and shall plan its schedule of operations well ahead of time. If at any time it is discovered that work is being done which is not in accordance with the approved Plans and Specifications, the Contractor shall correct the Work immediately.

3.1.2 Contractor Responsibility to Study the Plans and Specifications

All inconsistencies or timing or sequences which appear to be in error in the Plans and Specifications shall promptly be called to the attention of the Architect or, Engineer, for interpretation or correction. Local conditions which may affect the structure shall be brought to the Architect's attention at once. In no case, shall the instruction of the Architect be construed to cause work to be done which is not in conformity with the approved Plans, Specifications, change orders, construction change documents, and as required by law. (See Title 24 Section 4-343)

3.1.3 All Work Under the Direction of Inspector

Pursuant to Title 24 requirements, the Contractor shall not carry on Work except with the knowledge of the Inspector. (See Title 24 generally)

3.1.4 Contractor to Establish Timing and Protocol with Inspector

Contractor shall establish a protocol for requesting inspection with Inspector so as to not delay the Work and provide adequate time for the Inspector to perform inspection. If such a protocol is not established ahead of time, Inspector may utilize the time criteria set by Title 24 of 48 hours in advance of submitting form DSA 156 for each new area. The DSA requirements under PR 13-01 specifically give the Special Inspector fourteen (14) days to post to the DSA website. Contractor is responsible for delays and for failure to plan.

For some Projects, there may be a need to incrementally install certain assemblies. It is up to Contractor to identify areas and assemblies that may be constructed incrementally. Contractor must identify and establish incremental areas of construction and establish protocols with Inspector for DSA 152 approvals so they may be presented to DSA. See PR-13 item 1.17 for further discussion.

3.1.5 Verified Reports

The Contractor shall make and submit to the office from time to time, verified reports as required in Title 24 Section 4-366. As part of the Close-Out of the Project (see Article 9.9), Contractor shall be required to execute a Form 6-C as required under Title 24 Sections 4-343.

Contractor shall fully comply with any and all reporting requirements of Education Code Sections 17315, et seq., in the manner prescribed by Title 24, as applicable.

3.1.6 Contractor Responsibility

The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors, material and equipment suppliers, and their agents, employees, invitees, and other persons performing portions of the Work under direct or indirect contract with the Contractor or any of its Subcontractors.

3.1.7 Obligations not Changed by Architect's Actions

The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect in the Architect's administration of the Contract or by tests, inspections, or approvals required or performed by persons other than the Contractor.

3.1.8 Acceptance/Approval of Work

The Contractor shall be responsible to determine when any completed portions of the Work already performed under this Contract or provided pursuant to Article 6 are suitable to receive subsequent Work thereon.

3.2 SUPERVISION

3.2.1 Supervision

Unless personally present on the Project site where the Work is being performed, the Contractor shall keep on the Work at all times during its progress a competent, English speaking construction Superintendent satisfactory to the Owner. The Superintendent shall represent the Contractor in its absence and shall be fully authorized to receive and fulfill any instruction from the Architect, the Inspector, the Owner or any other Owner representative (including CM in the cases where the Owner has a CM representative). All Requests for Information shall be originated by the Superintendent and responses thereto shall be given to the Superintendent. The Superintendent shall have authority to bind Contractor through the Superintendent's acts. The Superintendent shall represent the Contractor, and communications given to the Superintendent shall be binding on the Contractor. Before commencing the Work, Contractor shall give written notice to Owner (and CM representative) and Architect of the name and a Statement of Qualifications of such superintendent. If superintendent proves to be unsatisfactory to Contractor and ceases to be employed by Contractor, Contractor shall notify Owner and Architect in writing. A replacement superintendent must be approved by the Owner prior to performing additional work.

3.2.2 Staff

Notwithstanding other requirements of the Contract Documents, the Contractor and each Subcontractor shall: (1) furnish a competent and adequate staff as necessary for the proper administration, coordination, supervision, and superintendence of its portion of the Work; (2) organize the procurement of all materials and equipment so that the materials and equipment will be available at the time they are needed for the Work; and (3) keep an adequate force of skilled and fit workers on the job to complete the Work in accordance with all requirements of the Contract Documents.

3.2.3 Right to Remove

Owner shall have the right, but not the obligation, to require the removal from the Project of any superintendent, staff member, agent, or employee of any Contractor, Subcontractor, material or equipment supplier.

3.3 LABOR AND MATERIALS

3.3.1 Contractor to Provide

Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, material, equipment, tools, construction equipment and machinery, water, heat, air conditioning, utilities, transportation, and other facilities, services and permits necessary for proper execution and completion of the Work whether temporary or permanent and whether or not incorporated or to be incorporated in the Work.

3.3.2 Quality

Unless otherwise specified, all materials and equipment to be permanently installed in the Project shall be new and shall be of the highest quality or as specifically stated in the Contract Documents. The Contractor shall, if requested, furnish satisfactory evidence as to kind and quality of all materials and equipment within ten (10) days of a written request by the Owner, including furnishing the Owner with bona fide copies of invoices for materials or services provided on the Project. All labor shall be performed by workers skilled in their respective trades, and shall be of the same or higher quality as with the standards of other school construction.

3.3.3 Replacement

Any work, materials, or equipment, which do not conform to these requirements or the standards set forth in the Contract Documents, may be disapproved by the Owner, in which case, they shall be removed and replaced by the Contractor at no additional cost or extension of time to the Owner.

3.3.4 Discipline

The Contractor shall enforce strict discipline and good order among the Contractor's and Subcontractor's employees, and other persons carrying out the Contract. The Contractor shall not permit employment of unfit persons or persons not skilled in tasks assigned to them. As used in this subsection, "unfit" includes any person who the Owner concludes is improperly skilled for the task assigned to that person, who fails to comply with the requirements of this article, or who creates safety hazards which jeopardize other persons and/or property.

3.3.5 Fingerprinting (Applicable at the time Project is Occupied and on all Projects where Workers will come in Contact with Pupils, such as Modernization Projects)

If applicable, Contractor shall comply with the applicable provisions of Education Code Section 45125.1 in a method as determined by the Owner. Pursuant to Education Code section 45125.1, Contractor shall either conduct criminal background checks of all employees of Contractor assigned to the Project site, and shall certify that no employees who have been convicted of serious or violent felonies, as specified in Education Code Section 45125.1, will have contact with pupils, by utilizing the Certification Regarding Background Checks and the corresponding Attachment "A" as found in the Contract Documents or shall be separated by a physical barrier from students.

If it is determined that Contractor must provide certification of employees, as part of such certification, Contractor must provide the Owner with a list of all employees providing services pursuant to this Agreement, and designate which sites such employees will be assigned. In performing the services set forth in this Agreement, Contractor shall not utilize any employees who are not included on the above-referenced list.

At Owner's sole discretion, Owner may make a finding, as authorized under Education Code section 45125.1, that Contractor's employees will have only "limited contact" with pupils. Contractor's failure to comply with this law shall be considered a material breach of this Agreement upon where this Agreement may be terminated, at Owner's sole discretion, without any further compensation to Contractor.

In the case of new construction Projects where there are no students, if the Project Schedule provides for Beneficial Occupancy or portions of the Project or if the Project should be delayed, then Contractor, at no additional costs, shall meet the requirements of either fingerprinting or providing a physical barrier as required by the Owner.

3.3.6 Noise, Drugs, Tobacco, and Alcohol

Contractor shall take all steps necessary to insure that employees of Contractor or any of its subcontractors' employees do not use, consume, or work under the influence of any alcohol, tobacco or illegal drugs while on the project. Contractor shall further prevent any of its employees or its subcontractor employees from playing any recorded music devices or radios or wearing any radio headphone devices for entertainment while working on the project. Likewise, Contractor shall prevent its employees or subcontractor's employees from bringing any animal onto the project. Contractors shall not violate any written school policies.

3.3.7 Delivery of Material

Contractor shall place orders for materials or equipment so that the Work may be completed in accordance with the Construction schedule for the Work as set forth in Article 8 of this Agreement. Contractor shall, upon demand from the Architect, furnish to the Architect documentary evidence including, but not limited to purchase orders, invoices, bills of materials, work orders and bills of lading, showing that orders have been placed. Contractor shall have a system to receive materials and to ensure that the proper materials are being delivered, including in the case of critical materials to the Project, checking the delivery against Shop Drawings and ensuring that the materials meet the requirements of not only the Plans and Specifications, but also the approved Shop Drawings and Submittals and in conformance with Contractor's plan for delivery of materials (including but not limited to Contractor's representations in the Schedules for the Project and Contractor's equipment and materials schedule under Article 3.7.2.2). Contractor shall be responsible for all costs of accepting non-conforming materials delivered to the Project given Contractor's responsibilities and system for acceptance of deliveries. Contractor shall notify Inspector and Owner Representative (including CM) as early as possible, in writing, of the delivery of materials for the Project. The deliveries shall include documentation identifying the shipment sufficiently so that the Inspector, Architect or Owner Representative (including CM) may review the materials that are received.

Under no circumstances shall materials be delivered to the Project site that are meant for another Project.

3.3.8 Liens and Other Security Interests of Subcontractors and Material Suppliers

No material, supplies, or equipment for the Work shall be purchased subject to any chattel mortgage or under a conditional sale or other agreement by which an interest therein or in any part thereof is retained by seller or supplier. Contractor warrants good title to all material, supplies, and equipment installed or incorporated in Work and agrees upon completion of all Work to deliver premises, together with all improvements and appurtenances constructed or placed thereon by it, to Owner free from any claims, security interests, liens, or charges. Contractor further agrees that neither it nor any person, firm, or corporation furnishing any materials or labor for any Work covered by this Contract shall have any right to place a lien upon the premises or any improvement or appurtenance thereof, except that Contractor may install metering devices or other equipment of a utility company or political subdivision, title to which is commonly retained by the utility company or political subdivision. In event of installation of any such metering device or equipment, Contractor shall advise Owner as to its owner within five (5) days of such installation in writing, prior to making the installation.

Contractor agrees to indemnify, defend and hold the Owner harmless from any liens, stop notices, or assertion of security interests, including judgments and levies. If after written notice Contractor fails to address the lien, stop notice, or other security interest, the Owner may proceed to address the lien, stop notice or claim and seek reimbursement from Contractor.

3.3.8.1 *Stop Notice Releases*. All Stop Notice Releases shall be notarized and either executed by the same person who filed the Stop Notice or from an officer of the Trade Contractor or manager of Trade Contractor authorized to release Stop Notices.

3.3.9 Title to Materials

The title to new materials or equipment for the Work of this Contract shall remain with Contractor until incorporated in the Work of this Contract until Final Acceptance of the Project; no part of said materials shall be removed from its place of storage, and Contractor shall keep an accurate inventory of all said materials and equipment in a manner satisfactory to the Owner or its authorized representative. Responsibility for materials

remains with Contractor and Contractor shall replace materials in case of loss. Owner similarly may pay for materials stored off site, but Contractor shall remain responsible for the materials that are stored off site.

3.3.10 [Reserved]

3.3.11 Noise Control

The Contractor shall be responsible for the installation of noise reducing devices on construction equipment. Contractor shall comply with the requirements of the city and county having jurisdiction with regard to noise ordinances governing construction sites and activities. If school is in session at any point during the progress of the Project, and, in the Owner's reasonable discretion, the noise from such Work disrupts or disturbs the students or faculty or the normal operation of the school, at the Owner's request, the Contractor shall schedule the performance of all such Work around normal school hours or make other arrangements so that the Work does not cause such disruption or disturbance. There are specific periods of testing at operational schools and it is critical that Contractor control noise during periods of testing. In no event shall Contractor have a right to receive additional compensation or an extension to the Contract time as a result of any such rescheduling or the making of such arrangements. These controls shall be implemented during site preparation and construction. All noise related issues, including school operations, and noise during testing should be detailed in the Schedule provided pursuant to Article 8

3.4 WARRANTY

The Contractor warrants to the Owner and Architect that material and equipment furnished under the Contract will be of the highest quality and new unless otherwise required or permitted by the Contract Documents, that the Work will be free from defects not inherent in the quality required or permitted, and that the Work will conform with the requirements of the Contract Documents. Work not conforming to these requirements, including substitutions not properly approved and authorized, may be considered defective. Contractor's warranty to Owner includes, but is not limited to, the following representations:

1. In addition to any other warranties provided elsewhere, Contractor shall, and hereby does, warrant all Work after the date of Notice of Completion of Work by Owner and shall repair or replace any or all such Work, together with any other Work, which may be displaced in so doing that may prove defective in workmanship or materials within a two (2) year period from date of Final Completion which shall be no later than the final date of Punch List as noted at Article 9.11) without expense whatsoever to Owner, ordinary wear and tear, unusual abuse or neglect excepted. Owner will give notice of observed defects with reasonable promptness. Contractor shall notify Owner upon completion of repairs.

2. The guarantee period for corrected defective work shall continue for a duration equivalent to the original guarantee period.

3. In the event of failure of Contractor to comply with above mentioned conditions within one week after being notified in writing, Owner is hereby authorized to proceed to have defects repaired and made good at expense of Contractor who hereby agrees to pay costs and charges therefore immediately on demand.

4. This Article does not in any way limit the guarantee on any items for which a longer warranty is specified or on any items for which a manufacturer gives a guarantee for a longer period. Contractor shall furnish Owner all appropriate guarantee or warranty certificates upon completion of the project.

3.5 TAXES

Contractor will pay all applicable Federal, State, and local taxes on all materials, labor, or services furnished by it, and all taxes arising out of its operations under the Contract Documents. Owner is exempt from Federal Excise Tax, and a Certificate of Exemption shall be provided upon request.

3.6 PERMITS, FEES AND NOTICES

3.6.1 Payment

The Contractor shall secure and pay for all permits and governmental fees, licenses, and inspections necessary for proper execution and completion of the Work which are necessary after execution of the Contract and are legally required by any authority having jurisdiction over the Project, except those required by the Division of the State Architect (DSA). Owner shall be responsible for all testing and inspection as required by the DSA on-site or within the distance limitations set forth in Paragraph 13.5.2, unless a different mileage range is specified in the Supplemental Conditions.

3.6.1.1 *DSA Fees*. DSA policy is to charge CCD review fees for processing and approval of changes in the Plans and Specifications through the Construction Change Document process. Contractor is specifically directed to the current DSA IR A-30 which provides fee structure and charges that will be incurred for proceeding is with respect to the CCD process, a process that must be followed for each change in the Plans and Specifications.

3.6.2 Compliance

The Contractor shall comply with and give notices required by any law, ordinance, rule, regulation, and lawful order of public authorities bearing on performance of the Work. Specifically, the Division of State Architect provides State oversight of the Project and enforcement of Title 24 rules and regulations. Contractor is directed to the DSA website at http://www/dgs/ca/gov/dsa/home. There will be local governmental oversight from City, County or both. Finally, Regional Water Quality Control Board, State Fire Marshall, local fire marshal, Department of Industrial Relations, Department of Labor Standards Enforcement, and Air Quality Management Owner (Local and State) are some of the agencies that provide oversight and may require specific permits, fees, or provide oversight over the Project. Contractor represents understanding and specialized knowledge of the rules governing Owners and Contractor shall maintain compliance over the applicable rules and will file all documents required in order to ensure compliance with State, local, and other rules that apply to the Project.

3.7 SUBMITTALS REQUIRED AT THE COMMENCEMENT OF THE PROJECT

3.7.1 Requirements Within Ten (10) Calendar Days

Within ten (10) calendar days after Notice to Proceed, Contract shall submit the following:

3.7.1.1 Detailed Schedule of Values (See Article 9.2)

3.7.1.2 Submittal Listing and Schedule for Submittals

3.7.1.3 Preliminary Project Schedule (See Article 8)

3.7.1.4 Critical Path Product Submittals

3.7.2 Requirements Within Forty-Five (45) Calendar Days

Unless otherwise shortened by the Special Provisions or Contract Documents, within forty-five (45) calendar days after Notice to Proceed, Contractor shall submit the following:

3.7.2.1 Baseline Project Schedule (See Article 8)

3.7.2.2 All Submittals for the Project except those specifically agreed upon by Owner and Architect, in writing, and shall be specifically incorporated into the Submittal section of the Schedule so as to not delay the Work. The agreement to allow a later Submittal does not mean that Article 3.3.7 is waived.

3.8 DOCUMENTS, SAMPLES, AND COMPUTER AT THE SITE

The Contractor shall maintain at the Site for the Owner one current copy of the California Building Code, Titles 19 and 24 of the California Code of Regulations, any other document required by DSA, and one record copy of the Drawings, Specifications, Addenda, Change Orders, and other Modifications, in good order and marked currently to record changes and selections made during construction. In addition, the Contractor shall maintain at the Site approved Shop Drawings, Product Data, Samples, and similar required Submittals. These documents shall be available to the Architect and shall be delivered to the Architect for delivery to the Owner upon completion of the Work.

Contractor shall have an operational computer with internet access so Contractor can review and post documents as required for the Project, including but not limited to the filing and posting of DSA required documents for the Project.

Contractor shall be prepared to post and review documents posted to the DSA Project website.

3.9 SUBMITTALS INCLUDING SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES

3.9.1 Definitions

3.9.1.1 *Deferred Approvals*. Approval of certain aspects of the construction may be deferred until the construction Contract has been awarded. To facilitate the design process, DSA grants deferred approval to the design and detailing of certain elements of the Project at the request of the Architect or Engineer of Record. Design elements that may be deferred may include, but are not limited to Access floors, Bleachers, Elevator guide rails and related elevator systems, Exterior wall systems - precast concrete, glass fiber reinforced concrete, etc. , Skylights, Window wall systems, storefronts, Stage rigging, and other systems as noted in the Contract Documents. (Also see Article 1.2.2 and 3.9.3)

3.9.1.2 *Shop Drawings.* The term “Shop Drawings” as used herein means drawings, diagrams, equipment or product schedules, and other data, which are prepared by Contractor, Subcontractors, manufacturers, suppliers, or distributors illustrating some portion of the Work, and includes: illustrations; fabrication, erection, layout and setting drawings; manufacturer’s standard drawings; schedules; descriptive literature, instructions, catalogs, and brochures; performance and test data including charts; wiring and control diagrams; and all other drawings and descriptive data pertaining to materials, equipment, piping, duct and conduit systems, and methods of construction as may be required to show that the materials, equipment, or systems and their position conform to the requirements of the Contract Documents.

3.9.1.3 *Manufactured* applies to standard units usually mass-produced, and “Fabricated” means items specifically assembled or made out of selected materials to meet individual design requirements. Shop Drawings shall: establish the actual detail of all manufactured or fabricated items, indicate proper relation to adjoining work, amplify design details of mechanical and electrical systems and equipment in proper relation to physical spaces in the structure, and incorporate minor changes of design or construction to suit actual conditions.

3.9.1.4 *Submittals* is a term used interchangeably and sometimes refers to Shop Drawings, Product Data, and Samples since all subcontractor submissions are tracked in a Submittal Log and may include any of the noted items. However, generally, a Submittal is a manufacturer's product information and product data including description, characteristics, size, physical characteristics, and requirements to prepare the jobsite for receiving of the particular manufactured item.

3.9.1.5 *Samples*. The term “samples” as used herein are physical examples furnished by Contractor to illustrate materials, equipment, or quality and includes natural materials, fabricated items, equipment, devices, appliances, or parts thereof as called for in the Specifications, and any other samples as may be required by the Architect to determine whether the kind, quality, construction, finish, color, and other characteristics of the materials, etc., proposed by the Contractor conform to the required characteristics of the various parts of the Work. All Work shall be in accordance with the approved samples.

3.9.2 Shop Drawings.

3.9.2.1 *When Shop Drawings Are Required.* Shop Drawings are required for prefabricated components and for installation and coordination of these prefabricated components into the Project. In addition, Shop Drawings, are prepared to address the actual size and installation of components from various subcontractors and provides an opportunity for the Contractor to coordinate and address conflicts between the subcontracting trades.

3.9.2.2 *Shop Drawing Requirements.* The Contractor shall obtain and submit with Shop Drawings all seismic and other calculations and all product data from equipment manufacturers. "Product data" as used herein are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate a material, product, or system for some portion of the Work.

3.9.2.3 *Not a Reproduction of Architectural or Engineering Drawings.* The Shop Drawings are not a reproduction of the architectural or engineering drawings. Instead, they must show more detail than the Construction Documents and details the fabrication and/or installation of the items to the manufacturer's production crew or Contractor's installation crews.

3.9.2.4 *Shop Drawings Engineering Requirements*: Some Shop Drawings require an engineer stamp to be affixed on the Drawings and calculations. In such cases, a current and valid engineering stamp shall be affixed by a California registered engineer. No out of State engineers shall stamp Shop Drawings. (See DSA IR A-18). In most cases, an engineer means California registered mechanical, structural, electrical or plumbing engineer. California Registered Civil Engineers will not be accepted for structural details unless specifically approved by DSA.

3.9.3 Deferred Approvals

Deferred approvals shall be submitted and processed to ensure all DSA and other governmental approvals are secured so as to not delay the Project. There may be additional requirements for deferred approvals at Division 1 of the Specifications. All deferred approvals shall be prepared by Contractor or Contractor's agent early enough so as to not delay the Project. Contractor is aware that Title 24 California Code of Regulations Section 4-317 have specific requirements for deferred approval as to governing agencies and as to the Architect and Engineer for the Project. As a result, any delay associated with the time for approval by applicable agencies or by the Architect or Architect's consultants shall be Contractor's. Contractor is required to comply with inclusion of Deferred Approvals in the Schedule as required under Article 3.9.6

3.9.3.1 *DSA Approvals Required Prior to Work.* No work on a deferred approval item may proceed on the components until DSA approval is received. Contractor has provided DSA approval time and allowed adequate time for any DSA revisions in Contractor's Schedule as required pursuant to Article 8.

3.9.4 Submittals and Samples

3.9.4.1 *Information Required With Submittals*: Manufacturer, trade name, model or type number and quantities: Information provided must be of sufficient detail to allow Architect and Engineer to compare the submitted item with the specified products and acceptable products listed, in the Specifications and addenda.

3.9.4.2 *Finish Characteristics:* The Architect reviews the available finishes and selects the appropriate finish, if the finish was not previously specified in the documents. The Contractor should confirm that finish requirements in the Specification are being met by the product.

3.9.4.3 *Contractor Responsible for Jobsite Dimensions*: Some material is custom-fabricated to job conditions, requiring dimensions from the jobsite. These jobsite dimensions are provided by the Contractor as part of the Contractor's responsibilities for the Project and shall be provided prior to release of the product for manufacture. Contractor shall not rely on Architect or Engineers to provide jobsite dimensions.

3.9.5 Submittal Submission Procedure

3.9.5.1 *Transmittal Letter and Other Requirements.* All Submittals must be properly identified with the name of the Project and dated, and each lot submitted must be accompanied by a letter of transmittal referring to the name of the Project and to the Specification section number for identification of each item clearly stating in narrative form, as well as "clouding" on the submissions, all qualifications, departures, or deviations from the Contract Documents. Shop Drawings, for each section of the Work shall be numbered consecutively and the numbering system shall be retained throughout all revisions. All Subcontractor submissions shall be made through the Contractor. Each drawing shall have a clear space for the stamps of Architect and Contractor.

3.9.5.2 *Copies Required.* Each Submittal shall include one (1) legible, reproducible (if electronic is available, electronic copies shall also be provided) and five (5) legible prints of each drawing or schedule, table, cut sheet, etc., including fabrication, erection, layout and setting drawings, and such other drawings as required under the various sections of the Specifications, until final acceptance thereof is obtained. Subcontractor shall submit copies, in an amount as requested by the Contractor, of: (1) manufacturers' descriptive data for materials, equipment, and fixtures, including catalog sheets showing dimensions, performance, characteristics, and capacities; (2) wiring diagrams and controls; (3) schedules; (4) all seismic calculations and other calculations; and (5) other pertinent information as required by the Owner or Architect. See also Division 1.

3.9.5.3 *Corrections.* The Contractor shall make all corrections required by Architect, Owner or CM and shall resubmit, as required by Architect or CM, corrected copies of Shop Drawings or new samples until approved. Contractor shall direct specific attention in writing or on resubmitted Shop Drawings to revisions other than the corrections required by the Architect on previous submissions. Professional services required for more than one (1) re-review of required Submittals of Shop Drawings, product data, or samples are subject to charge to the Contractor pursuant to Paragraph 4.5.

3.9.5.4 *Approval Prior to Commencement of Work*. No portion of the Work requiring a Shop Drawing or sample submission or other Submittal shall be commenced until the submission has been reviewed by Contractor and Architect (and CM, if applicable) and approved by Architect (and CM where applicable) unless specifically directed in writing by the Architect. All such portions of the Work shall be in accordance with approved Shop Drawings and samples.

3.9.5.5 *Owner's Property.* All Submittals, Shop Drawings, computer disks, BIM modeling information, clash checks, schedules, annotated Specifications, samples and other Submittals shall become the Owner's property upon receipt by the Owner or Architect.

3.9.6 Schedule Requirements for Submittals

Contractor shall obtain and shall submit all required Submittals (i.e. Shop Drawings, Deferred Approvals, Samples, etc.), in accordance with Contractor's "Schedule for Submission of Shop Drawings and Samples" as required in the scheduling portion of the General Conditions at Articles 8 and the Specifications with such promptness as to cause no delay in its own Work or in that of any other contractor or subcontractor.

3.9.6.1 *Consideration of Schedule.* Contractor has considered lead times, DSA or other agency governmental review times, Architect or Engineer review times, manufacturing seasons, and specific long lead procurement concerns for all submittals for the Project.

3.9.7 General Submittal Requirements

3.9.7.1 *Contractor Submittal Representations.* By submitting Shop Drawings, product data, samples, etc., the Contractor represents that it has determined and verified all materials, field measurements, catalog numbers, related field construction criteria, and other relevant data in connection with each such submission, and that it has checked, verified, and coordinated the information contained within such Submittals with the requirements of the Work and of the Contract Documents, including the construction schedule.

3.9.7.2 *[Reserved].*

3.9.7.3 *No Deviation from Contract Documents.* The submission of the Shop Drawings, product data, samples, etc., shall not deviate from the *requirem*ents of the Contract Documents including detailing and design intent which is specifically outlined in Contract Documents except as specifically authorized by the Architect or through an accepted substitution pursuant to Paragraph 3.10.4. All deviations from the Contract Documents shall be narratively described in a transmittal accompanying the Shop Drawings. However, Shop Drawings shall not be used as a means of requesting a substitution, the procedure for which is defined in Paragraph 3.10.4, "Substitutions."

3.9.7.4 *[Reserved]*

3.9.7.5 *Incomplete Submittals.* Any submission, which in Architect's opinion is incomplete, contains errors, or has been checked superficially will be returned unreviewed by the Architect for resubmission by the Contractor.

3.9.7.6 *[Reserved]*

3.9.7.7 Extent of Review. In reviewing Shop Drawings, the Architect will not verify dimensions and field conditions. The Architect will review and approve Shop Drawings, product data, samples, etc., for aesthetics and for conformance with the design concept of the Work and the information in the Contract Documents. The Architect's review shall neither be construed as a complete check which relieves the Contractor, Subcontractor, manufacturer, fabricator, or supplier from responsibility for any deficiency that may exist or from any departures or deviations from the requirements of the Contract Documents unless the Contractor has, in writing, called the Architect's attention to the deviations at the time of submission. The Architect's review shall not relieve the Contractor or Subcontractors from responsibility for errors of any sort in Shop Drawings or schedules, for proper fitting of the Work, coordination of the differing subcontractor trades and Shop Drawings and Work which is not indicated on the Shop Drawings at the time of submission of Shop Drawings. Contractor and Subcontractors shall be solely responsible for any quantities which may be shown on the Submittals or Contract Documents.

3.10 SUBSTITUTIONS

3.10.1 Definition

A Substitution is a change in product, material, equipment, or method of construction from those required by the Construction Documents proposed by the Contractor. For this Project, a Substitution is subject to the filing of a Construction Substitution Request Form prior to the time of bid and meeting the requirements of this Article.

3.10.2 One Product Specified

Unless the Specifications state that no substitution is permitted, whenever the Contract Documents indicate any specific article, device, equipment, product, material, fixture, patented process, form, method, or type of construction or any specific name, make, trade name, or catalog number, with or without the words "or equal," such specification shall be deemed to be used for the purpose of facilitating description of the material, process, or article desired and shall be deemed to be followed by the words "or equal." Subject to the requirements of properly submitting a Substitution Request for as Addressed in Special Conditions, the Contractor may, unless otherwise stated, offer any material, process, article, etc., which shall be materially equal or better in every respect to that so indicated or specified ("Specified Item") and will completely accomplish the purpose of the Contract Documents.

3.10.3 Products Specified Which Are Commercially Unavailable

If the Contractor fails to make a request for substitutions for products, prior to the submission of its bid, and such products subsequently become commercially unavailable, the Contractor may request a substitution for such commercially unavailable item. The decision to grant this request is solely at the Owner's discretion. The written approval of the Owner, consistent with the procedure for Change Orders, shall be required for the use of a proposed substitute material. The Owner may condition its approval of the substitution upon the delivery to Owner of an extended warranty or other assurances of adequate performance of the substitution as well as an equitable deduction in the Contract price should the substituted item cost less than the Specified Item. All risks of delay due the approval of a requested substitution by the DSA, or any other governmental agency having jurisdiction, shall be

on the requesting party. All additional costs, DSA review costs, all procurement and construction delays, and all costs for review by the Architect or its consultants shall be the responsibility of the Contractor and will be deducted from Contractor's pay request.

3.11 INTEGRATION OF WORK

3.11.1 Scope

The Contractor shall be responsible for cutting, fitting, or patching to complete the Work and to make all parts fit together properly. Contractor shall be responsible for ensuring that all trades are coordinated and scheduled so as to ensure the timely and proper execution of the work. When modifying existing work or installing new Work adjacent to existing work, Contractor shall match, as closely as conditions of Site and materials will allow, the finishes, textures, and colors of the original work, refinishing existing work at no additional cost to Owner. All cost caused by defective or ill-timed work shall be borne by Contractor. Contractor shall be solely responsible for protecting existing work on adjacent properties and shall obtain all required permits for shoring and excavations near property lines.

3.12 CLEANING UP

3.12.1 Contractor's Responsibility to Clean Up

Contractor at all times shall keep premises free from debris such as waste, dust, excess water, storm water runoffs, rubbish, and excess materials and equipment. Contractor shall not leave debris under, in, or about the premises, but shall promptly remove same from the premises and dispose of it in a lawful manner. Disposal receipts or dump tickets shall be furnished to the Architect within five (5) days of request.

Contractor shall remove rubbish and debris resulting from the Work on a daily basis. Contractor shall maintain the structures and Site in a clean and orderly condition at all times until acceptance of the project by the Owner. Contractor shall keep its access driveways and adjacent streets, sidewalks, gutters and drains free of rubbish, debris and excess water by cleaning and removal each day. All concrete, sidewalks, and paths of travel shall be broom cleaned daily.

3.12.2 General Final Clean-Up

Upon completion of Work, Contractor shall employ experience workers or professional cleaners for final cleaning. Clean each surface to the condition expected in a normal, commercial, building cleaning and maintenance program.

a. Clean interior and exterior of buildings, including fixtures, equipment, walls, floors, ceilings, roofs, window sills and ledges, horizontal projections, and any areas where debris has collected, so surfaces are free from foreign material or discoloration;

b. Clean the Project site. The grounds should be cleared of any Contractor equipment, raked clean of debris and trash removed. Sweep paved areas broom clean;

c. Repair or replace any damaged materials. Replace any chipped or broken glass;

d. Remove any and all stains;

e. Remove labels that aren't permanent labels;

f. Clean and polish all glass, plumbing fixtures, equipment, finish hardware and similar finish surfaces. Remove any glazing compounds;

g. Remove temporary utilities, fencing, barricades, planking, sanitary facilities and similar temporary facilities from Site;

h. Remove temporary film that remains on any hardware, doors or other surfaces and

i. Seal the bottom and tops of all doors.

3.12.3 Special Clean-Up.

In addition to the general cleaning, the following special cleaning shall be done at the completion of the Work in accordance with the Specifications including, but not limited to:

a. Remove putty stains from glazing, then wash and polish glazing;

b. Remove marks, stains, fingerprints and other soil or dirt from painted, stained or decorated work;

c. Remove temporary protection and clean and polish floors and waxed surfaces;

d. Clean and polish hardware and plumbing trim; remove stains, dust, dirt, plaster and paint;

e. Wipe surfaces of mechanical and electrical equipment;

f. Remove spots, soil, plaster and paint from tile work, and wash tile;

g. Clean all fixtures and equipment, remove excess lubrication, clean light fixtures and lamps, polish metal surfaces;

h. Vacuum-clean carpeted surfaces; and

i. Remove debris from roofs, down spout and drainage system.

3.12.4 Failure to Cleanup

If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so, and the cost thereof shall be the responsibility of the Contractor pursuant to Article 2.2 and seek a Deductive Change Order.

3.13 ACCESS TO WORK

The Contractor shall provide the Owner, the Architect, Engineers and the Inspector of Record, access to the Work in preparation and progress wherever located. Contractor shall provide safe and proper facilities for such access so that Owner's representatives may perform their functions.

3.14 ROYALTIES AND PATENTS

3.14.1 Payment and Indemnity for Infringement

Contractor shall hold and save the Owner and its officers, agents, and employees, the Construction Manager, the Architect, and the Architect's consultants harmless from liability of any nature or kind, including cost and expense, for or on account of any patented or unpatented invention, process, article, or appliance manufactured or used in the performance of the Contract, including its use by the Owner, unless otherwise specifically provided in the Contract Documents, and unless such liability arises from the sole negligence, or active negligence, or willful misconduct of the Owner, the Architect, or the Architect's consultants.

3.15 [Reserved]

3.16 [Reserved]

3.17 AS-BUILT DRAWINGS AND ANNOTATED SPECIFICATIONS

Throughout the duration of the Project, Contractor shall maintain on a current basis an accurate and complete set of As-Built Drawings (and Annotated Specifications) clearly showing all changes, revisions to

Specifications and substitutions during construction, including, without limitation, field changes and the final location of all electrical and mechanical equipment, utility lines, ducts, outlets, structural members, walls, partitions, and other significant features. In case a Specification allows Contractor to elect one of several brands, makes, or types of material or equipment, the annotations shall show which of the allowable items the Contractor has furnished. The Contractor will update the As-Built Drawings and Annotated Specifications as often as necessary to keep them current, but no less often than weekly.

Contractor shall update As-Built Drawings with complete information on an area of Work at or near the time when the Work is being performed and prior to any DSA 152 sign off and prior to any Work being covered.

The As Built Drawings and Annotated Specifications shall be kept at the Site and available for review and inspection by the Owner and the Architect. Failure to maintain and update the As Built Drawings is a basis to withhold Progress Payments pursuant to Article 9.6.

3.17.1 Upon Beneficial Occupancy

Contractor shall obtain and pay for reproducible Plans upon Beneficial Occupancy. Contractor shall deliver Plans to Owner Representative (Construction Manager if one is hired for the Project).

3.17.2 As-Builts at Completion of Work

On completion of the Work and prior to and as a condition precedent to Application for Retention Payment, the Contractor will provide one neatly prepared and complete set of As-Built Drawings and Annotated Specifications to the Owner. Contractor shall certify the As-Builts as a complete and accurate reflection of the actual construction conditions of the Work by affixing a Stamp indicating the Drawings are As-Builts and Certifying Accuracy on the final set of As-Builts. Failure to deliver a complete Record Set of Drawings may result in significant withholdings to ensure Work is properly documented. See Article 9.9.1.

3.18 EQUIPMENT MANUALS

Contractor shall obtain and furnish three (3) complete sets of manuals containing the manufacturers' instructions for maintenance and operation of each item of equipment and apparatus furnished under the Contract Documents and any additional data specifically requested under the various sections of the Specifications for each division of the Work. The manuals shall be arranged in logical, sequential order, labeled, indexed, and placed in three-ring binders. At the completion of its Work, the Contractor shall certify, by endorsement thereon, that each of the manuals is complete, accurate, and covers all of its Work.

Prior to submittal of Contractor's Application for Retention Payment, and as a further condition to its approval by the Architect, each Subcontractor shall deliver the manuals, arranged in logical, sequential order, labeled, indexed, endorsed, and placed in three-ring binders, to the Contractor, who shall assemble these manuals for all divisions of the Work, review them for completeness, and submit them to the Owner through the Architect.

3.19 DIR REGISTRATION

Strict compliance with all DIR registration requirements in accordance with Labor Code sections 1725.5 and 1771.1 is a material obligation of the Contractor and all of its subcontractors (of any tier) under the Contract Documents. The foregoing includes, without limitation, compliance with DIR registration requirements at all times during performance of the Work by the Contractor and all of its subcontractors of any tier. The failure of the Contractor and all subcontractors of any tier to be properly registered with DIR at all times during performance of the Work is a material breach of the Contract and subject to termination for cause.

An affirmative and ongoing obligation of the Contractor under the Contract Documents is the verification that all subcontractors of any tier are at all times during performance of the Work are in full and strict compliance with the DIR registration requirements. The Contractor shall not permit or allow any subcontractor of any tier to perform any Work without the Contractor's verification that all subcontractors are in full and strict compliance with the DIR registration requirements. Any subcontractors of any tier not properly registered with DIR shall be substituted in accordance with Labor Code section 1771.1. Contractor or its subcontractors of any tier shall not be

entitled to any additional costs or time arising from or in any way related to compliance with the DIR registration requirements.

ARTICLE 4
ADMINISTRATION OF THE CONTRACT AND CLAIMS

4.1 ARCHITECT

4.1.1 Replacement of Architect

In the case of the termination of the Architect, the Owner may appoint an Architect or another construction professional or may perform such functions with its own licensed professional personnel. The status of the replacement Architect under the Contract Documents shall be the same as that of the former Architect.

4.2 ARCHITECT'S ADMINISTRATION OF THE CONTRACT

4.2.1 Status

Pursuant to Titles 2 of the California Code of Regulations and as required pursuant to the Field Act, Education Code 17280 et. seq., the Architect will provide administration of the Contract Documents and the Work, and will be the Owner's representative during construction, as well as during the one (1) year period following the commencement of any warranties. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

4.2.2 Site Visits

The Architect will visit the Site at intervals necessary in the judgment of the Architect to become generally familiar with the progress and quality of the Work and to determine in general if the Work is being performed in accordance with the Contract Documents and as otherwise required by DSA.

4.2.3 Limitations of Construction Responsibility

The Architect, Owner and CM shall not have control over, charge of, or be responsible for construction means, methods, techniques, schedules, sequences or procedures, fabrication, procurement, shipment, delivery, receipt, installation, or for safety precautions and programs in connection with the Work, since these are solely the Contractor's responsibility under the Contract Documents. The Architect, Owner and CM shall not have control over or charge of acts or omissions of the Contractor, Subcontractors, their agents or employees, or any other persons or entities performing or supplying portions of the Work. The Contractor shall not be relieved of obligations to perform the Work in accordance with the Contract Documents either by activities or duties of the Architect, Owner or CM in the Architect, Owner or CM's administration of the Contract Documents, or by tests, inspections, or approvals required or performed by persons other than the Contractor.

4.2.4 Communications Facilitating Contract Administration

Except where a CM is on the Project, or as otherwise provided in the Contract Documents or when direct communications are warranted by special circumstances, the Owner and the Contractor shall communicate through the Architect. In the cases where a CM is hired for the Project, all communication shall be through the CM (unless otherwise directed) with copies to the Owner, Architect and Inspector. Where direct communication is necessary between the Owner and the Contractor, the Owner's communication shall be through the Owner's authorized designated person. Contractor shall not rely upon any communications from the Owner that is not from the Owner's authorized designee. Communications by and with the Architect's consultants shall be through the Architect. Copies of all communication shall be sent to the Architect, Owner Representative and Inspector.

4.2.5 Payment Applications

The Architect will review and make recommendations to the Owner regarding the amounts due the Contractor on the Certificates for Payment pursuant to Article 9.3.4 and subject to the Inspector's review, (CM review, if applicable) and Architect's observation. This review of Payment Applications is sometimes called a "Pencil Draft." Return of a Pencil Draft shall constitute the Owner's dispute of the Pay Application that has been submitted. Contractor shall promptly respond to Pencil Drafts or Contractor's Pay Applications may be delayed. Contractor's

failure to promptly respond to a Pencil Draft shall qualify as a delay in the Prompt Payment of a Request for Payment or Request for Retention.

4.2.6 Rejection of Work

In addition to the rights, duties, and obligations of the Inspector under this Article, the Architect may recommend to the Owner that the Owner reject Work which does not conform to the Contract Documents. Contractor shall, without charge, replace or correct Work found by the Owner to not be in conformance to Contract requirements. Contractor shall promptly segregate and remove rejected materials from the Project site.

This section does not address a Notice of Non-Compliance and the remedies associated with a Notice of Non-Compliance which are addressed at Article 7.1.2.

4.3 PROJECT INSPECTOR

4.3.1 General

One or more project inspectors employed by the Owner and approved by the Division of the State Architect will be assigned to the Work in accordance with the requirements of Title 24 of the California Code of Regulations. The Inspector(s) duties are as specifically defined in Title 24 Section 4-333 and 4-342 and in DSA IR A-8.

4.3.2 Inspector's Duties and DSA Noted Timelines for Inspection

All Work shall be under the observation of the Inspector. The Inspector shall have free access to any or all parts of the Work at any time. The Contractor shall furnish the Inspector such information as may be necessary to keep the Inspector fully informed regarding progress and manner of Work and character of materials. Such observations shall not, in any way, relieve the Contractor from responsibility for full compliance with all terms and conditions of the Contract, or be construed to lessen to any degree the Contractor's responsibility for providing efficient and capable superintendence. The Inspector is not authorized to make changes in the Drawings or Specifications nor shall the Inspector's approval of the Work and methods relieve the Contractor of responsibility for the correction of subsequently discovered defects, or from its obligation to comply with the Contract Documents.

Inspector shall electronically post DSA required documents on the DSA electronic posting website. It is the Contractor's responsibility to determine the status of posting and determine if all the criteria for sign off of a category of Work on the Project Inspection Card (Form DSA 152) as defined more thoroughly in the most current version of the DSA 152 manual posted on the DSA website.

Inspector may collaborate with Contractor about approval of areas that may be constructed and approved incrementally under the DSA 152 card pursuant to the guidelines of PR-13 at Article 1.17. Inspector shall work with Contractor to present incremental approval proposals to DSA.

4.3.3 Inspector's Authority to Reject or Stop Work

The Inspector shall have the authority to reject Work whenever provisions of the Contract Documents are not being complied with, and Contractor shall instruct its Subcontractors and employees accordingly. In addition, the Inspector may stop any Work that poses a probable risk of harm to persons or property. The Contractor shall instruct its employees, Subcontractors, material and equipment suppliers, etc., accordingly. The absence of any Stop Work Order or rejection of any portion of the Work shall not relieve the Contractor from any of its obligations pursuant to the Contract Documents.

4.3.4 [Reserved]

4.3.5 Testing Times

The Owner will provide inspection and testing at its cost during the normal eight (8) hour day Monday through Friday (except holidays). Work by the Contractor outside of the normal eight (8) hour day shall constitute an authorization from the Contractor to the Owner to provide inspection and testing as required outside

of the normal eight (8) hour day. Contractor shall provide adequate time for inspections so as to not delay the Work.
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4.3.6 Special Inspection Out of State, Out of Country or Remote from Project

If Contractor has a subcontractor or supplier that requires in plant or special inspections or tests that are out of the Country, out of State or a Distance of more than 200 miles from the Project site, the Owner shall provide the Special Inspector or individual performing tests time for inspection and testing during normal work hours. Contractor, however, is responsible for the cost of travel, housing, food, out of area premiums that may be in the Inspector/Testing Agreement with Owner, or other expenses necessary to ensure proper inspection or testing is provided by a DSA Certified Inspector, Special Inspector, or individual performing tests. In some cases all three (DSA Inspector, Special Inspector, and Testing) may be required. In addition, if the DSA Certified Inspector, Special Inspector, or individual performing test has contractual travel clauses or special rates for out of town inspection, Contractor is responsible for all costs associated with the contractual travel costs in addition to all other costs. Arrangements for inspection and/or testing shall be made far enough in advance so as to not delay the Work.

4.4 STOP WORK ORDER

DSA may issue a Stop Work Order, or an Order to Comply, when either (1) the Work proceeds without DSA approval; (2)_the Work proceeds without a DSA Inspector of Record, or (3) where DSA determines that the Work is not being performed in accordance with applicable rules and regulations, and would compromise the structural integrity of the Project or would endanger lives. If a Stop Work Order is issued, the Work in the affected area shall cease until DSA withdraws the Stop Work Order. See Education Code Section 17307.5(b) and Education Code Section 81133.5.

4.5 RESPONSIBILITY FOR ADDITIONAL CHARGES INCURRED BY THE OWNER FOR PROFESSIONAL SERVICES

If at any time prior to the completion of the requirements under the Contract Documents, the Owner is required to provide or secure additional professional services (including CM, Inspection, Architect, Engineering and Special Consultant Services) for any reason by any act of the Contractor, the Owner may seek a Deductive Change Order for any costs incurred for any such additional services, which costs shall be deducted from the next progress payment. A Deductive Change Order shall be independent from any other Owner remedies and shall not be considered a waiver of any Owner rights or remedies. If payments then or thereafter due to the Contractor are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. Additional services shall include, but shall not be limited to, the following:

a. Services made necessary by the default of the Contractor (Article 14 or Article 2.2).

b. Services made necessary due to the defects or deficiencies in the Work of the Contractor (Article 2.2 and Article 9.6).

c. Spurious or frivolous RFI's issued that do not conform to the requirements of Article 7.4. Issuance of the same RFI after receiving an answer from the Architect or Engineer.

d. Review of Schedules that are provided by Contractor that do not Conform with the Requirements of Article 8.

e. Preparation of a CCD or ICD to correct a Contractor Deficiency, or Contractor Caused Notice of Non-Compliance (Article 7.3).

f. Review of Incomplete Shop Drawings or Submittals, including the submission of Piecemeal Shop Drawings or Submittals unless piecemeal Submittals are specifically agreed upon by Owner (Article 3.9).

g. Services required by failure of the Contractor to perform according to any provision of the Contract Documents.

h. Services in connection with evaluating substitutions of products, materials, equipment, Subcontractors' proposed by the Contractor, and making subsequent revisions to Drawings, Specifications, obtaining DSA approvals, DSA costs for review of CCD's, other governmental agency review costs, and providing other documentation required (except for the situation where the specified item is no longer manufactured or available) (Article 3.10).

i. Services for evaluating and processing Claims or Disputes submitted by the Contractor in connection with the Work outside the established Change Order process.

j. Services required by the failure of the Contractor to prosecute the Work in a timely manner in compliance within the specified time of completion.

k. Services in conjunction with the testing, adjusting, balancing and start-up of equipment other than the normal amount customarily associated for the type of Work involved.

l. Services in conjunction with more than one (1) re-review of Submittals of Shop Drawings, product data, samples, RFI's etc.

4.6 DISPUTES AND CLAIMS

4.6.1 Decision of Architect

Disputes between Owner and Contractor involving money or time, including those alleging an error or omission by the Architect shall be referred initially to the Architect for action within ten (10) days after Contractor's Article 7 request for Change is denied. A decision by the Architect, as provided in Paragraph 4.6.5, shall be required as a condition precedent to proceeding with remedies set forth in Paragraph 4.6.9 as to all such matters arising prior to the date Retention Payment Application is due, regardless of whether such matters relate to execution and progress of the Work, or the extent to which the Work has reached Final Completion.

The condition precedent of an Architect decision shall be waived if: (1) the position of Architect is vacant; (2) the Architect has not received evidence or has failed to render a decision within agreed time limit; (3) the Architect has failed to take action required under Paragraph 4.6.5 within thirty (30) days after the Claim is made, forty-five (45) days have passed after the Claim has been referred to the Architect; or (4) the Claim relates to a Stop Notice Claim not arising from any extra change order or Immediate Change Directive for which approval has not been provided.

4.6.2 [Reserved]

4.6.3 [Reserved]

4.6.4 [Reserved]

4.6.5 Architect's Written Decision

If a Dispute has not been resolved after consideration of the foregoing and of other evidence presented by the parties or requested by the Architect, the Architect (or Architect through CM) shall provide a written decision twenty (20) days after the Architect's preliminary decision rendered in accordance with Paragraph 4.6.1. Upon expiration of such time period, the Architect (or Architect through CM) will render to the parties its written decision relative to the Dispute, including any change in the Contract Sum or Contract Time or both.

The Architect may also request reasonable additional time to complete Architect's written decision.

If the resolution of the Dispute by the Architect is not satisfactory to the Contractor and copies of all back-up documentation of costs and the basis for the Dispute is fully articulated in a package of material that is complete, the Contractor may then submit a Claim to the Owner under Article 4.6.9

4.6.6 Continuing Contract Performance

Pending final resolution of a Dispute or Claim, including, negotiation, mediation, arbitration, or litigation, the Contractor shall proceed diligently with performance of the Contract, and the Owner shall continue to make any undisputed payments in accordance with the Contract (less any withholdings or offsets). If the Dispute or Claim is not resolved, Contractor agrees it will neither rescind the Contract nor stop the progress of the work, but Contractor's sole remedy shall be to submit such controversy to determination by a court of competent jurisdiction in the county where the project is located, after the project has been completed, and not before.

4.6.6.1 *Owner's Option to Submit Individual Disputes to Arbitration during Claims and Disputes Process*. At the Owner's sole option, in order to more efficiently resolve claims during the Project and prior to the completion of the Claims Process, pursuant to Government Code Section 9201, the Owner may submit individual Disputes or Claims for binding arbitration and Contractor agrees to the resolution of for each individual Dispute or Claim by an Arbitrator, including resolution of time and delays. If binding arbitration is utilized for individual disputes, such resolution is full and final as to that particular Dispute or Claim. THIS INDIVIDUAL DISPUTE ARBITRATION PROCESS IS NOT AN ARBITRATION CLAUSE AND SHALL NOT BE CONSTRUED AS AN AGREEMENT TO ARBITRATE. THIS INDIVIDUAL DISPUTES ARBITRATION PROCESS IS FOR THE SOLE PURPOSE OF STREAMLINING AND RESOLVING CLAIMS DURING CONSTRUCTION AND SHALL BE REQUESTED ON SPECIFIC INDIVIDUAL ITEMS BY THE OWNER PRIOR TO RETENTION PAYMENT (EVEN IF THERE ARE DEDUCTIONS MADE FROM RETENTION PAYMENT) WHICH REPRESENTS THE FINAL COMPLETION OF THE PROJECT.

a. If there is no Retention remaining on the Project, Individual Disputes initiated prior to Project Final Completion shall continue until a final disposition of the Arbitration or resolution of the individual Claim or Dispute.

b. No Tolling. The Arbitration process shall not toll the Disputes, Claims, or Appeals process under Article 4.6 or the requirement to submit claims to Court under Article 4.6.9.4.

4.6.7 [Reserved]

4.6.8 Dispute Concerning Extension of Time.

If Contractor and Owner cannot agree upon an extension of time, whether compensable or not, then Contractor must have first completed the procedures set forth in Paragraph 8.4. Upon completion of the procedures set forth under Paragraph 8.4, Contractor must then comply with the requirements in this Article including those set forth under Paragraph 4.6.9.

4.6.9 Claims Procedures

Pursuant to the remedies under Public Contract Code Section 9201 and Government Code Section 930.2, Contractor, through execution of this Agreement, also agrees to comply with the Claims requirements of Article 4.6 to quickly and efficiently resolve disputes. Further, to provide a level of accuracy to the records submitted, the Owner shall have the right to audit books and records pursuant to Article 13.11 based on the actual costs incurred and to reduce the uncertainty in resolving disputes with limited information.

4.6.9.1 *Procedure Applicable to All Claims*

a. Definition of Claim: A "Claim" is where a Dispute between the parties rises to the level where backup documentation is assembled and provided to the Owner as a separate demand by the Contractor for (1) time extension, (2) payment of money or damages arising from Work done by or on behalf of the Contractor pursuant to the CONTRACT and payment of which is not otherwise expressly provided for or the claimant is not otherwise entitled to, or (3) and amount the payment of which is disputed by the Owner.

b. Filing Claim Is Not Basis to Discontinue Work: The Contractor shall promptly comply with Work under the Contract or Work requested by the Owner even though a written claim has been filed. The Contractor and the Owner shall make good faith efforts to resolve any and all claims that may arise during the performance of the Work covered by this Contract.

c. Claim Notification: The Contractor shall within seven (7) calendar days after the Written Decision of the Architect, or if the time period for Architect's Decision has passed under Article 4.6.1, submit a notification, in writing, with the Owner (and the Owner's CM) stating clearly the basis for the claim. If the notification is not submitted within seven (7) days after the Written Decision of the Architect or the passage of time under Article 4.6.1, the Contractor shall be deemed to have waived all right to assert the claim, and the claim shall be denied. Claims submitted after the Retention Payment date shall also be considered null and void by the Owner. All claims shall be reviewed pursuant to Article 4.6.1 through 4.6.5.

The Formal Notification of Claim must be presented as follows:

(1) All documentation submitted pursuant to Article 4.6 to the Architect shall be submitted with the "claim."

(2) Any additional or supporting documentation that Contractor believes is relevant should be submitted at this time.

d. Formal Claim Appeal Submission: If the Contractor does not concur with the Owner's decision regarding the Claim Notification, the Contractor will issue a formal Claim Appeal within fourteen (14) days of receipt of the Owner's decision and all detailed information in support of the Claim Appeal within thirty (30) days. All appeals shall be submitted before Retention Payment. If the Claim Appeal is not submitted within fourteen (14) calendar days and detailed information within thirty (30) days, the Contractor shall be deemed to have waived its right to assert the Claim and the Claim shall be denied. Contractor's failure to submit any detailed information which is in the possession of Contractor shall render such information inadmissible by Contractor at trial or arbitration.

e. Appeal Claim Format: The Contractor shall provide all written detailed documentation which supports the claim, including but not limited to: arguments, justifications, cost, estimates, Schedule analysis and detailed documentation. The format of the Claim Appeal shall be as follows:

1. Cover letter.

2. Summary of factual basis of Claim and amount of claim.

3. Summary of the basis of the Claim, including the specific clause and section under the Contract under which the claim is made.

4. Documents relating to the Claim, including:
   a. Specifications sections in question.
   b. Relevant portions of the Drawings
   c. Applicable Clarifications (RFI's)
   d. Other relevant information, including responses that were received.
   e. Break down of all costs associated with the Claim.
   f. Applicable Daily reports and logs.
   g. For Claims involving overhead, cost escalation, acceleration, disruption or increased costs, a full version of job costs reports organized by category of work or Schedule of Values with budget

information tracked against actual costs. Any and all supporting back-up data, including the original bid (and associated original unaltered metadata). Certification: The Contractor (and subcontractors, if applicable) shall submit with the claim a certification under penalty of perjury:

1. That the Contractor has reviewed the claim and that such claim is made in good faith;

2. Supporting data are accurate and complete to the best of the Contractor's knowledge and belief;

3. The amount requested accurately reflects the amount of compensation for which the Contractor believes the Owner is liable; and

4. That the Contractor is familiar with Government Code Sections 12650 et seq. and Penal Code Section 72 and that false claims can lead to substantial fines and/or imprisonment.

f. Signature of Certification: If the Contractor is not an individual, the certification shall be executed by an officer or general partner of the Contractor having overall responsibility for the conduct of the Contractor's affairs.

g. Mandatory Claim Appeal Procedure: The Contractor's Claim Appeal shall be denied if it fails to follow the requirements of this Article.

4.6.9.2 Owner (through CM or Owner's Agent or Attorney) May Request Additional Information: Within thirty (30) days of receipt of the Claim Appeal and the information under this Article, the Owner may request in writing any additional documentation supporting the claim or documentation relating to defenses to the claim which the Owner may assert. Nothing in the claims procedures set forth in this Article 4 of the General Conditions shall act to waive or relieve the Contractor from meeting the requirements set forth in Government Code section 900 et seq.

4.6.9.3 *Binding Arbitration of Individual Claim Issues.* To expedite resolution of Claims pursuant to Public Contract Code Section 9201, at the Owner's sole option, the Owner may submit individual Claims to Arbitration prior to Retention Payment consistent with the requirements of Article 4.6.6.1.

4.6.9.4 *Resolution of Claims in Court of Competent Jurisdiction.* If Claims are not resolved under the procedure set forth and pursuant to Article 4.6.9, such claim or controversy shall be submitted to a court in the County of the location of the Project after the Project has been completed, and not before.

ARTICLE 5
SUBCONTRACTORS

5.1 DEFINITIONS

5.1.1 Subcontractual Relations Bound to Same Contract Terms as General Contractor

By appropriate agreement, written where legally required for validity, the Contractor shall require each Subcontractor, to the extent of the Work to be performed by the Subcontractor, to be bound to the Contractor by terms of the Contract Documents, and to assume toward the Contractor all the same obligations and responsibilities, assumed by Contractor pursuant to the Contract Documents.

5.1.2 Subcontractor Licenses

All Subcontractors shall be properly licensed by the California State Licensing Board. All Subcontractors (of any tier) performing any portion of the Work must comply with the Labor Code sections 1725.5 and 1771.1 and must be properly and currently registered with the California Department of Industrial Relations and qualified to perform public works pursuant to Labor Code section 1725.5 throughout the duration of the Project. No portion of the Work is permitted to be performed by a subcontractor of any tier unless the Subcontractor is properly registered with DIR. Any Subcontractors of any tier not properly registered with DIR shall be substituted in accordance with Labor Code section 1771.1.

5.1.3 Substitution of Subcontractor

Substitution of Subcontractors shall be permitted only as authorized under Public Contract Code §§ 4107 et. seq. Any substitutions of Subcontractors shall not result in any increase in the Contract Price or result in the granting of any extension of time for the completion of the Project.

5.1.4 Contingent Assignment of Subcontracts and Other Contracts

Each subcontract, purchase order, vendor contract or agreement for any portion of the Work is hereby assigned by the Contractor to the Owner provided that:

a. Such assignment is effective only after Termination of this Contract with the Contractor by the Owner as provided under Article 14 and only for those subcontracts and other contracts and agreements that the Owner accepts by notifying the Subcontractor or Materialman (as may be applicable) in writing; and

b. Such assignment is subject to the prior rights of the Surety(ies) obligated under the Payment Bond and Performance Bond.

c. The Contractor shall include adequate provisions for this contingent assignment of subcontracts and other contracts and agreements in each such document.

ARTICLE 6
CONSTRUCTION BY OWNER OR BY SEPARATE CONTRACTORS

6.1 OWNER'S RIGHT TO PERFORM CONSTRUCTION AND TO AWARD SEPARATE CONTRACTS

6.1.1 Separate Contracts.

6.1.1.1 Owner reserves the right to let other contracts in connection with this Work. Contractor shall afford other contractors reasonable opportunity for (1) introduction and storage of their materials; (2) access to the Work; and (3) execution of their work. Contractor shall properly connect and coordinate its work with that of other Contractors.

6.1.1.2 Contractor shall ascertain to its own satisfaction the scope of the Project and nature of any other contracts that have been or may be awarded by Owner in prosecution of the Project and the potential impact of such Work on the Baseline Schedule or Schedule updates.

6.1.1.3 Nothing herein contained shall be interpreted as granting to Contractor the exclusive occupancy at the site of Project. Contractor shall not cause any unnecessary hindrance or delay to any other contractor working on the Project Site. If execution of any contract by the Owner is likely to cause interference with Contractor's performance of this Contract, once Contractor provides Owner timely written notice and identifies the Schedule Conflict, Owner shall decide which contractor shall cease work temporarily and which contractor shall continue, or whether Work can be coordinated so that contractors may proceed simultaneously.

6.1.1.4 Owner shall not be responsible for any damages suffered or extra costs incurred by Contractor resulting directly or indirectly from award or performance or attempted performance of any other contract or contracts at the Project necessary for the performance of the Project (examples include Electrical Utility Contractor, separate offsite contractor, a separate grading contractor, furniture installation etc.).

6.2 [Reserved]

6.3 OWNER'S RIGHT TO CLEAN UP

If a dispute arises among the Contractor, separate contractors, and the Owner as to the responsibility under their respective contracts for maintaining the premises and surrounding area free from waste materials and rubbish as described in Paragraph 3.12, the Owner may clean up and allocate the cost among those it deems responsible.

ARTICLE 7
CHANGES IN THE WORK

7.1 CHANGES

7.1.1 No Changes Without Authorization

There shall be no change whatsoever in the Drawings, Specifications, or in the Work without an executed Change Order, Change Order Request, Immediate Change Directive, or order by the Architect for a minor change in the Work as herein provided. Owner shall not be liable for the cost of any extra work or any substitutions, changes, additions, omissions, or deviations from the Drawings and Specifications unless the Owner's Governing Board or designated representative with delegated authority (subject to Board ratification) has authorized the same and the cost thereof approved in writing by Change Order or executed Construction Change Document. No extension of time for performance of the Work shall be allowed hereunder unless claim for such extension is made at the time changes in the Work are ordered, and such time duly adjusted in writing in the Change Order.

7.1.2 Notices of Non-Compliance

Contractor deviation or changes from approved Plans and Specifications may result in the issuance of a Notice of Non-Compliance (See DSA Form 154). Contractor is specifically notified that deviations from the Plans and Specifications, whether major or minor, may result in the requirement to obtain a DSA Construction Change Document to correct the Notice of Non-Compliance. (See Article 7.3.1 for Definition of CCD). In some cases, the lack of a DSA approved CCD AND verification from the Inspector that a Notice of Non-Compliance has been corrected may result in a critical path delay to the next stage of Work on the Project. Specifically, a deviation from approved Plans and Specifications may prevent approval of the category of Work listed in the DSA 152 Project Inspection Card. Any delays that are caused by the Contractor's deviation from approved Plans and Specifications shall be the Contractor's responsibility.

7.1.3 Architect Authority

The Architect will have authority to order minor changes in the Work that do not involve DSA Approval not involving any adjustment in the Contract Sum, or an extension of the Contract Time.

7.2 CHANGE ORDERS ("CO")

A CO is a written instrument prepared by the Architect and signed by the Owner (as authorized by the Owner's Governing Board), the Contractor, and the Architect stating their agreement upon all of the following:

a. A description of a change in the Work;

b. The amount of the adjustment in the Contract Sum, if any; and

c. The extent of the adjustment in the Contract Time, if any.

A CO may be comprised of ICD's, Response to RFP's and COR's

7.3 CONSTRUCTION CHANGE DOCUMENT (CCD Category A, and CCD Category B) and IMMEDIATE CHANGE DIRECTIVE (ICD)

7.3.1 Definitions

7.3.1.1 *Construction Change Document (CCD)*. A Construction Change Document is a DSA term that is utilized to address changes to the DSA approved Plans and Specifications. There are two types of Construction Change Documents. (1) DSA approved CCD Category A (DSA Form 140) for Work affecting Structural, Access or Fire-Life Safety of the Project which will require a DSA approval; and, (2) CCD Category B (DSA Form 141) for work NOT affecting Structural Safety, Access Compliance or Fire and Life Safety that will not require a DSA approval (except to confirm that no Approval is required);

7.3.1.2 *Immediate Change Directive (ICD)*. An Immediate Change Directive is a written order to the Contractor prepared by the Architect and signed by the Owner (and CM if there is a CM on the Project) and the Architect, directing a change in the Work and stating a proposed basis for adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by ICD, without invalidating the Contract, direct immediate changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions within. If applicable, the Contract Sum and Contract Time will be adjusted accordingly.

In the case of an Immediate Change Directive being issued, Contractor must commence Work immediately or delays from failure to perform the ICD shall be the responsibility of Contractor and the failure to move forward with Work immediately shall also be grounds for Termination under Article 14.

An ICD does not automatically trigger an Article 7.6 Dispute or Claim. Contractor must timely follow the procedures outlined at Article 7.6 and 4.6 where applicable.

Refer to Division 1 for a copy of the proposed Immediate Change Directive form.

7.3.2 Use to Direct Change

An ICD shall be used to move work forward immediately and to avoid delay. In some cases, an ICD shall be issued in the absence of agreement on the terms of a CO, COR, or RFP. A copy of an ICD form is provided in Division 1. The anticipated not to exceed price for the Work will be inserted into the ICD. In the case of an ICD issued to correct Contractor Deficiencies or to correct a Contractor caused Notice of Non-Compliance, the ICD may be issued with $0 and 0 time. Contract may prepare a COR associated with the ICD pursuant to Article 7. However, Contractor shall proceed with all Work required under an Approved ICD immediately upon issuance. Failure to proceed with the Work under an ICD shall be grounds for Termination for Cause under Article 14 or take over the Work under Article 2.2.

If adequate time exists, an ICD may be subject of an RFP for pricing and determination if any time that may be required. However, if an RFP is not completed, Contractor shall immediately commence Work when an ICD is issued. If the RFP is incomplete, it may still be completed to be submitted for Pricing Purposes as long as the PR is submitted within the timeline provided by the PR, or within 10 days following issuance of the ICD.

7.3.3 ICD Issued Over a Notice of Non-Compliance or to Cover Work Subject to a DSA 152 Sign Off

In some cases, an ICD shall be for the purpose of proceeding with Work to keep the Project on Schedule and as an acknowledgement by the Owner that Contractor is proceeding with Work contrary to a Notice of Non-Compliance, prior to issuance of a DSA approved CCD Category A, or to direct the covering of Work which has not yet received a DSA 152 Inspection Approval to move forward.

7.3.3.1 *Contractor Compliance with all Aspects of an IC*D. Contractor is to undertake the ICD and comply with all aspects of the Work outlined in the ICD. Inspector is to inspect the Work pursuant to the ICD. Failure to follow the ICD may result in deduction of the ICD Work under Article 2.2 or Termination of the Contractor pursuant to Article 14. .

7.3.3.2 *Exception in the Case of DSA Issued Stop Work Order*. Contractor must proceed with an ICD even if a CCD has not been approved by DSA except in the case of a DSA issued Stop Work Order. If a DSA Stop Work Order is issued, Contractor must stop work and wait further direction from the Owner.

7.3.3.3 *ICD Due to Contractor Deficiency or Contractor Caused Notice of Non-Compliance.* If an ICD is issued to correct a Contractor Deficiency or a Contractor caused notice of Non-Compliance, Contractor specifically acknowledges responsibility for all consequential damages associated with the Contractor Deficiency or Contractor Caused Notice of Non-Compliance and all consequential damages and costs incurred to correct the deficiency under Article 4.5

7.4 REQUEST FOR INFORMATION ("RFI")

7.4.1 Definition

An RFI is a written request prepared by the Contractor requesting the Architect to provide additional information necessary to clarify or amplify an item which the Contractor believes is not clearly shown or called for in the Drawings or Specifications, or to address problems which have arisen under field conditions.

7.4.1.1 An RFI shall not be used as a vehicle to generate time extensions.

7.4.1.2 Resubmission of the same or similar RFI is not acceptable. RFI's that are similar should be addressed in Project meetings where the requestor (Contractor, subcontractor or vendor) is able to address the particular issue with the Architect or Engineer and a resolution addressed in the minutes.

7.4.1.3 An RFI response applicable to a specific area cannot be extended to other situations unless specifically addressed in writing within the RFI or in a separate RFI.

7.4.1.4 RFI's should provide a proposed solution and should adequately describe the problem that has arisen.

7.4.2 Scope

The RFI shall reference all the applicable Contract Documents including Specification section, detail, page numbers, drawing numbers, and sheet numbers, etc. The Contractor shall make suggestions and interpretations of the issue raised by the RFI. An RFI cannot modify the Contract Cost, Contract Time, or the Contract Documents.

7.4.3 Response Time

The Architect must respond to a RFI within a reasonable time after receiving such request. If the Architect's response results in a change in the Work, then such change shall be effected by a written CO, COR RFP or ICD, if appropriate. If the Architect cannot respond to the RFI within a reasonable time, the Architect shall notify the Contractor, with a copy to the Inspector and the Owner, of the amount of time that will be required to respond.

7.4.4 Costs Incurred

The Contractor shall be responsible for any costs incurred for professional services as more fully set forth in Article 4.5, which shall be subject to a Deductive Change Order, if an RFI requests an interpretation or decision of a matter where the information sought is equally available to the party making such request. Owner, at its sole discretion, shall issue a Deductive Change Order to Contractor for all such professional services arising from this Article.

7.5 REQUEST FOR PROPOSAL ("RFP")

7.5.1 Definition

An RFP is a written request prepared by the Architect (and/or CM) requesting the Contractor to submit to the Owner and the Architect an estimate of the effect of a proposed change on the Contract Price and (if applicable) the Contract Time. If Architect issues a Bulletin, the Changed items in the Bulletin shall be addressed as an RFP and all responses shall be prepared to a Bulletin as addressed in this Article 7.5. A form RFP is included in the Division 1 documents.

7.5.2 Scope

An RFP shall contain adequate information, including any necessary Drawings and Specifications, to enable Contractor to provide the cost breakdowns required by Paragraph 7.7. The Contractor shall not be entitled to any Additional Compensation for preparing a response to an RFP, whether ultimately accepted or not.

7.5.3 Response Time

Contractor shall respond to an RFP within ten (10) days or the time period otherwise set forth in the RFP.

7.6 CHANGE ORDER REQUEST ("COR")

7.6.1 Definition

A COR is a written request prepared by the Contractor supported by backup documentation requesting that the Owner and the Architect issue a CO based upon a proposed change, cost, time, or cost and time that may be incurred on the Project or arising from an RFP, ICD, or CCD.

7.6.2 Changes in Price

A COR shall include breakdowns per Paragraph 7.7 to validate any change in Contract Price due to proposed change or claim.

7.6.3 Changes in Time

A COR shall also include any additional time required to complete the Project only if the delay is a critical path delay. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Project Schedule as defined in Article 8 of the General Contract. A schedule fragnent showing the time delay must be submitted with the COR. Any changes in time will be granted only if there is an impact to the critical path. If Contractor fails to request a time extension in a COR, then the Contractor is thereafter precluded from requesting or claiming a delay.

7.6.4 Notice of Change

Contractor shall submit a written Notice of Change to the Owner and the Architect if any instruction, request, drawing, specification, action, condition, omission, default, deduction, deletion, or other circumstance occurs that impacts the Contract Sum as defined in Article 9.1, the critical path, or the Contract Time as defined in Article 8.1.1. Such Notice of Change shall be provided prior to the commencement of performance of the Work affected and no later than five (5) Days after the discovery date of such circumstance by Contractor. Once a timely Notice of Change has been submitted to the Owner and Architect, Contractor shall thereafter submit a fully complete COR as required by Article 7.6 and Article 7.7. FAILURE BY THE CONTRACTOR TO PROVIDE A COMPLETE AND TIMELY NOTICE OF CHANGE AND/OR COR WHERE A NOTICE OF CHANGE AND/OR COR IS REQUIRED BY THIS ARTICLE 7.6 AND ARTICLE 7.7 SHALL CONSTITUTE A WAIVER BY CONTRACTOR OF THE RIGHT TO A CONTRACT ADJUSTMENT ON ACCOUNT OF SUCH CIRCUMSTANCES AND A WAIVER OF ANY RIGHT TO FURTHER RECOURSE OR RECOVERY BY REASON OF OR RELATED TO SUCH CHANGE BY MEANS OF THE DISPUTES AND CLAIMS PROCESS (SEE ARTICLE 4.6) OR BY ANY OTHER LEGAL PROCESS OTHERWISE PROVIDED FOR UNDER APPLICABLE LAWS.

7.7 COST OF CHANGE ORDERS

7.7.1 Scope

At the time a request is made for a change that impacts the Contract Sum as defined in Paragraph 9.1, the critical path, or the Contract Time as defined in Paragraph 8.1.1, the Contractor shall provide the Owner and the Architect, with a written estimate of the effect of the proposed CO upon the Contract Sum and the actual or estimated cost of construction, which shall include a complete itemized cost breakdown of all labor and material showing actual quantities, hours, unit prices, and wage rates required for the change, and the effect upon the Contract Time of such CO. Changes may be made by Owner by an appropriate written CO, or, at the Owner's option, such changes shall be implemented immediately upon the Contractor's receipt of an appropriate written Construction Change Document.

Owner may, as provided by law and without affecting the validity of this Agreement, order changes, modification, deletions and extra work by issuance of written CO or Construction Change Documents from time to time during the progress of the Project, Contract sum being adjusted accordingly.

7.7.1.1 *Time and Material Charges.* If the Owner orders Work on a "time and material" basis, timesheets shall be signed daily by the Inspector or Owner Designee at or near the time the Work is actually undertaken and shall show the hours worked, and the Work actually completed. No time sheets shall be signed the next day. A copy shall be provided to the Person signing the document at the time the document is signed, but not before 10 am the following day.

7.7.2 Determination of Cost

The amount of the increase or decrease in the Contract Price from a CO or COR, if any, shall be determined in one or more of the following ways as applicable to a specific situation:

a. Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation. If an agreement cannot be reached within fifteen (15) days after submission and negotiation of Contractor's proposal, Contractor may submit pursuant to Paragraph 7.7.3. Submission of sums which have no basis in fact are at the sole risk of Contractor and may be a violation of the False Claims Act set forth under Government Code Section 12650 et. seq.);

1. If the Owner objects to 7.7.2(a) as a method for submission due to inaccuracies in the submitted amount, overstatement of manpower or time required to perform the CO, or unreliability of the data provided, the Owner may either have the Architect or a professional estimator determine the cost for the CO, and the applicable time extension, or the Contractor shall utilize Paragraph 7.7.2(d) or 7.7.3.

2. Once the Owner provides a written objection to use of Article 7.7.2(a) due to unreliability of the estimated price, the Contractor shall no longer utilize mutual acceptance of a lump sum as a method for submission of CO's and shall provide a breakdown of estimated or actual costs pursuant to Article 7.7.2(d) or 7.7.3.

b. By unit prices contained in Contractor's original bid and incorporated in the Project documents or fixed by subsequent agreement between Owner and Contractor;

c. Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee. However, in the case of disagreement, Contractor must utilize the procedure under section 7.7.3; or

d. By cost of material and labor and percentage of overhead and profit. If the value is determined by this method the following requirements shall apply:

4. *Basis for Establishing Costs*

i. Labor will be the cost for wages prevailing locally for each craft or type of workers at the time the extra Work is done, plus employer payments of payroll taxes and workers compensation insurance (exclude insurance costs as part of the Overhead and Profit mark-up), health and welfare, pension, vacation, apprenticeship funds, and other direct costs resulting from Federal, State, or local laws, as well as assessments or benefits required by lawful collective bargaining agreements. In no case shall the total labor costs exceed the applicable prevailing wage rate for that particular classification. The use of a labor classification which would increase the extra Work cost will not be permitted unless the Contractor establishes the necessity for such additional costs. Labor costs for equipment operators and helpers shall be reported only when such costs are not included in the invoice for equipment rental.

ii. Materials shall be at invoice or lowest current price at which such materials are locally available and delivered to the Site in the quantities involved, plus sales tax, freight, and delivery. The Owner reserves the right to approve materials and sources of supply or to supply materials to the Contractor if necessary for the progress of the Work. No markup shall be applied to any material provided by the Owner.

iii. Tool and Equipment Rental. No payment will be made for the use of tools which have a replacement value of $250 or less.

Regardless of ownership, the rates to be used in determining equipment rental costs shall not exceed listed rates prevailing locally at equipment rental agencies or distributors at the time the Work is performed. Rates applied shall be appropriate based on actual equipment need and usage. Monthly, weekly or other extended use rates that results in the lowest cost shall be applied if equipment is used on site for extended periods.

The rental rates paid shall include all associated costs, including the cost of fuel, oil, lubrication, supplies, small tools, necessary attachments, repairs and maintenance of any kind, depreciation, storage, insurance, and all incidentals.

If tool and equipment charges are part of a Dispute, Claim, or Appeal, the Owner reserves the right to utilize actual costs for tools and equipment or a depreciation rate for equipment based on audit finding under Article 13.11 and deduct any rental charges that exceed actual or depreciated costs.

e. Other Items. The Owner may authorize other items which may be required on the extra work. Such items include labor, services, material, and equipment which are different in their nature from those required by the Work, and which are of a type not ordinarily available from the Contractor or any of the Subcontractors. Invoices covering all such items in detail shall be submitted with the request for payment.

f. Invoices. Vendors' invoices for material, equipment rentals, and other expenditures shall be submitted with the COR. If the request for payment is not substantiated by invoices or other documentation, the Owner may establish the cost of the item involved at the lowest price which was current at the time of the Daily Report.

g. Overhead. Overhead, including direct and indirect costs, shall be submitted with the COR and include: field overhead, home office overhead, off-site supervision, CO preparation/negotiation/research, time delays, project interference and disruption, additional guaranty and warranty durations, on-site supervision, additional temporary protection, additional temporary utilities, additional material handling costs, liability and property damage insurance, and additional safety equipment costs.

7.7.3 Format for COR or CO's

The following format shall be used as applicable by the Owner and the Contractor to communicate proposed additions to the Contract. All costs submitted shall be actual costs and labor shall be unburdened labor. Refer to Division 1 for a copy of the Construction Change Order form.

	EXTRA	CREDIT
(a) Material (attach itemized quantity and unit cost plus sales tax)	_____	_____

		EXTRA	CREDIT
(b)	Labor Not to Exceed Applicable Prevailing Wage Rates (attach itemized hours and rates)		
(c)	Equipment (attach invoices)		
(d)	Subtotal		
(e)	If Subcontractor performed work, add Subcontractor's overhead and profit to portions performed by Subcontractor, not to exceed 10% of item (d).		
(f)	Subtotal		
(g)	Contractor's Overhead and Profit: Not to exceed 10% of Item (d) if Contractor performed the work. No more than 5% of Item (d) if Subcontractor performed the work. If work was performed by Contractor and Subcontractors, portions performed by Contractor shall not exceed 10% of Item (d), and portions performed by Subcontractor shall not exceed 10% of Item (d).		
(h)	Subtotal		
(i)	Bond not to exceed one percent (1%) of Item (h)		

The undersigned Contractor approves the foregoing Change Order or Immediate Change Directive as to the changes, if any, and the Contract price specified for each item and as to the extension of time allowed, if any, for completion of the entire Work on account of said Change Order or Immediate Change Directive, and agrees to furnish all labor, materials and service and perform all Work necessary to complete any additional Work specified therein, for the consideration stated herein. It is understood that said Change Order or Immediate Change Directive shall be effective when approved by the Governing Board of the Owner.

It is expressly understood that the value of such extra Work or changes, as determined by any of the aforementioned methods, expressly includes any and all of the Contractor's costs and expenses, both direct and indirect, resulting from additional time required on the Project or resulting from delay to the Project. Any costs, expenses, damages or time extensions not included are deemed waived.

The Contractor expressly acknowledges and agrees that any change in the Work performed shall not be deemed to constitute a delay or other basis for claiming additional compensation based on theories including, but not limited to, acceleration, suspension or disruption to the Project.

7.7.3.1 *Adjustment for Time and Compensable Delay*. A CO shall also include any additional time required to complete the Project. Any additional time requested shall not be the number of days to make the proposed change, but must be based upon the impact to the Project Schedule as defined in Article 8 of the General Contract. A schedule fragnent showing the time delay must be submitted with the CO. Any changes in time will be granted only if there is an impact to the critical path. If Contractor fails to request a time extension in a CO, then the Contractor is thereafter precluded from requesting or claiming a delay.

7.7.4 Deductive Change Orders

All Deductive Change Order(s) must be prepared utilizing the form under Paragraph 7.7.3 (a)-(d) only setting forth the actual costs incurred. Except in the case of an Article 2.2 or 9.6 Deductive Change Order where no mark-up shall be allowed, Contractor will be allowed a maximum of 5% total profit and overhead. Unilateral Deductive Change Orders

For Unilateral Deductive Change Orders, or where credits are due from Contractor for Allowances, Deductive Items, Inspection, Damage, DSA CCD review costs, Architect or Inspector costs for after hours or corrective services, Work removed from the Agreement under Article 2.2 or Article 9.6, there shall be no mark-up.

Owner may, any time after a Deductive Change Order is presented to Contractor by Owner for items under Article 2.2 or Article 9.6 of if there is disagreement as to the Deductive Change Order, issue a unilateral Deductive Change Order on the Project and deduct the Deductive Change Order from a Progress Payment, Final Payment, or Retention.

7.7.5 [Reserved]

7.7.6 Notice Required

If the Contractor desires to initiate a Dispute for an increase in the Contract Price, or any extension in the Contract Time for completion, Contractor shall notify the applicable party responsible for addressing the Dispute or Claim pursuant to Article 4.6.

7.7.7 Alteration to Change Order Language

Contractor shall not alter or reserve time in COR's, CO's or ICD's. Contractor shall execute finalized CO's and proceed under Paragraph 7.7.7 and Paragraph 4.6 with proper notice. If Contractor intends to reserve time without an approved CPM schedule prepared pursuant to Article 8 or without submitting a schedule fragnent showing delay to critical path, then Contractor may be prosecuted pursuant to the False Claim Act.

ARTICLE 8
TIME AND SCHEDULE

8.1 DEFINITIONS

8.1.1 Contract Time

Contractor shall perform and reach Substantial Completion (See Article 1.1.46) within the time specified in the Agreement Form..

8.1.2 [Reserved]

8.1.3 Computation of Time

The term "day" as used in the Contract Documents shall mean calendar day unless otherwise specifically defined.

8.1.4 [Reserved]

8.2 HOURS OF WORK

8.2.1 Sufficient Forces

Contractors and Subcontractors shall continuously furnish sufficient forces to ensure the prosecution of the Work in accordance with the Construction Schedule.

8.2.2 Performance During Working Hours

Work shall be performed during regular working hours as set forth in the Special Conditions and as permitted by the appropriate governmental agency except that in the event of an emergency, or when required to complete the Work in accordance with job progress, Work may be performed outside of regular working hours with the advance written consent of the Owner and approval of any required governmental agencies.

8.2.3 Costs for After Hours Inspections

If the Contractor elects to perform Work outside the Inspector's regular working hours, costs of any inspections required outside regular working hours shall be invoiced to the Contractor by the Owner and a Deductive Change Order from the next Progress Payment as a Deductive Change Order.

8.3 PROGRESS AND COMPLETION

8.3.1 Time of the Essence

Time limits stated in the Contract Documents are of the essence to the Contract. By executing the Agreement, the Contractor confirms that the Contract Time is a reasonable period for performing the Work.

8.3.2 Project Schedule Requirements

8.3.2.1 *Timing*: Within ten (10) calendar days after Notice to Proceed, Contractor shall submit a Preliminary Project Schedule showing the order in which the Contractor proposes to perform the Work, and the dates on which the Contractor contemplates starting and completing the salient categories of the Work. This first schedule which outlines the Contractor's view of the practical way in which the Work will be accomplished is the Baseline Project Schedule. The Baseline Project Schedule showing all critical path items must be submitted within forty-five (45) calendar days after Notice to Proceed. If the Contractor Fails to submit either schedule within the proscribed time, then Owner may withhold processing and approval of progress payments pursuant to Article 9.4 and 9.6.

8.3.2.2 *[Reserved]*.

8.3.2.3 *Schedule Must Be Within the Given Contract Time.* The schedule shall not exceed time limits set forth in the Contract Documents and shall comply with all of the scheduling requirements as set forth in the Specifications.

8.3.2.4 *Submittals Must Be Incorporated (See Article 3.7.2 and 3.9.6)*: Contractor shall include Submittals as line items in the Baseline Schedule as required under Article 3.7.2 and 3.9.6. Submittals shall not delay the Work, Milestones, or the Completion Date. Failure to include Submittals in the Baseline Schedule shall be deemed a material breach by the Contractor.

8.3.2.5 *[Reserved]*

8.3.2.6 *No Early Completion.* Contractor shall not submit a schedule showing early completion without indicating float time through the date set for Project completion by Owner. Contractor's schedule shall account for all days past early completion as float which belongs to the Project. Usage of float shall not entitle Contractor to any delay claim or damages due to delay.

8.3.2.7 *Use of Schedule Provided in Bid Documents.* In some cases, the Bid will include a preliminary schedule indicating milestones and construction sequences for the Project along with general timing for the Project. The preliminary schedule is not intended to serve as the Baseline Schedule utilized for construction. It is up to the Contractor to study and develop a Baseline Schedule to address the actual durations and sequences of Work that is anticipated while maintaining the Milestones provided by the Owner. Contract shall obtain information from Contractor's subcontractors and vendors on the planning, progress, delivery of equipment, coordination, and timing of availability of subcontractors so a practical plan of Work is fully developed and represented in the Baseline Schedule.

8.3.2.8 *Incorrect Logic, Durations, Sequences, or Critical Path.* The Owner may reject or indicate durations, sequences, critical path or logic are not acceptable and request changes. The electronic copy of the schedule shall have adequate information so logic ties, duration, sequences and critical path may be reviewed electronically. Contractor is to diligently rebuild and resubmit the schedule to represent the Contractor's plan to complete the Work and maintain milestones at the next Progress meeting, or before the next progress meeting. If Contractor is not able to build a schedule that is acceptable to the Owner or Architect, the Owner reserves the right to utilize the unapproved originally submitted Baseline (See Article 8.3.2.12) and the comments submitted to hold Contractor accountable for timely delivery of Work and maintenance of Milestones. Furthermore, Contractor's representations in Baseline, if unacceptable, may also be used as a basis for termination of the Contract under Article 14 if Contractor fails to adequately maintain the schedule and falls significantly behind without undertaking the efforts to either submit and follow a recovery schedule or fail to submit a recovery schedule and make no effort toward recovery on the Project.

8.3.2.9 *Contractor Responsibility Even if Schedule Issues Are Not Discovered.* Failure on the Part of the Owner to discover errors or omissions in schedules submitted shall not be construed to be an approval of the error or omission and a flawed schedule is not grounds for a time extension.

8.3.2.9.1 [Reserved]

8.3.2.10 *[Reserved]*.

8.3.2.11 *Failure to Meet Requirements*. Failure of the Contractor to provide proper schedules as required by this Article and Article 9 is a material breach of the Contract and grounds for Termination pursuant to Article 14. The Owner, at its sole discretion, may choose, instead, to withhold, in whole or in part, any Progress Payments or Retention amounts otherwise payable to the Contractor.

8.3.2.12 *Use of an Unapproved Baseline Schedule*. If Schedule Submitted is unacceptable to the Owner (i.e. failing to meet the requirements of Article 8.3.2) and Contractor does not incorporate or address the written comments to the schedule and a Baseline Schedule is not approved, but due to extreme necessity, the Owner moves forward without an approved Baseline Schedule, Contractor shall diligently revise and meet Schedule update requirements of Article 8 and incorporate all Article 8.3.2 comments in all updates). However, for purposes of Termination pursuant to Article 14, the Schedule initially submitted shall be treated as a Baseline Schedule with

durations shortened to accommodate all Float and other mandatory Schedule Requirements under Article 8.3.2.1 as well as incorporate all 8.3.2 revisions from Owner or Architect that are noted.

8.3.3 Update Schedules

8.3.3.1 *Updates Shall Be Based on Approved Baseline Schedule*. Except in the case where there has not been agreement as to a Baseline Schedule as addressed in Article 8.3.2.4, after there has been agreement as to the Baseline Schedule, the Baseline Schedule shall be used to build future schedule updates. Schedule Updates shall be a CPM based schedule consistent with the Baseline Schedule requirements of 8.3.2

In the case of utilization of Article 8.3.2.4 and no Baseline has been approved, Schedule updates shall be provided monthly and each update shall incorporate all comments and revisions noted as not complying with the requirements of Article 8.3.2. Contractor shall be held to the Article 8.3.2.4 Unapproved Baseline Schedule, inclusive of all Milestones, adjusted for comments and all required Baseline Schedule Inclusions under Article 8.3.2.1.

8.3.3.2 *Schedule Updates*. Contractor shall update the schedule each month to address actual start dates and durations, the percent complete on activities, actual completion dates, estimated remaining duration for the Work in progress, estimated start dates for Work scheduled to start at future times and changes in duration of Work items

8.3.3.3 *[Reserved]*

8.3.3.4 *Recovery Schedule*. In addition to providing a schedule update every thirty (30) days, the Contractor, if requested by the Architect or Owner, shall take the steps necessary to improve Contractor's progress and demonstrate to the Owner and Architect that the Contractor has seriously considered how the lost time, the Completion Date, or the milestones that are required to be met within the terms of the Contract. Contractor shall immediately provide a Recovery Schedule showing how the Completion Date will be met. In no case, shall a Recovery Schedule be provided later than ten (10) days following the request for a Recovery Schedule from the Architect or Owner.

8.4 EXTENSIONS OF TIME - LIQUIDATED DAMAGES

8.4.1 Liquidated Damages

CONTRACTOR AND OWNER HEREBY AGREE THAT THE EXACT AMOUNT OF DAMAGES FOR FAILURE TO COMPLETE THE WORK WITHIN THE TIME SPECIFIED IS EXTREMELY DIFFICULT OR IMPOSSIBLE TO DETERMINE. IF THE WORK IS NOT SUBSTANTIALLY COMPLETED IN THE TIME SET FORTH IN THE AGREEMENT, IT IS UNDERSTOOD THAT THE OWNER WILL SUFFER DAMAGES. IT BEING IMPRACTICAL AND UNFEASIBLE TO DETERMINE THE AMOUNT OF ACTUAL DAMAGE, IT IS AGREED THE CONTRACTOR SHALL PAY TO THE OWNER THE AMOUNT LIQUIDATED DAMAGES SET FORTH IN THE AGREEMENT, FOR EACH CALENDAR DAY OF DELAY IN REACHING SUBSTANTIAL COMPLETION (SEE ART 1.1.46). CONTRACTOR AND ITS SURETY SHALL BE LIABLE FOR THE AMOUNT THEREOF PURSUANT TO GOVERNMENT CODE SECTION 53069.85.

8.4.2 Delay

Except and only to the extent provided under Article 7 and Article 8, by signing the Agreement, Contractor agrees to (a) bear the risk of delays to completion of the Work; and (b)that Contractor's bid for the Contract was made with full knowledge of this risk.

8.4.3 [Reserved]

8.4.4 Notice by Contractor Required

The Contractor shall within five (5) calendar days of beginning of any such delay notify the Owner in writing of causes of delay with justification and supporting documentation. Claims relating to time extensions shall be made in accordance with applicable provisions of Article 7.

8.4.4.1 *[Reserved]*

ARTICLE 9
PAYMENTS AND COMPLETION

9.1 CONTRACT SUM

The Contract Sum is stated in the Agreement and, including authorized adjustments, is the total amount payable by the Owner to the Contractor for performance of the Work under the Contract Documents.

9.2 COST BREAKDOWN

9.2.1 [Reserved]

9.2.2 Information and Preparation of Schedule of Values

9.2.2.1 *Break Down of Schedule of Values*. Schedule of Values shall be broken down by Project, site, building, milestone, or other meaningful method to measure the level of Project Completion as determined by the Owner.

9.2.2.2 *Based on Contractor Bid Costs.* The Schedule of Values shall be based on the costs from Contractor's bid to the Owner. However, the submission of the Schedule of Values shall not be front loaded so the Contractor is paid a greater value than the value of the Work actually performed and shall not shift funds from parts of the Project that are later to Work that is performed earlier.

9.2.2.3 Largest Dollar Value for Each Line Item. Identify subcontractors and materials suppliers proposed to provide portions of Work equal to or greater than ten thousand dollars ($10,000) or one-half (1/2) of one percent (1%) of their Contract Price, whichever is less.

9.2.2.4 *Allowances*. Any Allowances provided for in the Contract shall be a line item in the Schedule of Values.

9.2.2.5 *Labor and Materials Shall Be Separate*. Labor and Materials shall be broken into two separate line items unless specifically agreed in writing by the Owner.

9.2.2.6 *Cost of Contract Closeout*. The cost of contract closeout shall be shown as individual line items:

a. Punch List – 3% of the total contract price

b. Closeout Documentation – 2% of the total contract price

9.2.3 Owner Approval Required

The Owner shall review all submissions received pursuant to Paragraph 9.2 in a timely manner. All submissions must be approved by the Owner before becoming the basis of any payment.

9.3 PROGRESS PAYMENTS

9.3.1 Payments to Contractor

Unless there is a resolution indicating that the Work for the Project is sufficiently complex, within thirty (30) days after approval of the Request for Payment, Contractor shall be paid a sum equal to ninety-five percent (95%) of the value of the Work performed (as certified by Architect and Inspector and verified by Contractor) up to the last day of the previous month, less the aggregate of previous payments. The value of the Work completed shall be the Contractor's best estimate. Work completed as estimated shall be an approximation or estimate only and no mistake, inaccuracy, error or falsification in said any approved estimate shall operate to release the Contractor, or any surety upon any bond, from damages arising from such Work, or from the Owner's enforcement of each and every provision of this Contract including but not limited to the Performance Bond and Payment Bond. The Owner shall have the right to subsequently to correct any mistake, inaccuracy, error or falsification made or

otherwise set forth in any approved Request for Payment and such correction may occur in any future Payment Application or in the Retention Payment to the Contractor.

9.3.2 Purchase of Materials and Equipment and Cost Fluctuations

The Contractor is required to order, obtain, and store materials and equipment sufficiently in advance of its Work at no additional cost or advance payment from Owner to assure that there will be no delays or cost fluctuations due to market fluctuations or procurement difficulties. Contractor further understands and incorporates into Contractor's bid cost any wage rate increases during the Project for the Contractor's labor force as well as all other subcontractor and vendor labor forces.

9.3.3 No Waiver

No payment by Owner hereunder shall be interpreted so as to imply that Owner has inspected, approved, or accepted any part of the Work. Contractor specifically understands that Title 24 Section 4-343 that:

"It is the duty of the contractor to complete the work covered by his or her contract in accordance with the approved Plans and Specifications therefore. The contractor in no way is relieved of any responsibility by the activities of the Architect, Engineer, Inspector or DSA in the performance of such duties...In no case, however, shall the instruction of the Architect or registered Engineer be construed to cause work to be done with is not in conformity with the approved Plans, Specifications, and change orders... "

9.3.4 Issuance of Certificate of Payment

The Architect shall, within seven (7) days after receipt of the Contractor's Application for Payment, either approve such payment or notify the Contractor in writing of the Architect's reasons for withholding approval in whole or in part as provided in Paragraph 9.6. The review of the Contractor's Application for Payment by the Architect is based on the Architect's observations at the Site and the data comprising the Application for Payment that the Work has progressed to the point indicated and that, to the best of the Architect's knowledge, information, and belief, the quality of the Work is in accordance with the Contract Documents. In some cases, the Architect may act upon or rely on the evaluation of the Work by the Inspector. This review of Payment Applications is sometimes called a "Pencil Draft." Owner's return of a Pencil Draft shall constitute the Owner's dispute of the Pay Application that has been submitted. Contractor shall promptly respond to Pencil Drafts or Contractor's Pay Applications may be delayed. Contractor's failure to promptly respond to a Pencil Draft shall qualify as a delay in the Prompt Payment of a Request for Payment or Request for Retention.

9.3.5 [Reserved]

9.4 APPLICATIONS FOR PROGRESS PAYMENTS

9.4.1 Procedure

9.4.1.1 *Application for Progress.* On or before the fifth (5th) day of each calendar month during the progress of the Work, Contractor shall submit to the Architect an itemized Application for Progress Payment for operations completed. Such application shall be notarized, if required, and supported by the following or such portion thereof as Architect requires:

4. The amount paid to the date of the Application to the Contractor, to all its Subcontractors, and all others furnishing labor, material, or equipment for its Contract;

5. The amount being requested under the Application for Payment by the Contractor on its own behalf and separately stating the amount requested on behalf of each of the Subcontractors and all others furnishing labor, material, and equipment under the Contract;

6. The balance that will be due to each of such entities after said payment is made;

7. A certification that the As-Built Drawings and Annotated Specifications are current;

8. Itemized breakdown of Work done for the purpose of requesting partial payment;

9. An updated construction schedule in conformance with Paragraph 8;

10. The additions to and subtractions from the Contract Price and Contract Time;

11. A summary of the Retention held;

12. Material invoices, evidence of equipment purchases, rentals, and other support and details of cost as the Owner may require from time to time;

13. The percentage of completion of the Contractor's Work by line item;

14. An updated Schedule of Values from the preceding Application for Payment; and

15. Prerequisites for Progress Payments.

9.4.1.2 *[Reserved]*:

9.4.1.3 *[Reserved]*.

9.4.1.4 *All Payment Requests.* No payment requests will be processed unless Contractor has submitted copies of the Certified Payroll records for the Work which correlates to the payment request and a proper CPM schedule pursuant to Article 8 is submitted. Contractor must also submit all required OCIP information and documents as set forth in the OCIP Manual and Information, if applicable.

9.4.1.5 *Final Pay Application (90% or 95%).* See Article 9.11.1

9.4.1.6 *Final Pay Application (100%).* See Article 9.11.3

9.5 STOP NOTICE CLAIMS AND WARRANTY OF TITLE

The Contractor warrants title to all Work. The Contractor further warrants that all Work is free and clear of liens, claims, security interests, stop notices, or encumbrances in favor of the Contractor, Subcontractors, material and equipment suppliers, or other persons or entities making a claim by reason of having provided labor, materials, and equipment relating to the Work. Failure to keep work free of liens, stop notices, claims, security interests or encumbrances is grounds to make a claim against Contractor's payment and performance bond to immediately remedy and defend.

If a lien or stop notice of any nature should at any time be filed against the Work or any Owner property, by any entity which has supplied material or services at the request of the Contractor, Contractor and Contractor's surety shall promptly, on demand by Owner and at Contractor's and surety's own expense, take any and all action necessary to cause any such lien or stop notice to be released or discharged immediately therefrom.

If the Contractor fails to furnish to the Owner within ten (10) calendar days after written demand by the Owner, satisfactory evidence that a lien or stop notice has been so released, discharged, or secured, then Owner may discharge such indebtedness and deduct the amount required therefor, together with any and all losses, costs, damages, and attorney's fees and expense incurred or suffered by Owner from any sum payable to Contractor under the Contract. In addition, any liens, stop notices, claims, security interests or encumbrances shall trigger the indemnification requirements under Article 3.15 and shall act as a trigger under Civil Code Section 2778 and 2779 requiring reimbursement for any and all costs following the Owner's written demand has been made.

9.6 DECISIONS TO WITHHOLD PAYMENT

9.6.1 Reasons to Withhold Payment

The Owner may withhold payment in whole, or in part, to the extent reasonably necessary to protect the Owner if, in the Owner's opinion, the representations to the Owner required by Paragraph 9.4 cannot be made. The Owner may withhold payment, in whole, or in part, to such extent as may be necessary to protect the Owner from loss because of, but not limited to:

a. Defective Work not remedied;

b. Stop Notices served upon the Owner;

c. Liquidated damages assessed against the Contractor;

d. The cost of completion of the Contract if there exists reasonable doubt that the Work can be completed for the unpaid balance of any Contract Price or by the completion date;

e. Damage to the Owner or other contractor;

f. Unsatisfactory prosecution of the Work by the Contractor;

g. Failure to store and properly secure materials;

h. Failure of the Contractor to submit on a timely basis, proper and sufficient documentation required by the Contract Documents, including, without limitation, acceptable monthly progress schedules, Shop Drawings, Submittal schedules, schedule of values, product data and samples, proposed product lists, executed Change Order, Construction Change Documents, and verified reports;

i. Failure of the Contractor to maintain As Built Drawings;

j. Erroneous estimates by the Contractor of the value of the Work performed, or other false statements in an Application for Payment;

k. Unauthorized deviations from the Contract Documents (including but not limited to Unresolved Notices of Deviations (DSA Form 154));

l. Failure of the Contractor to prosecute the Work in a timely manner in compliance with established progress schedules and completion dates.

m. Failure to properly pay prevailing wages as defined in Labor Code section 1720, et seq.;

n. Failure to properly maintain or clean up the Site;

o. Payments to indemnify, defend, or hold harmless the Owner;

p. Any payments due to the Owner including but not limited to payments for failed tests, or utilities changes or permits;

q. Failure to submit an acceptable schedule in accordance with Paragraph 3.8;

r. Failure to pay Subcontractor or suppliers as required by Paragraph 9.8.1;

s. Failure to secure warranties, including the cost to pay for warranties;

t. Failure to provide release from material suppliers or subcontractors when requested to do so;

u. Items deducted pursuant to Article 2.2;

v. Incomplete Punch List items under Article 9.9.1.2 which have gone through the Article 2.2 process; or

w. Allowances that have not been used.

9.6.2 Reallocation of Withheld Amounts

Owner may, in its discretion, apply any withheld amount to payment of outstanding claims or obligations as defined in Paragraphs 9.6.1 and 9.5. In so doing, Owner shall make such payments on behalf of Contractor. If any payment is so made by Owner, then such amount shall be considered as a payment made under Contract by Owner to Contractor and Owner shall not be liable to Contractor for such payments made in good faith. Such payments may be made without prior judicial determination of claim or obligation. Owner will render Contractor an accounting of such funds disbursed on behalf of Contractor.

If Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents or fails to perform any provision thereof, Owner may, after ten (10) calendar days written notice to the Contractor and without prejudice to any other remedy make good such deficiencies. The Owner shall adjust the total Contract price by reducing the amount thereof by the cost of making good such deficiencies. If Owner deems it inexpedient to correct Work which is damaged, defective, or not done in accordance with Contract provisions, an equitable reduction in the Contract price (of at least 150% of the estimated reasonable value of the nonconforming Work) shall be made therefor.

9.6.3 Payment After Cure

When the grounds for declining approval are removed, payment shall be made for amounts withheld because of them. No interest shall be paid on any retainage or amounts withheld due to the failure of the Contractor to perform in accordance with the terms and conditions of the Contract Documents.

9.7 NONCONFORMING WORK

Contractor shall promptly remove from premises all Work identified by Owner as failing to conform to the Contract whether incorporated or not. Contractor shall promptly replace and re-execute its own Work to comply with the Contract without additional expense to Owner and shall bear the expense of making good all Work of other contractors destroyed or damaged by such removal or replacement.

If Contractor does not remove such Work which has been identified by Owner as failing to conform to the Contract Documents within a reasonable time, fixed by written notice, Owner may remove it and may store the material at Contractor’s expense. If Contractor does not pay expenses of such removal within ten (10) calendar days’ time thereafter, Owner may sell such materials at auction or at private sale and shall account for net proceeds thereof, after deducting all costs and expenses that should have been borne by Contractor.

9.8 [Reserved]

9.9 COMPLETION OF THE WORK

9.9.1 Close-Out Procedures

9.9.1.1 *[Reserved]*

9.9.1.2 *Punch List Is Prepared Only After the Project Is Substantially Complete.* If any of the conditions noted in Article 1.1.46 as defining Substantial Completion are not met, the Inspector, Architect or Owner may reject Contractor's Incomplete Punch Items as premature. If the Architect and Inspector commence review of Incomplete Punch Items, all rights are reserved until the Project actually meets the definition of Substantially Complete. Liquidated Damages, warranties, and other contractual rights are not affected by Incomplete Punch Items unless otherwise addressed in these General Conditions.

Once the Inspector and the Architect determine the Project is Substantially Complete, a Certificate of Substantial Completion shall be issued. The Inspector and Architect shall prepare a Punch List of items which is an inspection report of the Work, if any, required in order to complete the Contract Documents and ensure compliance with the DSA Approved Plans so the Project may be Completed by the Contractor and a final DSA Close-Out is approved. When all Work for the Project is Complete, including Punch Lists and all Work complies with the approved Contract Documents and Change Orders, the Project has reached Final Completion.

9.9.1.3 *Time for Completion of Punch List.* Contractor shall only be given a period of no more than thirty (30) days to complete the Punch List on Project. During the Punch List period Contractor Superintendent and Project Manager shall remain engaged in the Project and shall not be removed or replaced. If the Punch List is not completed at the end of the Punch List time then Contractor shall issue a valued Punch List within 5 days after the date the Punch List time ends. If Contractor does not issue such a list, the Owner or Architect may issue a valued Punch List to the Contractor and withhold up to 150% of the value of the Punch List Work pursuant to Article 2.2 of this Agreement.

9.9.1.4 *[Reserved]*

9.9.1.5 *[Reserved]*

9.9.2 Close-Out Requirements for Final Completion of the Project

a. Utility Connections. Buildings shall be connected to water, gas, sewer, and electric services, complete and ready for use. Service connections shall be made and existing services reconnected

b. As-Builts Up to Date and Complete. The intent of this procedure is to obtain an exact "As-Built" record of the Work upon completion of the project. The following information shall be carefully and correctly drawn on the prints and all items shall be accurately located and dimensioned from finished surfaces of building walls on all As Built Drawings

1. The exact location and elevations of all covered utilities, including valves, cleanouts, etc. must be shown on As-Builts

2. Contractor is liable and responsible for inaccuracies in As-Built Drawings, even though they become evident at some future date.

3. Upon completion of the Work and as a condition precedent to approval of Retention Payment, Contractor shall obtain the Inspector's approval of the "As-Built" information. When completed, Contractor shall deliver corrected sepias and/or a Diskette with an electronic file in a format acceptable to the Owner.

4. Owner may withhold the cost to hire a draftsman and potholing and testing service to complete Record As-Built Drawings at substantial cost if the Contractor does not deliver a complete set of Record As-Built Drawings. This shall result in withholding of between $10,000 to $20,000 per building that does not have a corresponding Record As Built Drawing.

c. Any Work not installed as originally indicated on Drawings

d. All DSA Close-Out requirements (See DSA Certification Guide) Contractor is also specifically directed to Item 3.2 in the DSA Certification Guide and the applicable certificates for the DSA-311 form.

e. Submission of Form 6-C. Contractor shall be required to execute a Form 6-C as required under Title 24 Sections 4-343. The Contractor understands that the filing with DSA of a Form 6-C is a requirement to obtain final DSA Approval of the Construction by Contractor and utilized to verify under penalty of perjury that the Work performed by Contractor complies with the DSA approved Contract Documents. The failure to file a DSA Form 6C

has two consequences. First, the Construction of the Project will not comply with the Design Immunity Provisions of Government Code Section 830.6 and exposes the Owner and the individual Board members to Personal Liability for injuries that occur on the Project.

Secondly , under DSA IR A-20, since the Project cannot be Certified by DSA, no future or further Projects will be authorized so Contractor will have essentially condemned the campus from any future modernization or addition of new classrooms through their failure to file the DSA Form 6C.

4. *Execution of the DSA Form 6-C is mandatory*. Refusal to Execute the Form 6-C, which is a Final DSA Verified Report that all Work performed complies with the DSA approved Contract Documents is a violation of Education Code Section 17312 and shall be referred to the Attorney General for Prosecution.

5. *Referral to the Owner Attorney for Extortion*. If the Contractor's refusal to execute the DSA Form 6C is to leverage a Dispute, Claim or Litigation, then the matter shall also be referred to the Owner Attorney for prosecution for Extortion.

6. *Contractor shall be Responsible for All Costs to Certify the Project*. The Owner may Certify the Project complies with Approved Plans and Specifications by utilizing the procedures under the Project Certification Guide (Located at the DSA website at http://www.documents.dgs.ca.gov/dsa/plan_review_process/project_certification_guide_updated_03-15-13.pdf). All costs for professionals, inspection, and testing required for an alternate Project Certification shall be the Contractor's responsibility and the Owner reserves its right to institute legal action against the Contractor and Contractor's Surety for all costs to Certify the Project and all costs to correct Non-Compliant Work that is discovered during the Alternate Certification Process.

f. ADA Work that must be corrected to receive DSA certification. See Article 12.2.

g. Maintenance Manuals. At least thirty (30) days prior to final inspection, three (3) copies of complete operations and maintenance manuals, repair parts lists, service instructions for all electrical and mechanical equipment, and equipment warranties shall be submitted. All installation, operating, and maintenance information and drawings shall be bound in 8½" x 11" binders. Provide a table of contents in front and all items shall be indexed with tabs. Each manual shall also contain a list of subcontractors, with their addresses and the names of persons to contact in cases of emergency. Identifying labels shall provide names of manufactures, their addresses, ratings, and capacities of equipment and machinery.

4. Maintenance manuals shall also be delivered in electronic media for the Project. Any demonstration videos shall also be provided on electronic media.

h. Inspection Requirements. Before calling for final inspection, Contractor shall determine that the following Work has been performed:

4. The Work has been completed.

5. All life safety items are completed and in working order.

6. Mechanical and electrical Work complete, fixtures in place, connected and tested.

7. Electrical circuits scheduled in panels and disconnect switches labeled.

8. Painting and special finishes complete.

9. Doors complete with hardware, cleaned of protective film relieved of sticking or binding and in working order.

10. Tops and bottoms of doors sealed.

11. Floors waxed and polished as specified.

12. Broken glass replaced and glass cleaned.

13. Grounds cleared of Contractor's equipment, raked clean of debris, and trash removed from Site.

14. Work cleaned, free of stains, scratches, and other foreign matter, replacement of damaged and broken material.

15. Finished and decorative work shall have marks, dirt and superfluous labels removed.

16. Final cleanup, as in Paragraph 3.12.

17. All Work pursuant to Article 9.11.

18. Furnish a letter to Owner stating that the Owner's Representative or other designated person or persons have been instructed in working characteristics of mechanical and electrical equipment.

9.9.3 Costs of Multiple Inspections

More than two (2) requests of the Owner to make inspections required under Paragraph 9.9.1 shall be considered an additional service of Architect, Inspector, Engineer or other consultants shall be the Contractor's responsibility pursuant to Article 4.5 and all subsequent costs will be prepared as a Deductive Change Order.

9.10 PARTIAL OCCUPANCY OR USE

9.10.1 Owner's Rights

The Owner may occupy or use any completed or partially completed portion of the Work at any stage. The Owner and the Contractor shall agree in writing to the responsibilities assigned to each of them for payments, security, maintenance, heat, utilities, damage to the Work, insurance, the period for correction of the Work, and the commencement of warranties required by the Contract Documents. If Owner and Contractor cannot agree as to responsibilities such disagreement shall be resolved pursuant to Paragraph 4.6. When the Contractor considers a portion complete, the Contractor shall prepare and submit a Punch List to the Owner as provided under Paragraph 9.9.1.

9.10.2 Inspection Prior to Occupancy or Use

Immediately prior to such partial occupancy or use, the Owner, the Contractor, and the Architect shall jointly inspect the area to be occupied or portion of the Work to be used in order to determine and record the condition of the Work.

9.10.3 No Waiver

Unless otherwise agreed upon, partial occupancy or use of a portion or portions of the Work shall not constitute acceptance of Work not complying with the requirements of the Contract Documents.

9.11 COMPLETION AND FINAL PAYMENT

9.11.1 Final Payment (90% Billing if Substantially Complex Finding and 95% Billing If No Finding Is Made)

The following items must be completed before the Final Pay Application will be accepted for processing at Substantial Completion of the Project:

a. Inspector Sign off of each item in the DSA 152 Project Inspection Card;

b. The Project has reached the Punch List items under Article 9.9.1.2 and the Project has been determined to be Substantially Complete under Article 1.1.28;

c. Removal of temporary facilities and services;

d. Testing, adjusting and balance records are complete;

e. Removal of surplus materials, rubbish, and similar elements;

f. Change Over of Door locks;

g. Deductive items pursuant to Article 9.6 and Article 2.2; and

h. Completion and submission of all final Change Orders for the Project.

9.11.2 Final Inspection (Punch List Completion)

Contractor shall comply with Punch List procedures under Article 9.9.1.1, and maintain the presence of Project Superintendent and Project Manager (not replacement project superintendent or project manager) until the Punch List is complete to ensure proper and timely completion of the Punch List. Under no circumstances shall Contractor demobilize its forces prior to completion of the Punch List.

Upon completion of the Work under Article 9.9.1, the Contractor shall notify the CJUSD and Architect, who shall again inspect such Work. If the Architect and the CJUSD find the Work contained in the Punch List acceptable under the Contract Documents, the Work shall have reached Final Completion. Architect shall notify Contractor, who shall then submit to the Architect its Application for Retention Payment. This Application for Retention Payment shall contain any deductions under Article 9.6, including but not limited to incomplete Punch List items under Article 9.9.1.

Upon receipt and approval of Application for Retention Payment, the Architect shall issue a Form 6 stating that to the best of its knowledge, information, and belief, and on the basis of its observations, inspections, and all other data accumulated or received by the Architect in connection with the Work, such Work has been completed in accordance with the Contract Documents. The Owner shall thereupon inspect such Work and either accept the Work as complete or notify the Architect and the Contractor in writing of reasons why the Work is not complete. Upon acceptance of the Work of the Contractor as fully complete (which, absent unusual circumstances, will occur when the Punch List items have been satisfactorily completed), the Owner shall record a Notice of Completion with the County Recorder, and the Contractor shall, upon receipt of payment from the Owner, pay the amounts due Subcontractors.

If the Architect and the Owner find that the Work Contained in the Punch List is unacceptable, then Contractor shall issue a valued Punch List within 5 days after the date the Punch List time ends. If Contractor does not issue such a list, the Owner or Architect may issue a valued Punch List to the Contractor and withhold up to 150% of the value of the Punch List Work pursuant to Article 2.2 of this Agreement.

9.11.3 Retainage (100% Billing for the Entire Project)

The retainage, less any amounts disputed by the Owner or which the Owner has the right to withhold Pursuant to Paragraph 9.6 (including but not limited to incomplete Punch List items under Article 9.9.1), shall be paid after approval by the Owner of the Application for Retention Payment, after the satisfaction of the

conditions set forth in Article 9, the Final Inspection under Article 9.11.2 is completed, and after thirty-five (35) days after the acceptance of the Work and recording of the Notice of Completion by Owner. No interest shall be paid on any retainage, or on any amounts withheld due to a failure of the Contractor to perform, in accordance with the terms and conditions of the Contract Documents, except as provided to the contrary in any Escrow Agreement between the Owner and the Contractor.

a. Procedures for Application for Retention Payment. The following conditions must be fulfilled prior to release of Retention Payment:

i. A full and final waiver or release of all Stop Notices in connection with the Work shall be submitted by Contractor, including a release of Stop Notice in recordable form, together with (to the extent permitted by law) a copy of the full and final release of all Stop Notice rights.

ii. The Contractor shall have made all corrections, including all Punch List Items, to the Work which are required to remedy any defects therein, to obtain compliance with the Contract Documents or any requirements of applicable codes and ordinances, or to fulfill any of the orders or directions of Owner required under the Contract Documents.

iii. Each Subcontractor shall have delivered to the Contractor all written guarantees, warranties, applications, releases from the Surety and warranty bonds (if applicable) required by the Contract Documents for its portion of the Work.

iv. Contractor must have completed all requirements set forth in Article 9.9.

v. Contractor must have issued a Form 6C for the Project.

vi. The Contractor shall have delivered to the Owner all manuals and materials required by the Contract Documents.

vii. The Contractor shall have completed final clean up as required by Paragraph 3.12.

viii. Contractor shall have all deductive items under Article 9.6 and Article 2.2 submitted as part of the Retention Payment.

9.11.4 Recording of a Notice of Completion After Punch List Period and Final Inspection.

When the Work, or designated portion thereof, is complete or the Owner has completed the Article 9.6 and/or the Article 2.2 process, whichever occurs first, the Owner will file either a Notice of Completion or a Notice of Completion noting Valued Punch List items. Valued Punch List items will be deducted from the Retention Payment.

During the time when Work is being performed on the Punch List, the Project does not meet the definition of “Complete” under Public Contract Code Section 7107(c)(1) even if there is “beneficial occupancy” of the Project since that has been no “cessation of labor” on the Project. Completion of Punch List under this Article is not “testing, startup, or commissioning by the public entity or its agent.” In other words, the continuing Punch List Work is Contractor labor on the Project until each and every item of Punch List Work is complete or the time periods under Article 9.9.1 have expired.

9.11.5 Warranties

Warranties required by the Contract Documents shall commence on the date of Completion of the entire Work. Warranty periods DO NOT commence at Substantial Completion or when a particular subcontractor work is complete. No additional charges, extras, Change Orders, or Claims may be sought for warranties commencing from the Notice of Completion.

Owner shall have the right to utilize equipment, test, and operate as necessary for acclimation, or testing without voiding or starting warranties. Taking beneficial occupancy shall not start warranties except in the case where the Owner agrees, in writing, that warranties shall commence running or where the Owner is taking phased occupancy of specific buildings or areas and completes separate Punch Lists as further addressed in Article 4.2.7.

9.11.6 Time for Submission of Application for Final Payment and Retention Payment (Unilateral Processing of Final and Retention Pay Application).

If Contractor submits a Final Pay Application which fails to include deductive items under Article 9.6, the Owner or Architect shall note this defective request for Final Pay Application. The Contractor shall be notified that specific deductive items shall be included in the Final Pay Application. If Contractor either continues to submit the Final Pay Application without deductive items under Article 9.6, or a period of 14 calendar days passes after Contractor is provided written notice of deductive items for inclusion in Final Pay Application, then Owner may either alter the Final Pay Application and recalculate the math on the Final Pay Application to address the Article 9.6 deductive items or process a Unilateral Final Pay Application.

9.11.7 Unilateral Release of Retention

After the recordation of the Notice of Completion, or within sixty (60) days following the completion of the Punch List or the expiration of the time for completion of Punch List under Article 9.9.1, if Contractor does not make an Application for Release of Retention, the CJUSD may unilaterally release retention less any deducts under Article 9.6 and/or Article 2.2, withholds due to stop notices, or withholdings due to other defective Work on the Project. CJUSD may also choose to unilaterally release Retention after deduction of 150% of any disputed items, which may also include items under Article 9.6 and 2.2. If a deduction pursuant to Article 9.6 is made from Retention, a letter deducting specific valued items shall be considered a notice of Default under the terms of the Escrow Agreement.

9.12 SUBSTITUTION OF SECURITIES

The Owner will permit the substitution of securities in accordance with the provisions of Public Contract Code section 22300.

ARTICLE 10
PROTECTION OF PERSONS AND PROPERTY

10.1 SAFETY PRECAUTIONS AND PROGRAMS

10.1.1 Contractor Responsibility

The Contractor shall be responsible for all damages to persons or property that occur as a result of its fault or negligence in connection with the prosecution of this Contract and shall take all necessary measures and be responsible for the proper care and protection of all materials delivered and Work performed until completion and final acceptance by the Owner. All Work shall be solely at the Contractor's risk, with the exception of damage to the Work caused by "acts of God" as defined in Public Contract Code Section 7105(b)(2).

Contractor shall take, and require subcontractor to take, all necessary precautions for safety of workers on the Work and shall comply with all applicable federal, state, local and other safety laws, standards, orders, rules, regulations, and building codes to prevent accidents or injury to persons on, about, or adjacent to premises where Work is being performed and to provide a safe and healthful place of employment. In addition to meeting all requirements of OSHA, Cal-OSHA, state, and local codes, Contractor shall furnish, erect and properly maintain at all times, as directed by Owner or Architect or required by conditions and progress of Work, all necessary safety devices, safeguards, construction canopies, signs, audible devices for protection of the blind, safety rails, belts and nets, barriers, lights, and watchmen for protection of workers and the public, and shall post danger signs warning against hazards created by such features in the course of construction. Contractor shall designate a responsible member of its organization on the Work, whose duty shall be to post information regarding protection and obligations of workers and other notices required under occupational safety and health laws, to comply with reporting and other occupational safety requirements, and to protect the life, safety and health of workers. The name and position of person so designated shall be reported to Owner by Contractor. Contractor shall correct any violations of safety laws, rules, orders, standards, or regulations. Upon the issuance of a citation or notice of violation by the Division of Occupational Safety and Health, such violation shall be corrected promptly.

10.1.2 Subcontractor Responsibility

Contractor shall require that Subcontractors participate in, and enforce, the safety and loss prevention programs established by the Contractor for the Project, which will cover all Work performed by the Contractor and its Subcontractors. Each Subcontractor shall designate a responsible member of its organization whose duties shall include loss and accident prevention, and who shall have the responsibility and full authority to enforce the program. This person shall attend meetings with the representatives of the various Subcontractors employed to ensure that all employees understand and comply with the programs.

10.1.3 Cooperation

All Subcontractors and material or equipment suppliers shall cooperate fully with Contractor, the Owner, and all insurance carriers and loss prevention engineers.

10.1.4 Accident Reports

Subcontractors shall immediately, within two (2) days, report in writing to the Contractor all accidents whatsoever arising out of, or in connection with, the performance of the Work, whether on or off the Site, which caused death, personal injury, or property damage, giving full details and statements of witnesses. In addition, if death or serious injuries or serious damages are caused, the accident shall be reported within four (4) days by telephone or messenger. Contractor shall thereafter immediately, within two (2) days, report the facts in writing to the Owner and the Architect giving full details of the accident.

10.1.5 First-Aid Supplies at Site

The Contractor will provide and maintain at the Site first-aid supplies which complies with the current Occupational Safety and Health Regulations.

10.1.6 Material Safety Data Sheets and Compliance with Proposition 65

Contractor is required to have material safety data sheets available in a readily accessible place at the job site for any material requiring a material safety data sheet per the Federal "hazard communication" standard, or employees' "right-to-know law." The Contractor is also required to properly label any substance brought into the job site, and require that any person working with the material, or within the general area of the material, is informed of the hazards of the substance and follows proper handling and protection procedures.

Contractor is required to comply with the provisions of California Health and Safety Code section 25249, et seq., which requires the posting and giving of notice to persons who may be exposed to any chemical known to the State of California to cause cancer. The Contractor agrees to familiarize itself with the provisions of this section, and to comply fully with its requirements.

10.1.7 Non-Utilization of Asbestos Material

NO ASBESTOS OR ASBESTOS-CONTAINING PRODUCTS SHALL BE USED IN THIS CONSTRUCTION OR IN ANY TOOLS, DEVICES, CLOTHING, OR EQUIPMENT USED TO EFFECT THIS CONSTRUCTION.

Decontamination and removal of Work found to contain asbestos or Work installed with asbestos-containing equipment shall be done only under supervision of a qualified consultant, knowledgeable in the field of asbestos abatement and accredited by the Environmental Protection Agency.

The asbestos removal contractor shall be an EPA accredited contractor qualified in the removal of asbestos and shall be chosen and approved by the asbestos consultant, who shall have sole discretion and final determination in this matter.

Interface of Work under this Contract with Work containing asbestos shall be executed by the Contractor at his risk and at his discretion, with full knowledge of the currently accepted standards, hazards, risks, and liabilities associated with asbestos work and asbestos-containing products. By execution of this Contract, the Contractor acknowledges the above and agrees to hold harmless Owner and its assigns for all asbestos liability which may be associated with this work and agrees to instruct his employees with respect to the above-mentioned standards, hazards, risks, and liabilities.

10.2 SAFETY OF PERSONS AND PROPERTY

10.2.1 The Contractor

The Contractor shall take reasonable precautions for the safety of, and shall provide reasonable protection to prevent damage, injury, or loss to:

a. Employees on the Work and other persons who may be affected thereby;

b. The Work, material, and equipment to be incorporated therein, whether in storage on or off the Site, under the care, custody, or control of the Contractor or the Contractor's Subcontractors or Sub-subcontractors; and

c. Other property at the Site or adjacent thereto such as trees, shrubs, lawns, walks, pavement, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

Contractor is constructive owner of Project site as more fully discussed in Paragraph 6.2.

10.2.2 Contractor Notices

The Contractor shall give notices and comply with applicable laws, ordinances, rules, regulations, and lawful orders of public authorities bearing on the safety of persons or property or their protection from damage, injury, or loss.

10.2.3 Safety Barriers and Safeguards

The Contractor shall erect and maintain, as required by existing conditions and performance of the Contract, reasonable safeguards for safety and protection, including posting danger signs and other warnings against hazards, promulgating safety regulations, and notifying owners and users of adjacent sites and utilities.

10.2.4 Use or Storage of Hazardous Material

When use or storage of explosives, other hazardous materials or equipment, or unusual methods are necessary for execution of the Work, the Contractor shall exercise utmost care and carry on such activities under supervision of properly qualified personnel. The Contractor shall notify the Owner any time that explosives or hazardous materials are expected to be stored on Site. Location of storage shall be coordinated with the Owner and local fire authorities.

10.2.5 Protection of Work

The Contractor and Subcontractors shall continuously protect the Work, the Owner's property, and the property of others, from damage, injury, or loss arising in connection with operations under the Contract Documents. The Contractor and Subcontractors, at their own expense, shall make good any such damage, injury, or loss, except such as may be solely due to, or caused by, agents or employees of the Owner.

The Contractor, at Contractor's expense, will remove all mud, water, or other elements as may be required for the proper protection and prosecution of its Work.

Contractor shall take adequate precautions to protect existing roads, sidewalks, curbs, pavements, utilities, adjoining property and structures (including, without limitation, protection from settlement or loss of lateral support), and to avoid damage thereto, and repair any damage thereto caused by construction operations. All permits, licenses, or inspection fees required for such repair Work shall be obtained and paid for by Contractor.

10.2.6 Requirements for Existing Sites

Contractor shall (unless waived by the Owner in writing):

a. When performing construction on existing sites, become informed and take into specific account the maturity of the students on the Site; and perform Work which may interfere with school routine before or after school hours, enclose working area with a substantial barricade, and arrange Work to cause a minimum amount of inconvenience and danger to students and faculty in their regular school activities. The Contractor shall comply with Specifications and directives of the Owner regarding the timing of certain construction activities in order to avoid unnecessary interference with school functioning.

b. Avoid performing any Work that will disturb students during testing.

c. Provide substantial barricades around any shrubs or trees indicated to be preserved.

d. Deliver materials to building area over route designated by Architect.

e. Take preventive measures to eliminate objectionable dust, noise, or other disturbances.

f. Confine apparatus, the storage of materials, and the operations of workers to limits indicated by law, ordinances, permits or directions of Architect; and not interfere with the Work or unreasonably encumber premises or overload any structure with materials; and enforce all instructions of Owner and Architect regarding signs, advertising, fires, and smoking and require that all workers comply with all regulations while on the Project site.

g. Take care to prevent disturbing or covering any survey markers, monuments, or other devices marking property boundaries or corners. If such markers are disturbed by accident, they shall be replaced by an approved land surveyor or civil engineer and all

maps and records required therefrom shall be filed with county and local authorities, at no cost to the Owner. All filing and plan check fees shall be paid by Contractor.

h. Provide Owner on request with Contractor's written safety program and safety plan for each site.

10.2.7 Shoring and Structural Loading

The Contractor shall not impose structural loading upon any part of the Work under construction or upon existing construction on or adjacent to the Site in excess of safe limits, or loading such as to result in damage to the structural, architectural, mechanical, electrical, or other components of the Work. The design of all temporary construction equipment and appliances used in construction of the Work and not a permanent part thereof, including, without limitation, hoisting equipment, cribbing, shoring, and temporary bracing of structural steel, is the sole responsibility of the Contractor. All such items shall conform with the requirements of governing codes and all laws, ordinances, rules, regulations, and orders of all authorities having jurisdiction. The Contractor shall take special precautions, such as shoring of masonry walls and temporary tie bracing of structural steel Work, to prevent possible wind damage during construction of the Work. The installation of such bracing or shoring shall not damage the Work in place or the Work installed by others. Any damage which does occur shall be promptly repaired by the Contractor at no cost to the Owner.

10.2.8 Conformance within Established Limits

The Contractor and Subcontractors shall confine their construction equipment, the storage of materials, and the operations of workers to the limits indicated by laws, ordinances, permits, and the limits established by the Owner or the Contractor, and shall not unreasonably encumber the premises with construction equipment or materials.

10.2.9 Subcontractor Enforcement of Rules

Subcontractors shall enforce the Owner's and the Contractor's instructions, laws, and regulations regarding signs, advertisements, fires, smoking, the presence of liquor, and the presence of firearms by any person at the Site.

10.2.10 Site Access

The Contractor and the Subcontractors shall use only those ingress and egress routes designated by the Owner, observe the boundaries of the Site designated by the Owner, park only in those areas designated by the Owner, which areas may be on or off the Site, and comply with any parking control program established by the Owner, such as furnishing license plate information and placing identifying stickers on vehicles.

10.2.11 Security Services.

The Contractor shall be responsible for providing security services for the Site as needed for the protection of the Site and as determined in the Owner's sole discretion.

10.3 EMERGENCIES

10.3.1 Emergency Action

In an emergency affecting the safety of persons or property, the Contractor shall take any action necessary, at the Contractor's discretion, to prevent threatened damage, injury, or loss. Additional compensation or extension of time claimed by the Contractor on account of an emergency shall be determined as provided in Article 7.

10.3.2 Accident Reports

The Contractor shall promptly report in writing to the Owner all accidents arising out of or in connection with the Work, which caused death, personal injury, or property damage, giving full details and

statements of any witnesses in conformance with Article 10.1.4. In addition, if death, serious personal injuries, or serious property damages are caused, the accident shall be reported in accordance with Paragraph 10.1.4, immediately by telephone or messenger to the Owner.

10.4 HAZARDOUS MATERIALS

10.4.1 Discovery of Hazardous Materials

In the event the Contractor encounters or suspects the presence on the job site of material reasonably believed to be asbestos, polychlorinated biphenyl (PCB), or any other material defined as being hazardous by § 25249.5 of the California Health and Safety Code, which has not been rendered harmless, the Contractor shall immediately stop Work in the area affected and report the condition to the Owner and the Architect in writing, whether or not such material was generated by the Contractor or the Owner. The Work in the affected area shall not thereafter be resumed, except by written agreement of the Owner and the Contractor, if in fact the material is asbestos, polychlorinated biphenyl (PCB), or other hazardous material, and has not been rendered harmless. The Work in the affected area shall be resumed only in the absence of asbestos, polychlorinated biphenyl (PCB), or other hazardous material, or when it has been rendered harmless by written agreement of the Owner and the Contractor.

10.4.2 Hazardous Material Work Limitations

In the event that the presence of hazardous materials is suspected or discovered on the Site (except in cases where asbestos and other hazardous material Work in the Contractor's responsibility), the Owner shall retain an independent testing laboratory to determine the nature of the material encountered and whether corrective measures or remedial action is required. The Contractor shall not be required pursuant to Article 7 to perform without consent any Work in the affected area of the Site relating to asbestos, polychlorinated biphenyl (PCB), or other hazardous material, until any known or suspected hazardous material has been removed, or rendered harmless, or determined to be harmless by Owner, as certified by an independent testing laboratory and approved by the appropriate government agency.

10.4.3 Indemnification by Contractor for Hazardous Material Caused by Contractor

In the event the hazardous materials on the Project Site is caused by the Contractor, the Contractor shall pay for all costs of testing and remediation, if any, and shall compensate the Owner for any additional costs incurred as a result of Contractor's generation of hazardous material on the Project Site. In addition, the Contractor shall defend, indemnify and hold harmless Owner and its agents, officers, and employees from and against any and all claims, damages, losses, costs and expenses incurred in connection with, arising out of, or relating to, the presence of hazardous material on the Project Site.

10.4.4 Terms of Hazardous Material Provision

The terms of this Hazardous Material provision shall survive the completion of the Work and/or any termination of this Contract.

ARTICLE 11
INSURANCE AND BONDS

11.1 CONTRACTOR'S LIABILITY INSURANCE

11.1.1 Insurance Requirements

Before the commencement of the Work, the Contractor shall purchase from and maintain in a company or companies lawfully authorized to do business in California with a financial rating of at least an A-VIII status as rated in the most recent edition of Best's Insurance Reports or as amended by the Supplementary General Conditions, such insurance as will protect the Owner from claims set forth below, which may arise out of or result from the Contractor's Work under the Contract and for which the Contractor may be legally liable, whether such Work are by the Contractor, by a Subcontractor, by anyone directly or indirectly employed by any of them, or by anyone for whose acts any of them may be liable. Any required insurance shall not contain any exclusion that applies to the type of work performed by the Contractor under the Contract Documents.

a. Claims for damages because of bodily injury, sickness, disease, or death of any person Owner would require indemnification and coverage for employee claim;

b. Claims for damages insured by usual personal injury liability coverage, which are sustained by a person as a result of an offense directly or indirectly related to employment of such person by the Contractor or by another person;

c. Claims for damages because of injury or destruction of tangible property, including loss of use resulting therefrom, arising from operations under the Contract Documents;

d. Claims for damages because of bodily injury, death of a person, or property damage arising out of the ownership, maintenance, or use of a motor vehicle, all mobile equipment, and vehicles moving under their own power and engaged in the Work;

e. Claims involving contractual liability applicable to the Contractor's obligations under the Contract Documents, including liability assumed by and the indemnity and defense obligations of the Contractor and the Subcontractors; and

f. Claims involving Completed Operations, Independent Contractors' coverage, and Broad Form property damage, without any exclusions for collapse, explosion, demolition, underground coverage, and excavating. (XCU)

g. Claims involving sudden or accidental discharge of contaminants or pollutants.

11.1.2 Specific Insurance Requirements [Change these terms in Special Conditions only – do not make changes here]

Contractor shall take out and maintain and shall require all Subcontractors, if any, whether primary or secondary, to take out and maintain:

Comprehensive General Liability Insurance with a combined single limit per occurrence of not less than $2,000,000.00 or Commercial General Liability Insurance which provides limits of not less than:

(a)	Per occurrence (combined single limit)	$2,000,000.00
(b)	Project Specific Aggregate (for this Project only)	$2,000,000.00
(c)	Products and Completed Operations (aggregate)	$2,000,000.00

(d)	Personal and Advertising Injury Limit	$1,000,000.00

Insurance Covering Special Hazards

The following Special hazards shall be covered by riders or riders to above mentioned public liability insurance or property damage insurance policy or policies of insurance, in amounts as follows:

(a)	Automotive and truck where operated in amounts	$1,000,000.00
(b)	Material Hoist where used in amount	$1,000,000.00
(c)	Explosion, Collapse and Underground (XCU coverage)	$1,000,000.00
(d)	Hazardous Materials	$1,000,000.00

In addition, provide Excess Liability Insurance coverage in the amount of Four Million Dollars ($4,000,000.00).

11.1.3 Subcontractor Insurance Requirements

The Contractor shall require its Subcontractors to take out and maintain public liability insurance and property damage insurance required under Article 11.1 in like amounts. A “claims made” or modified “occurrence” policy shall not satisfy the requirements of Article 11.1 without prior written approval of the Owner.

11.1.4 Additional Insured Endorsement Requirements

The Contractor shall name, on any policy of insurance required under Article 11.1, the Owner, CM, Architect, Inspector, the State of California, their officers, employees, agents, volunteers and independent contractors as additional insureds. Subcontractors shall name the Contractor, the Owner, Architect, Inspector, the State of California, their officers, employees, agents, volunteers and independent contractors as additional insureds. The Additional Insured Endorsement included on all such insurance policies shall be an ISO CG 20 10 (04/13), or an ISO CG 20 38 (04/13), or their equivalent as determined by the Owner in its sole discretion, and must state that coverage is afforded the additional insured with respect to claims arising out of operations performed by or on behalf of the insured. If the additional insureds have other insurance which is applicable to the loss, such other insurance shall be on an excess or contingent basis. The insurance provided by the Contractor pursuant to 11.1 must be designated in the policy as primary to any insurance obtained by the Owner. The amount of the insurer’s liability shall not be reduced by the existence of such other insurance.

11.2 WORKERS’ COMPENSATION INSURANCE

During the term of this Contract, the Contractor shall provide workers’ compensation and employer’s liability insurance for all of the Contractor’s employees engaged in Work under this Contract on or at the Site of the Project and, in case any of the Contractor’s Work is subcontracted, the Contractor shall require the Subcontractor to provide workers’ compensation insurance for all the Subcontractor’s employees engaged in Work under the subcontract. Any class of employee or employees not covered by a Subcontractor’s insurance shall be covered by the Contractor’s insurance. In case any class of employees engaged in Work under this Contract on or at the Site of the Project is not protected under the Workers’ Compensation laws, the Contractor shall provide or cause a Subcontractor to provide insurance coverage for the protection of those employees not otherwise protected. The Contractor shall file with the Owner certificates of insurance as required under Article 11.6 and in compliance with Labor Code § 3700.

Workers’ compensation limits as required by the Labor Code, but not less than $1,000,000 and employers’ liability limits of $1,000,000 per accident for bodily injury or disease.

11.3 BUILDER'S RISK/ "ALL RISK" INSURANCE

11.3.1 Course-of-Construction Insurance Requirements

The Contractor, during the progress of the Work and until final acceptance of the Work by Owner upon completion of the entire Contract, shall maintain Builder's Risk, Course of Construction or similar first party property coverage issued on a replacement cost value basis consistent with the total replacement cost of all insurable Work and the Project included within the Contract Documents. Coverage is to insure against all risks of accidental direct physical loss, and must include, by the basic grant of coverage or by endorsement, the perils of vandalism, malicious mischief (both without any limitation regarding vacancy or occupancy), fire, sprinkler leakage, civil authority, sonic boom, earthquake, flood, collapse, wind, lightning, smoke and riot. The coverage must include debris removal, demolition, increased costs due to enforcement of building ordinance and law in the repair and replacement of damage and undamaged portions of the property, and reasonable costs for the Architect's and engineering services and expenses required as a result of any insured loss upon the Work and Project which is the subject of the Contract Documents, including completed Work and Work in progress, to the full insurable value thereof. Such insurance shall include the Owner and the Architect as additional named insureds, and any other person with an insurable interest as designated by the Owner.

The Contractor shall submit to the Owner for its approval all items deemed to be uninsurable. The risk of the damage to the Work due to the perils covered by the "Builder's Risk/All Risk" Insurance, as well as any other hazard which might result in damage to the Work, is that of the Contractor and the surety, and no claims for such loss or damage shall be recognized by the Owner nor will such loss or damage excuse the complete and satisfactory performance of the Contract by the Contractor.

11.4 FIRE INSURANCE

Before the commencement of the Work, the Contractor shall procure, maintain, and cause to be maintained at the Contractor's expense, fire insurance on all Work subject to loss or damage by fire. The amount of fire insurance shall be sufficient to protect the Project against loss or damage in full until the Work is accepted by the Owner. This requirement may be waived upon confirmation by the Owner that such coverage is provided under the Builder's Risk Insurance being provided.

11.5 AUTOMOBILE LIABILITY

11.5.1 The Owner, Architect and Construction Manager, Inspectors, their directors, officers, employees, agents and volunteers shall be covered as additional insureds with respect to the ownership, operation, maintenance, use, loading or unloading of any auto owned, leased, hired or borrowed by the Contractor or for which the Contractor is responsible. Such insurance coverage shall be primary and non-contributory insurance as respects the Owner, Architect, Construction Manager, Project Inspector, their directors, officers, employees, agents and volunteers, or if excess, shall stand in an unbroken chain of coverage excess of the Contractor's scheduled underlying coverage. Any insurance or self-insurance maintained by the Owner, Architect, Construction Manager, Project Inspector, their directors, officers, employees, agents and volunteers shall be excess of the Contractor's insurance and shall not be called upon to contribute with it. The insurer shall agree to waive all rights of subrogation against the Owner, Architect, Construction Manager, Project Inspector, their directors, officers, employees, agents and volunteers for losses paid under the terms of the insurance policy that arise from Work performed by the Contractor.

11.5.2 Insurance Services Office Business Auto Coverage Form Number CA 0001, Code 1 (any auto) is required. Comprehensive Automobile Liability insurance to include all autos, owned, non-owned, and hired, with limits of $1,000,000 per accident for bodily injury and property damage

11.6 OTHER INSURANCE

The Contractor shall provide all other insurance required to be maintained under applicable laws, ordinances, rules, and regulations.

11.7 PROOF OF INSURANCE

The Contractor shall not commence Work nor shall it allow any Subcontractor to commence Work under this Contract until all required insurance and certificates have been obtained and delivered in duplicate to the Owner for approval subject to the following requirements:

a. Certificates and insurance policies shall include the following clause:

> "This policy and any coverage shall not be suspended, voided, non-renewed, canceled, or reduced in required limits of liability or amounts of insurance or coverage until notice has been mailed via certified mail to the Owner. Date of cancellation or reduction may not be less than thirty (30) days after the date of mailing notice."

b. Certificates of insurance shall state in particular those insured, the extent of insurance, location and operation to which the insurance applies, the expiration date, and cancellation and reduction notices.

c. Certificates of insurance shall clearly state that the Owner and the Architect are named as additional insureds under the policy described and that such insurance policy shall be primary to any insurance or self-insurance maintained by Owner.

d. The Contractor and its Subcontractors shall produce a certified copy of any insurance policy required under this Section upon written request of the Owner.

11.8 COMPLIANCE

In the event of the failure of Contractor to furnish and maintain any insurance required by this Article 11, the Contractor shall be in default under the Contract. Compliance by Contractor with the requirement to carry insurance and furnish certificates or policies evidencing the same shall not relieve the Contractor from liability assumed under any provision of the Contract Documents, including, without limitation, the obligation to defend and indemnify the Owner and the Architect.

11.9 WAIVER OF SUBROGATION

Contractor waives (to the extent permitted by law) any right to recover against the Owner for damages to the Work, any part thereof, or any and all claims arising by reason of any of the foregoing, but only to the extent that such damages and/or claims are covered by property insurance and only to the extent of such coverage (which shall exclude deductible amounts) by insurance actually carried by the Owner.

The provisions of this section are intended to restrict each party to recovery against insurance carriers only to the extent of such coverage and waive fully and for the benefit of each, any rights and/or claims which might give rise to a right of subrogation in any insurance carrier. The Owner and the Contractor shall each obtain in all policies of insurance carried by either of them, a waiver by the insurance companies thereunder of all rights of recovery by way of subrogation for any damages or claims covered by the insurance.

11.10 PERFORMANCE AND PAYMENT BONDS

11.10.1 Bond Requirements

Unless otherwise specified in the Supplemental Conditions, prior to commencing any portion of the Work, the Contractor shall furnish separate payment and performance bonds for its portion of the Work which shall cover 100% faithful performance of and payment of all obligations arising under the Contract Documents and/or guaranteeing the payment in full of all claims for labor performed and materials supplied for the Work. All bonds shall be provided by a corporate surety authorized and admitted to transact business in California as sureties.

To the extent, if any, that the Contract Price is increased in accordance with the Contract Documents, the Contractor shall, upon request of the Owner, cause the amount of the bonds to be increased accordingly and shall promptly deliver satisfactory evidence of such increase to the Owner. To the extent available, the bonds shall further provide that no change or alteration of the Contract Documents (including, without limitation, an increase in the Contract Price, as referred to above), extensions of time, or modifications of the time, terms, or conditions of payment to the Contractor will release the surety. If the Contractor fails to furnish the required bonds, the Owner may terminate the Contract for cause.

11.10.2 Surety Qualification

Only bonds executed by admitted Surety insurers as defined in Code of Civil Procedure § 995.120 shall be accepted. Surety must be a California-admitted surety and listed by the U.S. Treasury with a bonding capacity in excess of the Project cost.

11.10.3 Alternate Surety Qualifications

If a California-admitted surety insurer issuing bonds does not meet these requirements, the insurer will be considered qualified if it is in conformance with § 995.660 of the California Code of Civil Procedure and proof of such is provided to the Owner.

ARTICLE 12
UNCOVERING AND CORRECTION OF WORK

12.1 COMPLIANCE WITH TITLE 24 INSTALLATION REQUIREMENTS

Contractor is aware of the requirements governing Contractor's Work under title 24 Section 4-343 Issuance of Notices of Non-Compliance

The Inspector may issue a Notice of Non-Compliance on the Project indicating deviation from Plans and Specifications. It is Contractor's responsibility to correct all deviations from the approved Plans and Specifications unless the Owner has issued an Immediate Change Directive. In such case, the Contractor shall proceed with the Work with the understandings of the Owner as set forth in the ICD and as specifically noted in Article 7.3.

12.2 SPECIAL NOTICE OF AMERICAN'S WITH DISABILITIES ACT

Some of the requirements in the Plans and Specifications are meant to comply with the Americans with Disabilities Act ("ADA"). The requirements of the ADA are technical in nature and may appear to be minor in nature (i.e. whether a walkway or ramp has a 2% cross-slope). Contractor is warned that even the slightest deviation from the specific requirements from the ADA is considered a Civil Rights Violation and subjects the Owner to fines of three times actual damages sustained by a handicap individual or up to $4,000 per violation and attorney's fees required to enforce the ADA violation. As a result of the significant liability and exposure associated with ADA aspects of the Contract, Contractor shall take special care to meet all ADA requirements detailed in the Plans and Specifications. Failure to comply with ADA rules that results in a Notice of Non-Compliance shall be repaired to meet ADA requirements promptly. In addition, any ADA violations that are not identified by Inspector or Architect that are later identified shall be repaired and charged back to the Contractor through a Deductive Change Order.

12.2.1 Indemnification of ADA Claims

Contractor shall indemnify, hold harmless and defend the CJUSD from ADA claims arising from the failure to comply with the Plans and Specifications. Further, any withholdings for ADA violations under Article 9.6 shall include potential redesign costs and an accelerated repair costs due to the potential for ADA claims arising from DSA posting of ADA violations on the Project.

12.3 UNCOVERING OF WORK

12.3.1 Uncovering Work for Required Inspections

Work shall not be covered without the Inspector's review and the Architect's knowledge that the Work conforms with the requirements of the approved Plans and Specifications (except in the case of an ICD under Article 7.3). Inspector must be timely notified of inspections and of new areas so Work can be inspected at least 48 hours before opening a new area (For example, see DSA Form 156 for Commencement/Completion of Work Notification which requires "at least 48 hour" advance notification of a new area). An Inspector must comply with DSA protocols for signing each category or phase of Work under DSA Form 152 (in compliance with the Form 152 Manual) or a Notice of Deviation (DSA Form 154) will be issued requiring the Work that was not inspected be uncovered for inspection. Thus, if a portion of the Work is covered without Inspection or Architect approval, is subject to a Notice of Non-Compliance for being undertaken without Inspection, or otherwise not in compliance with the Contract Documents, after issuance of a Written Notice of Non-Compliance (Form 154) or a written notice to uncover Work, Contractor shall promptly uncover all Work (which includes furnishing all necessary facilities, labor, and material) for the Inspector's or the Architect's observation and such Work be replaced at the Contractor's expense without change in the Contract Sum or Time.

12.3.2 Costs for Inspections Not Required

If a portion of the Work has been covered is believed to be Non-Conforming to the Plans and Specifications, even if the Form 152 for the category of Work has been signed by the Inspector, the Inspector or the Architect may request to see such Work, and it shall be promptly uncovered by the Contractor. If such Work is in accordance with the Contract Documents, costs of uncover and replacement shall, by appropriate Change Order

and shall, be charged to the Owner. If such Work is not in accordance with Contract Documents, the Contractor shall be responsible for all costs to uncover the Work, delays incurred to uncover the Work, and Contractor shall pay all costs to correct the Non-Confirming construction condition unless the condition was caused by the Owner or a separate contractor, in which event the Owner shall be responsible for payment of such costs to the Contractor.

12.4 CORRECTION OF WORK

12.4.1 Correction of Rejected Work

The Contractor shall promptly correct the Work rejected by the Inspector or the Owner upon recommendation of the Architect as failing to conform to the requirements of the Contract Documents, whether observed before or after Completion and whether or not fabricated, installed, or completed. The Contractor shall bear costs of correcting the rejected Work, including cost for delays that may be incurred by Contractor or subcontractors, the cost for additional testing, inspections, and compensation for the Inspector's or the Architect's services and expenses made necessary thereby (including costs for preparing a CCD, DSA CCD review fess, and additional inspection and special inspection costs).

12.4.2 One-Year Warranty Corrections

If, within one (1) year after the date of Completion of the Work or a designated portion thereof, or after the date for commencement of warranties established under Paragraph 9.9.1, or by the terms of an applicable special warranty required by the Contract Documents, any of the Work is found to be not in accordance with the requirements of the Contract Documents, the Contractor shall correct it promptly after receipt of written notice from the Owner to do so unless the Owner has previously given the Contractor a written acceptance of such condition. This period of one (1) years shall be extended with respect to portions of the Work first performed after Completion by the period of time between Completion and the actual performance of the Work. This obligation under this Paragraph 12.4.2 shall survive acceptance of the Work under the Contract and termination of the Contract. The Owner shall give such notice promptly after discovery of the condition.

12.4.3 Owner's Rights if Contractor Fails to Correct

If the Contractor fails to correct nonconforming Work within a reasonable time, the Owner may correct the Work and seek a Deductive Change Order, pursuant to Article 9.6 or Article 2.2.

ARTICLE 13
MISCELLANEOUS PROVISIONS

13.1 GOVERNING LAW

The Contract shall be governed by the law of the place where the Project is located.

13.2 SUCCESSORS AND ASSIGNS

The Owner and the Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to the other party hereto and to partners, successors, assigns, and legal representatives of such other party in respect to covenants, agreements, and obligations contained in the Contract Documents. Neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make such an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

13.3 WRITTEN NOTICE

In the absence of specific notice requirements in the Contract Documents, written notice shall be deemed to have been duly served if delivered in person to the individual, member of the firm or entity, or to an officer of the corporation for which it was intended, or if delivered at or sent by registered or certified mail to the last business address known to the party giving notice.

13.4 RIGHTS AND REMEDIES

13.4.1 Duties and Obligations Cumulative

Duties and obligations imposed by the Contract Documents and rights and remedies available thereunder shall be in addition to and not a limitation of duties, obligations, rights, and remedies otherwise imposed or available by law.

13.4.2 No Waiver

No action or failure to act by the Inspector, the Owner, or the Architect shall constitute a waiver of a right or duty afforded them under the Contract Documents, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed in writing.

13.5 TESTS AND INSPECTIONS

13.5.1 Compliance

Tests, inspections, and approvals of portions of the Work required by the Contract Documents will comply with Division 1, Title 24, and with all other laws, ordinances, rules, regulations, or orders of public authorities having jurisdiction.

13.5.2 Independent Testing Laboratory

The Owner will select and pay an independent testing laboratory to conduct all tests and inspections. Selection of the materials required to be tested shall be made by the laboratory or the Owner's representative and not by the Contractor. Any costs or expenses of inspection or testing incurred outside of a fifty (50) mile radius from the Project Site or not located in a contiguous county to the Site, whichever distance is greater, shall be paid for by the Owner, invoiced by the Owner to the Contractor, and deducted from the next Progress Payment.

13.5.3 Advance Notice to Inspector

The Contractor shall notify the Inspector a sufficient time in advance of its readiness for required observation or inspection so that the Inspector may arrange for same. The Contractor shall notify the Inspector a

sufficient time in advance of the manufacture of material to be supplied under the Contract Documents which must, by terms of the Contract Documents, be tested in order that the Inspector may arrange for the testing of the material at the source of supply.

13.5.4 Testing Off-Site

Any material shipped by the Contractor from the source of supply, prior to having satisfactorily passed such testing and inspection or prior to the receipt of notice from said Inspector that such testing and inspection will not be required, shall not be incorporated in the Work.

13.5.5 Additional Testing or Inspection

If the Inspector, the Architect, the Owner, or public authority having jurisdiction determines that portions of the Work require additional testing, inspection, or approval not included under Paragraph 13.5.1, the Inspector will, upon written authorization from the Owner, make arrangements for such additional testing, inspection, or approval. The Owner shall bear such costs except as provided in Paragraph 13.5.7.

13.5.6 Costs for Retesting

If such procedures for testing, inspection, or approval under Paragraphs 13.5.1 and 13.5.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, the Contractor shall bear all costs arising from such failure, including those of re-testing, re-inspection, or re-approval, including, but not limited to, compensation for the Architect's services and expenses. Any such costs shall be paid by the Owner, invoiced to the Contractor, and deducted from the next Progress Payment.

13.5.7 Costs for Premature Test

In the event the Contractor requests any test or inspection for the Project and is not completely ready for the inspection, the Contractor shall be invoiced by the Owner for all costs and expenses resulting from that testing or inspection, including, but not limited to, the Inspector's and Architect's fees and expenses, and the amount of the invoice shall be deducted from the next Progress Payment.

13.6 TRENCH EXCAVATION

13.6.1 Trenches Greater Than Five Feet

Pursuant to Labor Code Section 6705, if the Contract Price exceeds $25,000 and involves the excavation of any trench or trenches five (5) feet or more in depth, the Contractor shall, in advance of excavation, submit to the Owner or a Registered Civil or Structural Engineer employed by the Owner or Architect, a detailed plan showing the design of shoring for protection from the hazard of caving ground during the excavation of such trench or trenches.

13.6.2 Excavation Safety

If such plan varies from the Shoring System Standards established by the Construction Safety Orders, the plan shall be prepared by a Registered Civil or Structural Engineer, but in no case shall such plan be less effective than that required by the Construction Safety Orders. No excavation of such trench or trenches shall be commenced until said plan has been accepted by the Owner or by the person to whom authority to accept has been delegated by the Owner.

13.6.3 No Tort Liability of Owner

Pursuant to Labor Code § 6705, nothing in this Article shall impose tort liability upon the Owner or any of its employees.

13.6.4 No Excavation without Permits

The Contractor shall not commence any excavation Work until it has secured all necessary permits including the required CAL OSHA excavation/shoring permit. Any permits shall be prominently displayed on the Site prior to the commencement of any excavation.

13.7 WAGE RATES, TRAVEL, AND SUBSISTENCE

13.7.1 Wage Rates

Pursuant to the provisions of Article 2 (commencing at § 1720), Chapter 1, Part 7, Division 2, of the Labor Code, the Owner has obtained the general prevailing rate of per diem wages and the general prevailing rate for holiday and overtime work in the locality in which this public works project is to be performed for each craft, classification, or type of worker needed for this Project from the Director of the Department of Industrial Relations ("Director"). These rates are on file at the administrative office of the Owner and are also available from the Director of the Department of Industrial Relations. Copies will be made available to any interested party on request. The Contractor shall post a copy of such wage rates at appropriate, conspicuous, weatherproof points at the Site.

Any worker employed to perform Work on the Project, but such Work is not covered by any classification listed in the published general prevailing wage rate determinations or per diem wages determined by the Director of the Department of Industrial Relations, shall be paid not less than the minimum rate of wages specified therein for the classification which most nearly corresponds to the employment of such person in such classification.

13.7.2 Holiday and Overtime Pay

Holiday and overtime work, when permitted by law, shall be paid for at the rate set forth in the prevailing wage rate determinations issued by the Director of the Department of Industrial Relations or at least one and one-half (1½) times the specified basic rate of per diem wages, plus employer payments, unless otherwise specified in the Contract Documents or authorized by law.

13.7.3 Wage Rates Not Affected by Subcontracts

The Contractor shall pay and shall cause to be paid each worker engaged in the execution of the Work on the Project not less than the general prevailing rate of per diem wages determined by the Director, regardless of any contractual relationship which may be alleged to exist between the Contractor or any Subcontractor and such workers.

13.7.4 Per Diem Wages

The Contractor shall pay and shall cause to be paid to each worker needed to execute the Work on the Project per diem wages including, but not limited to, employer payments for health and welfare, pensions, vacation, travel time and subsistence pay as provided for in Labor Code §1773.1.

13.7.5 Forfeiture and Payments

Pursuant to Labor Code §1775, the Contractor shall forfeit to the Owner, not more than Two Hundred Dollars ($200.00) for each calendar day, or portion thereof, for each worker paid less than the prevailing wages rates as determined by the Director of the Department of Industrial Relations, for the work or craft in which the worker is employed for any Work done under the Agreement by the Contractor or by any Subcontractor under it. The amount of the penalty shall be determined by the Labor Commissioner and shall be based on consideration of: (1) whether the Contractor or Subcontractor's failure to pay the correct rate of per diem wages was a good faith mistake and, if so, the error was promptly and voluntarily correct upon being brought to the attention of the Contractor or Subcontractor; and (2) whether the Contractor or Subcontractor has a prior record of failing to meet its prevailing wage obligations.

13.7.6 Monitoring and Enforcement by Labor Commissioner

Monitoring and enforcement of the prevailing wage laws and related requirements will be performed by the Labor Commissioner/ Department of Labor Standards Enforcement (DLSE). The Contractor and all Subcontractors shall be required to furnish, at least monthly, certified payroll records directly to the Labor Commissioner in accordance with Labor Code section 1771.4. All payroll records shall be furnished in a format required by the Labor Commissioner. The Contractor and all Subcontractors must sign up for, and utilize, the Labor Commissioner's electronic certified payroll records submission system. The CJUSD will have direct and immediate access to all CPRs for the Project that are submitted through the Labor Commissioner's system. The CJUSD can use this information for any appropriate purpose, including monitoring compliance, identifying suspected violations, and responding to Public Records Act requests.

The Labor Commissioner/ DLSE may conduct various compliance monitoring and enforcement activities including, but not limited to, confirming the accuracy of payroll records, conducting worker interviews, conducting audits, requiring submission of itemized statements prepared in accordance with Labor Code section 226, and conducting random in-person inspections of the Project site ("On-Site Visits"). On-Site Visits may include inspections of records, inspections of the Work site and observation of work activities, interviews of workers and others involved with the Project, and any other activities deemed necessary by the Labor Commissioner/DLSE to ensure compliance with prevailing wage requirements. The Labor Commissioner/DLSE shall have free access to any construction site or other place of labor and may obtain any information or statistics pertaining to the lawful duties of the Labor Commissioner/DLSE.

Any lawful activities conducted or any requests made by the Labor Commissioner/DLSE shall not be the basis for any delays, claims, costs, damages or liability of any kind against the CJUSD by the Contractor. Contractor and all Subcontractors shall cooperate and comply with any lawful requests by the Labor Commissioner/ DLSE. The failure of the Labor Commissioner, DLSE, or any other entity related to the Department of Industrial Relations to comply with any requirement imposed by the California Code of Regulations, Title 8, Chapter 8 shall not of itself constitute a defense to the failure to pay prevailing wages or to comply with any other obligation imposed by Division 2, Part 7, Chapter 1 of the Labor Code.

Prior to commencing any Work on the Project, the Contractor shall post the required notice/poster required under the California Code of Regulations and Labor Code section 1771.4 in both English and Spanish at a conspicuous, weatherproof area at the Project site. The required notice/poster is available on the Labor Commissioner's website.

13.8 RECORDS OF WAGES PAID

13.8.1 Payroll Records

a. Pursuant to §1776 of the Labor Code, the Contractor and each Subcontractor shall keep an accurate payroll record showing the name, address, social security number, work classification and straight time and overtime hours worked each day and week, and the actual per diem wages paid to each journeyman, apprentice, worker or other employee employed by him or her in connection with the Project.

b. All payroll records as specified in Labor Code §1776 of the Contractor and all Subcontractors shall be certified and furnished directly to the Labor Commissioner in accordance with Labor Code §1771.4(a)(3) on a monthly basis (or more frequently if required by the CJUSD or the Labor Commissioner) and in a format prescribed by the Labor Commissioner. Payroll records as specified in Labor Code §1776 shall be certified and submitted to the CJUSD with each application for payment. All payroll records shall be available for inspection at all reasonable hours at the principal office of the Contractor on the following basis:

1. A certified copy of an employee's payroll record shall be made available for inspection or furnished to the employee or his or her authorized representative on request.

2. A certified copy of all payroll records shall be made available for inspection or furnished upon request to a representative of Owner, the Division of Labor Standards Enforcement or the Division of Apprenticeship Standards of the Department of Industrial Relations.

3. A certified copy of all payroll records shall be made available upon request by the public for inspection or for copies thereof. However, a request by the public shall be made through the Owner, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement. If the requested payroll records have not been provided pursuant to Paragraph (2) above, the requesting party shall, prior to being provided the records, reimburse the costs, according to law for the preparation by the Contractor, Subcontractor(s), and the entity through which the request was made. The public shall not be given access to such records at the principal office of the Contractor.

c. The certified payroll records shall be on forms provided by the Division of Labor Standards Enforcement or shall contain the same information as the forms provided by the Division of Labor Standards Enforcement.

d. The Contractor or Subcontractor(s) shall file a certified copy of all payroll records with the entity that requested such records within 10 calendar days after receipt of a written request.

e. Any copy of records made available for inspection as copies and furnished upon request to the public or any public agency by the Owner, the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement shall be marked or obliterated to prevent disclosure of an individual's name, address and social security number. The name and address of the Contractor awarded the Contract or the Subcontractor(s) performing the Contract shall not be marked or obliterated. Any copy of records made available for inspection by, or furnished to, a joint labor-management committee established pursuant to the federal Labor Management Cooperation Act of 1978 (Section 175a of Title 29 of the United States Code) shall be marked or obliterated only to prevent disclosure of an individual's name and social security number. Notwithstanding any other provision of law, agencies that are included in the Joint Enforcement Strike Force on the Underground Economy established pursuant to Section 329 of the Unemployment Insurance Code and other law enforcement agencies investigating violations of law shall, upon request, be provided non-redacted copies of certified payroll records.

f. The Contractor shall inform the Owner of the location of all payroll records, including the street address, city and county, and shall, within five working days, provide a notice of a change of location and address.

g. The Contractor or Subcontractor(s) shall have 10 calendar days in which to comply subsequent to receipt of a written notice requesting payroll records. In the event that the Contractor or Subcontractor(s) fails to comply within the 10-day period, the Contractor or Subcontractor(s) shall, as a penalty to the Owner, forfeit One Hundred Dollars ($100.00) for each calendar day, or portion thereof, for each worker, until strict compliance is effectuated. Upon the request of the Division of Apprenticeship Standards or the Division of Labor Standards Enforcement, these penalties shall be withheld from progress payments then due.

Responsibility for compliance with this Article shall rest upon the Contractor.

13.8.2 Withholding of Contract Payments & Penalties

The Owner may withhold or delay contract payments to the Contractor and/or any Subcontractor if:

a. The required prevailing rate of per diem wages determined by the Director of the Department of Industrial Relations is not paid to all workers employed on the Project; or

b. The Contractor or Subcontractor(s) fail to submit all required certified payroll records with each application for payment, but not less than once per month; or

c. The Contractor or Subcontractor(s) submit incomplete or inadequate payroll records; or

d. The Contractor or Subcontractor(s) fail to comply with the Labor Code requirements concerning apprentices; or

e. The Contractor or Subcontractor(s) fail to comply with any applicable state laws governing workers on public works projects.

13.9 APPRENTICES

13.9.1 Apprentice Wages and Definitions

All apprentices employed by the Contractor to perform services under the Contract shall be paid the standard wage paid to apprentices under the regulations of the craft or trade for which he or she is employed, and as determined by the Director of the Department of Industrial Relations, and shall be employed only at the craft or trade to which he or she is registered. Only apprentices, as defined in §3077 of the Labor Code, who are in training under apprenticeship standards that have been approved by the Chief of the Division of Apprenticeship Standards and who are parties to written apprenticeship agreements under Chapter 4 (commencing with §3070) of Division 3, are eligible to be employed under this Contract. The employment and training of each apprentice shall be in accordance with the apprenticeship standards and apprentice agreements under which he or she is training, or in accordance with the rules and regulations of the California Apprenticeship Council.

13.9.2 Employment of Apprentices

Contractor agrees to comply with the requirements of Labor Code §1777.5. The Contractor awarded the Project, or any Subcontractor under him or her, when performing any of the Work under the Contract or subcontract, employs workers in any apprenticeable craft or trade, the Contractor and Subcontractor shall employ apprentices in the ratio set forth in Labor Code §1777.5. The Contractor or any Subcontractor must apply to any apprenticeship program in the craft or trade that can provide apprentices to the Project site for a certificate approving the contractor or subcontractor under the apprenticeship standards for the employment and training of apprentices in the area or industry affected. However, the decision of the apprenticeship program to approve or deny a certificate shall be subject to review by the Administrator of Apprenticeship. The apprenticeship program or programs, upon approving the Contractor or Subcontractor, shall arrange for the dispatch of apprentices to the Contractor or Subcontractor upon the Contractor's or Subcontractor's request. "Apprenticeable craft or trade" as used in this Article means a craft or trade determined as an apprenticeable occupation in accordance with the rules and regulations prescribed by the California Apprenticeship Council. The ratio of work performed by apprentices to journeyman employed in a particular craft or trade on the Project shall be in accordance with Labor Code §1777.5.

13.9.3 Submission of Contract Information

Prior to commencing Work on the Project, the Contractor and Subcontractors shall submit contract award information to the applicable apprenticeship program(s) that can supply apprentices to the Project and make the request for the dispatch of apprentices in accordance with the Labor Code. The information submitted shall include an estimate of journeyman hours to be performed under the Contact, the number of apprentices proposed to be employed, and the approximate dates the apprentices would be employed. A copy of this information shall also be submitted to the Owner if requested. Within 60 days after concluding Work on the Project, the Contractor and Subcontractors shall submit to the Owner, if requested, and to the apprenticeship program a verified statement of the journeyman and apprentice hours performed on the Project.

13.9.4 Apprentice Fund

The Contractor or any Subcontractor under him or her, who, in performing any of the Work under the Contract, employs journeymen or apprentices in any apprenticeable craft or trade shall contribute to the California Apprenticeship Council the same amount that the Director determines is the prevailing amount of apprenticeship training contributions in the area of the Project. The Contractor and Subcontractors may take as a credit for payments to the California Apprenticeship Council any amounts paid by the Contractor or Subcontractor to an approved apprenticeship program that can supply apprentices to the Project. The Contractor and Subcontractors may add the amount of the contributions in computing his or her bid for the Contract.

13.9.5 Prime Contractor Compliance

The responsibility of compliance with Article 13 and §1777.5 of the Labor Code for all apprenticeable occupations is with the Prime Contractor. Any Contractor or Subcontractor that knowingly violates the provisions of this Article or Labor Code §1777.5 shall be subject to the penalties set forth in Labor Code §1777.7.

13.10 ASSIGNMENT OF ANTITRUST CLAIMS

13.10.1 Application

Pursuant to Government Code § 4551, in entering into a public works contract or a subcontract to supply goods, services, or materials pursuant to a public works contract, the Contractor or Subcontractor offers and agrees to assign to the Owner all rights, title, and interest in and to all causes of action it may have under Section 4 of the Clayton Act, (15 U.S.C. § 15) or under the Cartwright Act (Chapter 2 [commencing with § 16700] of Part 2 of Division 7 of the Business and Professions Code), arising from the purchase of goods, services, or materials pursuant to the public works contract or the subcontract. This assignment shall be made and become effective at the time the awarding body tenders Retention Payment to the Contractor, without further acknowledgment by the parties. If the Owner receives, either through judgment or settlement, a monetary recovery for a cause of action assigned under Chapter 11 (commencing with § 4550) of Division 5 of Title 1 of the Government Code, the assignor shall be entitled to receive reimbursement for actual legal costs incurred and may, upon demand, recover from the Owner any portion of the recovery, including treble damages, attributable to overcharges that were paid by the assignor but were not paid by the Owner as part of the bid price, less the expenses incurred in obtaining that portion of the recovery.

13.10.2 Assignment of Claim

Upon demand in writing by the assignor, the Owner shall, within one (1) year from such demand, reassign the cause of action assigned pursuant to this Article if the assignor has been or may have been injured by the violation of law for which the cause of action arose and the Owner has not been injured thereby or the Owner declines to file a court action for the cause of action.

13.11 STATE AND OWNER CONDUCTED AUDITS

Pursuant to and in accordance with the provisions of Government Code § 10532, or any amendments thereto, all books, records, and files of the Owner, the Contractor, or any Subcontractor connected with the performance of this Contract involving the expenditure of state funds in excess of Ten Thousand Dollars ($10,000.00), including, but not limited to, the administration thereof, shall be subject to the examination and audit of the Office of the Auditor General of the State of California for a period of five (5) years after Retention Payment is made or a Notice of Completion is Recorded, whichever occurs first. Contractor shall preserve and cause to be preserved such books, records, hard drives, electronic media, and files for the audit period.

Pursuant to the remedies under Public Contract Code Section 9201 and Government Code Section 930.2, Contractor, through execution of this Agreement, also agrees the Owner shall have the right to review and audit, upon reasonable notice, the books and records of the Contractor concerning any monies associated with the Project. The purpose of this Audit is to quickly and efficiently resolve disputes based on the actual costs incurred and to reduce the uncertainty in resolving disputes with limited information. The Owner shall perform any audits at its own cost and any such audit shall be performed by an independent auditor, having no direct or indirect relationship with the functions or activities being audited or with the business conducted by the Contractor or Owner.

In the even the independent auditor determines that Change Orders, Response to Request for Proposals, Claims, Appeal of Claims, or other requests for payment the Auditor shall report the results of the Audit findings to the Owner and provide a copy to the Contractor after giving the Owner Board the opportunity for at least 10 days review. If the Contractor disputes the findings of the independent auditor, such dispute shall be handled in the manner set forth under Article 4.6.2 entitled Disputes.

If Contractor having agreed to the terms of this Contract fails to produce books or records requested by Auditor, such failure to produce books or records that were required to be preserved for audit, it shall be presumed that the information contained in the withheld books or records were unfavorable to the Contractor and the Auditor shall note this refusal in the results of the Audit findings for further evaluation by the Owner and the Owner's Board. The refusal to release records that are concerning monies associated with the Project may be used as a grounds to debar the Contractor for failure to preserve records under Article 13.11 and the failure to produce required audit records may also be used as a grounds for a negative finding against the Contractor depending on the significance of the records that are withheld by Contractor. Failure to produce Job Cost Data tied to Job cost categories and budgets shall be presumed an intentional failure to produce key audit records. Similarly, failure to produce daily time records (prepared at or near the time of the Work actually took place (See Article 3.16) shall be presumed an intentional failure to produce key audited records.

If Contractor is seeking costs for inefficiency, home office overhead, or unanticipated increased costs due to delays or acceleration, Contractor shall also produce copies of the original bid tabulation utilized in submitting Contractors bid for the Project. This document shall be considered confidential and shall not be subject to disclosure through a Public Records Act and shall not be distributed to anyone other than the Owner and the Owner's counsel. This bid tabulation shall only be used in litigation, arbitration, evaluation of Claims or Disputes, Audit, and trial. If the records for the bid tabulation are kept on a computer, the Contractor shall also produce all metadata (in native format) that accompanies the bid tabulation for inspection to prove the authenticity of the underlying bid tabulation. Failure to produce the bid tabulation for review of inefficiency, home office overhead, or unanticipated increased costs due to delays or accelerations shall be considered material evidence that the bid tabulation was not favorable to the Contractor. This evidence shall be entered as a jury instruction for trial that the bid tabulation was not produced and the bid tabulation information was unfavorable to the Contractor. The evidence may also be used in Debarment Proceedings, and noted as an exception to an Audit Findings.

Upon notification of Contractor concerning the results of the audit and a reasonable time has passed for Contractor to respond to Audit Findings and if either there is no Dispute of the Audit findings under Article 4.6.2 or if the result after utilizing the Disputes Clause confirms the Audit findings, the Owner may seek reimbursement for overstated Claims, Change Orders, or Appeal of Claims and may also undertake debarment proceedings.

13.12 STORM WATER POLLUTION PREVENTION

13.12.1 Application

This Section addresses the preparation, implementation and monitoring of a Storm Water Pollution Prevention Plan (SWPPP) for the purpose of preventing the discharge of pollutants from the construction site. This includes the elimination of pollution discharges such as improper dumping, spills or leakage from storage tanks or transfer areas. The Owner has retained a firm to prepare a SWPPP and obtain approval of the Permit Registration Documents (“PRDs”) that include a Notice of Intent, Construction Risk Calculation, Site Map, SWPPP, Annual Fee and any additional required documents from all applicable Local Governing Agencies including the Regional Water Quality Control Board. The Contractor shall secure a certification that the Project has met all of the conditions of the General Construction Activity Storm Water Permit (GCASP) and comply with all applicable local, state and federal regulations governing storm water pollution prevention.

13.12.2 References and Materials

- California Stormwater Quality Association New Development and Redevelopment Best Management Practice Handbook

- 2009 California Stormwater Quality Association Construction BMP Handbook .

- State Water Resources Control Board (2009). Order 2009-0009-DWQ, NPDES General Permit No. CAS000002: Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbing Activities. Available on-line at:

- http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.- Use materials of a class, grade and type needed to meet the performance described in the BMP Handbook.

13.12.3 Preparation and Approval

13.12.4 Not used. Implementation

The Contractor shall implement the Storm Water Pollution Prevention Plan by doing the following:

a. Obtain a Waste Discharger Identification (WDID) number from the SWRCB before beginning construction. This number will be issued once the PRDs are administratively accepted and fee is received.

b. Keep the SWPPP, REAPs, monitoring data on the construction site.

c. Employ a Qualified SWPPP Practitioner (QSP) to implement the SWPPP during construction and develop Rain Event Action Plans ("REAPs").

d. Install, inspect, maintain and monitor BMPs required by the General Permit.

e. Install perimeter controls prior to starting other construction work at the site.

f. Contain on-site storm water at the jobsite. Do not drain on-site water directly into the storm drain.

g. Implement the SWPPP.

h. Provide SWPPP and BMP implementation training for those responsible for implementing the SWPPP.

i. Designate trained personnel for the proper implementation of the SWPPP.

j. Conduct monitoring, as required, and assess compliance with the Numeric Action Levels (NALs) or Numeric Effluent Limitations (NELs) appropriate to your project.

k. Report monitoring data.

4. Maintain a paper or electronic copy of all required records for three years from the date generated or date submitted, whichever is last. These records must be available at the construction site until construction is completed.

5. Have a QSD revise the SWPPP as needed to reflect the phases of construction and to suit changing site conditions and instances when properly installed systems are ineffective.

6. Assist the Owner with entering any necessary data or information into the Stormwater Multi-Application and Reporting System ("SMARTS") system.

l. At the end of Construction Contract:

4. Submit Notice of Termination (NOT) into the SMARTS when construction is complete and conditions of termination listed in the NOT have been satisfied. A copy of the NOT can be found at:

http://www.waterboards.ca.gov/water_issues/programs/stormwater/construction.shtml.

5. Leave in place storm water pollution prevention controls needed for post-construction storm water management and remove those that are not needed as determined by the Owner. Thereafter, left-in-place controls will be maintained by the Owner.

6. Provide Site Monitoring Reports, SWPPP revisions, Compliance Certifications and related documents to the Owner. Post-construction storm water operation and management plan as mentioned in the compliance certifications are considered to be in place at the end of the Construction Contract.

13.12.5 Monitoring

The Contractor shall conduct examination of storm water pollution prevention controls as required by the State Water Resources Control Board (2009). Order 2009-0009-DWQ, NPDES General Permit No. CAS000002: Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbing Activities. This includes properly qualified personnel performing all required monitoring, testing, inspections and monitoring. The Contractor shall also conduct examination of storm water pollution prevention controls, as well as before and after each storm event in compliance with the State Water Resources Control Board Order No. 2009-0009-DWQ, National Pollutant Discharge Elimination System General Permit No. CAS000002, Waste Discharge Requirements for Discharges of Storm Water Runoff Associated with Construction and Land Disturbance Activities (General Permit) (SWRCB, 2009).and at least once each 24-hour period during extended storm events to identify BMP effectiveness and implement repairs or BMP changes as soon as feasible. All maintenance related to a storm event should be completed within 48 hours of the storm event. The Contactor shall also prepare and maintain, at the jobsite, a log of each inspection using Site Monitoring Report forms.

13.12.6 Liabilities and Penalties

a. Review of the SWPPP and inspection logs by the Owner shall not relieve the Contractor from liabilities arising from non-compliance with storm water pollution regulations.

b. Payment of penalties for non-compliance by the Contractor shall be the sole responsibility of the Contractor and will not be reimbursed by the Owner.

c. Compliance with the Clean Water Act pertaining to construction activity is the sole responsibility of the Contractor. For any fine(s) levied against the Owner due to non-compliance by the Contractor, the Owner will deduct from the final payment due the Contractor the total amount of the fine(s) levied on the Owner, plus legal and associated costs.

d. The Contractor shall submit to the Owner a completed NOI for change of information (Construction Site Information and Material Handling/Management Practices).

ARTICLE 14
TERMINATION OR SUSPENSION OF THE CONTRACT

14.1 TERMINATION BY THE CONTRACTOR FOR CAUSE

14.1.1 Grounds for Termination

The Contractor may terminate the Contract if the Work is stopped for a period of thirty (30) consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons performing portions of the Work for whom the Contractor is contractually responsible, for only the following reasons:

a. Issuance of an order of a court or other public authority having jurisdiction; or

b. An act of the United State or California government, such as a declaration of national emergency.

14.1.2 Notice of Termination

If one of the above reasons exists, the Contractor may, upon written notice of seven (7) additional days to the Owner, terminate the Contract and recover from the Owner payment for Work executed and for reasonable costs verified by the Architect with respect to materials, equipment, tools, construction equipment, and machinery, including reasonable overhead, profit, and damages.

14.2 TERMINATION BY THE OWNER FOR CAUSE

14.2.1 Grounds for Termination

The Owner may terminate the Contractor and/or this Contract for the following reasons:

a. Persistently or repeatedly refuses or fails to supply enough properly skilled workers or proper materials;

b. Persistently or repeatedly is absent, without excuse, from the job site;

c. Fails to make payment to Subcontractors, suppliers, materialmen, etc.;

d. Persistently disregards laws, ordinances, rules, regulations, or orders of a public authority having jurisdiction;

e. Fails to provide a schedule or fails or refuses to update schedules required under the Contract;

f. Falls behind on the Project and refuses or fails to undertake a recovery schedule;

g. If the Contractor has been debarred from performing Work;

h. Becomes bankrupt or insolvent, including the filing of a general assignment for the benefit of creditors; or

i. Otherwise is in substantial breach of a provision of the Contract Documents.

14.2.2 Notification of Termination

When any of the above reasons exist, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety written notice of seven (7) days, terminate the Contractor and/or this Contract and may, subject to any prior rights of the surety:

a. Take possession of the Project and of all material, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;

b. Accept assignment of Subcontracts. Contractor acknowledges and agrees that if the Owner (in its sole and absolute discretion) decides to takeover completion of the Project, the Contractor agrees to immediately assign all subcontracts to the Owner which the Owner has chosen to accept;

c. Complete the Work by any reasonable method the Owner may deem expedient, including contracting with a replacement contractor or contractors; and,

d. Agree to accept a takeover and completion arrangement with Surety that is acceptable to the Owner Board.

14.2.3 Takeover and Completion of Work after Termination for Cause

A Termination for Cause is an urgent matter which requires immediate radiation since Project Work is open and incomplete, the site is subject to vandalism and theft, the Project site is considered a public nuisance, and there is a possibility of injury and deterioration of the Project Work and materials. Thus, the Owner shall be entitled to enter a takeover contract to either remediate the unfinished condition or complete the Work for this Project.

14.2.4 Payments Withheld

If the Owner terminates the Contract for one of the reasons stated in Paragraph 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is complete. All costs associated with the termination and completion of the Project shall be the responsibility of the Contractor and/or its surety.

14.2.5 Payments upon Completion

If the unpaid balance of the Contract Sum exceeds costs of completing the Work, including compensation for professional services and expenses made necessary thereby, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor and its Surety shall pay the difference to the Owner. The amount to be paid to the Contractor, or Owner, as the case may be, shall be certified by the Architect upon application. This payment obligation shall survive completion of the Contract.

14.3 TERMINATION OF CONTRACT BY OWNER (CONTRACTOR NOT AT FAULT)

14.3.1 Termination for Convenience

Owner may terminate the Contract upon fifteen (15) calendar days of written notice to the Contractor and use any reasonable method the Owner deems expedient to complete the project, including contracting with replacement contractor or contractors, if it is found that reasons beyond the control of either the Owner or Contractor make it impossible or against the Owner's interest to complete the Work. In such a case, the Contractor shall have no claims against the Owner except: (1) the actual cost for labor, materials, and services performed which may be documented through timesheets, invoices, receipts, or otherwise, and (2) ten percent (10%) profit and overhead, and (3) five percent (5%) termination cost of the total of items (1) and (2). Contractor acknowledges and agrees that if the Owner (in its sole and absolute discretion) decides to takeover completion of the Project, the Contractor agrees to immediately assign all subcontracts to the Owner which the Owner has chosen to accept.

14.3.2 [Reserved]

14.4 REMEDIES OTHER THAN TERMINATION

If a default occurs, the Owner may, without prejudice to any other right or remedy, including, without limitation, its right to terminate the Contract pursuant to Article 14.2, do any of the following:

a. Permit the Contractor to continue under this Contract, but make good such deficiencies or complete the Contract by whatever method the Owner may deem expedient, and the cost and expense thereof shall be deducted from the Contract Price or paid by the Contractor to the Owner on demand;

b. If the workmanship performed by the Contractor is faulty or defective materials are provided, erected or installed, then the Owner may order the Contractor to remove the faulty workmanship or defective materials and to replace the same with work or materials that conform to the Contract Documents, in which event the Contractor, at its sole costs and expense, shall proceed in accordance with the Owner's order and complete the same within the time period given by the Owner in its notice to the Contractor; or

c. Initiate procedures to declare the Contractor a non-responsible bidder for a period of two (2) to five (5) years thereafter.

All amounts expended by the Owner in connection with the exercise of its rights hereunder shall accrue interest from the date expended until paid to the Owner at the maximum legal rate. The Owner may retain or withhold any such amounts from the Contract Price. If the Contractor is ordered to replace any faulty workmanship or defective materials pursuant to Paragraph (b) above, the Contractor shall replace the same with new work or materials approved by the Architect and the Owner, and, at its own cost, shall repair or replace, in a manner and to the extent the Architect and the Owner shall direct, all Work or material that is damaged, injured or destroyed by the removal of said faulty workmanship or defective material, or by the replacement of the same with acceptable work or materials. In no event shall anything in this Paragraph be deemed to constitute a waiver by the Owner of any other rights or remedies that it may have at law or in equity, it being acknowledged and agreed by the Contractor that the remedies set forth in this Paragraph are in addition to, and not in lieu of, any other rights or remedies that the Owner may have at law or in equity.

SECTION 00 73 13

SPECIAL CONDITIONS

1. Refer to **INSTRUCTIONS TO BIDDERS, ARTICLE** 15 (b): The following Request form shall be used (see following page):

REQUEST FOR SUBSTITUTION PRIOR TO TIME OF BID

Pursuant to Public Contract Code Section 3400, bidder submits the following request to Substitute prior to bid submittal. I understand that if the request to substitute is not "an/or equal" or is not accepted by CJUSD and I answer "no" I will not provide the specified item, then I will be held non-responsive and my bid will be rejected. With this understanding, I hereby request Substitution of the following articles, devices, equipment, products, materials, fixtures, patented processes, forms, methods, or types of construction:

	Specification Section	Specified Item	Requested Substituted Item	Contractor Agrees to Provide Specified Item if request to Substitute is Denied[1] (circle one)	CJUSD Decision (circle one)
1.				Yes No	Grant Deny
2.				Yes No	Grant Deny
3.				Yes No	Grant Deny
4.				Yes No	Grant Deny
5.				Yes No	Grant Deny
6.				Yes No	Grant Deny
7.				Yes No	Grant Deny
8.				Yes No	Grant Deny
9.				Yes No	Grant Deny
10.				Yes No	Grant Deny
11.				Yes No	Grant Deny
12.				Yes No	Grant Deny

This Request Form must be accompanied by evidence as to whether the proposed Substitution (1) is equal in quality, service, and ability to the Specified Item; (2) will entail no change in detail, construction, and scheduling

[1] Bidder must state whether bidder will provide the Specified Item in the event the Substitution request is evaluated and denied. If bidder states that bidder will not provide the Specified Item, the denial of a request to Substitute shall result in the rejection of the bidder as non-responsive. However, if bidder states that bidder will provide the Specified Item in the event that bidder's request for Substitution is denied, bidder shall execute the Agreement and provide the Specified Item(s). If bidder refuses to execute the Agreement due to the CJUSD's decision to require the Specified Item(s) at no additional cost, bidder's Bid Bond shall be forfeited.

of related work; (3) will be acceptable in consideration of the required design and artistic effect; (4) will provide no cost disadvantage to the CJUSD; (5) will require no excessive or more expensive maintenance, including adequacy and availability of replacement parts; (6) will require no change of the construction schedule or milestones for the Project; and, (7) Contractor agrees to pay for any DSA Fees or other Governmental Plan check costs associated with this Substitution Request. (See General Conditions Section 3.6)

The undersigned states that the following paragraphs are correct:

- The proposed Substitution does not affect the dimensions shown on the Drawings.

- The undersigned will pay for changes to the building design, including Architect, engineering, or other consultant design, detailing, DSA plan check or other governmental plan check costs, and construction costs caused by the requested substitution.

- The proposed substitution will have no adverse effect on other trades, the Contract Time, or specified warranty requirements.

- Maintenance and service parts will be available locally for the proposed substitution.

- In order for the Architect to properly review the substitution request, within five (5) days following the opening of bids, the Contractor shall provide samples, test criteria, manufacturer information, and any other documents requested by Architect or Architect's engineers or consultants, including the submissions that would ordinarily be required under Article 3.7 for Shop Drawings along with a document which provides a side by side comparison of key characteristics and performance criteria (often known as a CSI side by side comparison chart).

- If Substitution Request is accepted by the CJUSD, Contractor is still required to provide a Submittal for the substituted item pursuant to Article 3.7 and shall provide required Schedule information (including schedule fragnets, if applicable) for the substituted item as required under Article 8.3.2.1. The approval of the Architect, Engineer, or CJUSD of the substitution request does not mean that the Contractor is relieved of Contractor's responsibilities for Submittals, Shop Drawings, and schedules under Article 3.7 and 8.3.2 if the Contractor is awarded the Project.

Name of Bidder: _____

By:_____

CJUSD: _____

By: _____

2. **SCOPE OF WORK**

The scope of work for the Center High School Modernization includes site improvements, ADA upgrades and other upgrades to the existing infrastructure. Improvements include fire alarm, security system, and digital intercom clock bell. ADA upgrades to path of travel, restroom and classroom fixtures. Site improvements to the bus loop and parking lot, addition of fencing and exterior door hardware upgrades for security. There are four alternates included; the replacement of HVAC on building "J", the replacement of gas and water valves, carpet and rubber base replacement in the classrooms and the replacement of an electric transformer.

The following supplements modify the General Conditions. Where a portion of the General Conditions is modified and or deleted by these Special Conditions, the unaltered portions of the General Conditions shall remain in effect.

3. **Article 8 – TIME**

Article 8 Schedule Inclusion Requirements –The Contractor's Baseline Schedule shall include the following Milestone Schedule:

The Schedule the Work to accommodate the following milestone requirements:

- Signed Contract (Due TBD)

- Post Bid Document Phase – Milestone #1 (Start Date: Not Later than TBD)
  - Notice of Intent to Award
  - Post-Bid Contract Submittals
  - Critical Path Project Submittals/Shop Drawings
- Post Bid Document Phase – Milestone #1 (Completion Date: Not Later than TBD)

- Procurement/Mobilization Phase – Milestone #2 (Start Date: Not Later than TBD)
  - Notice to Proceed
  - Submission of all remaining required submittals in accordance with General Conditions, Article 3.7.
  - Procure long lead/critical path materials
  - Mobilization/initial layout
- Procurement/Mobilization Phase – Milestone #2 (Completion Date: Not Later than TBD)

- Construction Work Phase – Milestone #3 (Start Date: Not Later than TBD)
  - All related scope of work.
- Construction Work Phase – Milestone #3 (Completion Date: Not Later than TBD)

- Final Contract Close-Out Phase – Milestone #5 (Start Date: Not Later than TBD)
  - Final Contract Close-Out Procedures, in accordance with General Conditions, Article 9.9.
- Final Contract Close-Out Phase – Milestone #5 (Completion Date: Not Later than TBD)

4. **Article 8.4.1 Liquidated Damages** – Contractor will be liable to Owner for liquidated damages pursuant to Article 8.4 for each calendar day of delay in the amount set forth in the Agreement Form.

5. **Article 11.10 Performance and Payment Bonds** – The number of executed copies of the Performance Bond and the Payment Bond required is two (2).

6. **Article 13.12 Storm Water Pollution Prevention** – Delete this section

Commented [A8]: If we are improving more than 1 acre this may be needed.

SECTION 01 21 00

CASH ALLOWANCES

PART 1 – GENERAL

1.01 SUMMARY

A. To provide a budget to cover scope of work not precisely determined by the Contract Documents prior to bidding, allow within the proposed Contract Sum the amounts described in this Section.

B. Related work:

1. Documents affecting work of this Section include, but are not necessarily limited to, Bidding and Contract Requirements, General Requirements and related Technical Requirements.

2. Other provisions concerning Cash Allowances are stated in General Conditions.

3. Other provisions concerning Cash Allowances also may be stated in other Sections of the Project Manual.

1.02 SPECIFIC CASH ALLOWANCES

BID PACKAGE #19-xx Center High School Modernization Project

A. Center High School Allowance #1: District to provide within the final Contract Price the amount of $50,000 for unforeseen conditions to be used at the Owner's discretion. This allowance will be expended under a "time and material" basis using current prevailing wage rates, as directed by the Architect and Owner's Representative. All unused portions of the allowance will be deducted from the contract through a change order.

PART 2 – PRODUCTS

Not Used.

PART 3 – EXECUTION

Not Used.

END OF DOCUMENT

SECTION 01 23 00

ALTERNATES

PART 1 – GENERAL

1.01 ALTERNATES

BID PACKAGE #19-xx Center High School Modernization Project

A. Center High School Add Alternate #1 – Replacement of HVAC units and ancillary work related to the replacement of HVAC on Building “J”. Contractor to provide a contract price to replace scope as described in the technical specifications and drawings.

B. Center High School Add Alternate #2 - Replacement of Carpet and Rubber Base in Classrooms. Contractor to provide a contract price to replace carpet and rubber base in classrooms as described in the technical specifications and drawings.

END OF DOCUMENT

SECTION 01 26 36

ADDITIONAL REQUIREMENTS FOR DSA REVIEWED PROJECTS

PART 1 – GENERAL

1.01 SUMMARY

A. The following additional requirements apply to this Project, which is being reviewed and approved by the Division of the State Architect (DSA).

B. Contractor's responsibility to follow DSA IR-A24 and PR 13-01 throughout the project.

1.02 ADDITIONAL REQUIREMENTS

A. The Contractor shall maintain full compliance with the requirements specified in Parts 1 thru 5 and Part 9, Title 24, California Code of Regulations (CCR). Unless otherwise indicated or specified, work shall be performed in full conformance with the latest edition of applicable regulatory requirements. All work shall be performed in accordance with the rules and regulations, Title 24, Parts 1-5 and Part 9, California Code of Regulations, and Division of the State Architect, and a copy shall be kept on the job at all times during construction. The codes adopted by the City, County, State and Federal agencies shall govern minimum requirements for this Project. The Contractor shall notify the District of any conflicts between the requirements of the Contract Documents and the requirements of this paragraph.

B. In addition to the duties specified in the Contract Documents, the duties of the Contractor shall be in accordance with the requirements specified in Section 4-343 of Part 1, Title 24, California Code of Regulations (CCR).

C. Unless otherwise indicated or specified, perform the work in conformance with the latest edition of applicable regulatory requirements. A copy of Parts 1, 2, 3, 4, &5 of Title 24 CCR shall be available on the Project site. The codes adopted by the City, County, State and Federal agencies shall govern minimum requirements for this Project.

D. In addition to the duties specified in the Contract Documents, the duties of the Architect and the Architect's consultants shall be in accordance with the requirements specified in Section 4-341 of Part 1, Title 24, CCR.

E. Neither DSA, nor the decisions and instructions rendered by DSA are subject to arbitration proceedings.

F. Architect shall notify DSA at start of construction in accordance with 4-341(e) of Part 1, Title 24, CCR.

G. All Addenda and Category "A" (DSA 140) Construction Change Documents (CCD) shall be signed by the Architect and approved by DSA. Do not proceed with work changes until the Construction Change Document(s) that requires DSA approval have been submitted to and approved by DSA in accordance with CCR Section 4-338(c) of Part 1, Title 24, CCR.

H. The architect of record is responsible to determine if DSA approval is required for Proposed Construction Changes, it will be so noted on the Construction Change Directive and Change Order (For District use only) and the Construction Change Document(s) sent for DSA approval and in accordance with CCR Section 4-338 (c) of Part 1, Title 24, CCR. and DSA IR A-6. Substitutions are changes to the Contract Documents and shall be considered Construction Changes, and, if DSA approval is required, shall be approved by DSA prior to fabrication or use.

I. Contractor shall submit verified reports in accordance with Sections 4-343(c) of Part 1, Title 24, CCR. Architect shall submit verified reports in accordance with Sections 4-341(f) of Part 1, Title

24, CCR.

J. DSA may supervise construction, reconstruction, or repair in accordance with Section 4-334 of Part 1, Title 24, CCR.

K. Construction shall be observed by a full-time Project Inspector employed by the District, approved by the Architect, Structural Engineer and DSA in accordance with Sections 4-333(b) and 4-342 of Part 1, Title 24, CCR.

L. A DSA accepted Testing Laboratory directly employed by the District shall conduct all the required tests and inspection for the Project. Testing requirements of District's Testing Laboratory shall be in accordance with Section 4-335 of Part 1, Title 24, CCR.

M. Special inspection of masonry construction, lumber, wood framing using timber connections, ready-mixed concrete, high strength steel bolt installation, welding, and mechanical and electrical work shall be as required by Section 4-333(c) of Part 1, Title 24, CCR. The costs of special inspection will be paid for by the District.

N. The intent of these Drawings and Specifications is that all work is to be in accordance with Title 24, California Code of Regulations. Should any existing conditions such as deterioration or non-complying construction be discovered which is not covered by the Contract Documents wherein the finished work will not comply with Title 24, California Code of Regulations, a construction change document, or separate set of plans and specifications, detailing and specifying the required work shall be submitted to and approved by DSA before proceeding with the work.

O. Substitutions relating to structural and Fire-Life-Safety (FLS) shall be submitted to DSA for review and approval prior to fabrication and installation.

PART 2 – PRODUCTS
Not Used.

PART 3 – EXECUTION
Not Used.

END OF DOCUMENT

SECTION 01 31 19

PROJECT MEETING & PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Owner's Representative will schedule and administer a preconstruction meeting, regular progress meetings, and specially called meetings throughout progress of the Work, and will:

1. Prepare agenda for meetings.
2. Make physical arrangements for meetings.
3. Preside at meetings.
4. Record the minutes; include significant proceedings and decisions.
5. Reproduce and distribute copies of minutes after each meeting to participants in the meeting and to parties affected by decisions made at meeting.

B. Representatives of Contractor, subcontractors and suppliers attending meetings shall be experienced supervisory staff with written authorization to act on behalf of the entity each represents.

1.02 PRECONSTRUCTION MEETING

A. Timing: Prior to start of construction.

B. Attendance: Architect and consultants as appropriate, District's representative, Owner's Representative, Contractors as requested.

C. Purpose: Discuss and familiarize Contractors with construction administrative procedures to be used on Project.

1.03 PROGRESS MEETINGS

A. Timing: Frequency, day and time to be determined by Owner's Representative, Architect and District.

B. Attendance: Owner's Representative and each contractor on site. Owner's Representative, Architect, consultants and subcontractors when required.

C. Purpose: The purpose of these meetings is to provide a formal and regular forum for the District, Owner's Representative, Architect and the Contractors to present questions, problems or issues that need to be addressed. It will also provide an opportunity to review the progress on previous issues and action items along with submittal and schedule review.

D. Each Contractor scheduled to commence Work within the following week will attend the current week's meeting to coordinate Work with other contractors already on site.

1.04 SPECIALLY CALLED MEETINGS

A. The Owner's Representative may call a special meeting at any time during the course of the Project. Special Project meetings shall include representatives of the Project as requested in order to discuss problems and/or solutions that are common to the Project.

PART 2 – PRODUCTS
Not Used.

PART 3 – EXECUTION
Not Used.

END OF DOCUMENT

SECTION 01 35 76

ALTERATION PROJECT PROCEDURES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Products and installation for patching and extending work.

B. Transition and adjustments.

C. Repair of damaged surfaces, finishes, and cleaning.

D. Salvage materials.

1.02 RELATED SECTIONS

A. Section 01 73 29: Cutting and Patching.

1.03 ALTERATIONS, CUTTING AND PROTECTION

A. Assign the work of moving, removal, cutting and patching, to trades qualified to perform the work in manner to cause least damage to each type of work, and provide means of returning surfaces to appearance of new work.

B. Perform cutting and removal work to remove minimum necessary, and in a manner to avoid damage to adjacent work.

1. Cut finish surfaces such as concrete, masonry, drywall, plaster or metals, by methods to terminate surfaces in a straight line at a natural point of division, or where indicated.

C. Cutting, boring, saw cutting, notching or drilling through the new or existing structural elements to be done only when specifically detailed on drawings or approved by Architect, Structural Engineer and DSA Representative.

D. Protect existing finishes, equipment, and adjacent work, which is scheduled to remain, from damage.

1. Protect existing and new' work from extremes of temperature.

a. Maintain existing Interior work above 60 degrees F.

b. Provide heat and humidity control as needed to prevent damage to remaining existing work and to new work.

E. Provide temporary enclosures to separate work areas from existing building and from areas occupied by District.

PART 2 – PRODUCTS

2.01 PRODUCTS FOR PATCHING AND EXTENDING WORK

A. New Materials. As specified in product Sections; match new materials to Work.

1. Provide same products or types of construction as that in existing structure, as needed to patch, extend or match existing work.

2. Presence of a product, finish, or type of construction, requires that patching, extending or matching shall be performed consistent to, or better than, existing standards of quality.

B. Type and Quality of Existing Products: Determine by Inspection and testing existing products where necessary, referring to existing Work as a standard.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that demolition is complete, and areas are ready for installation of new Work.

B. Beginning of restoration Work means acceptance of existing conditions.

3.02 PREPARATION

C. Cut, move, or remove items as necessary for access to alterations and/or renovation Work. Replace and restore at completion. The full extent of cutting and patching is not shown nor specified. The Contractor shall perform all cutting and patching as required.

D. Remove unsuitable material not marked for salvage, such as rotted wood, corroded metals, and deteriorated masonry and concrete. Replace materials as specified for finished Work.

E. Remove debris and abandoned items from area and from concealed spaces.

F. Prepare surface and remove surface finishes to provide for proper installation of new work and finishes.

3.03 INSTALLATION

A. Coordinate work of alterations and renovations to expedite completion and to accommodate District occupancy. Patch and extend existing work using skilled mechanics that are capable of matching existing quality of workmanship. Quality of patched or extended work shall be not less than that Specified for new work.

B. Room Finishes. Complete in all respects consistent with the Contract Documents.

C. Remove, cut, and patch Work in a manner to minimize damage and to provide a means of restoring Products and finishes to specified condition.

D. Install Products as specified In Individual Sections.

3.04 TRANSITIONS

A. Where new Work abuts or aligns with existing, perform a smooth and even transition.

B. Patch Work to match existing adjacent Work in texture and appearance, without breaks, steps or bulkheads.

C. When finished surfaces are cut so that a smooth transition with new work is not possible, terminate existing surface along a straight line at a natural line of division and make recommendation to Architect.

3.05 ADJUSTMENTS

A. Where change of plane of 1/4 inch or more occurs, submit recommendation for providing a smooth transition.

B. Where extreme change of plane of two inches or more occurs, request Instructions from Architect as to method of making transition.

C. Trim existing doors as necessary to clear new threshold Installation. Refinish trim as required.

D. Fit work at penetrations of surfaces as shown on drawings.

3.06 SALVAGED MATERIALS

A. Salvaged Materials from existing facilities, which are specified in the Special Provisions or tagged in the field prior to the pre-bid walk-through to be salvaged, shall remain the property of the District. The Contractor shall include the removal, disassembly, preparation, marking, bundling, packaging, tagging, hauling, and stockpiling of salvaged materials or facilities to the location specified in the Special Provisions, or as directed by the District's Representative. Materials include parts, articles, and equipment of assembled facilities. Salvaging does not include the preparation of existing material that is to be reused in the work.

B. When only specific materials from the facility are designated to be salvaged, the remaining materials from that facility shall be removed and disposed of as provided for elsewhere in the Contract Documents. Materials to be salvaged shall not be removed until their use in the existing facility is no longer required, as determined by the District's Representative.

C. When practicable, salvaged materials shall be hauled directly to the location specified in the Special Provisions and stockpiled; however, salvaged materials may be temporarily stored at a location selected by the Contractor and approved by the District's Representative and later hauled to and stockpiled at their final location. Materials which are lost before stockpiling at their final location shall either be replaced by the Contractor, at the Contractor's expense, or, at the discretion of the District's Representative, the estimated cost of replacement may be deducted from any moneys due or to become due to the Contractor.

D. Materials designated to be salvaged that are damaged, as determined by the District's Representative, shall be segregated from undamaged material. After review of the damaged materials by the District's Representative, all damaged materials that are rejected by the District's Representative shall become the property of the Contractor and shall be disposed of as provided elsewhere in the Contract Documents.

E. Materials to be salvaged that are damaged as a result of the Contractor's operations shall be repaired by the Contractor, at the Contractor's expense, to the satisfaction of the District's Representative. Materials that are damaged beyond repair as a result of the Contractor's operations shall be disposed of as provided elsewhere in the Contract Documents and replaced at the Contractor's expense; or, at the discretion of the District's Representative, the estimated cost of replacement may be deducted from any moneys due or to become due to the Contractor.

F. Replacements for lost or damaged materials shall be of the same kind and of the same or better quality and condition as the lost or damaged materials were prior to their removal. Replacement materials should also be of the same size, color, weight, etc. of the original materials. Matching or exceeding quality and condition alone may not permit the reuse of material.

3.07 REPAIR OF DAMAGED SURFACES

A. Patch or replace portions of existing surfaces, which are damaged, lifted, discolored, or showing other imperfections.

B. Repair substrate prior to patching finish.

3.08 FINISHES

A. Finish surfaces as specified in Individual Product Sections.

B. Finish patches to produce uniform finish and texture over entire area. When finish cannot be matched, refinish entire surface to nearest Intersections.

3.09 CLEANING

A. Clean adjacent District occupied areas of work soiled by work of this Contract (See General Conditions).

END OF DOCUMENT

SECTION 01 45 00

QUALITY CONTROL

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Quality assurance and control of installation.

B. References.

C. Field samples.

D. Mock-up.

E. Inspection and testing laboratory services.

F. Manufacturers' field services and reports.

1.02 RELATED SECTIONS

A. General Conditions – Article 3: The Contractor

B. Technical Specifications

1.03 QUALITY ASSURANCE/CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.

B. Comply fully with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Perform work by persons qualified to produce workmanship of specified quality.

F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

G. Contractors Line of Authority: Contractor shall provide one person who shall be both knowledgeable and responsible for all work to be performed on this project at all times during normal work hours. In Contractors absence, Contractors appointed representative shall be responsible for all directions given him and said directions shall be binding as if given to the Contractor. Contractor’s representative shall be responsible to coordinate all work to be performed.

H. Shop and fieldwork shall be performed by mechanics skilled and experienced in the fabrication and installation of the work involved. All work on this project shall be done in accordance with the best practices of the various trades involved and in accordance with the drawings, approved shop drawings and these specifications.

I. All work shall be erected and installed plumb, level, square and true and in proper alignment and

relationship to the work of other trades. All finished work shall be free from defects. The Architect reserves the right to reject any materials and workmanship which are not considered to be up to the highest standards of the various trades involved. Such Inferior material or workmanship shall be replaced at no additional cost to the Owner.

J. All work shall be installed by a knowledgeable contractor and defined "certified to install" by the specified materials manufacturers. The specifications and recommendations of the manufacturer whose materials are used shall be strictly adhered to during the application or installation of materials.

K. Any additional work beyond that specified or illustrated, or any modification thereto, that is necessary for the furnishing of guarantee shall be provided by the Contractor without additional cost to the District.

1.04 REFERENCES

A. Conform to reference standards by date of issue current on date of the Contract Documents.

B. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

C. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

D. The Contractor shall be responsible for being current and knowledgeable of all building codes involved for all trades under his direction.

E. Provide all work and materials in full accordance with the California Building Standards Code (CBC), the State Fire Marshal, Safety Orders of the Division of Industrial Safety, the National Electric Code, the Uniform Building Code, Uniform Mechanical Code, Uniform Plumbing Code, and any other applicable laws or regulations. Nothing in these plans or specifications is to be construed to permit work not conforming to these Codes.

F. Furnish without extra charge any additional material and labor required to comply with these Rules and Regulations.

1.05 FIELD SAMPLES

A. Install field samples at the site as required by individual specifications Sections for review.

B. Acceptable samples represent a quality level for the Work.

C. Where field sample is specified in Individual Sections to be removed, clear area after field sample has been accepted by Architect.

1.06 MOCK-UP

A. Assemble and erect specified items, with specified attachment and anchorage devices, flashings, seals, and finishes.

B. Where mock-up is specified in Individual Sections to be removed, clear area after mock-up has been accepted by Architect.

1.07 INSPECTION AND TESTING LABORATORY SERVICES

A. Inspection and Testing labs shall be directly employed by the District.

1.08 MANUFACTURERS FIELD SERVICES AND REPORTS

A. Submit qualifications of observer to Architect 30 days in advance of required observations.

B. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance of equipment as applicable, and to initiate instructions when necessary.

C. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

D. Submit report in duplicate within 30 days of observation to Architect for review.

PART 2 – PRODUCTS
Not Used.

PART 3 – EXECUTION
Not Used.

END OF DOCUMENT

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Temporary Facilities and controls required for this Work include, but are not necessarily limited to:

1. Parking and storage areas.
2. Site fencing and security.
3. Sanitary facilities.
4. Final and course of construction cleanup and removal of debris.

1.02 TEMPORARY UTILITIES

A. Contractor to provide if needed.

1.03 FIELD OFFICE/STORAGE CONTAINERS

A. Contractor to provide if needed.

1.04 PARKING OF VEHICLES

A. Each Contractor shall assume **all** responsibility for job site vehicle parking of his and his subcontractor's vehicles. Locations of parking shall be as directed by the Owner's Representative.

1.05 STORAGE AND LAYDOWN AREAS

A. The Owner's Representative will coordinate use of available laydown areas among various contractors. Only areas designated by Owner's Representative can be used by Contractors. Each contractor is responsible for providing his own fenced storage facilities (trailers or cargo containers.)

1.06 TEMPORARY SITE FENCING AND SECURITY

A. Each Contractor shall provide and maintain temporary fencing surrounding the buildings and/or rooms under construction, and staging areas. Set-up/relocation of temporary fencing shall be included for each phase of work as shown on the Preliminary Construction Schedule. Contractor is responsible for the security of all equipment, material, and completed construction items. Contractor is also responsible for securing any breeches to existing security system/building caused by his Work. Temporary measures may include watchman, temporary doors, temporary alarm, etc.

1.07 SANITARY FACILITIES

A. Each Contractor shall provide sanitary toilet facilities for use of all Workers employed on Project, in accordance with State and Local health departments. Use of District toilet facilities will not be allowed.

1.08 CLEANUP AND REMOVAL OF DEBRIS

A. Each Contractor shall assume all responsibility for cleanup and removal of debris created by his Scope of Work on a daily basis. No community dumpsters will be provided. In the event unidentifiable job site clutter or debris becomes a problem, at Owner's Representatives request, each contractor shall provide sufficient labor to be directed by Owner's Representatives personnel in a group cleanup effort. If a Contractor's clean-up is found to be deficient, the District may backcharge the Contractor for clean-up and/or withhold progress payments as determined appropriate by the District in accordance with General Conditions - Article 2: Owner, Section 2.2 Owner's Right to Carry Out the Work Due to Partial Default in a Specific Segregated Area of Work (Two (2) Business Day Notice to Cure and Correct).

1.09 TEMPORARY CONSTRUCTION, EQUIPMENT AND PROTECTION

A. Contractor shall provide, maintain and remove upon completion of Work, all temporary rigging, scaffolding, hoisting equipment, rubbish chutes, ladders, barricades, lights and all other protective structures or devices necessary for safety of Workers and public property as required to complete the Bid Package Scope of Work.

1. Safety:
The contractor is responsible for the complete safety of district personnel, students, and the general public at all times.

2. Walkways and barricades:
If Contractor's portion of Work interferes with pedestrian traffic, provide pedestrian walkway protection conforming to City standards and CAL OSHA requirements.

3. Access:
The contractor is responsible to maintain access to the buildings at all times. Temporary covered walkways and/or barricades may be required.

4. Protection:
Each Contractor must protect all Workers and equipment from power lines by maintaining safe distances and by providing protective devices where and as required by Industrial Safety Commission and CAL-OSHA.

5. Temporary construction and equipment:
All temporary construction and equipment shall conform to all regulations, ordinances, laws and other requirements of State and any other authorities having jurisdiction (including insurance companies), with regards to safety precautions, operations and fire hazards.

PART 2 – PRODUCTS
Not Used.

PART 3 – EXECUTION
Not Used.

END OF DOCUMENT

SECTION 01 73 29

CUTTING AND PATCHING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Execute cutting, fitting or patching of Work, required to:

1. Make parts fit properly.

2. Uncover Work to provide for installation of ill-timed Work.

3. Remove and replace Work not conforming to requirements of Contract Documents.

4. Remove and replace defective Work.

5. Remove samples of installed Work as specified for testing.

6. Remove existing materials (demolition) required prior to installation of specified Work.

7. Uncover Work to provide for Architect's observation of covered Work.

B. Do not endanger structural integrity of any Work by cutting or altering any part of it.

C. The Contractors with structural responsibility within their scope of Work shall solely execute structural cutting and patching required for this Project, according to DSA Approved Drawings.

D. Minor cutting and patching of finishes and/or trim will be performed by the Contractor where required for the execution of his Work. Locations of all cutting and patching (core boring, etc.) shall be reviewed and approved by the Architect, Structural Engineer and DSA Representative prior to the start of Work.

E. Cutting, boring, saw cutting, notching or drilling through the new or existing structural elements to be done only when specifically detailed on drawings or approved by Architect, Structural Engineer and DSA Representative.

F. The Contractor shall make the field measurements necessary for his Work and be responsible for its accuracy. Also, should any structural difficulties prevent a Contractor from installing his material properly, the District's Representative and Architect shall be notified in writing within 24 hours. Cutting into the walls, ceilings and floors, if necessary, shall be carefully and neatly performed and then be repaired as specified in the Contract Documents. The Architect shall be consulted prior to the start of Work in all cases where cutting into a structural portion of the building is either desirable or necessary so that satisfactory reinforcement may be provided.

G. Patching of all exposed architectural finishes shall be performed under the supervision of the Inspector. Cutting and patching of existing architectural finishes shall be minimized to the extent possible through careful routing and placement of new Work. The Architect or Inspector shall have the authority to reject substandard or unacceptable patching.

H. Patching of openings that are cut in any fire rated walls or membranes shall be sealed tightly using approved materials only. Verify that fire rating envelopes are maintained and inspections provided prior to concealing Work. Cutting and patching, if required by Agencies to verify adequacy of protection after concealment, shall be performed at no cost to the District.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 01 50 00: Temporary Facilities and Controls.

1.03 SUBMITTALS

A. Prior to cutting which affects structural safety of Project, submit written notice to Architect requesting consent to proceed with cutting. See items “C” and “F”, Section 1.01.

B. Should conditions of Work or schedule require change of materials or methods, submit written recommendation to Architect, within 48 hours, including:

1. Conditions requiring change.

2. Recommendations for alternative materials or methods.

3. Submittals as required for substitutions.

4. Quotations of charges or credits.

C. Submit 48-hour advance written notice to Architect (with a copy to the District’s Representative) designating the time Work will be uncovered.

D. Submit all materials to be used in cutting and patching in accordance with Special Conditions..

PART 2 – PRODUCTS

2.01 MATERIALS

A. Primary Products: Materials for replacement of Work removed are to comply with Technical Specifications and are required to match original installation.

B. Product Substitution: For any proposed change in materials, submit request for substitution in accordance with Special Conditions.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine existing conditions prior to commencing Work, including elements subject to movement or damage during cutting and patching.

B. After uncovering existing Work, examine conditions affecting installation of new products and performance of Work.

C. Beginning of cutting or patching operations means acceptance of existing conditions.

3.02 PREPARATION

A. Provide means of shoring, bracing and temporary supports as required to maintain structural integrity of the Work.

B. Provide devices, enclosures and methods to protect adjacent surfaces and areas of the property from damage, dust or disruption.

C. Provide protection from the elements for areas, which may be exposed during cutting or patching.

D. Maintain excavations free of water.

3.03 CUTTING

A. Execute cutting, fitting and adjustment of products to permit finished installation to comply with specified tolerances and finishes.

B. Perform cutting and demolition by methods, which will prevent damage to other Work, and will provide proper surfaces to receive installation of repairs and new Work.

C. Uncover Work to install improperly sequenced Work.

D. Remove and replace defective, rejected or non-conforming Work.

E. Remove samples of installed Work for testing when requested.

F. Provide openings in the Work for penetration of Mechanical and Electrical Work.

G. Employ only experienced installers to perform cutting for weather exposed, moisture resistant and sight-exposed surfaces.

H. Cut concrete, tile plaster and other rigid materials using masonry/concrete saws and core drills. Pneumatic tools are not allowed without prior approval.

3.04 PATCHING

A. Execute patching to match adjacent Work.

B. Fit products together to integrate seamlessly with adjacent Work.

C. Execute patching by methods to avoid damage to adjacent Work, and which will provide appropriate surfaces to receive finishing Work.

D. Employ only experienced installers to perform patching for weather exposed, moisture resistant and sight-exposed surfaces.

E. Restore Work with new products in accordance with requirements of the Contract Documents.

F. At penetrations of fire rated walls, partitions, ceiling or floor construction, completely seal voids with approved fire rated material in accordance with the manufacturer's installation instructions and applicable Codes.

G. Fit Work to pipes, sleeves, ducts, conduits and other penetrations through affected surfaces neatly and leave in finished condition.

H. All patched surfaces are to match adjacent finishes in all respects: Type, texture, thickness and color. For continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit or area.

END OF DOCUMENT

SECTION 01 74 23

FINAL CLEANING

PART 1 – GENERAL

1.01 SUMMARY

A. General Works Package Contractor #2 is responsible for daily cleanup and a final cleaning prior to occupancy. This section only addresses the final cleaning required prior to punch listing and occupancy.

B. Cleaning Program:

1. The cleaning program shall include all construction areas and surrounding areas affected by the construction including site, exteriors of buildings / structures, roofs and interior of buildings.

2. The areas to be cleaned shall be turned over to the owner in a "move-in" condition.

3. All areas shall be free of all construction materials, dust, debris, markings and dirt.

4. All surfaces shall be washed, cleaned and cleared of markings.

5. All existing and new fixtures shall be cleaned, sanitized and ready for use.

6. All new and existing hard surface floors will be stripped and waxed.

1.02 PROJECT CONDITIONS

A. Comply fully with Federal and local environmental and antipollution regulations.

B. Do not dispose of volatile wastes, such as mineral spirits, oil, or paint thinner, in storm or sanitary drains.

C. Burning or burying of debris, rubbish, or other waste material on the premises is not permitted.

PART 2 – PRODUCTS

2.01 MATERIALS AND METHODS

A. Use cleaning materials and methods which will not create hazards to health or property or cause damage to products and which are recommended by manufacturers of products to be cleaned.

PART 3 – EXECUTION

3.01 FINAL CLEANING

A. General: Provide final cleaning operations. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit of Work to the condition expected from a commercial building cleaning and maintenance program. Comply with manufacturer's instructions.

B. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for the entire Project or a portion of the Project.

1. Clean the Project Site, yard and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and foreign

substances.

2. Sweep paved areas broom clean. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.

3. Remove petrochemical spills, stains, and other foreign deposits.

4. Remove tools, construction equipment, machinery, and surplus material from the site.

5. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.

6. All walls not newly painted shall be washed to clean readily removable dirt, markings, dust, and grime.

7. Remove debris and surface dust from limited access spaces, including roofs, attics and similar spaces.

8. All existing floors shall be thoroughly stripped of old wax and have at least four (4) coats of a combination wax/sealer, or two (2) coats of sealer and four (4) coats of wax. General Works Package Contractor #2 shall submit for prior approval manufactures information on floor finish to be applied. All new floors shall have their factory seal stripped off and shall have a floor finish applied according to the recommendations of the manufacturer.

9. New carpeted areas shall be thoroughly vacuumed, including edges. Any spotting during construction shall be removed. Existing carpeted areas shall be thoroughly shampooed.

10. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other substances that are noticeable vision obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces. Clean interior and exterior of all windows.

11. Clean all Toilet Rooms thoroughly and sanitized. All wall surfaces shall be free of grime, dirt, dust, markings and graffiti. All mirrors, fixtures, and partitions will be cleaned free of dirt and markings.

12. Scrub and seal all ceramic and terrazzo floors and walls.

13. Remove labels that are not permanent labels.

14. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration.

15. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.

16. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.

17. Replace disposable air filters and clean permanent air filters. Clean all exposed surfaces of diffusers, registers, and grilles.

18. Clean ducts, blowers, and coils if units were operated without filters during construction.

19. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned out bulbs; defective and noisy starters in fluorescent fixtures, and defective dimming switches.

20. Leave the Project clean and ready for occupancy.

21. Removal of Protection: Remove temporary protection and facilities installed during construction to protect previously completed installations during the remainder of the construction period. Repair any damage from removal.

22. Compliances: Comply with governing regulations and safety standards for cleaning operations.

23. Remove waste materials from the site and dispose of lawfully.

24. Where extra materials of value remain after completion of associated Work, they become the Owner's property. Dispose of these materials as directed by the Owner.

END OF DOCUMENT

SECTION 02 41 00

SITE DEMOLITION

PART 1 – GENERAL

1.01 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 10 00: Site Clearing and Demolition

B. Section 31 22 00: Excavating, Grading and Site Preparation

C. Section 31 23 00: Excavating, Backfilling, and Compacting for Utilities

1.03 REGULATORY REQUIREMENTS

A. Conform to applicable jurisdictional authority regulations and codes for disposal of debris.

B. Coordinate clearing Work with utility companies.

C. Maintain emergency access ways at all times.

D. Contractor shall comply with all applicable laws and ordinances regarding hazardous materials, including contaminated soils, hazardous material transformers, and similar materials or components.

1.04 SUBMITTALS:

A. Schedule: Submit a detailed sequence of demolition and removal work, including dates for shutoff, capping, and continuance of utility services.

B. Procedures: Submit written procedures documenting the proposed methods to be used to control dust and noise.

1.05 EXISTING CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

B. Conduct demolition to minimize interference with adjacent structures or items to remain. Maintain protected egress and access at all times.

1.06 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and

completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Safety Precautions Prevent damage to existing elements identified to remain or to be salvaged, and prevent injury to the public and workmen engaged on site. Demolish roofs, walls and other building elements in such manner that demolished materials fall within foundation lines of building. Do not allow demolition debris to accumulate on site. Pull down hazardous work at end of each day; do not leave standing or hanging overnight, or over weekends.

D. Protect existing items which are not indicated to be altered.

a. Protect utilities designated to remain from damage.

b. Protect trees, plant growth, and features designated to remain as final landscaping as shown on drawings.

c. Protect bench marks from damage or displacement.

E. Trees: Carefully protect existing trees that are to remain. Provide temporary irrigation as necessary to maintain health of trees.

F. Fire Safety: The contractor shall conform to chapter 33 of the California Fire Code (CFC), "Fire Safety During Construction and Demolition", at all times during the construction process. A copy of this chapter can be provided.

G. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

H. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily basis to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

I. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

J. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

PART 2 - PRODUCTS

Not Used

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine conditions of work in place before beginning work; report defects.

B. Report existence of hazardous materials or unsafe structural conditions.

3.02 PREPARATION

A. Scheduling:

1. General: Coordinate and schedule demolition work as required by the Owner and as necessary to facilitate construction progress.

B. Hazardous Materials:

1. General: Identify chemicals, gases, explosives, acids, flammables, or other dangerous materials before proceeding with demolition operations, and notify such jurisdictional agencies as may be required. Collect and legally dispose of such materials at official disposal locations away from the site.

2. Asbestos: If asbestos or materials containing asbestos are encountered, stop work immediately and contact the Owner. Do not proceed with demolition until directed by Owner.

C. Utility and Service Termination

1. Locate and identify existing utility, service and irrigation system components affected by work of this contract. Review existing record drawings, conduct site investigations, contact Underground Service Alert and other qualified cable/pipe/line locator services, and implement all other means necessary to define the location of underground systems.

2. Prior to beginning any demolition, properly disconnect all water, gas and electrical power supply at appropriate disconnect locations. Obtain all necessary releases and approvals from serving utility companies.

3. Prior to demolition or disconnect, obtain Owners approval that such system does not impact facilities or systems beyond the extent of this contract.

4. Mark location of disconnected systems. Identify and indicate stub-out locations on Project Record Documents.

D. Verify that existing plant life and features designated to remain are tagged or identified.

1. The Architect will mark the features, trees, and shrubs to remain within the construction area. Contractor shall not commence clearing and grubbing operations until authorized by the Owner and all protective measures are in place.

E. Coordinate the time and duration of all system disconnects with Owner.

3.03 DEMOLITION

A. General Requirements

1. Clear areas required for access to site and execution of Work, including pavements, structures, foundations, vegetation, trash and debris.

2. Coordinate with Owner the time of day and route to remove demolished materials from premises.

3. Remove demolished materials from site as work progresses. Upon completion of work, leave areas of work in clean condition.

4. Remove all buried debris, rubble, trash, or other material not deemed suitable by the Geotechnical Engineer.

5. Fill all voids or excavations resulting from clearing, demolition, or removal of vegetation with specified fill material.

B. Fixture and Equipment Removal:

1. Remove existing fixtures and equipment as identified and shown on drawings and required by Architect.

2. Verify all service connections to fixtures and equipment designated for removal have been properly disconnected.

3. Remove all conductors from conduit at all abandoned circuits.

3.04 UTILITY AND BUILDING SERVICES REMOVAL AND RE-INSTALLATION

A. Where crossing paths and potential points of interference with existing utility services are shown or can be reasonably inferred from surface conditions or evidence of subsurface systems, such as meter boxes, vaults, relief vents, cleanouts and similar components.

1. Review all contract documents showing crossing paths and potential points of interference.

2. Pot-hole or determine by other means the accurate depth and location of such utilities.

3. Incorporate all costs required to complete work under this contract, including additional trenching, re-routing of existing and new utilities, and all means necessary to construct work under this contract.

4. No additional cost to the Owner will be allowed for work necessary to accommodate utility conflicts where such crossing paths are shown on contract drawings or can be reasonably inferred from surface conditions or components.

B. Remove all conductors from conduit at all abandoned electrical circuits.

C. Seal off ends of all piping, drains and other components as directed by Architect and serving utility.

D. Where necessary to maintain service to existing utility and building systems, relocate or redirect all conduit and conductors, piping, drains, and associated system components.

1. Re-circuit all electrical as required.

2. Re-circuit all landscape irrigation valving and control systems as required.

3. Temporarily terminate landscape system components in approved boxes or with approved caps, suitable for re-connection or extension.

4. Extend or otherwise modify all site drainage systems, including catch basins, drain inlets and piping. Fine grade to maintain proper drainage flow pattern to drains.

E. Demolish structure in an orderly and careful manner.

1. Use of explosives prohibited.

3.05 SITE PAVEMENT REMOVAL

A. Remove sidewalk and curb where required for new construction as specified and as indicated on the Drawings.

1. Remove all paving by saw-cutting.

2. Remove concrete paving and curbing at locations shown on drawings. Locate closest adjacent expansion or weakened plane joint to define start of removal or saw-cutting.

B. Remove asphalt concrete paving areas where required for new construction as specified and as indicated on the Drawings.

1. Remove all paving by saw-cutting.

2. Remove paving assembly as required to expose subgrade.

3.06 LANDSCAPE AND IRRIGATION SYSTEMS DEMOLITION AND RENOVATION

A. Clearing, grubbing, and planting demolition.

1. Remove grass and grass roots to a minimum depth of two inches below existing grade.

2. Remove all shrubs, plants and other vegetation within the area of the work unless designated to remain. Grub and remove all roots of all vegetation to a depth of 24 inches below existing grade.

3. Remove only those trees which are specifically designated for removal, or as shown on the drawings, within the construction area. Remove all stumps. Remove root ball and root systems larger than 1 inch in diameter to a depth of two feet below existing or finished grades, whichever is lower and a minimum of five feet beyond the edge of paving, structure, wall or walkway.

4. Hand cut existing tree roots over 1 inch in diameter as necessary for trenching or other new construction, apply multiple coats of emulsified asphalt sealant especially made for horticultural use on cut or damaged plant tissues to cut faces and adjacent surfaces. Cover exposed roots with wet burlap to prevent roots from dying out until backfilling is complete.

5. Disking and mixing of vegetation, trash, debris, and other deleterious materials with surface soils prior to grading is not permitted.

6. Remove all buried debris, organic material, rubble, trash, or other material not deemed suitable by the Geotechnical Engineer.

7. Fill all voids or excavations resulting from clearing, demolition, or removal of vegetation with fill material in compliance with Section 310000.

8. Selected equipment of such sizes and capacities that the existing environment is disturbed as little as possible, and to afford ease of mobility within limited and relatively confined work areas. Make every effort to preserve the topography in its natural state.

9. Keep drains, catch basins, surface drainage courses and related drainage system components clear of debris and construction materials.

10. Remove irrigation piping and appurtenances as necessary within area of work, unless noted otherwise to remain. Replace irrigation piping and appurtenances to irrigate new and/or existing landscaping. Contractor shall be responsible for temporary landscape irrigation until such time that irrigation system is restored and operational.

3.07 DISPOSAL

Demolished materials become property of the Contractor and shall be removed from premises, except those items specifically listed to be retained by Owner.

A. Dispose of all demolished material, trash, debris, and other materials not used in the work in accordance with the regulations of jurisdictional authority.

B. It is recommended that all materials that are of a recyclable nature, be transported to a suitable legal recycling facility instead of a dump or refuse facility (unless they are one-in-the same).

C. Burning and Burying of Materials: NOT ALLOWED.

D. Haul Routes:

1. Obtain permits as required by jurisdictional agencies. Establish haul routes in advance; post flagmen for the safety of the public and workmen.

2. Keep streets free of mud, rubbish, etc.; assume responsibility for damage resulting from hauling operations; hold Owner free of liability in connection therewith.

E. Remove demolished materials and debris from site on a daily basis.

3.08 CLEANING

A. Upon completion of work of this Section promptly remove from the working area all scraps, debris.

C. Clean excess material from surface of all remaining paved surfaces and utility structures.

D. Power wash all concrete surfaces to remove stains, dried mud, tire marks, and rust spots.

[END OF SECTION 02 41 00]

SECTION 02 41 19

SELECTIVE DEMOLITION

PART 1 – GENERAL

1.01 DESCRIPTION

A. Section Includes:

1. Demolition and removal of selected portions of building or structure.
2. Demolition and removal of selected site elements.
3. Salvage of existing items to be reused or recycled.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

B. Section 31 10 00: Site Clearing and Demolition

C. Section 31 22 00: Excavating, Grading and Site Preparation

D. Section 31 23 00: Excavating, Backfilling, and Compacting for Utilities

1.03 DEFINITIONS

A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.

B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage, and deliver to Owner ready for reuse.

C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.

D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.

E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.

1.04 MATERIALS OWNERSHIP

A. Unless otherwise indicated, demolition waste becomes property of Contractor.

B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.

C. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.05 INFORMATIONAL SUBMITTALS

A. Schedule of Selective Demolition Activities: Indicate the following:

1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.

2. Interruption of utility services. Indicate how long utility services will be interrupted.

3. Coordination for shutoff, capping, and continuation of utility services.

4. Use of elevator and stairs.

5. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.

B. Predemolition Photographs or Video: Show existing conditions of adjoining construction, including finish surfaces, that might be misconstrued as damage caused by demolition operations. Comply with General Conditions. Submit before Work begins.

F. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

G. Warranties: Documentation indicating that existing warranties are still in effect after completion of selective demolition.

1.06 CLOSEOUT SUBMITTALS

A. Inventory: Submit a list of items that have been removed and salvaged.

1.07 QUALITY ASSURANCE

A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.08 FIELD CONDITIONS

A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.

B. Conditions existing at time of inspection for bidding purpose will be maintained by Owner as far as practical.

C. Notify Architect of discrepancies between existing conditions and Drawings before proceeding with selective demolition.

D. Hazardous Materials: Present in buildings and structures to be selectively demolished. A report on the presence of hazardous materials is on file for review and use. Examine report to become aware of locations where hazardous materials are present.

1. Hazardous material remediation is specified elsewhere in the Contract Documents.

2. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.

3. Owner will provide material safety data sheets for suspected hazardous materials that are known to be present in buildings and structures to be selectively demolished because of building operations or processes performed there.

E. Storage or sale of removed items or materials on-site is not permitted.

F. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.

1. Maintain fire-protection facilities in service during selective demolition operations.

1.09 WARRANTY

A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during selective demolition, by methods and with materials and using approved contractors so as not to void existing warranties. Notify warrantor before proceeding. Existing warranties include the following:

1. Existing Roof Warranties

B. Notify warrantor on completion of selective demolition, and obtain documentation verifying that existing system has been inspected and warranty remains in effect. Submit documentation at Project closeout.

1.10 COORDINATION

A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 – PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.

B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Verify that utilities have been disconnected and capped before starting selective demolition operations.

B. Review Project Record Documents of existing construction or other existing condition and hazardous material information provided by Owner. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

C. Engage a professional engineer to perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.

1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.

D. Steel Tendons: Locate tensioned steel tendons and include recommendations for de-tensioning.

E. Verify that hazardous materials have been remediated before proceeding with building demolition operations.

F. Survey of Existing Conditions: Record existing conditions by use of measured drawings.

1. Before selective demolition or removal of existing building elements that will be reproduced or duplicated in final Work, make permanent record of measurements, materials, and construction details required to make exact reproduction.

3.02 PREPARATION

A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.03 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.

B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.

1. Owner will arrange to shut off indicated services/systems when requested by Contractor.

2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.

3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated on Drawings to be removed.

a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.

b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.

c. Equipment to Be Removed: Disconnect and cap services and remove equipment.

d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.

e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.

g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

3.04 PROTECTION

A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.

1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.

2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.

3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.

4. Cover and protect furniture, furnishings, and equipment that have not been removed.

5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 015000 "Temporary Facilities and Controls."

B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.

1. Strengthen or add new supports when required during progress of selective demolition.

C. Remove temporary barricades and protections where hazards no longer exist.

D. Cover all fire alarm devices to remain in area of work not being relocated by project. Where device is directly affected by scope of work, de-program device from Fire Alarm Control Panel and remove device from room.

3.05 SELECTIVE DEMOLITION, GENERAL

A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:

1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.

2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.

3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.

4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.

5. Maintain fire watch during and for at least <Insert number> hours after flame-cutting operations.

6. Maintain adequate ventilation when using cutting torches.

7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.

8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.

9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

10. Dispose of demolished items and materials promptly.

B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.

C. Removed and Salvaged Items:

1. Clean salvaged items.

2. Pack or crate items after cleaning. Identify contents of containers.

3. Store items in a secure area until delivery to Owner.

4. Transport items to Owner's storage area on-site designated by Owner.

5. Protect items from damage during transport and storage.

D. Removed and Reinstalled Items:

1. Clean and repair items to functional condition adequate for intended reuse.

2. Pack or crate items after cleaning and repairing. Identify contents of containers.

3. Protect items from damage during transport and storage.

4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.

F. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Architect, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.

3.06 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS

A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.

C. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.

D. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.

E. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.

F. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.

1. Remove existing roof membrane, flashings, copings, and roof accessories.

2. Remove existing roofing system down to substrate.

3.07 DISPOSAL OF DEMOLISHED MATERIALS

A. Remove demolition waste materials from Project site and dispose of them in an EPA-approved construction and demolition waste landfill acceptable to authorities having jurisdiction.

1. Do not allow demolished materials to accumulate on-site.

2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

3. Remove debris from elevated portions of building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.

B. Burning: Do not burn demolished materials.

3.08 CLEANING

A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

[END OF SECTION 02 41 19]

SECTION 02 51 33.16

SANDBLASTING

PART 1 – GENERAL

1.01 DESCRIPTION

A. None.

1.02 SECTION INCLUDES

A. Sandblast Finish for preparation of paint systems.

1.03 RELATED SECTIONS

A. Section 09 90 00: Painting.

B. Section 09 96 23: Graffiti Resistant Coatings.

1.04 QUALITY ASSURANCE

A. Contractor's Qualification: Sandblasting operations shall be performed by a firm normally engaged in this business. All work shall be performed by skilled mechanics using suitable equipment to provide a clean and uniform overall surface texture and color.

B. Sample Test Area: Prior to beginning of sandblasting operations, the Contractor shall be required to sandblast, concrete panels and metal decking - canopy's in an area designated by the Architect. These test areas shall be sandblasted in the presence of and as directed by Architect. After approval by Architect, for texture, the areas so approved shall be representative of the workmanship and finish to be required on the entire Project.

C. Furnish all necessary materials, equipment, labor and services to clean existing surfaces as shown on the drawings.

1.05 SAFETY

A. The sandblasting machine operator shall be furnished with, and shall wear at all times during the actual sandblasting operation, a hood with vision panel. Hood shall be supplied with filtered air. All other personnel and helpers shall be furnished with, and wear during sandblasting operation, a respirator which covers both the nose and the mouth.

1.06 PROTECTION

A. Windows, equipment, doors, frames, trim, flashings, metal caps, etc. in areas where sandblasting is to take place shall be protected from sandblasting operations and from intrusion of rebound. Protection shall be positive and shall be reviewed by Architect prior to beginning of work.

PART 2 – PRODUCTS

NOT USED

PART 3 – EXECUTION

3.01 INSPECTION AND PREPARATION

A. Do not commence sandblasting operations until unsatisfactory conditions or preparation requirements have been corrected or satisfied.

B. All adjacent surfaces (ceramic tile, window and door frames, etc.) shall be masked or otherwise protected to prevent damage thereto.

3.02 SANDBLASTING

A. General:

1. Care shall be taken during sandblasting operations to not cut or gauge surfaces. Strokes shall be lapped so as to maintain an even textured surface.

a. Sandblasting shall be as light as possible, but sufficient to clean the surface.

2. Wall, column and facia finish appearance after sandblasting shall match existing campus buildings.

B. Equipment: Air compressors shall have a capacity of 300 CFM for each nozzle being used. Minimum air pressure at the nozzle shall be 100 psi. (or as required for each different surface)

1. Nozzle shall be a Venturi type with a minimum inside diameter of 3/8 inch. The hose line shall have adequate strength for the pressure being used, and the inside diameter of the hose shall be not less than 1-1/2 inches to keep the sand in continuous suspension while traveling through the hose.

C. Abrasives: Abrasive material used for blasting operations shall be Silica sand, hard angular sand, blasting grit, or crushed chat.

1. Sand shall be free of deleterious substances such as fine clay particles.

D. Abrasive Supply: The Contractor shall assure himself that the supply of abrasive material he intends to use is sufficient to complete the sandblasting operation. Once selected, the abrasive material nor the source of supply shall be changed during the course of the sandblasting operation.

E. Rebound: Reuse of rebound will not be allowed. All rebound shall become the property of the sandblasting contractor and disposed of by him.

F. Operating procedure shall be as follows:

1. Abrasive: 30 to 40 mesh. **

2. Pressure: *80 90 lbs. **

3. Nozzle: Not less than 3/8 inch.

a. Distance of Nozzle from Wall: As required to provide the finishes specified herein and approved by Architect.

b. Nozzle shall always be right angles to the wall.

c. *If pressure is increased, the distance of the nozzle from the item being sandblasted should also be increased.

d. **Abrasive and pressure may very due to different materials to be sandblasted, contractor is to use proper materials and methods to receive desired finishing.

G. Finish: Ensure exposed-to-view finish surfaces of sandblasted items are uniform in appearance.

3.03 CLEAN-UP

A. At the conclusion of the work of this Section, clean down sandblasted surfaces and remove all equipment used in work. Remove all surplus material, rubbish and debris from the premises and leave broom clean.

[END OF SECTION 02 51 33.16]

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Concrete Formwork.

B. Reinforcement of Concrete.

C. Concrete Placing and Finishing.

D. Concrete Flatwork.

1.02 RELATED SECTIONS

A. Section 00 72 13: General Conditions.

B. Section 05 40 00: Cold Formed Metal Framing.

C. Section 06 10 00: Rough Carpentry.

1.03 REFERENCES

A. Chapter 19A, CBC (latest edition).

B. ACI 211.1 - Standard Practice for Selecting Proportions for Normal Weight, Heavy Weight and Mass Concrete.

C. ACI 301 - Specifications for Structural Concrete for Buildings.

D. ACI 304R - Guide for Measuring, Mixing, Transporting and Placing Concrete.

E. ACI 305R - Hot Weather Concreting.

F. ACI 306R - Cold Weather Concreting.

G. ACI 308 - Standard Practice for Curing Concrete.

H. ACI 309R - Guide for Consolidation of Concrete.

I. ACI 318 - Building Code Requirements for Structural Concrete.

J. ASTM A615 / A615M – 09b - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.

K. ASTM C33 / C33M-08 - Concrete Aggregates.

L. ASTM C94 / C94M –09a - Ready-Mixed Concrete.

M. ASTM C114- 09b - Methods of Chemical Analysis of Hydraulic Cement.

N. ASTM C150 / C150M-09 - Portland Cement.

O. ASTM C260-06 - Air Entraining Admixtures.

P. ASTM C494 / C49M-08a - Water Reducing Admixtures.

1.04 QUALITY ASSURANCE

A. All Concrete for the project shall be controlled concrete of specified strengths, of uniform color, and free from defects liable to adversely affect strength, durability or appearance of the structure or its components.

B. Requirements of Regulatory Agencies: The quality and design of structural concrete shall comply with the requirements of the California Building Code, except where more stringent requirements are specified.

C. Workmanship: Materials and methods used for the production and placement of concrete shall be such as to assure the specified quality and shall conform to applicable requirements of the Building Code for Reinforced Concrete (ACI 318) of the American Concrete Institute, except as otherwise specified in this Section.

1. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Project Inspector. Work not so inspected is subject to uncovering and replacement.

2. Proper installation of partitions and equipment requires the floor finish to be level and smooth throughout. Extreme care shall be exercised during all floating and troweling operations to check levels often.

3. Any concrete work which does not comply with tolerances and elevations shown on drawings will be cause for rejection of all work affected, and, if so rejected, such work shall be removed and replaced at no increase in cost to the Owner.

D. Repair of Defective Concrete Surfaces shall be done in the following manner when, in the opinion of the Architect, such defects may be repaired and at no additional cost to the Owner.

1. Rock pockets, voids, spalls, cracks and exposed reinforcing shall be repaired with 1:2 cement mortar or cut out and patched. Prepare surfaces and bond cement mortar with concrete adhesive as hereinafter specified.

2. Floor surfaces which exceed the allowable variation in plane or level (when an 8'-0" long straightedge is laid on the finished surface, the surface varies more than 3/16" in 8'-0") shall be ground and/or filled to obtain the level and plane required. Fill materials, where required, shall be of type approved by the Architect.

3. Surfaces which are not plumb and square or which do not conform to the lines and levels indicated shall be chipped, ground, filled or trued as required to obtain the desired results.

E. Uniformity of Concrete: All aggregates shall be measured by weight and the proportion of water to cement shall be accurately controlled by either automatic measuring devices or calibrated containers. All concrete placed shall be uniform strength and color appearance as well as surface texture.

F. Screeds shall be provided all construction joints as required to ensure installation of concrete to lines and elevations noted.

G. Concrete Preplacement Inspection: Concrete shall not be poured until the forms, reinforcement, and preparations are complete and have been reviewed by the Project Inspector.

H. Ready-Mixed Concrete: ASTM C94 / C94M-09a except as otherwise specified herein. Mix and deliver in accordance with the requirements set forth in ASTM C94 and ACI 301. Continuous Batch Plant inspection is required per CBC Section 1705A.3.3. Contractor may request waiver of batch plant inspection in accordance with CBC Section 1705A.3.3.1 provided the following is met:

1. Approved Testing Laboratory shall check the first batching for each class of concrete and furnish mix proportions to the Licensed Weighmaster.

2. Licensed Weighmaster to positively identify materials as to quantity and to certify to each load by ticket.

3. Ticket shall be transmitted to Project Inspector by truck driver with load identified thereon. Project Inspector will not accept load without load ticket identifying mix and will keep daily record of pours, identifying each truck, its load and time of receipt and will transmit two copies of record to DSA.

4. Do not add water at the site to concrete mixes with a maximum specified WCR unless the water content at batch time provides for a WCR less than specified and this provision, including the quantity of water which may be added at the site, is specifically noted on the Mix Design and Certification by the mix preparer.

5. At end of project, Weighmaster shall furnish affidavit to DSA on form satisfactory to DSA, certifying that all concrete furnished conforms in every particular and to proportions established by mix designs.

I. Tests: For structural concrete, the Testing Lab shall take four (4) test cylinders of concrete not less than once each day, not less than once for every 50 cubic yards of concrete, or not less than 2,000 square feet of slab or wall surface area. Cylinders shall be made and stored as per instructions given by the testing laboratory and shall be in accordance with ASTM Specifications C-31 / C31M-09 and C-39 / C39M-09a. Cylinders shall be tested for ultimate compressive strength of concrete with one cylinder tested at the age of 7 days and two (from the same batch) to be tested at the age of 28 days, with one cylinder held as a spare for future testing if needed. Tests shall be made by a recognized test laboratory selected by the Owner and approved by the Architect.

6. Cylinders not meeting the required design stresses shall indicate defective concrete and such concrete shall be removed and replaced at no increase in cost to the Owner. Core tests requested by the Contractor to establish design stresses, when cylinder tests indicate defective concrete, shall be paid for by the Contractor.

1.05 SUBMITTALS

A. Submit under provisions of Section 00 33 00.

B. Manufacturer's Data: Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, joint systems, chemical floor hardeners, and others as may be requested by the Architect.

C. Shop Drawings:

1. Shop drawings sheet size shall be 24" x 30" minimum and shall not be a reproduction of the construction documents.

2. Reinforcing Steel: The correctness of the bending diagrams is the responsibility of the Contractor. Identify such shop drawings with a reference thereon to sheet and detail numbers from the contract drawings. No reinforcing steel shall be fabricated without approved shop drawings.

3. Proposed location of constructions and cold joints when different or in addition to those shown on the drawings.

4. Construction mount layout per paragraph 3.05.

D. Concrete Mix Design: Submit proposed mix design prepared by concrete supplier. Mix design must submitted to Owner for review and acceptance by a recognized independent testing lab, for all structural concrete.

1.06 JOB CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required by construction activities.

PART 2 – PRODUCTS

2.01 FORM MATERIALS

A. Plywood Forms shall be exterior plyform, in large sheets of adequate thickness to support the imposed loads, but in no case less than 5/8" thick.

B. Lumber Forms may be used for concrete surfaces that are unexposed and require no further surface applied materials. Lumber, if used, shall be clean and sound 2 x 12 No. 2 grade or better Douglas fir.

C. Form Coating: Form shall be coated with nongrain-raising and nonstaining types of form coating that will not leave a residual matter on the face of the concrete or adversely affect proper bonding of any subsequent paint or other surface applications.

1. Form coating containing mineral oils or other nondrying materials will not be permitted for any concrete work.

D. Form Ties: Snap off metal of fixed length: leaving no metal within 1-1/2 inches of surface and no fractures, spalls or other surface defects larger than one-inch diameter; manufactured by Burke, Dayton Superior, or accepted equal.

E. Spreaders: Metal (no wood permitted).

F. Form Release Agent: Colorless, nonstaining, free from Lass; chemically active agent that shall not impair bonding of paint or other coatings intended for use.

2.02 REINFORCING MATERIALS

A. Reinforcing Bars: ASTM A615 / A615M -09b with Supplement S1, marked "S", Grade 60 for #4 bar and larger, Grade 40 for bars smaller than #4.

B. Furnish 6x6 W1.4xW1.4 welded wire fabric in flat sheets; rolls will not be allowed.

C. Wire Ties for tying reinforcing steel shall be #16 annealed wire.

D. Bar Supports: Comply with CRSI "Recommended Practice for Placing Bar Supports, Specifications and Nomenclature, Latest Edition", except as otherwise specified. Wood is not permitted as supports for reinforcing.

E. Spacers and Chairs: As manufactured by Kalman Steel Company, Concrete Engineering Company, or approved equal.

2.03 CONCRETE MATERIALS

A. Portland Cement: ASTM C150 / C150M-09, Type II, low alkali. All cement used shall be of one manufacturer.

1. Use Type IIA cement if pumping of concrete is selected and permitted for placing of concrete.

2. All cement shall contain not more than 0.6 percent total alkali when calculated as sodium oxide as determined by "Methods of Chemical Analysis of Hydraulic Cement", ASTM C114-

09b.

B. Fly Ash: Western Fly Ash, conforming to ASTM C618 for Class N or Class F materials (Class C is not permitted). Not more than 15% (by weight) may be substituted for portland cement.

C. Water: Clean and free from deleterious amounts of acids, alkalis, salts and organic matter.

D. Concrete Aggregates: ASTM C33 / C33M-08 except as otherwise specified hereinafter. All aggregates shall be nonreactive and nondegenerative, and shall consist of sound crushed rock, washed gravel, or a combination of both.

1. Modify fine aggregates when air entrained concrete is used in accordance to Paragraph 4.2.4 of ASTM C33 / C33M-08.

2. Aggregate sources shall be approved by the Architect. Aggregate shall result in shrinkage of concrete not exceeding .048 percent at 28 days. Testing lab shall verify aggregate and concrete shrinkage.

3. Do not use fine or course aggregates that contain substances that are known to cause spalling or adverse reactions in the concrete.

E. Admixtures: Except for admixtures noted below, no other admixtures shall be used without written approval from the Architect. Where such agents are permitted, they shall be a type approved and used only as directed by the Architect and at no increase in cost to the Owner. Agents including calcium chloride will <u>not</u> be permitted for use in concrete under any circumstances

1. Air Entraining Agents: ASTM C260. Use where specified. The maximum entrained air content shall be no more than 4 percent + 1 percent by volume unless noted otherwise. Approved air entraining agents are Sika AER, Master Builders Micro Air, Darex AEA, and Protex AEA.

2. Water Reducing Admixtures: ASTM C494 and ACI 318, Section 3.6. Use where specified. Approved agent is Master Builders Pozzolith 322-N, used at the rate of 5+2 fluid ounces per 100 pounds of cement.

3. Structural Slab Admixture: Moxie 1800 Super-Admix by Moxie International shall be used in interior structural slabs-on-grade mixes, omitting air entrainment (ASTM C260) and water-reducing (ASTM C494) admixtures. Use rates as recommended by manufacturer.

2.04 CRUSHED ROCK BASE:

A. Under all new concrete ramps and paving, or as otherwise indicated on the Drawings, provide a minimum of 4 inches of crushed rock fill. Crushed rock fill shall be clean gravel of 1” max. size and have no material passing through a No. 4 sieve.

2.05 JOINT MATERIAL:

A. Provide 3/8” wide fiber expansion joint material, Model No. 320-F, as manufactured by W.R. Meadows or equal.

B. Provide Snap-Cap as manufactured by W.R. Meadows or equal. Snap-Cap shall have a top plastic edge that can be used for leveling concrete. Once concrete has set up, top edge of Snap-Cap can be pulled free and discarded. Joint shall then be sealed.

C. Joint sealing material shall be a two-component, self-leveling, polyurethane elastomeric sealant. Product shall be Sikaflex 2cSL as manufactured Sika Corporation, or equal. Color shall be shall be chosen from the full range of manufacturer’s standard colors.

2.06 RELATED MATERIALS

A. Concrete Adhesive and Bonding Agent: "Concresive #1001-LPL" (1-1/2 hour maximum pot life), an epoxy polysulfide type concrete adhesive as manufactured by Master Builders or equal.

B. Liquid Curing Compound: W.R. Meadows, Product: "Vocomp-20" or equal.

C. Bonding Adhesive: Burke, Bondcrete-S; use as a modifier for patching and overlays up to 1/2" thick or equal.

D. Vapor Barrier: Stego Wrap, 15 mil. vapor barrier system, with a Class A rating, and perm rating not to exceed 0.01 perms; by Stego Industries of San Juan Capistrano, CA (877) 464-7834, VaporGuard by Reef Industries (713) 507-4250., Sundance 15 mil Vapor Barrier by Sundance Inc. (855) 300-7156, or 15 mil Husky, Yellow Guard, Vapor Barrier by Poly-America (800) 527-3322.. No substitutions will be accepted. System to include Stego Mastic, Stego “Crete Claw Tape” and pipe boots, or accepted equal by the specified manufacturers. Conform to ASTM 1745.

E. Doweling Epoxy: Hilti “HIT-HY 200” (ICC-ES ESR-3187), Simpson Strong-Tie “SET-XP” Epoxy (ICC-ES ESR-2508), or accepted equal.

1. Anchor rods shall be furnished with a 45-degree chisel point on one end to allow for easy insertion into adhesive filled hole and manufactured to meet the requirements of ASTM A36. Nuts and washers shall be furnished to meet the requirements of the anchor rod specifications noted above.

2. Install per manufacturer’s recommendation; use stainless steel for all exterior work.

3. Testing required as noted in the Structural Drawings.

F. Drilled-in Concrete Anchors: Hilti “Kwik Bolt TZ” (ICC-ES ESR-1917), Simpson Strong-Tie “Strong-Bolt 2” (ICC-ES ESR-3037), or accepted equal.

1. Install per manufacturer’s recommendation; use stainless steel for all exterior work.

2. Testing required as noted in the Structural Drawings.

G. Patching Mortar: Meadow-Crete GPS, one-component, trowel applied, polymer enhanced, shrinkage-compensated, fiber reinforced, cementitious repair mortar for horizontal, vertical and overhead applications as manufactured by W.R. Meadows or accepted equal.

H. Non-shrink Grout: Masterflow 713 Plus by Master Builders or accepted equal. Premixed, non-metallic, no chlorides, non-staining and non-shrinking per CRD-C621, Corps of Engineers Specification and ASTM C 1107, Grades B and C.

2.07 CONCRETE DESIGN

A. Designed Strength and Classes of Concrete:

1. Class "C" concrete of 1" max. size aggregate shall have 4000 psi 28 day strength with a maximum water to cementitious materials ratio of 0.45. Use for interior structural concrete less than 8" min. thickness including interior floor slabs and curbs. At all interior slabs provide Moxie 1800 Super-Admix and omit air entrainment (ASTM C26) and water-reducing (ASTM C494) admixtures.

2. Class "D" concrete of 1-1/2" max. size aggregate shall have 1500 psi 28 day strength with a maximum water to cementitious materials ratio of 0.55. Use for lean mix fill.

B. Slump of Concrete: The slump of concrete as determined by the Standard Test Method for Slump of Hydraulic Cement Concrete ASTM Designation C-143 / C143M-09 shall be as follows:

1. Class "C": 4" plus or minus 1" (5" maximum).

C. Laboratory Mix Design: Concrete designs shall be reviewed by the Testing Laboratory. The concrete mix designs reviewed by the Testing Laboratory and approved by the Project Architect or Structural Engineer shall be used by the Contractor. Contractor shall provide samples of aggregates as required by the laboratory to review the mix designs.

D. Water Reducing Admixture: Unless noted otherwise, all concrete shall contain a water reducing admixture.

2.07 CONCRETE MIXING

A. Ready-Mixed Concrete: ASTM C94 / C94M-09a except as otherwise specified herein.

1. Transit-mixed concrete shall be mixed for a period of not less than 10 minutes at a peripheral drum speed of approximately 200 feet per minute, and mixing shall be continued until discharge is complete. At least 3 minutes of the mixing period shall be at the job. Transit mixers shall be equipped with water measuring devices consisting of either accurately calibrated water tanks or water meters.

2. When outside air temperature is between 85 degrees and 90 degrees, reduce mixing and delivery time from 90 minutes to 75 minutes. When outside air temperature is above 90 degrees, reduce mixing and delivery time to 60 minutes

B. Job Mixing: Non-structural concrete only. The capacity of the mixer shall be such that it will handle one or more full sack batches. No split sack batches will be permitted except when all materials are weighed. The rated capacity of the mixer shall not be exceeded. The mixing drum shall be equipped with an automatic timing and locking device and with an accurate water gauge for measuring the amount of water used. Mixing time of each batch shall be at least 1-1/2 minutes after all ingredients are in the mixer.

PART 3 – EXECUTION

3.01 FORMS

A. Build and Erect Forms to conform to the required shapes, patterns, lines, grades and dimensions indicated. Forms shall be substantial and tight to prevent any leakage of mortar, properly braced and tied together to maintain their position and shape. Forms shall not deflect under the dead load weight of the plastic concrete or construction loads. Joints in forming material shall be butted tightly and shall bear on solid construction. Provide tool edges where indicated. Completed form work to be checked for grade and alignment to tolerances not exceeding 1/8” in 10’-0” for top of forms and not more than 1/4” in 10’-0” for vertical face.

B. Cast-in Items: Set in formwork all new sleeves, inserts, anchors, and similar items furnished and required under the work of other sections. Brace, anchor and support cast-in-items to prevent displacements and distortions.

C. Clean forms after each use and coat with release agent as required.

D. Space clamps, ties, hangers and other form accessories so that working capacities are not exceeded by loads imposed from concrete or concreting operations.

E. Build openings into vertical forms at regular intervals if necessary to facilitate concrete placement, and at bottoms of forms to permit cleaning and inspection.

F. Build in securely braced temporary bulkheads, keyed as required, at approved locations of construction joints.

G. Slope tie-wires downward to outside of wall.

H. During and immediately after concrete placing, tighten forms, posts and shores. Readjust to maintain grades, levels and camber.

I. No metal or wood stakes are allowed in areas to be concreted.

3.02 REINFORCEMENT FABRICATION

A. Steel reinforcement shall not be bent or straightened in a manner that will injure the material. Bars with kinks or bends not shown on the Drawings shall not be used. Heating of the bars for bending will not be permitted.

1. Spacers and chairs shall be as specified or detailed and spaced such that steel reinforcement will be carried without deflection.

2. Concrete blocks may be used to support bottom layer of steel in floor slabs on grade.

3. Bars shall be in long lengths with laps and splices as shown. Offset laps 5'-0" minimum in adjacent bars. Place steel with clearances and cover as shown. Bar laps shall be as indicated on the drawings. Tie all laps and all intersections with specified wire. Maintain clear space between parallel bars not less than 1-1/2 times nominal diameter for round bars, or twice side dimension for square bars, but in no case shall clear space be less than 1-1/2", nor less than 1-1/2 times maximum size concrete aggregate.

4. Reinforcing dowels for slabs shall be placed as detailed. Grease one penetration so that pour will not bond to dowel. Sleeves may be used if approved by the Architect before installation. Install dowels through all construction and expansion joints for all slabs on grade.

5. Install welded wire fabric in lengths as long as possible. Lap adjoining pieces at least one full mesh and lace splices with wire ties. Offset laps of adjoining widths to prevent continuous laps in either direction.

6. Cut bars true to length with ends square and free of burrs.

B. Drawing Notes: Refer to notes on Drawings for additional reinforcement requirements.

C. Welding of reinforcing bar shall be performed only where indicated on plans and in compliance with AWS D1.4. All welding of reinforcement is to be inspected in accordance with CBC Table 1705A.2.1, Item 5(b).

3.03 CONCRETE PLACEMENT

A. Surrounding Conditions: Before any concrete is placed, the following items of work shall have been completed in the area of placing.

1. Forms shall have been erected, adequately braced, cleaned, sealed, lubricated if required, and bulkheaded where placing is to stop.

a. Any wood forms other than plywood shall be thoroughly water soaked before placing any concrete. The wetting of forms shall be started at least 12 hours before concreting.

2. Reinforcing steel shall have been placed, tied, supported, and, at the time the concrete is placed around it, shall be cleaned of rust, scale, mill scale or other coatings that will destroy or reduce bond.

3. Embedded work of all trades shall be in place in the forms and adequately tied and braced.

4. The entire place of deposit shall have been cleaned of dirt, chips, sawdust, rubbish, debris, hardened concrete and other foreign matter before concrete is deposited therein. No wooden ties nor blocking shall be left in concrete except where indicated for attachment of other work.

5. Concrete surfaces to which fresh concrete is to be bonded shall be saw cut and broken away as indicated. Surfaces shall be brush cleaned to remove all dust and foreign matter and to expose the aggregate, and then coated with the bonding adhesive herein specified.

B. Conveying Concrete from mixer to forms shall be as rapid as possible.

1. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM C94 / C94M-09a. A delivery ticket shall be furnished for each load of ready-mix or transit-mix concrete. A copy of each delivery ticket shall be handed to the job superintendent at the time of delivery and unloading. A record copy of the delivery tickets shall be forwarded to the Architect for his files.

2. Conveying equipment shall be of a sufficient capacity to ensure a practically continuous flow of concrete to the placing point without separation or loss of materials. Carts and buggies shall be equipped with pneumatic tires. Runway supports shall not bear on reinforcing or fresh concrete. All conveying equipment shall be thoroughly cleaned before beginning and at frequent intervals during the placing of the concrete.

   a. Chutes, if employed, shall slope not less than 4" or more than 6" per foot of horizontal run.

3. Exercise care not to spill concrete on forms and reinforcing steel during the conveying operations. Where such spillage or splattering occurs, the surfaces shall be thoroughly cleaned before concrete hardens.

C. Placing Concrete: Notify the Architect at least 48 hours in advance of beginning of pouring operations. Under no circumstances shall concrete that has partially hardened be deposited on the work. No concrete shall be placed during rainy weather without the Architect's approval.

1. The Project Inspector shall keep a record on the site of the time and date of placing the concrete in each portion of the structure in accordance with CBC Section 1705A.3.6. The record shall be kept until the completion of the structure and a copy provided to the Architect and DSA.

2. Before starting new pour on or against concrete that has hardened, forms shall be retightened and the hardened concrete roughened and thoroughly cleaned of foreign matter and any laitance by sandblasting. Just ahead of the new pour, slush joints with a 2" layer of grout of the designated concrete mix minus 50 percent of the large aggregate.

3. Reinforcing steel exposed to the sun shall be cooled by a water spray prior to the placing of concrete.

4. No adjustment of steel reinforcement will be permitted during the placement of concrete.

5. Concrete shall be scheduled so that the placing is a continuous operation for the completion of each section between predetermined construction joints. If a planned concreting operation cannot be carried on continuously, the concreting shall stop at temporary bulkheads. Locate where resulting construction joints shall be as shown on the Drawings or as approved by the Architect. Prior to placing of concrete for any concrete slabs, the moisture content of the subgrade below the slabs shall be adjusted to at least optimum moisture.

6. Deposit the concrete in forms as nearly as practicable in its final position to avoid flowing and maintain until completion of the unit an approximate horizontal plastic surface. Thoroughly compact all concrete during placing operations, thoroughly around

reinforcement, embedded fixtures or accessories, and into the corners of forms to eliminate air pockets and honeycombing. Compacting shall be done with mechanical vibrators. Vibrators shall not be used to cause concrete to flow horizontally. Thoroughly compact concrete to the forms to release the air and secure full contact of the concrete with the forms.

7. Hot Weather Concreting: Concrete placing and finishing operations during hot weather shall be done as quickly as possible. Ample personnel shall be available to handle and place the concrete immediately after its mixing or delivery to the site of the work. Concrete shall be placed in layers thin enough and over areas small enough to ensure complete bond and union of adjacent layers, and thus prevent "cold joints".

   a. At air temperatures of 80 degrees Fahrenheit or above the following precautions should be taken:

      1) In no case shall the temperature of the concrete exceed 90 degrees Fahrenheit when placed in the work.

      2) If necessary to produce and maintain concrete at an acceptable temperature, chopped or crushed ice shall be added directly into the mixer up to 50 percent by weight of the mixing water used, the weight of the ice being included in batch weight of the mixing water. The ice shall be added at such a rate and in such a manner that it will be completely melted by the time concrete is mixed.

      3) Stockpiled aggregates shall be saturated and kept surface moist by continuous fog spray or by intermittent sprinkling.

      4) Forms, reinforcements and subgrade surfaces shall be wet down immediately before concrete is placed in contact therewith. Remove all excess water before placing concrete. Wetting down of areas around the work to cool the surrounding air and increase the humidity is recommended.

8. Cold Weather Requirements: Do not place concrete when ambient temperature is below 40 degrees Fahrenheit and falling.

3.04 CONCRETE FINISHING

A. All Concrete Work, except as otherwise specified, shall be of a quality that will present a finished appearance upon the stripping of the forms. Only a minimum of patching and finishing should be necessary as required to fill holes left by form ties and to remove any fins or minor irregularities left by the joints in the forms. Except as otherwise specified, all concrete surfaces shall be finished as follows:

B. Final Tooling: Tool edges of paving, gutters, curbs and joints formed in fresh concrete with a jointing tool to a radius of 1/4”. Repeat tooling of edges and joints after applying surface finishes. Eliminate tools marks on all concrete surfaces.

3.05 CONSTRUCTION JOINTS

A. Control joints shall be saw cut into concrete as soon as concrete slab can be walked on. Do not wait until the following day to saw cut concrete slab control joints.

B. Construct contraction, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline unless otherwise indicated.

C. Joints at Existing Concrete: All joints between existing concrete and new concrete are to include

dowels a t a minimum of #4 bars @ 4'-0" on center, 18" maximum from the ends, epoxy set into existing concrete a minimum of 6" in length at the centerline of existing concrete slab.

D. Contraction Joints(Control Joints): Provide weakened-plane contraction joints, sectioning concrete into areas indicated. Construct contraction joints for a depth equal to at least 1/4 of the concrete thickness. Form in fresh concrete by grooving and finishing each edge of joint with a radiused jointer tool. Joints to be spaced at 10' on center maximum or as shown on the drawings.

E. Construction Joints: Set construction joints at side and end terminations of concrete placement and at locations where placement operations are stopped for more than 1/2 hour, unless placement ends at isolation joints.

1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys. Use Burke "Keyed Kold Joint Header Form", or approved equal. Embed keys at least 1 1/2" into concrete.

2. Continue reinforcement across construction joints.

3. Use bonding agent on existing concrete surfaces that will be joined with fresh concrete.

F. Isolation Joints (Expansion Joints): Form isolation joints of performed joint filler strips abutting concrete curbs, catch basin, manholes, inlets, structures, walks, other fixed objects, and where indicated.

1. Extend joint fillers full width and depth of joint, not less than 1/2" or more than 1" below finished surface where a joint sealant is indicated. Place top of removable joint filler flush with finished concrete surface.

2. Protect top edge of joint filler during concrete placement with metal, plastic, or other temporary, removable performed cap.

3. After concrete has set up, remove cap exposing top edge of fiber joint filler, and apply joint sealant.

3.06 PUMPING OF CONCRETE may be permitted for concrete, providing:

A. The Contractor engages a testing laboratory to design concrete mixes for pumping. Trial batches shall be made and tested as required hereinbefore for typical concrete.

B. The quality and proportioning of aggregates for pumping conditions shall be determined in accordance with ACI, Recommended Practice 613. Aggregate proportioning must be tailored to the particular pump intended for use.

C. When starting a pump operation, actual pumping of concrete shall be preceded by a mortar mix (concrete without coarse aggregate) for the purpose of lubrication.

D. All mortar and concrete leakage resulting from pumping operations shall be removed from formwork, reinforcing steel and any finished surface.

3.07 CURING

A. Protect freshly placed concrete from premature drying and excessive cold or hot temperature. Comply with the recommendations of ACI 306R for cold weather protection and ACI 305R for hot weather protection during curing.

B. Evaporation control is to be implemented in hot, dry and windy weather by protecting concrete from rapid moisture loss before and during finishing operations with an evaporation control material. Apply in accordance with manufacturer's instructions after screeding and bull floating, but not before floating.

C. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.

D. Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound, or a combination.

1. For moisture-curing, keep surfaces continuously moist for not less than 7 days with water, a continuous water-fog spray, or absorptive cover kept wet continuously wet.

2. For moisture-retaining-cover, cover concrete with moisture retaining cover with side and end laps sealed.

3. For curing compound, apply in accordance with manufacturer's instructions. Recoat areas subjected to rainfall within 3-hours after initial application.

C. Forms shall remain in place for not less than the following periods of time. These periods represent minimum cumulative number of days during which temperature of air in contact with concrete is 60 degrees F and above.

1. Vertical forms of foundations and walls: 5 days.

2. Slab edge screens or forms: 7 days.

3. Concrete columns and beam soffits: 28 days.

3.08 CLEANING AND PROTECTION

A. Clean all surfaces and leave in satisfactory condition to receive final finish surface treatment.

B. Protect concrete surfaces from damage by tools, equipment, material and workmen. No traffic, shoring or other loading will be permitted until concrete has hardened sufficiently to prevent injury to finish and strength, but at least 14 days.

1. Remove surface stains and spillage of materials as they occur.

2. Sweep concrete and wash free of stains, discolorations, dirt, and other foreign material prior to final inspection.

[END OF SECTION 03 30 00]

SECTION 04 01 20.91

MASONRY RESTORATION AND CLEANING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Water cleaning of existing masonry surfaces.

B. Repointing mortar joints.

C. Repair of damaged masonry.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 07 90 00: Joint Sealers.

C. Section 09 96 23: Graffiti Resistant Coatings.

1.03 REFERENCES

A. ACI 530 - Building Code Requirements for Masonry Structures.

B. ACI 530.1 - Specifications For Masonry Structures.

C. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold Weather Masonry Construction.

D. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Hot Weather Masonry Construction.

1.04 SUBMITTALS

A. Submit under provisions of Section 00 72 00.

B. Product Data: Provide data on cleaning solutions manufacturer's application instructions including special procedures, perimeter conditions, application equipment and protection measures required.

C. Samples: Submit four samples of face brick, units to illustrate color, texture and extremes of color range to match existing.

1.05 QUALITY ASSURANCE

A. Perform Work in accordance with ACI 530 and ACI 530.1.

B. Restorer: Company specializing in masonry restoration with minimum three years documented experience.

1.06 MOCKUP

A. Provide mockups for each different type of masonry surface.

B. Clean a 10 x 10 ft panel of existing wall to determine extent of cleaning.

C. Repeat, using same cleaning methods on three additional different panels, until acceptable.

D. Locate where directed.

E. Acceptable panel and method of procedure will become the standard for work of this section.

1.07 PRE-INSTALLATION CONFERENCE

A. Convene one week prior to commencing work of this section, under provisions of Section 00 72 00.

B. Require attendance of parties directly affecting work of this section.

C. Review conditions of installation, installation procedures, and coordination with related work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 00 72 00.

B. Deliver masonry neatly stacked and tied on pallets. Store clear of ground with adequate waterproof covering.

C. Store restoration cleaner materials in manufacturer's packaging.

1.09 PROTECTION

A. Protect elements surrounding the work of this section from damage or disfiguration.

B. Immediately remove stains, efflorescence, or other excess resulting from the work of this section.

C. Protect roof membrane and flashings from damage. Lay 1/2 inch plywood on roof surfaces over full extent of work area and traffic route.

D. Provide waterproof dams to divert flowing water to exterior.

1.10 ENVIRONMENTAL REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F prior to, during, and 48 hours after completion of masonry work.

1.11 SEQUENCING

A. Sequence work under the provisions of Section 00 72 00.

B. Perform repointing after cleaning masonry surfaces.

1.12 SCHEDULING

A. Schedule work under the provisions of Section 00 72 00.

B. Perform cleaning, to exterior masonry between the hours of 7 a.m. to 4 p.m.

PART 2 – PRODUCTS

2.01 CLEANING MATERIALS

A. Cleaning Agent: Prosoco Sure Klean (Custom Masonry Cleaner) Limestone Restorer or Klenztone.

2.02 MORTAR MATERIALS

A. Pointing Mortar: ASTM C270, Type N, using the property specification.

2.03 MASONRY MATERIALS

A. Brick: Match existing units in size and color.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces to be cleaned and restored are ready for work of this section.

3.02 PREPARATION

A. Carefully remove and store fixtures, fittings, finishing hardware, accessories.

B. Close off, seal, mask, and board up areas, landscaping, materials, and surfaces not receiving work of this section to protect from damage.

C. Protect interior surfaces from damage due to cleaning procedures.

D. Removal of Plant Growth: Remove plant, moss, shrub and all other organic growth from masonry surfaces.

3.03 REBUILDING

A. Cut out damaged and deteriorated masonry with care in a manner to prevent damage to any adjacent remaining materials.

B. Support structure as necessary in advance of cutting out units.

C. Cut away loose or unsound adjoining masonry and mortar as directed to provide firm and solid bearing for new work.

D. Build in new masonry units following procedures for new work.

E. Mortar Mix: Colored and proportioned to match existing work.

F. Ensure that anchors and flashings are correctly located and built in.

G. Install built in masonry work to match and align with existing, with joints and coursing true and level, faces plumb and in line. Build in all openings, accessories and fittings.

3.04 REPOINTING

A. Cut out loose or disintegrated mortar in joints to minimum 1/2 inch depth or until sound mortar is reached.

B. Utilize power tools only after test cuts determine no damage to masonry units will result.

C. Do not damage masonry units.

D. When cutting is complete, remove dust and loose material with water jet.

E. Pre-moisten joint and apply specified mortar. Pack tightly in maximum 1/4 inch layers. Form a smooth, compact concave joint to match existing.

F. Moist cure for 72 hours.

3.05 CLEANING EXISTING MASONRY AND CONCRETE

A. Cleaning Detergent: Spray clean masonry and concrete surfaces at indicated locations with detergent in accordance with the manufacturer's instructions. Saturate with clean water and flush loose mortar and dirt.

B. High Pressure Cold Water: Cold water blast with sufficient pressure to concrete and brick masonry surfaces, at indicated locations, providing uniform finish.

3.06 RESTORATION CLEANING

A. Clean surfaces and remove large particles with wood scrapers or nonferrous wire brush.

B. Spray coat existing masonry with restoration cleaner, mixed into solution in accordance with manufacturer's instructions.

C. Provide additional applications as required for uniformly cleaned masonry.

D. Allow sufficient time for solution to remain on masonry and agitate with soft fiber brush or sponge.

E. Rinse from the bottom up with potable water applied at low pressure.

3.07 CLEANING

A. As work proceeds and on completion, remove excess mortar, smears, droppings.

B. Clean surrounding surfaces.

[END OF SECTION 04 01 20.91]

SECTION 05 40 00

COLD FORMED METAL FRAMING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Load bearing formed steel stud exterior wall framing.

1.02 RELATED SECTIONS

A. Section 00 72 13: General Conditions.

B. Section 06 10 00: Rough Carpentry.

C. Section 07 92 00: Joint Sealants.

D. Section 09 21 16: Gypsum Board Assemblies.

1.03 REFERENCES

A. ASTM A123 / A123M-09- Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

B. ASTM A924 / A924M-09a- General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

C. AWS D1.1 - Structural Welding Code.

D. AWS D1.3 - Structural Welding Code – Sheet Metal.

E. SSPC (Steel Structures Painting Council) - Steel Structures Painting Manual.

F. MFMA (Metal Framing Manufacturers Association) - Guidelines for the Use of Metal Framing.

G. ASTM A653 - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

H. ASTM A1011 - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength

1.04 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, type and location of fasteners, and accessories or items required of related work.

C. Indicate stud layout.

D. Describe method for securing studs to tracks and for welded framing connections.

E. Product Data: Provide data on standard framing members; describe materials and finish, product criteria, and limitations.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.04 QUALITY ASSURANCE

A. Structural properties of framing members in accordance with AWCI, MFMA, and AWS D1.3 requirements.

1.05 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

B. Installer: Company specializing in performing the work of this section with minimum three years experience.

1.06 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.07 COORDINATION

A. Coordinate work under provisions of Section 01 50 00.

B. Coordinate with the placement of components within the stud framing system, specified in Divisions 15 and 16.

PART 2 – PRODUCTS

2.01 FRAMING MATERIALS

A. Joists: ASTM A1003, Grade 50 sheet steel, solid web, thickness and depth as indicated on drawings.

2.02 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered.

B. Plates, Gussets, Clips: Formed sheet steel, thickness determined for conditions encountered.

C. Touch-Up Primer for Galvanized Surfaces: SSPC - Paint 20 Type II Organic zinc rich.

2.03 FASTENERS

A. Self-drilling, Self-tapping Screws, Bolts, Nuts and Washers: ASTM A123 / A123M-09, hot dip galvanized to 1.25 oz/sq ft.

B. Welding: In conformance with AWS D1.1 and AWS D1.3.

2.04 FINISHES

A. Studs: Galvanize to G90 coating class.

B. Tracks and Headers: Galvanize to G90 coating class.

C. Bracing, Furring, Bridging: ASTM A123 / A123M-09, hot dip galvanized to 1.25 oz/sq ft.

D. Plates, Gussets, Clips: ASTM A123 / A123M-09, hot dip galvanized to 1.25 oz/sq ft.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify site conditions under provisions of Section 01 50 00.

B. Verify that building framing components are ready to receive work.

3.02 ERECTION OF STUDDING

A. Install components in accordance with manufacturer's instructions.

B. Place studs at 16 inches oc(or as shown on drawings); not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using method shown on drawings.

C. Construct corners using minimum three studs. Double stud wall openings, door and window jambs.

D. Erect load bearing studs one piece full length. Splicing of studs is not permitted.

E. Erect load bearing studs, brace, and reinforce to develop full strength, to achieve design requirements.

F. Install intermediate studs above and below openings to align with wall stud spacing.

G. Provide deflection allowance in stud track, directly below horizontal building framing at non-load bearing framing.

H. Attach furring channels to studs for attachment of fixtures anchored to walls.

I. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

J. Touch-up field welds and damaged galvanized surfaces with primer.

K. Complete framing ready to receive exterior finish system.

3.03 ERECTION TOLERANCES

A. Maximum Variation from True Position: 1/8 inch.

B. Maximum Variation of any Member from Plane: 1/8 inch.

[END OF SECTION 05 40 00]

SECTION 05 50 00

METAL FABRICATIONS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Shop fabricated ferrous metal items, galvanized and prime painted.

1.02 RELATED SECTIONS

A. Section 00 72 13: General Conditions.

B. Section 03 30 00: Cast-in-Place Concrete.

C. Section 07 71 23: Manufactured Gutters and Downspouts.

D. Section 09 91 00: Painting.

1.03 REFERENCES

A. ASTM A36 / A36M-08 - Carbon Structural Steel.

B. ASTM A53 / A53M-07 - Pipe, Steel, Black and Hot-Dipped, Zinc-Coated Welded and Seamless.

C. ASTM A123 / A123M-09 - Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.

D. ASTM A283 / A283M-03 (2007) - Low and Intermediate Tensile Strength Carbon Steel Plates.

E. ASTM A307-07b - Carbon Steel Bolts and Studs, 60,000 PSI Tensile Strength.

F. ASTM A924 / A924M-09a- General requirements for Steel Sheet, Metallic-Coated by the Hot-Dip process.

G. ASTM A501-07 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

H. AWS A2.1 - Standard Welding Symbols.

I. AWS D1.1 - Structural Welding Code.

J. SSPC - Steel Structures Painting Council.

K. CBC - California Building Code, 2010 Edition.

1.04 SUBMITTALS

A. Submit under provisions of Section 00 33 00.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable. Provide specific submittal for all ramp and sloped walk guide rails, handrails, and guardrails prior to fabrication clearly showing spacing of rails and embed details.

C. Indicate welded connections using standard AWS A2.1 welding symbols. Indicate net weld lengths.

1.05 QUALIFICATIONS

A. Welders' Certificates: Submit under provisions of Section 01 33 00, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.06 FIELD MEASUREMENTS

A. Field verify all dimensions prior to fabrication.

PART 2 – PRODUCTS

2.01 MATERIALS

A. General: All material that will be exposed must be smooth and free of surface blemishes including pitting, seam marks, roller marks, trade names and irregularities.

B. Steel Sections: ASTM A36 / A36M-08.

C. Steel Tubing: ASTM A500, Grade B.

D. Pipe and Downspouts: ASTM A53 / A53M-07, Type E, Grade B.

E. Plates: ASTM A36 / A36M-08.

F. Bolts, Nuts, and Washers: ASTM A307-07b.

G. Drilled-in Concrete Anchors: Hilti “Kwik Bolt TZ” (ICC Report No. ESR-1917), Ramset T3 (ICC Report No. ESR-1955), or accepted equal; stainless steel for all exterior work; testing required.

H. Drilled-in Masonry Anchors: Hilti “Kwik Bolt 3” (ICC Report No. ESR-1385), Ramset T3 (ICC Report No. ESR-1955),or accepted equal; stainless steel for all exterior work; testing required.

I. Welding Materials: AWS D1.1; type required for materials being welded.

J. Shop and Touch-Up Primer: TNEMEC 10-99 - Red primer or Devoe DEVGUARD 4141.

K. Touch-Up Primer for Galvanized Surfaces: Zinc rich type.

L. Metal Framing Channels: Channel members shall be fabricated from structural grade steel conforming to ASTM A924-09a; P1000 as manufactured by Unistrut or approved equal. Finish shall be hot-dip galvanized coating.

M. Pipe/Conduit Clamps: Punch-press made from hot-rolled, pickled and oiled steel plates, strip or coil and conform to ASTM A36 / A36M-08; P2600 as manufactured by Unistrut or approved substitute. Finish shall be hot-dip galvanized coating.

N. Non-Shrink Grout: Euco-Dry Pack Grout, natural aggregate, high strength non-shrink. “Pac-It” - W.R. Meadows, or approved equal.

O. Removable Post Insert Sleeves: For mounting new posts/rails in new concrete, Wagner Companies EZ SLEEVE or equal. (888)243-6914.

2.02 FABRICATION

A. Workmanship

1. Form exposed work true to line and level with accurate angles and surfaces and straight, sharp edges.

2. Ease exposed edges to a radius of approximately 1/32 inch, unless indicated otherwise.

3. Form bent-metal corners to the smallest radius possible without causing grain separation or otherwise impairing work.

4. Weld corners and seams continuously, complying with AWS recommendations. At exposed connections, grind exposed welds smooth and flush to match and blend with adjoining surfaces. Welds to be imperceptible in finished work.

5. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners wherever possible.

B. Assemblies

1. Use materials of sizes and thickness indicted or required to produce strength and durability in finished product for use intended.

2. Work to dimensions indicated.

3. Fit and shop assemble in largest practical sections for delivery to site.

4. Cut, reinforce, drill and tap miscellaneous metal work as required to receive finished hardware and similar items.

5. Exposed mechanical fasteners: When application will not permit concealed fasteners, locate exposed fasteners in unobtrusive manner, consistent with design of component, except where specifically noted otherwise. Use Phillips flat-head countersunk screws or bolts for exposed fasteners.

6. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

7. Fabricate joints exposed to the weather to be weather to be weather tight and provide weep holes as required.

C. Fit and shop assemble in largest practical sections, for delivery to site.

D. Fabricate items with joints tightly fitted and secured.

E. Continuously seal joined members by continuous welds.

F. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

G. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where specifically noted otherwise.

H. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FINISHES

A. Prepare surfaces to be primed in accordance with SSPC SP 2.

B. Prime all surfaces that are not scheduled to receive galvanization, except, do not prime surfaces embedded in concrete nor in areas of field welds until welds are completed and inspected.

C. Prime paint items with one coat.

D. Galvanize in accordance with ASTM A123 / A123M-09, designated steel items. Provide minimum 1.25 oz/sq ft galvanized coating.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

B. Beginning of installation means erector accepts existing conditions.

C. Contractor shall conform all existing downspouts to remain are fully functional.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

B. Supply items required to be cast into concrete or embedded in masonry with setting templates, to appropriate sections.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Field weld components indicated on shop drawings.

D. Perform field welding in accordance with AWS D1.1.

E. Obtain Architect approval prior to site cutting or making adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

3.04 SCHEDULE

A. The Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.

1. Steel pipe railing, (galvanized at exterior, primed at interior).

2. Pipe rail wall support brackets, (galvanized at exterior, primed at interior).

3. Steel pipe downspouts and downspout support brackets, galvanized.

4. Unistrut P-1000 Support System.

[END OF SECTION 05 50 00]

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Description of requirements for materials, fabrications and installation of rough carpentry and associated items (except that which is specified elsewhere) indicated on Drawings and necessary to complete the work. Items include, but are not necessarily limited to, the following:

1. Blocking, Backing, Stripping, Furring, and Nailers.
2. Rough Hardware.
3. Wood Framing.
4. Plywood Sheathing.
5. Preservative Treatment.
6. Metal Fabrications.

1.02 RELATED SECTIONS

A. Section 00 72 13: General Conditions

B. Section 03 30 00: Cast-in-Place Concrete

C. Section 05 50 00: Metal Fabrications

D. Section 06 20 00: Finish Carpentry

E. Section 07 90 00: Joint Protection

1.03 QUALITY ASSURANCE

A. Manufacturer data: Submit product data for all materials specified under this section and as applicable to each site.

B. Coordinate the work of all trades to ensure proper placement of all materials, anchors, etc., as well as providing for openings and anchors for the installation of surface mounted materials and equipment.

C. Qualifications of Workmen: Provide sufficient skilled workmen and supervisors who shall be present at all times during execution of this portion of the work and who shall be thoroughly familiar with the type of construction involved and the materials and techniques specified.

D. Rejection: In the acceptance or rejection of rough carpentry, no allowance will be made for lack of skill on the part of the workmen.

E. Requirements of Regulatory Agencies:

1. California Building Code Standard, No. 23-1, "Classification, Definition and Methods in California of Grading all Species of Lumber":

   a. No. 23-2 - "Construction and Industrial Plywood".

2. California Building Code (CBC), edition applicable to project per cover sheet.

F. References and Standards: Provide materials graded under latest Edition of the pertinent following Agencies:

1. American Society for Testing and Materials (ASTM).

2. Lumber: West Coast Lumber Inspection Bureau (WCLIB), Rule 17, Standard Grading Rules for West Coast Lumber.

3. Lumber: Western Wood Products Association (WWPA); Western Lumber Grading Rules.

4. Plywood: American Plywood Association (APA) Plywood Specifications and Grades and Voluntary Product Standard DOC PS 1 “Construction and Industrial Plywood”.

5. Wood Preservative: American Wood Protection Association (AWPA), Standard U1.

6. California Building Code, latest edition.

G. Design Criteria: Pressure treatment shall not adversely affect application, permanence, or appearance of finish paint system.

1.04 SUBMITTALS

A. Submit under provisions of Section 01 33 00.

B. Certification:

1. Pressure Treated Wood: Certification for water-borne preservative that moisture content was reduced to 19% maximum, after treatment.

2. Pressure Treated Wood: Submit certification by treating plant stating the chemicals and process used, net amount of salts retained, and conformance with applicable standards.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Protection, General: Protect wood from moisture while being stored and while work is in progress.

B. Protection:

1. After delivery, store all materials in such a manner as to ensure proper ventilation and drainage and to protect against damage and the weather.

2. Keep all material clearly identified with all grade marks legible; keep all damaged material clearly identified as damaged, and separately store to prevent its inadvertent use. Do not allow installation of damaged or otherwise non-complying material.

3. Use all means necessary to protect the installed work and materials of all other trades.

C. Replacements: In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

1.06 JOB CONDITIONS

A. Environmental Requirements: Maintain uniform moisture content of lumber at 19 percent or less prior to close-in.

B. Sequencing: Coordinate details with other work supporting, adjoining, or fastening to rough carpentry work.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Wood:

1. Lumber (Blocking, Backing, Stripping, Furring, and Nailers): WCLIB Construction.

2. Lumber (Wood Framing): Meet requirements of following minimum grades, and as noted on Structural Drawings.

Item	Species	Grade	Reference
Studs	D.F.	No. 1 2 x 4 Light Framing	WCLIB 124b
Studs	D.F.	No. 1	WCLIB 121
Plates	D.F.	No. 1	WCLIB 123b
Beams	D.F.	Select Structural	WCLIB 130b
Joists	D.F.	No. 1	WCLIB 123b
Posts	D.F.	Select Structural	WCLIB 131b

3. 3x and larger lumber shall be free of heart center.

4. 2x6 T & G Douglas Fir No. 1.

B. Plywood:

1. Roof and Wall Structural Sheathing: PS-1 Structural 1, CDX APA with exterior glue.

2. Thickness and type shall be as indicated on Drawings.

C. Pressure-Treated Lumber:

1. Douglas Fir pressure-treated.

a. Required for cast-in-nailers, sills or anywhere wood is in contact with concrete, masonry or grout.

b. Required for all rooftop blocking.

D. Building Paper: Fed. Spec. UU-B-790a, Type I, Grade B (15 lb. min.).

E. Preservative Treatment

1. Furnish pressure treated Douglas Fir in accordance with AWPA, Standard U1. Each piece is required to bear AWPA stamp.

2. Field treat cut edges and holes frilled in factory treated lumber with an approved AWPA Standard U1 preservative product.

3. For fastener requirements, see Paragraph 2.01-F-8.

F. Rough Hardware Fastenings and Connections: All types including bolts, lag screws, nails, spikes, screws, washers, framing devices and other rough hardware, or kinds that may be purchased and that require no further fabrication, shall be furnished and installed for all finish and rough carpentry. All exterior hardware shall be hot-dipped galvanized per ASTM A123 / A123M-09 Standards.

1. Nails: ASTM F1667 Common wire nails or spikes; box nails not permitted.

2. Wood Screws: Wood Screws: ANSI Standard B18.6.1; use galvanized type for exterior work.

3. Lag Screws: Conform to ASTM A307-07b and ANSI Standard B18.2.1. Dimensions and installation shall conform to requirements described in the National Design Specification (NDS), current edition.

4. Bolts: ASTM A307-07b, Grade A, hexagonal heads, unless noted otherwise.

5. Washers: Washers for bearing against wood shall be provided under all bolt heads and nuts. Washers shall be as indicated on Drawings.

6. Powder Driven Fasteners: Tempered steel pins with special corrosive-resistant plating or coating. Pins shall have guide washers to accurately control penetration, minimum 1-1/8 inch. Fastening shall be accomplished by low-velocity pistol-driven powder activated tool. Pins and tool shall be as manufactured by Hilti Fastening Systems; Impex Tool Corporation; or approved equal. ICBO approved.

7. Fabricated Sheet Metal Timber Framing Connectors: CBC approved. Fabricate from hot-dipped galvanized steel. Connectors shall be at least 18 gauge minimum material (1/8" plate materials where welded, unless otherwise noted), punched for nailing. Nails and Nailing shall conform to the manufacturer's instructions with a nail provided for each punched hole. Types as noted on Drawings, manufactured by Simpson Co. or approved substitute. All framing connectors shall be stamped with manufacturer's logo, and model designation.

8. All fasteners into preservative-treated and fire-retardant-treated wood shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper per CBC 2304.10.5. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153. Fasteners other than nails, timber rivets, wood screws and lag screws shall be permitted to be of zinc coated steel with coating weights in accordance with ASTM B 695, Class 55 minimum.

G. Exterior Trim and Fascias: RIS Grade Stamped, Redwood, B Heart, Vertical Grain, Kiln Dried, surfaced sizes as indicated on the drawings.

2.02 FABRICATION

A. Lumber:

1. Air- or kiln-dry to maximum 19 percent moisture content, prior to installation. Lumber must be 19 percent moisture content prior to close-in and finish.

2. Furnish S4S unless otherwise noted.

3. Size to conform with rules of governing standard. Sizes shown are nominal unless otherwise noted.

2.03 SOURCE QUALITY CONTROL

A. Grade Mark each piece of lumber. Marking must be done by recognized agency. Lumber Manufacturer's Association Certificates may be accepted in lieu of such grade and trademarks.

1. Douglas Fir shall bear WCLIB grade stamp.

B. Plywood Sheathing: Each panel shall be legibly identified as to type, grade and specie by APA grade. If plies are spliced, the slope of the scarf shall not be steeper than 1:8. White pockets will not be permitted in face plies.

C. Each piece of preservative treated lumber shall bear AWPA stamp.

2.04 WOOD PRESERVATIVE TREATMENT

A. Preservative treatment: Comply with applicable requirements of AWPA standards C2 for lumber and C9 for plywood. After treatment, kiln dry lumber to a maximum moisture content of 19 percent, and plywood to 15 percent.

1. Pressure treat members connected with roofing, flashing and weatherproofing; including but not limited to cants, nailers, curbs, equipment supports and blocking.

2. Pressure treat members that are concealed and in contact with masonry or concrete, including, but not limited to, sills, nailers, blocking, furring and studs.

PART 3 – EXECUTION

3.01 SURFACE CONDITIONS

A. Inspection:

1. Prior to all work of this Section, carefully inspect the installed work of all other trades and verify that all such work is complete to the point where this installation may properly proceed.

2. Verify that rough carpentry may be performed in strict accordance with the original design and all pertinent codes and regulations.

B. Selection of Lumber Pieces: Carefully select all members. Select individual pieces so that knot and obvious defects will not interfere with placing bolts or proper nailing or making proper connections. Cut out and discard all defects which will render a piece unable to serve its intended function.

C. Lumber may be rejected by the Architect, whether or not it has been installed, for excessive warp, twist, bow, crook, mildew, fungus, or mold, as well as for improper cutting and fitting. No load carrying member shall be exposed to earthen materials.

D. Shimming: Do not shim any framing component.

3.02 FASTENING

A. Nailing: Except as otherwise indicated on Drawings or specified, all nailing shall be as scheduled on Drawings:

1. Nails or Spikes shall be common wire unless noted otherwise. Penetration of nails or spikes shall be one-half the length of the nail or spike into the piece receiving the point. However, to connect pieces 2 inches in thickness, 16d nails shall be used unless noted otherwise.

a. Bore holes for nails wherever necessary to prevent splitting.

b. Use finish or casing nails for finish work.

c. Use of nailing guns is as limited by CBC, and must be approved by Architect and DSA. Submittal of guns and nails is required.

B. Bolts: Bolts shall be of sizes indicated. Drive fit with washers under nuts. Tighten all bolts and screws before closing in.

C. Framing Devices: As specified under Products, sizes as indicated. Use half-length nails where

required.

D. Lag Screws: Pre-Bore lead holes and install per NDS, current edition.

3.03 FRAMING AND ROUGH CARPENTRY

A. Sills: Shall be in long lengths of sizes shown, fastened with anchor bolts at exterior walls and with powder driven fasteners at interior walls as indicated, a minimum of two (2) fasteners per piece and a bolt within 9" but not nearer than 6" from end of piece. Place malleable iron or steel plate washers (but not cut washers) under nuts bearing on wood. Set sills level and true and bed exterior wall sills and interior bearing wall sills on 1/2 inch dry-pack or non-shrink grout.

B. Studs, Posts and Columns: Shall be full length. Corners shall be as detailed. Partitions or walls containing plumbing, heating or other piping shall be so formed as to give proper clearance for materials. Cut members as required to provide full bearing at ends. Connect to structure as indicated.

C. Plates: Shall be in long lengths and spliced as shown.

D. Blocking: Shall be same thickness and width of studs or joists unless shown otherwise. Blocking shall not be spaced over 8'-0" o.c. Install fire blocking in accordance with CBC, Section 717. Install blocking at all plywood joints unless otherwise noted on the drawings. Install blocking for fastening all surface applied items.

E. Joists and Beams: Shall be in long lengths and spliced over bearings unless shown otherwise. Install with crown side up. Beams or headers indicated to be built up of two or more joists shall be fabricated on the job using full length members. For two piece members, stitch nail pieces together with 16d common nails spaced not over 12" o.c. and staggered. Clinch nails protruding through members.

1. Provide double joists and headers at all openings through floors and roofs unless otherwise shown on Drawings.

2. Provide typical headers at all openings through walls where one or more studs are required to be cut. For penetration through walls narrower than stud spacing, provide solid backing on all sides for fastening finish materials.

F. Plywood Structural Sheathing: Install to pattern indicated and provide blocking at joints where noted on the drawings. Center all joints over bearing supports. Nail to framing as indicated. Install plywood with face plies perpendicular to joists or studs unless indicated otherwise.

G. Wood Furring, Stripping and Grounds: Install as shown or required to provide nailing of materials or passage of pipes, conduits, etc., not otherwise accommodated.

H. Bridging: Space not over 8'-0" o.c. for spans over 16'-0". Spans over 8'-0" and under 16'-0" shall have bridging placed at midspan. Bridging shall be two 2 x 3's or solid blocking as indicated. Joists 8" or less in depth shall not require bridging unless specifically indicated.

I. Backing: Shall be provided for all wall and ceiling finishes and for supporting of fixtures and equipment for all trades, including toilet partitions, toilet room accessories, frames, case work, mirrors, trim, applied wall finishes, etc. Coordinate placement of backing and supports with manufacturer or supplier of mounted items.

J. Building Paper: Install two layers in all exterior locations. Install with weather lap edges a minimum of 2 inch horizontal and 6 inch vertical laps. Continue building paper minimum 6 inches around inside and outside corners. Fasten in place with appropriate staples.

K. Cuts or holes in preservative treated wood shall be treated in accordance with AWPB standard M4 in the field.

3.04 MISCELLANEOUS HARDWARE

A. Finish hardware is specified in Section 08 71 00. All other hardware indicated or required but not specified elsewhere shall be furnished and installed hereunder, including appropriate screws or other fastening devices.

3.05 MISCELLANEOUS CARPENTRY WORK

A. Miscellaneous Carpentry Work not included under other sections shall be furnished and installed hereunder as indicated. Carefully locate and securely anchor such items to structure.

B. Drypack: Drypack shall consist of 1 part high early strength Portland cement to not more than 3 parts of sand by volume. Add only a minimum amount of water to hold the mixture in shape while packing and to provide hydration. Solidly ram drypack into place to provide uniform bearing and cure with moist sacks or cloths for a period of at least three (3) days.

C. Plywood Backing for electrical, telephone, and similar types of wall mounted equipment shall be provided hereunder where required. Plywood shall be 3/4" thick exterior A-C plywood with 'A' face exposed.

D. Shoring and Bracing: Shore or brace for temporary support of all work as required during the construction period except any shoring and bracing specified and included under other sections of these specifications.

E. Temporary Enclosures: Provide and maintain all barricades and enclosures required to protect the work in progress.

F. Protect all work in progress and all work installed, as well as the work of all other trades. Any work damaged as a result of the work under this section shall be corrected to its original condition or replaced if directed by the Architect and at no increase in cost to the Owner.

G. Protection Devices: Pedestrian walkways, barricades, lights, shoring and other protective structures and devices necessary for the protection of pedestrians shall conform in all respects to the requirements of CBC, Section 3303, Title 24 and to the requirements of the Department of Public Works.

3.06 FRAMING TOLERANCES

A. Maximum variation from true flatness: 1/4 inch in ten feet in any direction.

3.07 CLEAN-UP

A. Upon completion of the work of this Section, remove all surplus materials, rubbish and debris from the premises.

[END OF SECTION 06 10 00]

SECTION 06 20 00

FINISH CARPENTRY

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Finish Carpentry Items, Other Than Shop Fabricated Casework.

B. Hardware and Attachment Accessories.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 06 10 00: Rough Carpentry.

C. Section 09 90 00: Painting.

D. Section 08 71 00: Door Hardware.

1.03 QUALITY ASSURANCE

A. Standards of Construction: All work shall be manufactured in accordance with North American Architectural Woodwork Standards(WI), latest edition, including all supplements and in the grades hereinafter specified.

B. Installer's Qualifications: Use only journeymen finish carpenters who are thoroughly trained and experienced in the skills required for the cutting and fitting of trim and finish materials.

C. Installation Acceptance: All rejected work shall be removed and replaced with no additional cost to the Owner.

1.04 SUBMITTALS

A. Shop Drawings: Shop drawings shall include details and erection data associated with the work of other trades; location; materials, species of wood; quality grade; type of finish; profiles, dimensions; fastenings and clearances. Detail drawings shall be either full size or three inches equals one foot (3" = 1').

1. The mill shall take and be responsible for all field measurements required for the proper fabrication and installation of the work. Show all field dimensions beyond control of mill.

a. Report any major discrepancy between the Drawings and the field dimensions to the Architect before fabrication of the work.

2. Coordinate dimensions and installation requirements of Owner furnished equipment.

B. Certification:

1. Submit WI Certified Compliance certification covering all work of this Section prior to delivery of any materials to the job site.

2. Grade mark and mill identification of the association having jurisdiction shall appear distinctly legible on the back of each piece of lumber and plywood. No marks shall appear on exposed faces of work to receive transparent or semi-transparent finished.

C. Samples: Submit samples of all interior and exterior trim materials. Samples shall be finished as

specified and submitted for color and material approval prior to delivery and installation.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery: Do not deliver material to site until required temperature and relative humidity conditions have been stabilized and will be maintained in installation areas.

B. Storage, Handling and Protection: Provide all work or materials necessary to store, cover and protect all materials specified to be furnished and installed under this Section. Store all materials under cover in a well-ventilated enclosure and protect against extreme changes in temperature and humidity. Avoid any marring and keep the materials clean during handling and installation operations. Protect exposed finish work and materials after their erection from damage of any character. Work damaged through neglect or failure to provide protection shall be repaired or replaced by the Contractor without additional cost to the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS

A. All Material Grades and Construction shall be WI custom grade, including all supplements, unless specified or indicated otherwise. Semi-exposed and other components shall be as permitted by WI standards for construction quality specified herein except as otherwise detailed or specified. Moisture content shall be in accordance with WI Standards for millwork.

B. Wood Trim: Douglas Fir, surfaced, Kiln Dried, Opaque Finish.

C. Adhesives:

1. For Exterior Work: CS 35-61 Type I (fully waterproof). Shall withstand shear and cyclic boil tests specified in PS 51-71.

2. For Interior Work: CS 35-61 Type II (water-resistant). Shall withstand cold-soak tests specified in PS 51-71.

D. Fasteners:

1. Bright finish nails for interior work; aluminum or galvanized nails for exterior work. Screws shall be cadmium plated.

2. Lag Screws: Conform to ASTM A307. Dimensions and installation shall conform to requirements described in the National Design Specification (NDS), 1991 Edition.

E. Wood Door Frames: Douglas Fir, vertical grain, surfaced, kiln dried opaque finish.

F. Cememtitious Siding:

1. Hardi-Home, lap siding as manufactured by James Hardie. With embossed EZ line alignment aid and “Rustic Cedar” woodgrain. Provide with factory “Prime Plus” prime coat and prepare for field painting.

G. Wood Siding:

1. DuraTemp Primed Siding as manufactured by Roseburg (541)679-3311. Made of genuine plywood and surface shall be 100% clear and free of patches and repairs. Provide 15/32” thickness in longest lengths possible. All edges shall be shiplap.

2.02 FABRICATION, GENERAL

A. Moisture Content for all finish carpentry shall lay between 6 and 12 percent, consistent with the

average atmospheric conditions at the project.

B. Scribing Allowance: Provide at walls, ceilings, etc., in accordance with WI standards.

C. Surfaces: Machine sanded on all flat top face areas, smoothly machine run in all depressed flat surfaces and on molded contours. Sander marks shall be fine enough to be completely concealed by the painter's applied finish work. All members shall be finished true and straight, with all edges clean cut and all exposed surfaces free from all working defects.

D. Lengths shall be those usually available in the species specified.

E. Milling: All finish carpentry and millwork members shall be milled to dimensions and profiles indicated. Provide surface applied or plowed stops of the profile and dimension shown. Except where exact lengths can be determined, all members and materials shall be provided "long" for cutting and fitting in the field. Built-up members shall be fabricated as detailed and shall be carefully assembled to provide a finished product that is free from warp and defects and is true to line.

1. Assemble in the mill in as large units as practicable to minimize field cutting and fitting. Where necessary to fit at the site, provide ample allowance for cutting and fitting.

PART 3 – EXECUTION

3.01 CONDITION OF SURFACES

A. Examine all framing, grounds, stripping and blocking to secure finish carpentry and trim. Do not install finish carpentry and trim until all defects are corrected.

3.02 INSTALLATION

A. Workmanship Quality: All wood finish shall be installed level, plumb and true, with members neatly and accurately scribed in place. All trim shall be applied in lengths as long as practicable. Butt joints shall be beveled together, exterior angles mitered and interior angles coped, unless shown otherwise. All exposed nails and screws shall be set for putty unless indicated or specified otherwise.

B. Wood Trim: Set plumb and square. Verify wall thickness for proper trim width. Anchor trim securely to structure to prevent rotation or damage. All wood trim installed in the field shall be carefully cut to length and all joints neatly made to provide for tight, rigid connections.

C. Cementitious Siding: Install in strict conformance to the manufacturer’s written installation instructions. Install over two layer of Grade “D” building paper. Caulk all butt joints and where product abuts trim or other surfaces.

3.03 MISCELLANEOUS

A. Provide and install all miscellaneous finish carpentry items to conform to the workmanship quality specified above and shown on the Drawings. Millwork shall be installed in a neat, workmanlike manner, free of hammer marks and surface defects. Pieces shall fit together neatly with all corners mitered. Do not install finish carpentry until it has been backprimed as specified in Painting Section 09 90 00.

3.04 CLEAN-UP

A. General: Keep the premises in a neat, safe and orderly condition at all times during execution of this portion of the work, free of accumulations of sawdust, cut-ends and debris.

B. Clean-up: Upon completion of the work of this Section, remove all surplus materials, rubbish and debris from the premises and leave "broom clean".

[END OF SECTION 06 20 00]

SECTION 06 41 00

CUSTOM CASEWORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Special fabricated cabinet units.

B. Countertops (plastic laminate and solid phenolic chemical resistant).

C. Cabinet hardware.

D. Preparation for installing utilities.

E. Repair of existing casework.

F. Identification tags at doors and drawers.

1.02 RELATED SECTIONS

A. Section 00 72 13: General Conditions.

B. Section 06 20 00: Finish Carpentry.

C. Section 09 68 00: Carpet.

D. Section 09 90 00: Painting.

E. Division 22: For resin and stainless steel sinks, faucets and trims and other related new and existing mechanical work.

F. Division 26: For new and existing electrical work installed in casework.

1.03 REFERENCES

A. ANSI/BHMA A156.9 - Cabinet Hardware.

B. WI - Woodwork Institute, North American Architectural Woodwork Standards, latest edition.

C. FS MM-L--736 - Lumber, Hardware.

D. National Electric Manufacturers Association (NEMA) LD3 - High Pressure Decorative Laminates.

E. PS 20 - American Softwood Lumber Standard.

1.04 SUBMITTALS

A. Shop Drawings:

1. Must bear WI certificate of compliance stamp and be in accordance with Section 1 of the WI Manual of Millwork.

2. Indicate materials, component profiles and elevations, assembly methods, joint details, anchorage details, accessory listings, hardware schedule, and schedule of finishes.

3. The casework fabricator shall take and be responsible for all field measurements required for the proper fabrication and installation of the work. Show all field dimensions beyond

control of mill.

a. Report any major discrepancy between the Drawings and field dimensions to the Architect before fabrication of the work.

4. Indicate conditions for all casework, identified with locations, quality grade, type of finish and species of wood.

5. Show casework in related and dimensional position with sections either full size or three inches equals 1 foot (3" - 1').

6. Coordinate dimensions of equipment or items indicated to be built into the casework.

7. Coordinate dimensions and installation of Owner-furnished equipment.

8. Indicate casework hardware proposed for use.

9. Indicate new identification tag layout and numerical sequencing per information provide by Owner.

B. Product Data: Manufacture literature for all hardware to be provided.

C. Samples:

1. Finishes for color selection.

2. Hardware: drawer pulls, hinges, locks and other hardware accessories.

3. Identification tag and fasteners.

D. Samples: Submit two physical samples and product data sheets of drawer pulls, hinges, locks, ID tags, and other specified hardware accessories, illustrating hardware type and finish.

1.05 QUALITY ASSURANCE

A. This project requires WI Compliance for product and installation.

B. All work shall be manufactured and installed in accordance with the standard established in the latest edition of the Manual of Millwork (including any amendments) as adopted by the WOODWORK INSTITUTE (WI) in Custom Grade.

C. All casework and counter tops to bear WI stamp of certification.

1.06 QUALIFICATIONS

A. Manufacturer: WI certified company specializing in manufacturing the products specified in this section with minimum five years experience.

1.07 PRE-INSTALLATION CONFERENCE

A. Convene one week prior to commencing installation work of this section.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage, and deter their erection from damage of any character. Work damages through neglect or failure to provide protection shall be made good by the contractor and without additional cost to the Owner.

1.09 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on shop drawings.

B. Field verify existing finish floor conditions to insure specified finish countertop heights and knee space clearances at accessible stations are maintained. If shimming is required to level units, this shall be taken into account in base cabinet construction.

1.10 COORDINATION

A. Coordinate the work with electrical rough-in, to assure orderly and efficient sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

PART 2 – PRODUCTS

2.01 SHEET MATERIALS

A. Particle Board or MDF: WI custom composed of wood chips, medium density, 3/4-inch thick made with high waterproof resin binders; industrial grade; sanded faces.

B. Melamine Faced Industrial Board: At all concealed and some “semi-exposed” locations provide low pressure thermoset melamine over industrial grade 3/4" particleboard. Facing color to be selected by Architect from manufacturer's full range of standard color.

1. Interiors of closed cabinets to be melamine faced.

2. Interiors of drawers to be melamine faced.

C. High Pressure Decorative Laminate (HPDL): At all exposed surfaces and some “semi-exposed” locations provide high pressure plastic laminate, minimum 0.048-inch thick as manufactured by Wilsonart, Formica, Nevamar, or approved equal. Colors to be selected from manufacturer’s full range of colors in Matt finish.

1. Open shelving and cubbies to be plastic laminate.

D. Plywood Sub-top: At all new cabinet locations provide ½” or 1” thick AC structural plywood a shown on drawings. Edge bind all exposed edges to match cabinet body. Provide longer ‘leg’ as shown on drawings to attach to wall ledger.

E. Core Materials for Plastic Laminate Covered Countertops, and Splashes: Industrial Grade Particleboard. Minimum thickness shall be 3/4" with backing sheet.

F. Fasteners: Bolts, Nuts, Washers, Lags, Pins, and Screws to be per WI standards and as shown on approved shop drawings.

G. Wood Veneer Laminate: At locations indicated on the Drawings, provide natural wood veneer overlay in lieu of high pressure plastic laminate. Wood veneer shall be selected to best match existing adjacent wood veneer casework. Finish with stain and clear lacquer to best match existing.

H. Vertical Cabinet Faces used for Marking Surfaces:

1. Non-magnetic: Wilsonart Markerboard Laminate, Frosty White color, #1573-09.

2. Magnetic: Formica Magnetic Markerboard, Crystal White, #M3091, gloss finish.

2.02 COUNTERTOPS

A. Countertops to have integral splashes.

B. Countertops, splashes and ends shall be faced with High-Pressure Laminated Plastic Sheets, a minimum of .050 inches thick. Underside of countertops shall have a backing sheet applied.

C. All countertops with sinks or adjacent to sinks are to have no drip edge excluding solid phenolic laboratory tops listed below.

2.03 LABORATORY SOLID PHENOLIC LABORATORY TOPS, SHELVES & SPLASHES

A. Monolithic specialized chemical & heat resistant solid phenolic specially formulated for use in laboratory conditions equal to "TopLab Plus" as manufactured by Trespa (415) 468-8448, www.trespanorthamerica.com. Product shall meet the following criteria.

1. Color shall be black with matt sheen finish.

2. Thickness shall be minimum 3/4 inch.

3. Edge treatment shall be 1/8 inch chamfer.

4. Chemical resistance: Provide solid phenolic panel providing minimum performance when tested for chemical resistance in accordance with SEFA 8.

5. Microbial Characteristics: Product shall not support microorganic growth.

6. Fire Performance: Maximum flamespread of 25 per ASTM E84, Class 1, Class A.

7. Weight: 93 pcf.

8. Compressive Strength: 24,000 psi minimum.

B. All shelves(inside cabinets and exposed) shall include seismic lips at front edge of shelf to prevent items from sliding off shelves during a seismic event.

2.04 HARDWARE

A. Hardware shall be furnished and installed as required to provide for a complete casework installation. Provide all additional hardware items as needed for a complete and proper installation as recommended by WI Supplemental No. 1 for Finish Hardware.

B. Hardware shall be 626 finish, unless specified otherwise.

C. Drawer and Cabinet Locks:

1. Provide where indicated on the drawings or casework schedule on new and/or existing drawers and doors.

a. All casework locks to be Olympus Lock Inc. 500DR, R Series or approved equal. Finish shall be US26D. Provide (2) keys for each lock. Locks in each room shall be keyed alike. Each room shall be keyed different. Provide master key per site.

D. Cabinet Hinges:

1. Heavy-duty 5-knuckle hinges, 2 ¾” with 26D satin chromium plated finish as manufactured by; Stanley 1592 or Stanley 351490HT, or approved equal.

a. Let-in hinges to achieve 1/8” reveals at doors.

E. Door and Drawer Pulls:

1. "U" shape, Stanley 4484, Hafele 116-05-922, or approved equal.

2. Brushed Chrome or Brushed Stainless Steel Finish

F. Drawer Guides:

1.	Small Drawer (up to 12”):	Accruide Model 2023 (50 lbs.) Clear Zinc Finish
2.	Medium Drawer (up to 24”):	Accuride Model 7432(100 lbs.) Clear Zinc Finish
3.	Large Drawer (up to 36”):	Accuride Model 4032: (150 lbs.) Clear Zinc Finish
4.	Extra Large Drawers (over 36”)	Accuride Model 3641: (180 lbs.) Clear Zinc Finish

G. Magnetic Catches:

1. Epco 591, Jaybee 3776, or approved equal.

2. Floating or self-aligning type, aluminum or durable plastic case, type as required for conditions.

3. One per leaf for doors up to 48 inches high and two per leaf for doors over 48 inches.

4. Catch on inside of door to be mounted directly behind door pull on outside of door.

H. Elbow Catches:

1. Ives 2F14, National Lock B238, or approved equal. One at each pair of locked doors, omit magnetic catch.

I. Adjustable Shelf Standards:

1. Hettich “Sekura” #1005767 or approved equal all metal construction with 80 lb load rating.

2. Retention pins only required at front shelf support clips. Rear clips may be non retention pin type.

J. Rubber wall base: See specification Section 09 68 00.

2.04 GLASS

A. Where glass is identified in cabinet doors, glass shall be 1/4" thick tempered. Provide recessed frame reveal to receive glass for flush installation on interior of cabinet door. Secure with removable screw-type fasteners. Provide sealant or gaskets as required to securely fasten glass for tight fit without vibration.

2.05 REPAIRS TO EXISTING CASEWORK

A. Where existing casework is identified for repair or components are being replaced, fabricate appropriate components to best suite replacement or repair work being performed and to best match existing construction materials, methods and finishes.

2.06 FABRICATION

A. Construction Style:

1. 3/4 inch thick; flush overlay Style “1”, Type A construction, Custom Grade, WI certified casework.

2. Apply high pressure plastic laminate finish (natural wood veneer where indicated on the Drawings) in full, uninterrupted sheets consistent with manufactured sizes.

3. Fit corners and joints hairline; secure joints with concealed fasteners. Slightly bevel arises.

4. Locate counter butt joints minimum 2 feet from sink cut-outs.

B. Edging:

1. Front edge of shelves to have one-piece 3mm PVC edge banding.

2. Case edges to have one-piece 1mm PVC edge banding.

3. Colors to be selected from manufacture standard color range.

C. Shelving:

1. All shelving less than 25" to be 3/4 inch thick melamine covered Industrial Board.

2. All shelves between 25” to 34” to be 1” inch thick melamine covered Industrial Board.

3. All shelves between 34” to 46” to be 3/4” inch thick HPL covered Veneer Core DF Plywood

4. All shelves over 46” to be 1” inch thick HPL covered Veneer Core DF Plywood.

5. Fixed shelves shall be dadoed into vertical.

6. Dividers, where used as vertical supports, shall be 3/4" Industrial Board melamine covered with 1” PVC edging.

7. All shelves shall have holes on bottom front sides to receive adjustable shelf bracket retention pins.

D. Countertops:

1. All countertops shall be fully supported.

2. Joints in countertops shall be layed out such that they do not occur at an open knee space or other open base cabinet area.

3. Where open base conditions do occur, a front and rear apron shall be provided (if shown on the Drawings or not) and shall be constructed of plastic laminate covered base cabinet material in a depth as required to maintain a minimum 27" clearance to floor for accessibility access. Where accessible clearances may be tight, a painted steel angle or tube shall be provided as shown and detailed on drawings.

E. Laboratory Countertops, splashes and ends identified to be solid chemical/heat resistant phenolic as defined in section 2.02 above. Where epoxy resin sinks are specified under Division 15, sinks shall be recessed flush mount and continuously sealed per manufacturer's written installation instructions. Provide all support bracing as required to adequately support sink per manufacturer's written instructions. All exposed edges shall have a minimum 1/8 chamfer. Countertop joints shall be layed out such that they do not occur at open knee spaces. Provide installation of solid phenolic products in full conformance with manufacturer's written instructions. Provide all sealants, adhesives, clamps and accessories for a complete installation.

F. Doors and Drawer Material:

1. Drawer Interiors: Thermo fused Melamine, thermoset decorative overlay conforming to requirements of AWS-NAAWS, latest edition, color as selected.

a. 1/2 inch thick veneer core plywood with white cabinet liner on all semi-exposed sides.

b. Bottom panel to be 1/4 inch thick veneer core plywood with white cabinet liner on each side.

c. Drawer bottoms are to be fully housed into sides, back and sub front.

G. Glass in cabinet doors shall be securely fastened and fit tight without rattling in its setting bed.

H. Where existing casework is identified to be repaired, materials, methods and finishes shall best match existing to suite conditions of repair.

2.07 MISCELLANEOUS METAL ITEMS

A. Provide as required to fabricate casework.

B. Provide all other miscellaneous casework, counters, shelving, which are not otherwise specified. All such work shall be of custom grade quality with finishes as shown. Where no finish is indicated, it shall be same as similar or adjacent work.

C. Clean all adjacent areas affected by casework installation.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

1.02 INSTALLATION

A. Set and secure casework in place; rigid, plumb, and level, in accordance with WI standards and DSA approved anchorage details.

B. All fasteners securing cabinet bodies to preservative treated wood sill plates shall be of hot dipped zinc-coated galvanized steel, stainless steel, silicon bronze or copper. The coating weights for zinc-coated fasteners shall be in accordance with ASTM A 153.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units counter tops and support brackets.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch. Do not use additional overlay trim for this purpose.

F. Provide closure panels and seal all cases to walls including tops wall hung cabinets and tall cabinets.

G. Countersink anchorage devices at exposed locations. Conceal with solid wood plugs of species to match surrounding wood; finish flush with surrounding surfaces.

H. Where existing casework is identified for repair or components are being replaced, fabricate

appropriate components to best suite replacement or repair work being performed. Where a cabinet unit may be removed and a free end left exposed, new end panels and filler strips shall be provided for a clean finish.

I. Where new countertops are replacing existing, remove and re-install any and all apparatus support sleeves and other accessories. Re-install all electrical outlets, gas valves, water valves and other accessories unless otherwise noted.

J. Field verify existing finish floor conditions to insure specified finish countertop heights and knee space clearances at accessible stations are maintained. If shimming is required to level units, this shall be taken into account in base cabinet construction. In no case shall specified finish countertop heights and clearances be compromised.

K. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

L. Provide cutouts for plumbing fixtures, apparatus sleeves, inserts, grommets, outlet boxes, fixtures and fittings. Verify locations of cutouts from on-site dimensions. Seal contact surfaces of cut edges. Where existing countertops are being replaced with new, remove and reinstall all existing fittings unless otherwise indicated on the Drawings.

M. Install rubber wall base at all exposed toe-kicks and extend inside all accessible sink base cabinets.

3.03 ADJUSTING

A. Adjust work prior to final inspection for smooth operation.

B. Adjust moving or operating parts to function smoothly and correctly.

C. Owner reserves the right to request an inspection by WI representative for conformance to reference standards.

3.04 CLEANING

A. Clean work prior to final inspection.

B. Clean casework, counters, shelves, hardware, fittings and fixtures.

C. Clean all adjacent areas affected by Casework installation.

3.05 CONTRACTOR INSPECTION OF EXISTING CASEWORK

A. Contractor shall review all hardware and operation condition of existing casework and notify Architect of any repair or replacement required to provide operation as if new.

[END OF SECTION 06 41 00]

SECTION 07 21 00

BUILDING INSULATION

PART 1 – GENERAL

1.01 APPLICABLE REQUIREMENTS

A. The requirements of Divisions 00 & 01 apply to all work of this Section.

1.02 SCOPE

A. Building insulation required for this work includes, but is not necessarily limited to:

1. Sound Insulation.

2. Thermal Insulation in walls and below roof deck.

3. At fire rated assemblies, provide insulation at fire rated construction only as allowed by the California Building Code.

1.03 RELATED WORK SPECIFIED ELSEWHERE

A. Section 06 10 00: Rough Carpentry

1.04 STANDARDS:

A. CBC, California Building Code - 2016 Edition, as amended.

B. California Quality Standards for Insulating Materials.

C. CBC 2016 edition, Section 720.

1.05 SUBMITTALS:

A. Submit the following items in accordance with Divisions 00 & 01:

1. List of materials.

2. Product data for each type of insulation specified.

3. Insulation Certificate: Installer shall submit a copy to the Architect and post in a conspicuous location in each building a certificate signed by the installer and the General Contractor stating that the installation conforms with the requirements of CBC 2016 edition, Title 24, Chapter 2–53, and that the materials installed conform with the requirements of the California Quality Standards for Insulating Materials. The certificate shall state the manufacturer's name and material identification and the installed "R" value. Submittal required.

1.06 DELIVERY, STORAGE AND HANDLING:

A. Deliver materials to the job site and store in a safe dry place with all labels intact and legible at time of installation.

B. Protect building insulation materials before installation and protect the installed work and materials of other trades.

C. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:

A. Johns-Manville.

B. Owens–Corning Fiberglass Corporation

C. Celotex Corporation

D. CertainTeed Corporation.

E. USG Thermafiber (at fire rated construction assemblies where required by listed Design Number).

F. Approved equal.

2.02 MATERIALS:

A. Type A, Sound Insulation: A batt-like non-combustible, formaldehyde free product manufactured from inorganic fibers for installation in framed wall cavities. The nominal 16 inch, or as required x 96 inch batts shall be un-faced and sized to fit full depth of framed walls.

1. Un-faced insulation shall comply with ASTM C-665, Type I. Provide fire rated type insulation at all rated walls to receive insulation.

2. Product Fire Hazard Classification Rating as required by the specified codes and standards for use at locations and conditions indicated.

3. Minimum Thickness: As required to fill full depth of wall cavity.

4. Minimum R Value: 11.0 at 75 degrees F in accordance with ASTM C-518 and C-653.

5. Flame Spread = 25, Smoke Developed = 50.

6. Use at ALL interior framed walls to a minimum height of 6" above line of ceiling unless specifically noted otherwise. Additionally, provide minimum 16" wide continuous batt at perimeter of all lay-in acoustic ceilings where opposite side of wall is an occupiable space.

B. Type B, Friction-Fit Thermal Insulation: A blanket-like non-fire rated, formaldehyde free product manufactured from inorganic glass fibers for installation in framed exterior walls. The nominal 16 inch, or as required wide blankets shall be faced with a factory applied integral kraft vapor barrier for use at protected spaces and code approved for unexposed applications.

1. Faced insulation shall comply with ASTM C-665, Type II, Class C.

2. Composite Product Fire Hazard Classification Rating as required by the specified codes and standards for use at locations and conditions as indicated.

3. Minimum Thickness: As required to fill full depth of wall cavity.

4. Minimum R Value: 19 at 75 degrees F. at 6" or greater walls as shown on Drawings in accordance with ASTM C-518 or C-653.

5. Water Vapor Transmission (permeance): 1.0 perms maximum when tested in accordance with ASTM B-96, desiccant method. Moisture absorption less than 1% by volume.

6. Flame Spread = 25, Smoke Developed = 450. Product is covered by gypsum board wall finish. Flame and smoke ratings do NOT apply to facings per CBC 720.2.1.

7. Use at all non-rated exterior wall and attic wall cavities unless specifically noted otherwise.

C. Type C, Friction-Fit Rated Thermal Insulation: A blanket-like, formaldehyde free product manufactured from inorganic glass fibers for installation in framed exterior walls. The nominal 16 inch, or as required, wide blankets shall be faced with a factory applied integral foil vapor barrier which is flame resistant and code approved for exposed or rated applications.

1. Faced insulation shall comply with ASTM C-665, Type III, Class A.

2. Composite Product Fire Hazard Classification Rating as required by the specified codes and standards for use at locations and conditions indicated.

3. Minimum Thickness: As required to fill full depth of wall cavity.

4. Minimum R Value: 19 at 75 degrees F at 6" or greater walls in accordance with ASTM C-518 and C-653.

5. Water Vapor Transmission (permeance): 0.5 perms maximum when tested in accordance with ASTM B-96, desiccant method. Moisture absorption less than 1% by volume.

6. Refer to Drawings for rated wall locations.

7. Flame Spread = 25, Smoke Developed = 50 or less in accordance with ASTM E-84 test method.

8. Use at all fire rated exterior wall and attic wall cavities unless specifically noted otherwise.

D. Type D, Friction-Fit Thermal Insulation: A blanket-like non-fire rated, formaldehyde free product manufactured from inorganic glass fibers for installation in framed ceiling and attic spaces. The nominal 16 inch, or as required wide blankets shall be faced with a factory applied integral kraft vapor barrier for use at protected spaces and code approved for unexposed applications.

1. Faced insulation shall comply with ASTM C-665, Type II, Class C.

2. Composite Product Fire Hazard Classification Rating as required by the specified codes and standards for use at locations and conditions as indicated.

3. Minimum Thickness: As required to fill full depth of wall cavity.

4. Minimum R Value: 30 at 75 degrees F. in accordance with ASTM C-518 or C-653.

5. Water Vapor Transmission (permeance): 1.0 perms maximum when tested in accordance with ASTM B-96, desiccant method. Moisture absorption less than 1% by volume.

6. Flame Spread = 25, Smoke Developed = 450. Product is covered by gypsum board wall finish. Flame and smoke ratings do NOT apply to facings per CBC 720.2.1.

7. Use at all non-rated bottom of roof areas and as otherwise shown on Drawings.

2.03 MISCELLANEOUS MATERIALS:

A. All other materials, such as additional insulation materials, fasteners, line wire, tape and retainers, not specifically described but required for a complete and proper installation of building insulation, shall be subject to submittal approvals.

1. Provide additional insulation materials selected from manufacturer's standard materials. These materials shall conform to the specified Codes, Standards and performance

requirements as indicated in the Contract Documents or as required for the complete and proper construction of the building envelope.

PART 3 – EXECUTION

3.01 INSPECTION:

A. Prior to all work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may begin.

B. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in discrepant areas until all such discrepancies have been fully resolved.

3.02 INSTALLATION:

A. Batt, Blanket Insulation: Provide insulation barrier system with no voids in system. Keep end joints to a minimum. Install with vapor barrier to warm (interior) side. Fit ends and edges tight to framing members. Keep all piping and other work on warm side of insulation. Provide tape vapor barrier joints. Tape as required.

B. Install fire rated insulation where indicated on the Drawings or where required to maintain the code required integrity of fire-rated assemblies.

3.03 PROTECTION:

A. Protect installed insulation from damage until covered.

[END OF SECTION 07 21 00]

SECTION 07 26 00

VAPOR RETARDERS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Concrete Vapor Emission Control System for remediation of excessive slab moisture and / or alkyd levels.

B. Repairs and preparation of concrete substrate and to install the concrete vapor emission control system.

C. Subfloor testing after concrete treatment.

1.02 RELATED SECTIONS

A. Bid Form: Bid Allowance with Unit Cost for potential slab treatment.

B. Section 00 72 13: General Conditions.

C. Section 32 13 13: Concrete Paving.

D. Section 06 10 00: Rough Carpentry: Subfloor surface.

E. Section 09 65 00: Resilient Flooring.

F. Section 09 96 56: Epoxy Flooring and Base System.

G. Section 09 68 00: Carpet.

1.03 REFERENCES

A. ASTM C920-14 – Elastomeric Joint Sealants.

B. ASTM E96 / E96M-16 – Test Method for Water Vapor Transmission of Materials.

C. ASTM F710-11-Practice for Prepping Concrete Floors to Receive Resilient Flooring.

D. ASTM F1869-16 - Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

E. ASTM F2170-16 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes

QUALITY ASSURANCE

A. Manufacturer Qualifications:

1. Ten-year experience in producing moisture vapor control emission products.

2. Minimum $5-million product liability insurance policy from an A-rated carrier.

3. A warranty program covering coats associated with repair or replacement of concrete vapor emission control system and finish floor covering or coating, including repair or replacement labor.

B. Installer Qualifications:

1. Installer shall have experience in the installation of floor covering or floor coatings and shall have experience in the installation of concrete vapor emission control systems.

2. Floor covering installer must be factory trained and certified for the installation of the specific products being installed.

3. Installer to provide project inspector proof of certification prior to starting work.

4. Certified installer must be present on job site while work is in progress.

C. Testing Laboratory Qualifications:

1. Certified, bonded, qualified and experienced agency to perform pH and moisture vapor emission tests.

D. Pre-installation Meeting:

1. Contactor to notify Construction Manager with a minimum of 5-days notice when anticipated to be ready for pre-installation meeting.

2. Contractor, installer and manufacturer representative are required to attend pre-installation meeting. Contractor is responsible for coordinating and scheduling their attendance.

3. Construction Manager will schedule meeting with Contractor team, Project Inspector, and Architect.

4. Purpose of Meeting: To review subfloor condition and test results; determination of appropriate treatment system(s) and location(s); and review installation requirements.

1.05 SUBMITTALS

A. Provide a complete submittal package with all components required within this section. Submit per Section 00 72 13.

1. Product Data: Provide product data describing physical and performance characteristics, material safety data sheets, certificates, warranty information and manufacture’s installation instructions for proposed product.

2. Submit product manufacturer’s field reports and test reports with warranty certification.

3. Submit anhydrous calcium chloride testing according to ASTM F1869 and RH Probe Tests results according to ASTM F2170. Submit substrate pH readings. Tests shall be performed by the Owner's Inspector and results provided to the Architect, Owner, General Contractor, flooring installer and Water Vapor Reduction System Manufacturer's Representative.

1.06 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer’s original, unopened, undamaged containers with identification labels intact.

B. Store products in an approved ventilated dry area; protect from dampness, freezing, and direct sun light. Product should not be stored in areas with temperatures in excess of 90 °F or below 50 °F.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Areas to receive Vapor Emission Control System shall be clean, fully enclosed, weather tight with the permanent HVAC set at a uniform temperature per manufacturer's recommendation.

B. Maintain ambient temperature required by manufacturer three days prior to, during, and 24 hours after installation of Vapor Emission Control System.

C. Do not apply moisture vapor reduction system to unprotected surfaces or when water is accumulated on the surface of the concrete.

D. Do not apply water vapor reduction system when temperature is lower than 50° F or expected to fall below this temperature within 24 hours from time of application.

E. Protection: Protect water vapor reduction system to prevent damage from topical water for a minimum period of 24 hours from time of application.

1.09 WARRANTY

A. Contractor shall file a pre-installation checklist with the manufacturer (as required) and receive written confirmation of the approval to proceed in order to obtain full warranty.

B. Emission control system warranty must be from the manufacturer, in writing, and cover the cost of system materials, cementitious compounds and labor costs of application and preparation. In addition, the warranty must extend to the flooring material, adhesive and installation labor.

C. Warranty period shall be no less than ten years or the life of the flooring covering whichever comes first.

D. Warranty exclusion shall be limited to:

1. Moisture failure due to topical intrusion of plumbing failure or other substances entering from the surfaces.

2. Seismic damage occurring after installation.

3. Replacement of flooring during warranty period as removal of flooring could damage emission control system.

4. Aggregate found to be defective (expansive and reactive aggregate are examples).

E. Warranty shall not exclude cracks visible at time of installation nor "improper installation".

F. Manufacturer to provide evidence of a product liability insurance policy. Insurer shall have no less than an "A" rating from one of the four major rating services. A certificate of insurance shall be delivered to the Owner and shall name the Owner, Architect and General contractor as co-insured. Liability shall be in the amount of $5-million per occurrence.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Vapor Emission Control System: The appropriate system(s) shall depend on the existing slab moisture and pH levels and the requirements of the specific floor covering product. The determination of which of the following systems would be most appropriate and the extent of treatment area(s) shall be made by the Owner's representative once the existing slab testing results are known.

1. Koester VAP1 2000 System. 100% solids epoxy.

2. Mapei Planiseal VS System. An alkali-resistant, two-component, 100%-solids epoxy

coating that effectively stops moisture-related problems with floor coverings.

3. ARDEX MC™ RAPID.100% solids epoxy system.

2.02 MIX DESIGNS

A. VAP1 2000:

1. Use clean containers and mix thoroughly as per Manufacturer's requirements to obtain a homogeneous mixture. Use a low speed motor less than 400 rpm and a two bladed Jiffy mixing blade only. DO NOT AERATE. Mix ratios are measured by volume.

2. VAP I® 2000 Mix Ratio: Mix Component A and B at a ratio of 2.4:1 by volume.

B. Mapai Planiseal VS:

1. Premix Part A to a homogenous consistency (2 to 3 minutes) using a low-speed mixer (at 300 to 450 rpm) and a “jiffy” (paint mixer) mixing paddle.

2. Pour Part B into Part A container and mix thoroughly to a smooth, homogenous consistency. Do not mix at high speeds, which can trap air within the mixed material.

3. Pour and spread the entire unit of any mixed Planiseal VS onto the substrate within 5 minutes of mixing.

C. ARDEX MC PLUS:

1. Each individual unit of ARDEX MC RAPID™ Red and ARDEX MC RAPID™ Green contains separate, pre-measured quantities of the hardener (Part A) and the resin (Part B). The hardening agent (Part A) is added to the resin (Part B).

2. ARDEX MRP and/or ARDEX K 301 are mixed in 2-bag batches at one time. Mix each bag of powder with the prescribed amount of water using an ARDEX Mixing Paddle and a 1/2" heavy-duty drill (min. 650 rpm). Mix thoroughly for approximately 2-3 minutes to obtain a lump-free mixture. Follow written installation instructions for each material.

3. For mix designs related to the use of ARDEX underlayments and toppings, refer to the standard mixing instructions for installation over concrete as shown in the manufacturer’s installation instructions.

4. For instructions on the filling of dormant cracks and joints, follow the written instructions of the selected epoxy manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Calcium Chloride, RH Probe and pH test requirements:

1. Anhydrous calcium chloride testing shall be performed by the Owner's Inspector.

2. Provide anhydrous calcium chloride tests according ASTM F1869 protocol.

3. Provide RH Probe Tests according to ASTM F2170 protocol.

4. Only conduct calcium chloride tests at the same temperature and humidity expected during normal use. If this is not possible then follow the F1869 method for non acclimated spaces. Maintain these conditions 48 hours prior to and during tests. Water vapor transmission levels are directly affected by ambient room temperature and readings

conducted without a sustained ambient temperature and humidity are NOT acceptable.

5. Provide substrate surface pH readings.

6. Owner's Inspector shall provide test results with a marked up floor finish plan showing test results. Inspector shall provide a written clarification on status of the ambient air temperature and humidity before and during the testing procedures.

B. Concrete Slab Inspection

1. Existing concrete slabs - Testing for concrete deficiencies and contaminates such as un-reacted silicates, chlorides, A.S.R. (alkali-silica reaction), oil contamination, etc. is recommended by Koster to avoid bonding issues. These conditions can cause bonding concerns with all epoxy and finished floor coatings, including the Koster VAP 1 2000. This testing is not required by Koster. This testing should be performed by the owner's independent testing agency using utilizing standard coring methods and review of the history of the slab installation if available. Concrete should conform to ACI Committee 201 Report "Guide to Durable Concrete."

2. New concrete slabs - Review Section 03 30 00 curing compounds. Silicate based curing compounds should be avoided.

3.02 PREPARATION

A. Inspect all surfaces with regard to their suitability to receive moisture vapor reduction system with manufacturer's representative.

B. Clean all surfaces to receive moisture vapor reduction system. Shot blast all floors to a CPS #3 or #4 and clean surfaces with vacuum and remove all residue off the concrete. Grinding is allowed only in areas not accessible by shot blasting. Do not acid etch. Remove ALL defective materials, and foreign matter such as dust, adhesives, gypsum based patching and leveling compounds, paint, dirt, un-reacted sprayed on silicates, floor hardeners, bond breakers, oil, grease, curing agents, form release agents, efflorescence, laitance, shot blast bee bees, etc. Repair all cracks, expansion joint, control joints, and open surface honeycombs and fill in accordance with Manufacturers recommendations. Inform vapor reduction system manufacturer if concrete additives like silicates or chlorides or any other soluble compounds that have been used in the concrete mix or topically applied. Reinforcing fibers that are visible after shot blasting must be removed and vacuumed leaving no fibers left on the concrete surfaces. **Provide uncontaminated, sound surface.**

C. Repair concrete prior to moisture vapor reduction system. Consult with vapor reduction manufacturer to determine suitable products for concrete repair.

D. Shot blast a small test area and review surface profile with the finished flooring applicator. As the moisture vapor reduction system is not a leveling material make sure the flooring installer is aware that a feather finish or leveling material may be utilized to "flatten" the concrete after the application of the moisture vapor reduction system and prior to the flooring installation.

E. Clean substrate surfaces to receive system treatment and treat surface irregularities with a 100% Portland Cement based patching compounded and cementitious fill compatible with prescribed system treatment as recommended by the manufacturer of the moisture control system.

F. At all treated locations under finish goods i.e. carpet, VCT, etc., install self-leveling material to provide a smooth and uninterrupted concrete substrate for proper installation of floor finish.

3.03 JOINT AND CRACK PREPARATION

A. VAP1 2000:

1. Fill cracks, control joints, voids and deteriorated concrete with CTS Cements Rapid Set Cement All, Mortar Mix, Concrete Mix or Skim Coat prior to the VAP I 2000 application. Allow the products to cure according to Rapid Set's requirements before applying the VAP products over the repaired area. Do not use gypsum based cementitious patching, leveling and repair mortars under the VAP I 2000 systems. Cracks should be opened up to at least 1/4" x 1/4" to allow for a proper amount of Rapid Set materials to fill the voids. Any cracks/voids that may be contaminated by known or unknown substances should be routed out to remove any contaminants.

2. Expansion joints should be repaired per the detail on the VAP I 2000 data sheets. A fumed silica epoxy thickening agent (Aerosil or Cabosil) can be added to the VAP I 2000 products and used in place of cementious materials for control joints and cracks if needed.

3. Consult with Koster America for crack general repair guidelines.

B. Mapai Planiseal VS:

1. Repair cracks before application of the Planiseal VS using an appropriate high-modulus epoxy(Planibond EBA or Planibond CR 50) mixed with sand if required (depending on the size of crack under repair). Cracks narrower than 1/8” (3mm) may typically be filled with Planiseal VS neat. Cracks wider than 1/8” (3mm) are to be repaired with suitable high-modulus epoxy such as Planibond EBA or Planibond CR 50 (consider an epoxy mortar if appropriate) filled to 1/8” to ¼” (3 to 6mm) shy of the substrate surface (just below flush).

2. Avoid overfilling of cracks with high-modulus epoxies that will lead to epoxy spilling onto substrate. Any epoxy that spills onto the substrate surface must be removed, and any remaining residue must be fully seeded with sand. The subsequent application of the Planiseal VS must take place after all loose sand have been vacuumed up off the floor, and fully encapsulate the epoxy utilized for crack repair.

3. Contraction, control or saw-cut joint treatment – Dormant control joints may typically be filled with Planiseal VS, or with Planibond EBA or Planibond CR 50 (consider an epoxy mortar if appropriate) filled to 1/8” to ¼” (3 to 6mm) shy of the substrate surface (just below flush).

C. ARDEX MC:

1. Moving Joints – honor all expansion and isolation joints up through the ARDEX Moisture Control System, and underlayment or topping.

2. Saw cuts, control joints and dormant cracks –To ensure that a continuous barrier to moisture emissions is created over the entire surface, ARDEX recommends the use of a two-part, low viscosity rigid epoxy crack and joint filler to fill small, non-moving cracks and saw-cut joints in existing concrete substrates. Cracks greater than a hairline in width [1/32” (0.79 mm)] and saw-cuts must be filled in strict accordance with the installation instructions provided by the ARDEX Technical Department. Once the dormant cracks and saw-cuts have been properly filled, allow these areas to cure thoroughly in accordance with the epoxy manufacturer’s recommendations prior to proceeding with the ARDEX MC™ RAPID installation.

3. Saw Cuts, Control Joints and Dormant Cracks – fill all non-moving joints and cracks greater than 1/32” with a rigid, low-viscosity, two-part epoxy joint sealant. Once the cracks and joints have been properly filled, broadcast a sand layer to refusal and allow these areas to cure as recommended by the epoxy manufacturer prior to proceeding with the installation of the ARDEX MC™ RAPID.

3.03 INSTALLATION (per manufacturer's guidelines or as follows)

A. The coverage rates vary by system. Follow manufacturer recommendations for the specific project application.

B. Application of moisture reduction system shall be in strict accordance with manufacturer recommended methods and installation information.

C. Cementitious underlayment with suitable primer is recommended if required by the Owner, floor covering installer, or the floor covering manufacturer to smooth and/or level surfaces after shot blasting and installation of the moisture reduction system. No underlayment or feather finish system is allowed under the moisture reduction system material. When water based adhesives are utilized in the floor covering installation, use an approved cementitious underlayment system with primer prior to the installation of the flooring system. Contact the adhesive manufacturer for their minimum recommended thickness of cementitious underlayment to absorb excess moisture in the adhesive. Typically a minimum of 1/8" is required. Note this is only for some water based adhesives.

3.05 PROTECTION

A. Prohibit any traffic or any activity that generates dust or debris from contaminating the treated slab until finished flooring is installed.

B. Do not install finished flooring until the vapor control system has fully cured in accordance with manufacturer's recommendations.

[END OF SECTION 07 26 00]

SECTION 07 54 19

SINGLE-PLY ROOFING SYSTEM

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Single-Ply Roofing System consisting of:

1. Single-Ply Roofing Membrane over

2. Fiberglass-Faced Gypsum Roof Board over

3. Rigid Insulation and/or Rigid Tapered Insulation over

4. Roof Deck (Existing or New)

B. Separation sheet where required by manufacture.

C. Rigid board insulation, fiberglass-faced gypsum roof board, tapered insulation, base flashings and cant strips.

D. Walkway membrane (Traffic Pads) around all rooftop equipment and path to roof access ladders (or where there is no roof access ladder, to the edge of the roof).

E. Demolition work for removal of existing roofing system and other existing work as indicated on the drawings down to the structural decking, installing new underlayment, and re-roofing as indicated and specified.

1.02 RELATED SECTIONS

A. General Conditions.

B. Exhibit “A” – Asbestos and Lead in Paint Work Performance Specifications.

C. Section 02 41 00: Minor Demolition for Remodeling

D. Section 06 10 00: Rough Carpentry

E. Section 07 62 00: Sheet Metal and Flashing and Trim.

F. Section 07 71 23: Gutters and Related Flashings.

1.03 REFERENCES

A. ASTM C578-15b - Water Absorption of Plastics.

B. ASTM D751-06 - Coated Fabrics.

C. ASTM D1621-16 - Compressive Properties of Rigid Cellular Plastics.

D. National Roofing Contractors Association (NRCA) - Roofing Manual.

E. ANSI/SPRI Standards.

1.04 SYSTEM DESCRIPTION

A. Thermoplastic Sheet Membrane Conventional Single Ply Roofing System: One-ply membrane

system with fiberglass-faced gypsum roof board, rigid insulation, tapered rigid insulation (where shown on Drawings or where required by Project conditions) and mechanically attached membrane. The system shall provide a Class “A” rated roof.

1.05 SUBMITTALS

A. Shop Drawings: Provide complete set of roof plans with specific details referenced for various terminations and penetrations. Indicate setting plan for fiberglass-faced gypsum roof board, tapered insulation, joint or termination detail conditions, and conditions and details of interface with other materials and products. Include fastener layout as required to accommodate the required FM I-90 rating.(Note use only either FM or ASCE-7, paragraph C below)

B. Wind Uplift Performance: Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE-7.

C. Product Data: Submit in conjunction with shop drawings specific product data for all material items specified in this section and as required to comply with manufacture recommendations. Provide copies of manufacturer’s printed product data characteristics on membrane materials, preformed materials, accessories, flashing materials, fasteners, insulation, underlayment, sealant, seam sealer and cleaner.

D. Samples: Submit in conjunction with shop drawings and product data two samples each of fiberglass-faced gypsum roof board, roofing membrane, insulation, underlayment and fasteners.

E. Manufacturer's Installation Instructions: Submit in conjunction with shop drawings, product data and samples complete manufacture installation instructions.

F. Manufacturer's Certificate: Include in submittal package manufacturers certification that all submitted products meet or exceed specified requirements.

G. Installer’s Certification: Include in submittal package manufacturer’s certification that roofing company and employees to perform work under this contract meets the qualification requirements per section 1.06.

H. Manufacturer's Field Reports: Coordinate inspections with project inspector and manufacturer’s inspector. Submit notifications of inspections and copies of all inspection reports under provisions of Section 00 72 13.

I. Reports: Indicate procedures followed, ambient temperatures, humidity, wind velocity during application.*(Information only: not required for building code.)*

J. Upon completion of project, provide District with one complete, unopened roll of perimeter field sheet membrane.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the products specified in this section with five years experience.

B. Applicator: Company specializing and approved by the manufacturer(s) listed in Part 2 of this section. Company shall have a minimum of five years of experience in single-ply roofing installation. Employee’s must have manufacture’s certification to install submitted roofing product and a minimum of one year experience with single ply roofing systems. These qualification and experience requirement must be verified by the manufacturer of the submitted product and included in the submittal package.

1.07 REGULATORY REQUIREMENTS

A. Conform to California Building Code, 2016 edition, for roof assembly fire hazard requirements.

B. Underwriters Laboratories, Inc. (UL): Class 'A' UL Fire Rating Approval listing in the UL Roofing Materials Directory. (Verify with AHJ maybe over design)

C. Install single ply membrane roofing system in conformance with Factory Mutual I-90 wind uplift classification requirements.

1.08 PRE-INSTALLATION CONFERENCE

A. At least one week prior to installation of roofing and related work, the project inspector, General Prime Contractor, roofing installer, manufacturer, Owner's representatives and the Architect shall meet on the site.

B. At site meeting the team will review the approved submittal package, proposed sequencing, methods, suitability, job readiness and inspection requirements.

C. Meeting participants shall walk all roofs and review all existing conditions and determine if any unusual site conditions exist that needs to be addressed prior to proceeding with work. Immediately after the meeting, the General Prime Contractor must submit any questions or issues that were raised in writing to the Owner's representative via Request for Information (RFI).

D. Notification of the meeting shall be provided by the General Prime Contractor at least two weeks prior to the start of roofing.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original containers, dry, undamaged, seals and labels intact.

B. All materials required to complete roofing must be on site prior to removing existing roofing. All materials must be stored in a weathertight, lock-down, storage container(s) on site. Materials must be UV protected at all times with the type of covering specified by the manufacturer except on day of installation. Materials may not be staged on roof day prior to installation and all unused materials must be returned to storage container at end of day.

C. No materials or equipment can be stored on the roof at any time.

D. Store adhesive at temperatures above 40 degrees F or as otherwise recommended by the manufacture.

1.10 ENVIRONMENTAL REQUIREMENTS / JOB CONDITIONS

A. Verify and ensure that all roof drain lines are unblocked before starting any work. Contractor shall test all lines for proper drainage in the presence of Project Inspector prior to work commencing and again after work has been performed.

B. Do not remove any existing roofing if inclement weather is forecasted during period roof will be exposed. Only remove as much existing roofing as can be replaced the following day and made weathertight including flashing work. Install temporary waterstops and weather protection at the end of each day's work at transition areas. Remove temporary waterstops and weather protection at the start of the next day's work.

C. Immediately remove existing roofing materials and all associated debris from the construction site to a dumping area authorized to receive such debris. Comply with requirements of Exhibit "C" if applicable.

D. Immediately report any unforeseen conditions discovered after the roof removal to the Owner's Representative in writing via Request for Information (RFI). Stop work in area of unforeseen condition until the Construction Manager has responded with a solution to the problem. Provide

necessary waterstops and weather protection of area exposed. Maintain protection until issue has been resolved and the roofing can be completed.

E. Substrates to receive membrane or flashing shall be thoroughly dry. Should surface moisture occur, provide adequate equipment to dry the substrate. Do not apply roofing membrane to damp or frozen deck surface.

F. Prior to and during application, remove dirt, debris and dust from surfaces to be roofed for both new and re-roofing substrates.

G. Perform pullout tests to verify condition of existing deck or substrate and to confirm system design pullout values. Ten tests per deck type-plywood sheathing, diagonal sheathing, planks, etc. Tests shall be taken approximately 60-percent in perimeters and 40-percent from field areas.

H. Take precautions to prevent wind blow-off or wind damage during the course of the roofing application.

I. Do not install the roofing membrane in direct contact with any product containing asphalt, coal tar pitch, creosote or penta-based materials. Do not allow waste products containing petroleum, grease, acid, solvents, vegetable or mineral oil, animal oil, animal fat, etc., or direct steam venting to come into direct contact with the roofing membrane.

J. Do not store any materials or equipment on new or existing roofs. Provide protection of new and existing roofing during all equipment movement. Provide necessary protection and barriers to segregate the work areas and prevent damage to adjacent areas. If repetitive foot traffic over roofing is necessary, provide suitable protection to prevent any damage to new or existing roofs. All pipe threading must be done on the ground.

K. Comply with the requirements of local building codes and requirements. Follow safety regulations as recommended by CAL OSHA, latest edition.

L. Do not use products near fire or flame. Do not use open flames to expedite drying of surfaces, sealants, or adhesives

M. Avoid breathing vapors of solvent, sealant and adhesives. Use with adequate ventilation. Avoid prolonged contact of solvents, sealants, and adhesives with skin. Consult Material Safety Data Sheets and container labels for specific safety instructions.

N. Reference National Roofing Contractors Association (NRCA) - Roofing Manual.

1.11 COORDINATION

A. Coordinate work with the installation of conduits, piping and associated metal flashings, prior to work being installed to ensure compliance with manufacture's requirements.

B. Coordinate with roof removal requirements to minimize weather and water damage risks.

1.12 WARRANTY

A. Furnish written warranties from the roofing system manufacturer covering labor and materials for loss of watertightness caused by defective materials, including accessories, or by installation defects without financial limit for 15-years. Prior to the issuance of the warranty, the manufacturer and Architect punchlist(s) are to be prepared and all repair work verified to be complete. The effective warranty start date shall be the date that the Notice of Completion is filed for the entire project. There will be no incremental warranty periods. At which time all roofing and associated work must be 100% complete on the project..

B. The terms of the warranty shall provide for the removal, replacement, repair, and making good, without cost to the District, of defects due to imperfect materials and workmanship.

C. All repairs required under the warranty shall be made within 3-days??? after receiving notice of the need for repairs from the District, weather permitting.

PART 2 – PRODUCTS

2.01 APPROVED MANUFACTURER

A. Single Ply Membrane Roofing System: 80 mil PVC Mechanically Attached Roofing Membrane as manufactured by Johns Manville, GAF, Carlisle, Sarnafil or approved equal.

B. No TPO roofing systems allowed.

2.02 MATERIALS

A. Roofing Membrane

1. Thickness: 80-mils nominal (.080 inch).

2. Membrane shall be within 2 mils of specified thickness.

3. Membrane shall conform to ASTM D4434 **Type III**.

4. Breaking Strength: ANSI / ASTM D751A >325 psi

5. Elongation: ANSI / ASTM D751A > 20%

6. Tear Resistance: ASTM D751B > 50 lbs.

7. Water Absorption: ASTM D570 < 3.0%

8. Reflective Index Values for an Energy Smart Roof shall be as follows:

a. Solar Reflectance (Albedo)….83%

b. Thermal Emissivity……92%

c. Total Solar Reflective Index…at least 104 out of 100.

B. Seaming: Heat welded

C. Solvent: Solvent welding solution as recommended by roofing membrane manufacturer. (Please verify with manufacturer – JM doesn't have this)

D. Caulk: Single component, non-sag elastomeric polyurethane sealant. JM Single Ply Caulk or equal.

E. Aluminum Foil Tape: 3-mil thick aluminum foil tape with acrylic adhesive, for use over metal joints prior to strips being welded over the joints.

F. PVC Coated Flashing Metal: 24-gauge galvanized steel laminated to 20 -mils of roofing membrane in white color used for flashing and edge metal detailing as furnished by the membrane manufacturer. PVC coated metal shall be used at all roof curbs. JM PVC-Coated Metal or equal.

G. Termination Bar: Extruded aluminum bar 3/32-inch thick for use in terminating adhered, reinforced membrane base flashings in certain constructions. JM Termination Systems or equal.

H. Membrane Fasteners and Discs: As recommended by roofing membrane manufacturer for

securing membrane to deck surface. Where membrane fasteners project through existing steel decking that is exposed on the underside, provide minimum allowable exposure of fastener through deck. Adjust fastener lengths to accommodate changes in thickness of tapered insulation.

I. Prefabricated Details: Provide inside/outside corners, PVC vent pipe boots in sizes to fit pipes from 3/4- to 11- inches, and PVC pitch-pocket. Provide all materials. JM PVC Universal Corners, JM PVC Penetration Pan, JM PVC Pipe Boots, JM PVC Split Pipe Boot, JM PVC Square Pipe Boot, or equal.

J. Pitch-Pocket Filler: Polyurethane pourable sealer for use in pitch pockets. JM EPDM/PVC Pourable Sealer or equal.

K. Joint Cover Strips, Reinforcement Strips and Patching: 80 mil roofing membrane. JM PVC Detail Strip or equal.

L. Disc Caps: Prefabricated 7-inch, 80 mil, round pieces of roofing membrane for use in the disc-cap method of installation to cover the steel discs and fasteners used to secure the membrane to the roof through the top of the sheet. Heat Shrink Wrap Tubing by AC Delco, NAPA, BSP or equal at exposed ends of fasteners at underside of exposed metal decking where occurs. Paint to match existing color or new paint where occurs.

M. Retrofit Roof Drains: Marathon “Proliner Drain” or approved equal, PVC coated, size required to fit into existing drain pipe.

N. Roof Drains: Zurn RD2120, Zurn Z163, or approved equal.

O. Walkway Pads: Pads shall be manufacture standard 72-mil polyester reinforced material with anti-slip surface. Location shall be around all rooftop equipment, around all roof access hatches and at roof access ladder. Additional walkways may be required as indicated on roofing plans.JM PVC Walkpad or equal.

P. Rigid Insulation and Tapered Rigid Insulation

1. Polyisocyanurate Board Insulation: ASTM C 1289 Type II, Johns Manville **ENRGY 3**, Atlas or approved equal. LTTR R-Value rating (ASTM C1303) with pentane (HC) blowing agents.

2. Board size per manufacturer’s standard sizes and shall be cut as necessary for Project conditions.

3. Board thickness to be a minimum of 1-1/2 inch and provide tapered insulation as required for proper drainage and as shown on Drawings.

4. Board edges square.

5. Compression resistance to be per ASTM D1621 - 20 psi.

6. Install one or more layers of insulation under area of roofing to achieve required thickness. Where overall thickness is 1.5 inches or greater, install 2 or more layers with joints of each succeeding layer staggered from joints of previous layer a minimum of 6 inches in each direction

Q. Fiberglass-Faced Gypsum Roof Board: “Dens-Deck” or Securock Glass-mat, 1/4 inch thick (minimum) as manufactured by Georgia Pacific or USG, or approved equal.

R. Seam or Lap Sealant: Liquid PVC sealing compound as recommended by roofing manufacturer. JM PVC Edge Sealant, or approved equal.

S. Polyester Protection Mat: 9oz. Polyester fabric as recommended by roofing membrane

manufacturer. JM Polyester Mat Protection Slipsheet, or approved equal.

T. Cant Strips: Polyisocyanurate Board Insulation cut into wedges. Three inch horizontal and vertical legs.

U. Non-seismic roof blocks: Cooper Industries, Dura-Blok DB6 series, width as required to provide support of piping plus 12” additional length for future conduits. Provide with galvanized two-piece straps at all conduits.

V. Seismic roof supports/blocks: The Pate Company, es-1 or es-2 series, width as required to provide support of piping plus 12” additional length for future conduits. 18 ga. GSM with welded corners. Height as required.

2.03 MISCELLANEOUS

A. Furnish all other materials necessary for a complete waterproof single ply roofing system installation as recommended by single ply roofing system manufacturer for Project conditions.

B. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: JM Expand-O-Flash, JM Expand-O-Gard, or approved equal.

C. Coping System: Manufacturer’s factory fabricated coping consisting of a base piece and a snap-on cap. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: JM Presto-Lock Coping, or approved equal.

D. Fascia System: Manufacturer’s factory fabricated fascia consisting of a base piece and a snap-on cover. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: JM Presto Lock Fascia, JM Presto-Tite Fascia, or approved equal.

E. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

PART 3 – EXECUTION

3.01 GENERAL

A. When installing mechanically attached roofing in cooler weather, liquids such as solvents, sealants, etc., shall be stored at minimum 40-degrees F. until just prior to use in order to facilitate the installation.

B. At all locations where an adhesive adhered walk pad is removed or partially removed for cut-in or patch work on an existing PVC membrane roof, the PVC membrane under the pad must be removed and replaced. No mat adhesive covered PVC material shall be left.

C. Contractor is required to barricade off the ground, drive ways, pedestrian walks, etc. directly underneath area of work being done on roof.

3.02 SUBSTRATE CONDITIONS

A. The roof deck shall be structurally sound to provide proper securement for mechanical fasteners. Areas showing a loss of integrity due to corrosion, rotting, warping, concrete spalling, etc., shall be repaired or replaced prior to installing the roofing system. Immediately report any unforeseen conditions discovered after the roof removal to the Owner’s Representative in writing via Request

for Information (RFI). Stop work in area of unforeseen condition until the Construction Manager has responded with a solution to the problem. Provide necessary waterstops and weather protection of area exposed. Maintain protection until issue has been resolved and the roofing can be completed.

B. Make test cuts at each roof area prior to reroofing. The condition of the substrate shall be suitable to receive a mechanically attached roofing system. All test cuts shall be repaired by Contractor at no cost to Owner.

C. Verify that existing roof assembly contains no amount of coal tar pitch. The presence of coal tar pitch shall require the use of a Foil Slipsheet under the membrane. Unless the coal tar pitch is 10-years or older and is separated from the membrane by a layer of insulation a minimum of 1-1/2-inches thick having a minimum “R” value of 10.0. Joints shall be butted tightly together or be taped to prevent volatile from damaging roof membrane.

D. Contact the material manufacturer when the substrate is exposed to excessively high humidity and/or a corrosive environment. Use special fasteners and/or details as required.

3.03 PREPARATION OF EXISTING SUBSTRATE

A. General

1. To prevent delays or interruptions, coordinate with other work to ensure that components to be incorporated into the mechanically attached roofing system are available as the work progresses.

2. Examine substrates to which the roofing materials are to be applied to ensure that their condition is satisfactory for the roofing systems application.

3. Do not permit voids greater than 1/4-inch span in the substrate. Substrates for roofing materials shall be dry and free of oil, dirt, grease, sharp edges and debris.

4. Inspect substrates and correct defects before application of roofing membrane.

5. Remove existing roofing down to structural substrate.

6. Determine the condition of the existing roof sheathing. Areas with deteriorated decking or other materials shall have those affected materials removed and replaced.

7. When removing an existing roof during reroofing, remove only that amount of roofing and flashing that can be made watertight with new materials in a one-day period or prior to the onset of inclement weather.

3.04 WOOD NAILERS

A. Install nailers at the perimeter of the roof and around roof penetrations and projections. Do NOT use nails. Secure all nailers with coated screws. See drawings for size and spacing.

B. Anchor to the decks at a maximum 2’-0” o.c. to resist a pullout force of 200-lbs./lineal foot (or as specified by manufacturer) in any direction. Provide a 1/2-inch vent space between adjacent lengths of nailers. Install fasteners within 6-inches of each end. Spacing and fastener embedment shall conform to Factory Mutual Loss Prevention Data Sheet 1-49.

C. Vertical dimension of nailers shall be equal to the vertical dimension of the underlayment, rigid insulation and fiberglass faced gypsum roof board (top of the fiberglass faced gypsum roof board shall be flush with the top of the nailer).

3.05 RIGID INSULATION AND TAPERED RIGID INSTALLATION

A. Lay boards with edges in moderate contact without forcing onto roof deck. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

B. Rigid insulation and tapered rigid insulation shall be applied to surface of existing plywood roof deck, new plywood roof deck, existing diagonal sheathing, new diagonal sheathing, existing metal deck, new metal roof deck or other roof surface as shown on Drawings.

C. Thickness of rigid insulation and tapered rigid insulation shall be increased as necessary to accommodate roof deck conditions and as shown on Drawings.

D. Apply no more insulation than can be covered with membrane in same day.

E. Stagger all joints from underlayment joints and when multiple layers or types of insulation are being used.

F. Provide tapered edges at all transitions to avoid bumps in membrane.

G. Tapered rigid insulation shall be assembled in layers are recommended by manufacturer to achieve slopes and profiles as shown on Drawings.

H. Rigid Insulation over Existing Conduit and Pipe.

1. Contractor shall notch the insulation or cut and butt insulation against existing conduits and pipes so that conduit or pipes do not telegraph through insulation.

I. At all horizontal to vertical transitions, provide a custom cant strip along perimeter. This shall include parapet walls, mechanical curbs, roof top equipment, and other items as shown on drawings.

3.06 FIBERGLASS-FACED GYPSUM ROOF BOARD INSTALLATION

A. Place fiberglass-faced gypsum roof board over clean rigid insulation and/or tapered rigid insulation.

B. Fiberglass-faced gypsum roof board shall be installed as a part of the roofing system.

C. Where fiberglass-faced gypsum roof board is not required by CBC or required to achieve a Class A roofing system, fiberglass-faced gypsum roof board shall be installed as a part of the roofing system.

D. Fasten with insulation disk-type fasteners as recommended by manufacturer and approved by District to meet I-90 standards. (Include required fastener layout on shop drawings.)

E. Stagger joints a minimum of 6 inches from underlying rigid insulation joints.

3.07 MEMBRANE INSTALLATION

A. Apply membrane and mechanical attachment devices in accordance with approved shop drawings for FM I-90 rating.

B. At 1/2-inch plywood deck conditions, use continuous strip method. Fasteners shall penetrate into existing joist. Where a joist cannot be fastened to, a pull test per manufacturer’s requirements shall be required.

C. Roll out membrane, free from wrinkles or tears.

1. Place sheet into place without stretching. Allow the membrane to relax at least 15-minutes when the temperature is above 60-degrees F., or 30-minutes when the temperature is below 60-degrees F., prior to installation.

2. Inspect for damage.

3. Remove sections of membrane that are creased or damaged. Lap sheets as recommended by manufacturer depending on fastening method to be used.

D. Overlap edges and ends and seal by min. 1-1/2 inch heat weld. Seal permanently waterproof to provide a minimum 1-1/2 inch continuous welded seam. Apply uniform bead of sealant, furnished by manufacturer, to all edges.

E. In-Lap Fastening.

1. Perimeter: When installing roofing, install minimum two 1/2 sheets parallel with the perimeter and fasten with fastening system at the predetermined spacing in the lap area in a line centered approximately 1-1/2 inches from the edge of the sheet leaving 1/2-inch of membrane outside the disc.

2. Weld lap area to metal base flashing continuously a minimum of 2-inches weld width.

3. Field Areas:

a. Membrane shall run perpendicular to the orientation of wood decks.

b. Install membrane overlaps to facilitate the flow of water. Shingle joints on sloped substrate in direction of drainage.

c. Overlap membrane sheets a minimum of 5-inches to provide space for fastener and disc placement and for a continuous 2-inch width weld.

F. Contractor to coordinate with project inspector to verify welded seams for continuity and integrity using a rounded screwdriver or other suitable blunt object.

1. Seam checks shall be made daily.

2. Take sample of seams 2-inches wide and 12-inches long at least three times a day from completed seams.

3. Take samples from both field and edge seams.

4. One test must be taken from the first seam made of the day.

5. Each test cut shall be patched at no extra charge to the District.

6. Test cuts shall be used to determine adequate seam strength.

G. Seal membrane continuous around all roof penetrations.

3.08 WELDING OF LAP AREAS

A. General

1. Roofing membrane shall be hot air welded only.

2. Surfaces to be welded shall be clean and dry.

3. Solvent welds are not permitted.

B. Hot Air Welding

1. Follow hot air welding machine manufacturer's instructions for use.

2. Hand-held welding machines are also available to weld membrane.

   a. After the preheated nozzle tip is applied in the overlap area and the material starts to flow, immediately follow with a hand roller to press the heated membrane surfaces together with slow, even movements.

   b. Keep the roller within 1-inch of the nozzle tip. Angle the hot air tool so that the flowing air faces the roller.

   c. Adjust the temperature of the hot air tool so that a minimum of smoke is developed and material from the bottom of the sheet begins to soften and flow from the seam.

   d. Seam strength may be tested when cool. For best results, test seams 8-hours after hot air welding.

C. Quality Control of Seams

1. After seaming, check seams for integrity with a probe. Repair openings or "fishmouths" with a hand-held hot air tool fitted with a narrow nozzle tip and with a roller.

2. Each day several sections of welded seams shall be pulled apart to test the quality of the welds.

3. Should the welds be deficient, a more thorough examination of the work performed shall be carried out and necessary repairs made.

4. Use seam sealant to seal the membrane edges where reinforcing fabric is cut and exposed.

3.09 FLASHING AND ROOF DRAIN INSTALLATION

A. PVC Coated Metal Flashings and Accessories

1. Install PVC coated metal flashing in accordance with manufacturer's instructions and approved submittals.

2. Complete metal work concurrently with roofing and flashings so that a watertight condition exists daily.

3. Provide PVC coated metal transitions required at turn-up, peaks, valleys and slope intersections where the net change in slope exceeds 1-1/2-inch in 12-inches.

4. Install PVC coated metal to provide adequate resistance to bending and to allow for normal thermal expansion and contraction.

5. All joints shall be watertight and staggered over nailer joints to prevent joints in nailers and joints in metal from lining up.

6. Extend base flashings a minimum of 8-inches up vertical surfaces.

7. PVC coated metal flashings and terminations shall be securely fastened in the plane of the roof deck with fasteners recommended by the roofing system manufacturer.

8. Fasteners and roofing nails used to secure flashings to wood nailers shall be stainless steel, galvanized metal or other corrosion resistant material, with a head diameter of not less than 3/8-inch, and with fastener penetration into the wood nailer of at least one-inch,

installed at 6 inches on center and staggered one inch.

9. Assemble overflows in accordance with roofing system manufacturer's instructions and approved submittals.
10. Fabricate PVC coated metal with hemmed edges to prevent sharp metal edges from cutting the membrane, except when in conjunction with wood nailers.

11. Membrane flashings are not acceptable for use on this Project unless the use of PVC clad sheet metal is not feasible or where otherwise recommended by the roof membrane manufacturer.

12. Provide flashings at all existing and new penetrations through roof as shown.

13. Coordinate installation of sheet metal gutters and flashings by others.

B. Roof Drains and Overflow Drains

1. Install roof drains in existing drains in accordance with new roof drain manufacturer's instructions.

2. Install new overflow drains 18-inches from existing roof drains where indicated and in accordance with manufacturer's instructions.

3. Coordinate installation of overflow drains with plumbing piping.

3.10 MISCELLANEOUS

A. Install all materials required for a complete waterproof single ply roofing system as recommended by single ply roofing system manufacturer for Project conditions.

3.11 CLEANING

A. In areas where finished surfaces are soiled by Work of this section, consult manufacturer of surfaces for cleaning advice and conform to their documented instructions.

B. Final clean all new roofing and gutters prior to requesting acceptance of roofing installation.

C. Repair or replace defaced or disfigured finishes caused by work of this section.

3.12 PROTECTION

A. Protect building, finishes and contents against damage from roofing work and weather.

B. Where traffic must continue over finished roof membrane, provide adequate protection.

[END OF SECTION 07 54 19]

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Exterior wall flashings.

B. Roof flashings.

C. Window Flashings.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 07 54 19: Single-Ply Roofing System.

C. Section 07 71 23: Gutters and Related Flashings.

D. Section 07 90 00: Joint Sealers.

E. Section 09 90 00: Painting.

1.03 REFERENCES

A. ASTM A924 / A924M-16ae1 - General Requirements for Steel Sheet, Metallic Coated by the Hot-Dip Process.

B. ASTM B32-08 - Solder Metal.

C. FS SS-C-153 - Cement, Bituminous, Plastic.

D. NRCA (National Roofing Contractors Association) - Roofing Manual.

E. SMACNA - Architectural Sheet Metal Manual.

1.04 SYSTEM DESCRIPTION

A. Work of this Section is to physically protect roofing and exterior from damage that would permit water leakage to building interior.

1.05 QUALITY ASSURANCE

A. Applicator: Company specializing in sheet metal flashing work with five years minimum experience.

1.06 SUBMITTALS

A. Submit shop drawings and manufacturer's product data, installation instructions and general recommendations for each required material and product under provisions of Section 00700.

B. Describe material profile, jointing pattern, jointing details, fastening methods, and installation details.

C. Samples: Only as directed by Architect.

D. Mockup: Prior to proceeding on work at all windows and/or doors, Contractor shall provide (1) mockup at location chosen by Architect. Contractor shall provide all membranes, flashings, etc. for complete installation for review by Architect.

1.07 STORAGE AND HANDLING

A. Store products under provisions of Section 00 72 00.

B. Stack preformed material to prevent twisting, bending, or abrasion, and to provide ventilation.

C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

PART 2 – PRODUCTS

2.01 SHEET MATERIALS

A. Galvanized Steel: ASTM A924 / A924M, G90; 24 gage core steel.

2.02 ACCESSORIES

A. Fastener: Galvanized steel or Stainless steel with soft neoprene washers at exposed fasteners. Finish exposed fasteners same as flashing metal.

B. Protective Backing Paint: FS TT-C-494A. Bituminous.

C. Sealant: Type specified in Section 07 90 00.

D. Bedding Compound: Rubber-asphalt type.

E. Plastic Cement: FS SS-C-153, Type I-asphaltic base cement.

F. Solder: ASTM B32; 95-5 Tin Antimony type.

G. Flux: As recommended by sheet metal manufacturer.

H. Reglets: Type as shown on Drawings, compatible with flashing indicated, non-corrosive type.

I. Self-Adhered Flashing: Vycor Plus Self-Adhered Flashing as manufactured by Grace Construction Products, or equal. Product shall be 25 mil thickness, composed of durable, cross-laminated, high-density polyethylene sheet, backed by an aggressive, pressure-sensitive rubberized asphalt adhesive. Width and length as required for complete installation.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats and starter strips of same material as sheet, interlockable with sheet.

C. Form pieces in longest practical lengths.

D. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

E. Form material with flat lock seam.

F. Solder and seal metal joints. After soldering, remove flux. Wipe and wash solder joints clean.

G. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.

I. Expansion-contraction of sheet metal runs: Provide flat, loose locking slip joint at maximum of ten (10) foot intervals.

J. Separations: Provide for separation of metal from noncompatible metal or corrosive substrates by coating concealed surfaces at locations of contract, with bituminous coating or other permanent separation as recommended by manufacturer or fabricator.

2.04 FINISH

A. Backpaint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil.

B. Touch-up Paint: "Galvalloy" or "Galvweldalloy".

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify shapes and dimensions of surfaces to be covered.

B. Verify substrates are clean, dry, smooth and free of defects to the extent needed for sheet metal work.

C. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Field measure site conditions prior to fabricating work.

B. Install starter and edge strips, and cleats before starting installation.

C. Install reglets true to lines and levels. Seal top of reglets with sealant.

D. Insert flashings into reglets to form tight fit. Secure in place with plastic wedges at maximum twelve (12) inches on center. Seal flashings into reglets with sealant.

E. Secure flashings in place using concealed fasteners. Use exposed fasteners only in locations approved by Architect.

F. Lock and seal all joints.

G. Apply plastic cement compound between metal flashings and felt flashings.

H. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

I. Solder metal joints watertight for full metal surface contact. After soldering, wash metal clean with neutralizing solution and rinse with water.

J. Seal metal joints watertight.

3.03 INSTALLATION

A. Install VYCORner and Self-Adhered Flashings(SAF) per manufacturer’s guidelines as shown Grace’s Installation Guidelines: Installation Before Weather-Resistive Barrier(WRB), and as shown on drawings. Contractor shall further reference the Grace Contractor’s Guide for complete

details. Provide VYCORner at all window and door sill conditions securely anchored in place. Additionally wrap SAF over YVCORner and complete sill extending up each jamb to completely cover all wood surfaces and seal area from moisture and wind.

B. Conform to drawing details included in SMACNA and NRCA manual.

C. Insure that items are installed in true and accurate alignment with other items and related work; that joints are accurately fitted; that exposed surfaces are free from dents; that corners are reinforced; that seams are watertight.

D. All work shall be left free of oil, grease, or acid residue, ready to receive painter's finish.

E. Wherever possible, all fasteners shall be concealed. All exposed fasteners shall have neoprene gaskets and be capped with a bead of sealant.

F. Install counterflashings in reglets with continuous bead of sealant.

3.04 TOUCH-UP

A. Where galvanized finish is damaged by fabrication or installation, repair with specified touch-up material, applying in accordance with manufacturer's printed instructions.

[END OF SECTION 07 62 00]

SECTION 07 71 23

GUTTERS AND RELATED FLASHINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Galvanized steel gutters.

B. Downspouts.

C. Related flashing.

1.02 RELATED SECTIONS

A. Section 00 72 13: General Conditions.

B. Section 05 50 00: Metal Fabrications.

C. Section 07 62 00: Sheet Metal Flashing and Trim.

D. Section 07 54 19: Single-Ply Roofing System.

E. Section 07 90 00: Sealants.

F. Section 09 90 00: Painting:

1.03 REFERENCES

A. ASTM A924 / A924M-16ae1 - General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

B. FS TT-C-494 - Coating Compound, Bituminous, Solvent Type, Acid Resistant.

C. SMACNA - Architectural Sheet Metal Manual, current edition.

D. AWS - American Welding Society.

1.04 SUBMITTALS

A. Shop Drawings: Indicate locations, configurations, jointing methods, welding methods, fastening methods, expansion joint layouts, downspout layout and installation details.

B. Samples: Submit two samples, 12 inches long illustrating component design, finish, color, and configuration.

1.05 QUALITY ASSURANCE

A. Conform to SMACNA Manual for architectural sheet metal flashing and installation details.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect and handle products to site under provisions of Section 00 72 00.

B. Stack pre-formed material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope to drain.

C. Prevent contact with materials during storage which may cause discoloration, staining, or

damage.

1.07 COORDINATION

A. Coordinate painting portions prior to installation and the work with downspout discharge pipe inlet.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Galvanized Steel: ASTM A924 / A924M-09a, Grade A, G90 zinc coating;

B. Schedule 40 galvanized pipe.

2.02 COMPONENTS

A. Gutters: 18 gauge core steel. Minimum size shall be 6”x6” or as otherwise shown on drawings.

B. Downspouts: Finished grade to bottom of gutter shall be schedule 40 galvanized pipe, round shape only, 4” minimum diameter or size as shown on drawings.

C. Accessories: Profiled to suit gutters and downspouts.

2.03 ACCESSORIES

A. Anchorage Devices: SMACNA requirements.

B. Gutter Supports: Straps.

C. Fasteners: Galvanized steel or stainless steel and as specified in Section 05 50 00. Finish exposed fasteners same as flashing metal.

D. Clean out Tee: Smith 4510 cleanout tee with countersunk plug and round access cover. 4”, 5” or sized as required to coordinate with downspout and underground piping sizes.

E. Touch-up Primer: Cold applied zinc-rich type.

F. Protective Back Coating: FS TT-C-494, bituminous.

G. Sealant: Type as specified under Section 07 90 00.

H. Strainers: Provide and install strainers (bee hive type) at downspouts per SMACNA manual, latest edition.

2.04 FABRICATION

A. Form gutters of profiles and size indicated, to SMACNA requirements.

B. Gutters shall be fascia mounted whenever possible. See drawings for additional mounting information.

C. Fabricate with required connection pieces.

D. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

E. Hem all exposed edges of metal.

F. Welding process shall be Metallic Inert Gas (MIG).

G. Weld all shop formed metal joints. Grind exposed joints flush with adjacent surfaces and apply touch-up primer as specified.

H. Butt weld all field assembled gutter sections. Grind exposed joints flush with adjacent surfaces and apply touch-up primer as specified.

I. Fabricate gutter sections with SMACNA butt type expansion joints at 40ft. maximum with a minimum of one(1) downspout being centered in each 40' section. Provide additional downspouts as necessary to accommodate expansion joint locations.

J. All joints shall be water tight per SMACNA standards.

K. All downspouts shall have fully welded joints and be ground smooth. Provide T-shaped bracket welded to back of downspout for bolting to building. See drawings for additional information.

L. All downspouts that spill to grade shall have a 45 degree elbow of same pipe profile fully welded to bottom of downspout.

M. All downspouts connecting to underground storm drainage systems shall be provided with a cleanout tee at grade.

2.05 FINISHES

A. Field paint gutters under provisions of Section 09 90 00.

B. Apply bituminous protective backing on surfaces in contact with dissimilar materials.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work.

3.02 INSTALLATION

A. Install gutters and downspouts as shown on drawings. Install expansion joints, additional downspouts and accessories as specified.

B. Field assemble (weld) gutter sections at "ground level" wherever possible and lift into place as one unit.

C. Install gutters level and straight in line with building. Shim horizontally and vertically as required to level. Installed gutter to have no ponding water more than ¼" deep.

D. Water test all gutters and downspouts for leaks and ponding in presence of IOR.

E. Flash and seal gutters to downspouts and accessories.

[END OF SECTION 07 71 23]

SECTION 07 90 00

JOINT SEALERS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Preparing sealant substrate surfaces.

B. Concrete Joint Sealants.

C. Sealant and backing.

D. Fireproof Firestopping and firesafing materials and accessories.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 03 31 00: Structural Concrete.

C. Section 07 62 00: Sheet Metal Flashings and Trim

D. Section 07 71 23: Gutters and Related Flashings.

E. Section 08 11 00: Metal Doors and Frames: Perimeter sealants.

F. Section 09 21 16: Gypsum Board Systems.

G. Division 22: Plumbing.

H. Division 26: Electrical.

I. Section 32 13 00: Portland Cement Concrete Paving.

1.03 REFERENCES

A. ASTM C834-14 - Latex Sealants.

B. ASTM C920-14a - Elastomeric Joint Sealants.

C. ASTM E84-16 - Test Method for Surface Burning Characteristics of Building Materials.

D. ASTM E119-16a - Method for Fire Tests of Building Construction and Materials.

E. ASTM E814-13a - Test Method for Fire Tests of Through Penetration Firestops.

F. FM (Factory Mutual) - Fire Hazard Classifications.

G. UL - Fire Hazard Classifications.

H. UL 263 – Standard for Fire Tests of Building Construction and Materials.

I. UL 723 - Test for Surface Burning Characteristics of Building Materials.

J. UL 1479 - Fire Tests of Through-Penetration Firestops.

K. FS TT-S-00227 - Sealing Compound: Elastomeric Type, Multi-Component.

L. FS TT-S-00230 - Sealing Compound: Elastomeric Type, Single Component.

M. FS TT-S-001543 - Sealing Compound, Silicone Rubber Base.

1.04 SUBMITTALS

A. Submit manufacturer’s product data under provisions of Section 00 72 00 for each product required.

B. Submit product data indicating sealant chemical characteristics, performance criteria, limitations, and color availability.

C. Submit samples under provisions of Section 00 72 00.

D. Submit standard color ranges of exposed materials for Architect selection.

E. Submit manufacturer's installation instructions under provisions of Section 00 72 00.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this Section with minimum three years experience.

B. Applicator: Company specializing in applying the work of this section with minimum three years experience, with projects of a similar size and type.

C. Conform to Sealant Waterproofering and Restoration Institute requirements for materials and installation.

D. Prior to installation of joint sealants, field test adhesion to joint substrates.

1. Install joint sealants in 5-foot joint lengths. Allow to cure before testing. Test adhesion by pulling sealant out of joint.

2. Perform field tests for each type of elastomeric sealant and joint substrate.

3. Arrange for tests to take place with joint sealant manufacturer’s technical representative present.

4. Report whether or not sealant in joint connected to pulled out portion failed to adhere to joint substrates or tore cohesively. Include data on pull distance used to test each type of product and joint substrate.

5. Sealants not evidencing adhesive failure from testing, in absence of other indications of non-compliance with requirements, will be considered satisfactory. Do not use sealants that fail to adhere to joint substrate during testing.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Do not install solvent curing sealants in enclosed building spaces.

B. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

C. Do not install sealants under adverse weather conditions or when temperatures are above or below manufacturer's recommended limitations for installation.

D. Deliver materials in the unopened, original containers or unopened packages with manufacturer’s

name, labels, product identification, color, expiration period, curing time and mixing instructions for multi-component materials.

1.07 SEQUENCING AND SCHEDULING

A. Coordinate the work of this Section with all Sections referencing this Section.

1.08 WARRANTY

A. Provide two-year warranty for materials and workmanship under provisions of Section 00 72 00.

B. Warranty: Include coverage of installed sealants and accessories which fail to achieve air tight and watertight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 – PRODUCTS

2.01 SEALANTS

A. Silicone Sealant: Silicone Sealant (use at concrete, masonry, or glazing applications): FS TT-S-01543, Class A, low modulus type; Spectrum I as manufactured by Tremco, Inc.

B. Interior Building Sealant: Acrylic-emulsion; one-part, nonsag, mildew-resistant. Complying with ASTM C834, formulated to be paintable; Pecora Corp. “AC-20”, Sonneborn “Sonolac”, Tremco Inc. “Tremco Acrylic Latex 834” or approved equal.

C. Sanitary Sealant: One-part mildew-resistant silicone; ASTM C920 Type S; Grade NS Class 25; Uses NT, G, A and O; formulated with fungicide for sealing interior joints with nonporous substrates around ceramic file, showers, sinks and plumbing fixtures; Dow Corning Corp. “786 Mildew Resistant”, or approved equal.

D. Acoustical Sealant for Concealed Joints: Nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound; Pecora Corp. “BA-98”, Tremco Inc. “Tremco Acoustical Sealant” or approved equal.

E. Acoustical Sealant for Exposed Joints: Nonoxidizing, skinnable, paintanle, gunnable sealant recommended for sealing interior exposed joints to reduce transmission of airborne sound; Pecora Corp. “AC-20”, USG “Sheetrock Acoustical Sealant” or approved equal.

F. Concrete Expansion Joints: Joint sealing material shall be a two-component, self-leveling, polyurethane elastomeric sealant. Product shall be Sikaflex 2cSL as manufactured Sika Corporation, or equal. Color shall be chosen from the full range of manufacturer’s standard colors.

G. Vertical Building Expansion Joints: Joint sealing material shall be a one-component, polyurethane-based non-sag elastomeric sealant. Product shall be Sikaflex Construction Sealant as manufactured Sika Corporation, Pecora Corp. “DynaTrol II” or approved equal. Color shall be chosen from the full range of manufacturer’s standard colors.

H. Sheet Metal Flashings, Trims, Gutters, & Joints: Joint sealing material shall be a two-component, self-leveling, polyurethane elastomeric sealant. Product shall be Sikaflex 2cSL as manufactured Sika Corporation, or equal. Color shall be chosen from the full range of manufacturer’s standard colors. Provide Sikaflex 260 Primer at all stainless steel and/or galvanized substrate location for proper adhesion of Sikaflex 2cSL.

I. Substitutions: Under provisions of Section 00 72 00.

J. Color of sealant shall be as selected by Architect.

2.02 FIRESTOPPING SEALANTS

A. Firestopping Material: One-Piece insert conforming to the following:

1. All fire stopping shall be one part, two stage intumescent sealants and puttys.

2. All fire stopping sealants shall be capable of maintain an effective barrier against flame, heat, and smoke in compliance with the requirements of ASTM E814, UL 1479, ASTM E119, UL 723, ASTM E84 and UL 263.

3. Fire stopping materials shall be classified in the Underwriters Laboratories (UL) Fire Resistance Directory or listed in the Warnock Hersey International Directory.

4. Fire stopping materials shall be paintable or capable of receiving finish materials in those areas which are exposed to view and which are scheduled to receive finishes.

5. Acceptable Manufacturers: Hilti Firestop Systems, International Protective Coating Corporation “Flamesafe” Systems, 3M Fire Protection Products or approved equal.

6. Substitutions: Under provisions of Section 00 72 00.

2.03 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Non-staining; compatible with sealant and primer; such as round, closed cell polyethylene foam rod; oversized 30 to 50 percent larger than joint width. Materials impregnated with oil, bitumen or similar materials shall not be used. Sealant shall not adhere to back-up material.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

E. Solvents; cleaning agents or other accessory materials shall be as recommended by the sealant manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and joint openings are ready to receive work and field measurements are as shown on Drawings and recommended by the manufacturer.

B. Beginning of installation means installer accepts existing surfaces.

3.02 PREPARATION

A. Clean and prime joints in accordance with manufacturer's instructions.

B. Remove loose materials and foreign matter which might impair adhesion of sealant.

C. Verify that joint backing and release tapes are compatible with sealant.

D. Perform preparation in accordance with sealant manufacturer's recommendations.

E. Protect elements surrounding the work of this Section from damage or disfiguration.

F. Clean concrete, masonry, unglazed surfaces of ceramic tile and similar porous surfaces, by

brushing, grinding, blast cleaning, mechanical abrading, or acid washing to produce a clean, sound substrate. Remove loose particles remaining from cleaning operations by vacuuming or blowing out joints.

G. Clean metal, glass, glazed surfaces of ceramic tile and other non-porous surfaces by chemical cleaners or other means which are not harmful to substrates or leave residues capable of interfering with adhesion of joint sealants.

3.03 INSTALLATION

A. Install sealant in accordance with manufacturer's instructions.

B. Caulk all exterior joints and openings in the building envelope that are observable sources of air infiltration.

C. Measure joint dimensions and size materials to achieve required width/depth ratios.

D. Install joint backing to achieve a neck dimension no greater than 1/3 the joint width. Roll the material into the joint to avoid lengthwise stretching. Do not twist or braid rod stock.

E. Install bond breaker where joint backing is not used.

F. Prime surfaces to receive joint sealant with primer recommended by sealant manufacturer.

G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges. Apply masking tape where required to protect adjacent surfaces from sealant application.

H. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

I. Tool joints concave.

J. At all surface mounted light fixtures mounted on gypsum board ceilings, contractor shall caulk light fixture body to ceiling finish to eliminate gap between metal body and fixture. Coordinate locations with drawings.

K. Firestopping:

1. Apply materials in exact accordance with manufacturer’s latest published instructions, requirements, specifications, details and approved submittals.

2. Installation shall be in accordance with the appropriate UL Fire Resistance Directory or Listing with the appropriate Warnock Hersey International Listing.

3. Seal holes or voids made by penetrating items to ensure an effective fire and smoke barrier.

4. Seal intersections and penetrations of floors, ceilings, walls and columns.

5. Seal around cutouts for lights, cabinets, pipes, plumbing, HVAC ducts and electrical boxes, etc.

6. Where floor openings are four inches or more in width and subject to traffic or loading, install cover plate systems capable of supporting same loading as floor.

7. Interface with Other Projects: Coordinate and cooperate with adjacent, contiguous and related materials trades, (such as concrete, drywall, plumbing, conduit, electrical wiring, communication systems) to ensure a proper and timely installation.

8. Seal steel deck flute openings.

3.04 CLEANING AND REPAIRING

A. Clean work under provisions of Section 01 74 23.

B. Clean adjacent soiled surfaces. Use a solvent or cleaning agent as recommended by the sealant manufacturer.

C. Repair or replace defaced or disfigured finishes caused by work of this Section.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished installation under provisions of Section 00 72 00.

B. Protect sealants until cured.

C. Do not paint sealants until sealant is fully cured.

D. Do not paint silicone sealant.

[END OF SECTION 07 90 00]

SECTION 08 11 00

METAL DOORS AND FRAMES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Non-Rated and Rated Steel Doors.

B. Non-rated and Rated Metal Frames.

C. Door Glazing.

D. Door Louvers.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 00 72 00: Exhibits C, D, G - Abatement of Hazardous Materials.

C. Section 06 10 00: Rough Carpentry.

D. Section 08 71 00: Door Hardware.

E. Section 09 90 00: Painting.

1.03 REFERENCES

A. ANSI/SDI-100 – Specifications for Standard Steel Doors and Frames.

B. ANSI Z97.1 - Safety Performance Specifications and Methods of Test for Safety Glazing Used in Buildings.

C. ASTM A366/A366M-97e1 - Steel, Sheet, Carbon, Cold-Rolled, Commercial Quality.

D. ASTM A924 / A924M-16ae1 - General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process.

E. ASTM A1011 / A1011M-15 - Steel, Sheet and Strip, Hot Rolled, Carbon, Structural, High-Strength Low-Alloy High Strength Low Alloy with Improved Formability, and Ultra-High Strength

F. ASTM A1008M-16 – Standard Specifications for Steel Sheet, Cold -Rolled, Carbon, Structural, High-Strength Low-Alloy and High-Strength Low-Alloy with Improved Formability.

G. ASTM A568 / A568M-15 – Standard Specifications for Sheet Steel and Strip, Carbon, and High-Strength, Low-Alloy, Hot-Rolled and Cold-Rolled, General Requirements for

1.04 QUALITY ASSURANCE

A. Provide door and frame complying with Steel Door Institute "Recommended Specifications for Standard Steel Door and Frames" (SDI 100), and as herein specified.

B. Fire-rated door and frame assemblies shall be in accordance with ASTM E2074and labeled by U.L., Factory Mutual, Warnock Hersey, or other acceptable testing and inspecting organization having jurisdiction.

C. All doors requiring fire rating shall conform to the California State Fire Marshal Standard 12-43.4

Fire Rated Door Tests.

D. All metal doors shall have a 20-minute minimum fire rating and be labeled accordingly. See Door/Frame/Hardware schedule for additional requirements.

1.05 SUBMITTALS

A. Submit under provisions of Section 00 72 00.

B. Shop Drawings: Include illustrations and schedule of finish hardware, door and frame size, type, material, construction, finishing, anchoring, accessories, and preparation for installing hardware.

1. Method of attachment of frames to structure shall be approved by Architect.

C. Templates: Furnish hardware templates to fabricator of frames and doors to be factory prepared for installation of hardware.

D. General Contractor to confirm field measurements of all openings prior to submittal and fabrication of doors and frames.

1.06 PRODUCT DELIVERY AND STORAGE

A. Deliver all materials under protective cover and store in upright position within a dry enclosed space in a manner that will prevent rust and damage. Do not create a humidity chamber by using a plastic or canvas shelter that is not adequately vented.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Steelcraft Manufacturing Co.

1. Doors: L Series with Polystyrene Core

2. Frames: F Series

B. Curries Company Doors

1. Doors: 707 Series

2. Frames: M Series

C. Ceco

1. Doors: Legion Series

2. Frames: S Series

D. No substitutions or known equals.

2.02 MATERIALS

A. Hot-Rolled Steel Sheets and Strip for Frames: Commercial quality carbon steel, complying with ASTM A1011 / A1011M.

B. Cold-Rolled Steel Sheets for Doors: Commercial quality carbon steel, complying with ASTM A1008 / A1008M.

C. Factory Applied Primer Paint: Manufacturer standard rust inhibitor primer.

2.03 METAL DOOR FABRICATION

A. General: Fabricate to sizes shown, providing necessary clearances and bevels to permit operation without binding. Door shall be free from warp, wave, buckle or other defect. Field verify size of all doors.

3. Flush Door Construction: Door shall be fabricated with face sheets of 16 gauge steel. Weld face sheets 2 inches on center, minimum. Door shall be flush with edge seams filled and ground smooth. Bevel lock and hinge edges 1/8" in 2". Door shall be provided with top and bottom inverted 16 gauge steel channels welded within the door. Door shall be polystyrene core. No exposed seams shall occur on the door face or vertical edge. The top and bottom of the door shall be closed with a recessed channel and flush end closure treatment.

B. Preparation of Hardware: Door shall be mortised, reinforced, drilled and tapped at the factory from templates for all mortise hardware listed in the hardware schedule. Door shall be reinforced only for surface applied hardware such as closers, checks, escutcheons and kickplates, the drilling and tapping for which is to be done in the field by the door erector. Reinforcement shall consist of 12 gauge for locksets and latchsets, and 14 gauge for surface applied hardware, except butts, which shall have 3/16" thick plate. Door shall be provided with reinforcing unit as recommended by lock manufacturer. A continuous 12 ga. reinforcement shall be provided for continuous hinge prep and installation.

C. Hardware Mounting Heights and Door Clearances: In accordance with ANSI Industry Standards.

D. All louvers shall be installed minimum 10” above finished floor to edge of louver flange as required for accessibility requirements.

2.04 METAL FRAME FABRICATION

A. General: Pressed metal frames shall be formed to shapes shown. General Contractor to field verify size of all frames. Head and jambs are to be notched, mitered, fully welded and finished to present a smooth surface for painting.

1. Frames shall be fabricated from 16 gauge galvanized A60 steel, and shall be designed with integral rabbet, stop and trim.

2. At locations where existing wood/metal door frame is being replaced in existing wall, knock-down frames are acceptable. Contractor shall shim between rough opening and new frame as required.

B. Anchors: Frame shall be securely anchored to wooden structures with spot welded anchor straps and to existing masonry structure with masonry fasteners, punched and dimpled frames. Where anchorage is not specifically delineated, anchorage shall be as for a similar assembly, or approved manufacturer’s standard type, to securely fasten frames to wall construction involved (wire anchors not acceptable); also provide adjustable floor anchor at bottom of each door jamb. Provide minimum 3 anchors, equally spaced, at jamb end of frames. Anchors shall provide stiffness and rigidity to keep frames square, in accurate position without twisting, buckling or warping. It is acceptable for flush anchor heads to be left exposed.

C. Preparation for Hardware: Frames shall be prepared at the factory for all hardware using templates furnished by hardware supplier. Locations of miscellaneous hardware shall conform to the recommendations for the Door and Hardware Institute. Mortise, reinforce, drill and tap for all mortise type hardware. Reinforce for surface applied hardware, the drilling and tapping for which is to be done in the field door erector.

1. All hardware cutouts shall have steel plate reinforcements with tapped holes welded to frame. Reinforcement shall include 3/16” butt reinforcement; 12 gauge lock strike; 14

gauge for surface applied items.

2. Provide for three (3) rubber door silencers at single doors and (2) silencers at head of pair doors. Omit holes at frames to receive unitized weatherstripping; refer to Section 08712.

D. Combination and Window Frames: Furnish units for fixed glass, fabricated to the designs and dimensions indicated. Provide metal glazing stops and moldings for field assembly with countersunk oval head self-tapping screws spaced not over 16 inches o.c. Frames shall be complete with anchors.

E. Rated Doors and Frames: All fire rated doors and frames shall have a metal label, permanently fastened to the jamb indicating the fire rating and Test Agency name. Do not apply primer or paint over fire rating labels.

2.05 FINISH

A. All surfaces shall be cleaned, phosphatized, and given one coat rust-inhibiting prime paint in accordance with the Steel Door Institute Specification "Test Procedure and Acceptance Criteria for Primer Painted Steel Doors and Frames".

B. Field paint doors and frames under provisions of Section 09 90 00.

2.06 ACCESSORIES –

A. Door Louvers: 18 gauge, non-vision, inverted split “Y louver with 12 gauge security grille two sides, prime coat finish for field painting. Provide optional galvanized attached mesh insect screen. Size as shown on Drawings.

1. Anemostat security door louvers, model #PLSL.

2. Air Louvers Inc., Model 1500-A.

B. Door Vision Panels without privacy door: 20 ga.cold rolled steel, for 1-3/4” doors, unless otherwise noted use with ¼” thick glazing, prime coat finish for field painting. Size as shown on drawings.

1. Anemostat LoPro Metal Vision Frame.

2. Air Louvers Inc. Model VSL – Slimline.

C. Door Vision Panels with privacy door: 20 ga.cold rolled steel, for 1-3/4” doors, unless otherwise noted use with ¼” thick glazing, prime coat finish for field painting. Size as shown on drawings.

1. Air Louvers Inc. Model PDVSL.

2. Anemostat, model LoPro-SC.

D. PeepHoles: Schlage 190 Degree Wide Angle Viewer. Satin nickel finish.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Set Frame level and plumb, and brace adequately to prevent damage or distortion. Secure standard height frames to structure with minimum of three anchors at each jamb. Provide one additional anchor per 18” above standard height.

1. Attach to wooden structure with 16d nails on both sides of each strap into stud.

2. Attach to existing masonry structure with masonry anchors of appropriate length to penetrate masonry a minimum of 2”. Bondo screw heads, sand smooth to conceal fasteners.

3. Removable Spreaders: Size opening by inserting wood spreader cut to the exact opening width and fasten sill anchor at strike jamb with nails or screws. Remove spreader. Insert adjusting screw cover.

4. If knock-down frame is used, contractor shall shim between new frame and existing rough opening. Gap shall be fully filled all around frame.

B. Door Installation: Fit hollow door accurately in the frame with a tolerance of 1/8” at jamb and head.

C. Fit hollow metal door in existing wood framed opening (jamb) with a tolerance of 1/8” at jamb and head.

3.02 ERECTION TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch measured with straight edge, corner to corner.

B. New doors shall have maximum 3/8” undercut above finished floor with no threshold and 3/4" undercut above finished floor with threshold.

3.03 ADJUST AND CLEAN

A. Prime Coat Touch-Up: Immediately after erection, sand smooth all rusted or damaged areas of prime coat and apply touch-up of compatible air-drying primer. Touch-up shall not be obvious.

B. Cleaning and Finishing: Upon completion of the work, clean all exposed surfaces, removing any discoloration or foreign matter, and touch up all abraded or cut areas and exposed edges with finishing material recommended by the manufacturer. Touch-up of finish shall not be obvious.

C. Final Adjustments: Check and readjust operating finish hardware in hollow metal work just prior to final inspection. Leave work in complete and proper operating condition.

D. Defective Work: Remove and replace defective work, including doors and frames which are warped, bowed or otherwise damaged as directed by the Architect, with no additional cost to the Owner.

E. Protection: Protect installed hollow metal work against damage from other construction work.

3.04 CLEAN-UP

A. Upon completion of the work of this section, remove all excess materials, rubbish and debris from the premises.

[END OF SECTION 08 11 00]

SECTION 08 14 00

FLUSH WOOD DOORS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration.

B. Rated and Non-Rated.

C. Door Vision Panels.

D. Door Louvers.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 06 20 00: Finish Carpentry.

C. Section 08 11 00: Metal Doors and Frames: Steel door frames.

D. Section 08 71 00: Door Hardware.

E. Section 09 90 00: Painting: Site finishing doors.

1.03 REFERENCES

A. ANSI A135.4 - Basic Hardboard.

B. ANSI/HPMA HP - Hardwood and Decorative Plywood.

C. ASTM E413-16 - Rating Sound Insulation.

D. WIWI – North American Architectural Woodwork Standards.

1.04 SUBMITTALS

A. Shop Drawings: Illustrate door opening criteria, elevations, sizes, types, swings, undercuts required, special beveling, special blocking for hardware, and identify cutouts for glazing.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics; factory machining criteria, factory finishing criteria.

C. Samples: Submit two samples of door veneer, 8 x 10 inch in size illustrating wood grain.

D. Contractor to confirm field measurements of all openings prior to submittals and fabrication of doors and frames.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with WI Custom Grade.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years experience.

1.07 REGULATORY REQUIREMENTS

A. Fire Door Construction: Conform to California Building Code, Chapter 7.

B. Where opening has fire resistive rating of 20 minutes or longer, door shall bear testing agency-issued label for indicated rating. Do not prime or paint over fire rating labels.

C. NFPA Standard No. 80.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver, store, protect, and handle products to site under provisions of Section 00 72 00.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

1.09 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop drawings.

1.10 COORDINATION

A. Coordinate the work with door opening construction, door frame and door hardware installation.

1.11 WARRANTY

A. Provide warranty under provisions of Section 00 72 00 to the following term:

1. Interior Doors: Lifetime.

B. Include coverage for delamination of veneer, warping or twisting (not to exceed 1/4 inch in any face including diagonal) or other defects. Warranty shall cover replacement of door plus costs of hanging and finishing.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Algoma Hardwoods, Inc.

B. Mohawk Flush Doors Platinum Series

C. Graham Manufacturing by Assa Abloy

D. Or approved equal.

2.02 DOOR TYPES

A. Flush Interior Doors: 1-3/4 thick; solid core construction as indicated.

B. Faces: Stain grade and paint grade per district standard. Use solid stock for exposed edges to match face veneer. Face veneers for pairs of doors shall be selected for color and grain match.

2.03 DOOR CONSTRUCTION

A. Solid Core, Non-Rated:

1. Core: **LD1** or **LD2** cores, Type 2 or better.

2. Stiles: Minimum 1-1/4 inch with two ply edge strips glued to core, outer ply of hardwood.

3. Top and bottom rails: Minimum 1-1/4 inch two ply end strips glued to core.

4. Crossbands: 1/16 inch thick veneer.

5. Faces: Tempered 2S2, 1/8 inch hardboard for opaque finish.

6. Veneer: Flush veneered, five-ply construction.

7. Glue: Type 2 or better.

B. Fire Resistive Doors with 20 minute Fire Rating: Construction shall be similar to Solid Core Doors, and have fire rating of not less than 20 minutes when tested in accordance with California Building Code, Chapter 7 without hose stream test. Doors shall have 6 inch top rail. All doors scheduled to receive flush bolts and kick plates shall have an extra wide bottom rail to provide necessary strength for installation of the hardware requirements.

C. Fire Resistive Doors with 3/4 Hour or Longer Fire Ratings: Meet requirements of California Building Code, Chapter 7 and ASTM F152-95(2009) for fire-rating noted.

1. Core: Mineral Composition.

2. Category: B

3. Stiles and Top Rail: Firestop material as rated per manufacturer.

2.04 ADHESIVE

A. Facing Adhesive: Type 2 or better.

2.05 ACCESSORIES

A. Door Louvers: 18 gauge, non-vision, inverted split “Y louver with 12 gauge security grille two sides, prime coat finish for field painting. Size as shown on Drawings.

1. Anemostat security door louvers, model #PLSL.

2. Air Louvers Inc., model 1500-A.

3. Or Equal.

B. Door Vision Panels without privacy door: 20 ga.cold rolled steel, for 1-3/4” doors, unless otherwise noted use with ¼” thick glazing, prime coat finish for field painting. Size as shown on drawings.

1. Anemostat LoPro Metal Vision Frame.

2. Air Louvers Inc. Model VSL – Slimline.

C. Door Vision Panels with privacy door: 20 ga.cold rolled steel, for 1-3/4” doors, unless otherwise noted use with ¼” thick glazing, prime coat finish for field painting. Size as shown on drawings.

1. Air Louvers Inc. Model PDVSL.

2. Anemostat, model LoPro-SC.

2.06 FABRICATION

A. Fabricate non-rated doors in accordance with WI.

B. Provide hardware reinforcement for hardware specified in Section 08 71 00.

C. Fit door edge trim to edge of stiles after applying veneer facing.

D. Bond edge banding to cores.

E. Factory machine doors for finish hardware in accordance with hardware requirements and dimensions. Do not machine for surface hardware. Provide solid blocking for through bolted hardware.

F. Undercut doors 3/8 inch maximum above finish floor.

G. Glass Cutouts: Provide cutouts for glass of size and shape indicated. Glass for doors is specified under Section 08 80 00.

H. Fabricate and install doors in fire-rated frames in accordance with requirements of NFPA Standard No. 80(latest edition).

I. All louvers shall be installed minimum 10” above finished floor to edge of louver flange as required for accessibility requirements.

2.07 FINISH

A. All doors with transparent finish to be factory pre-finished, equal to TR6.

B. Apply seal coat at both ends of doors prior to final installation.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Field verify frame opening conditions and sizes.

B. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install rated and non-rated doors in accordance with AWS, NFPA 80, and U.L. requirements.

B. Trim non-rated door width by cutting equally on both jamb edges.

C. Trim door height by cutting bottom edges to a maximum of 3/4 inch.

D. Pilot drill screw and bolt holes.

E. Factory prep for hardware.

F. Coordinate installation of doors with installation of frames specified in Section 08 11 00 and hardware specified in Section 08 71 00. Coordinate the installation of new wood doors in existing (E) wood or metal frames.

3.03 INSTALLATION TOLERANCES

A. Maximum Diagonal Distortion (Warp): 1/8 inch measured with straight edge or taught string, corner to corner, over an imaginary 36 x 84 inch surface area.

B. Maximum Vertical Distortion (Bow): 1/8 inch measured with straight edge or taught string, top to

bottom, over an imaginary 36 x 84 inch surface area.

C. Maximum Width Distortion (Cup): 1/8 inch measured with straight edge or taught string, edge to edge, over an imaginary 36 x 84 inch surface area.

D. Doors to have a maximum tolerance of 1/8” between door and frame at jambs and head.

E. Doors shall have maximum 3/8” undercut above sill surface or floor finish.

3.04 ADJUSTING

A. Adjust work under provisions of Section 00 72 00.

B. Adjust door for smooth and balanced door movement.

[END OF SECTION 08 14 00]

SECTION 08 31 13

ACCESS DOORS AND FRAMES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Access panels for in-wall plumbing items.

B. Large access panels for entry to plumbing chase.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 07 90 00: Joint Sealers.

C. Section 09 21 16: Gypsum Board Systems.

1.03 SUBMITTALS

A. Product Data on panel size including material thickness, hinge type, lock type.

B. Attachment and finishing details.

1.04 FIELD MEASUREMENTS

A. Verify that field measurements are as indicated on shop Drawings.

1.05 COORDINATION

A. Coordinate Work with plumbing valve locations and sizes, wall openings, and adjacent Work.

PART 2 – PRODUCTS

2.01 GENERAL

A. All access panels shall be stainless steel Type 304.

2.02 ACCESS PANEL TYPES

A. Flush Type: Door style is flush with provision to conceal flange with drywall cement. 14 gauge steel frame, 14 gauge door panel. Minimum size 10”x10”, U.O.N. on drawings. Special, double-acting concealed spring hinges to allow 175 degree opening. Provide optional tamper proof torx screw or allen key. Location and quantity shown on drawings.

1. Elmdoor/Stoneman DW 14 Gage Access Doors

2. WB DW 400 by Williams Brother Corporation of America.

3. Or equal.

B. Large Removable Access Panels: Access doors provide critical service access to drywall and/or masonry walls. 14 gauge steel door panel and 14-18 gauge frame. Size as shown on drawings. Concealed spring hinges allow opening to 175 degrees. Provide optional tamper proof torx screw or allen key. Location, quantity and required size shown on drawings.

1. Elmdoor/Stoneman DW Series 14 Gage.

2. WB GP 100 Series by Williams Brothers Corporation of America.

3. Or equal.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify prepared openings for adequacy to access panel.

B. Verify that openings for panels are correctly sized and within tolerance.

C. Verify that surfaces of gypsum board and/or ceramic tile are clean, free of obstructions, and ready to receive panels. All ceramic grout joints shall be fully grouted prior to installation of panel.

D. Report in writing to, any conditions that may be detrimental to the Work.

3.02 PREPARATION

A. Contractor shall install blocking/backing in wall as required for correct anchorage of access panel.

B. Prior to final anchorage of panel, Contractor shall confirm that all shutoff valves rotate freely behind panel. Bending of valve levers as a means to rotate freely is not acceptable.

C. Prior to final anchorage of large chase access panel, Contractor shall review locations of piping in wall and that access to chase is not blocked by piping.

3.03 INSTALLATION

A. General: Install panels at locations indicated, according to manufacturer's recommendations and as specified herein.

B. Fill all anchorage hole in panels. Screws shall penetrate blocking minimum 1”.

C. Set all panels level and plumb in wall.

D. Contractor shall carefully cover drywall bead on all panels with concealed flanges. Clean all drywall mud from face of panel and inside panel frame.

E. At large chase access panels, contractor shall apply sealant to entire perimeter to wall finish surface.

3.04 CLEANING

A. Clean work under provisions of 00 72 00.

B. Remove drywall and grout materials from finish surfaces.

C. Remove labels after work is complete.

D. Clean stainless steel surfaces.

3.05 PROTECTION OF FINISHED WORK

A. Protect finished Work under provisions of Section 00 72 00.

B. Replacement: At completion of building construction and prior to its acceptance, all broken, dented, excessively scratched, or otherwise imperfect finished surfaces included under this

Section shall be replaced with new panels of the type specified, as directed by the Architect, and at no additional cost to the Owner.

[END OF SECTION 08 31 13]

SECTION 08 71 00

DOOR HARDWARE

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Hardware for hollow steel and wood doors, both new and existing.

B. Hardware for exterior site security gates.

C. Thresholds.

D. Weatherstripping/Gasketing.

1.02 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Furnish templates to Section 08 11 00 for door and frame preparation.

B. Furnish templates to Section 08 14 00 for door preparation.

C. Furnish templates to Section 08 71 00 for door and frame preparation.

1.03 RELATED SECTIONS

A. Section 00 72 00: General Conditions.

B. Section 06 20 00: Finish Carpentry.

C. Section 08 11 00: Metal Doors and Frames.

D. Section 08 14 00: Flush Wood Doors.

E. Section 32 31 13: Chain Link Fences and Gates.

1.04 REFERENCES

A. ANSI A117.1 - Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Disabled People.

B. AWS - Architectural Woodwork Standards.

C. BHMA - Builders' Hardware Manufacturers Association.

D. DHI - Door and Hardware Institute.

E. NAAMM - National Association of Architectural Metal Manufacturers.

F. 2016 California Building Code Chapter 10 & 11B.

G. NFPA 101 - Life Safety Code.

H. SDI - Steel Door Institute

I. California Building Code 11B-404.2.7 Door and gate hardware. Handles, pulls, latches, locks, and other operable parts on doors and gates shall comply with Section 11B-309.4. Operable parts of such hardware shall be 34 inches minimum and 44 inches maximum above the finish floor or ground.

1.05 COORDINATION

A. Coordinate work of this Section with other directly affected Sections involving manufacturer of any internal reinforcement for door hardware.

B. Patch existing hardware penetrations at metal doors/frames to remain as noted in Article 3.02 F&G. Prep existing door for new hardware as scheduled. (Also see Section 08 11 00).

C. Contractor to confirm field measurements, all hinge prep locations and threshold conditions prior to submission of submittals.

D. Contractor shall salvage all existing door hardware for owner. After owner's evaluation of salvaged hardware, contractor shall dispose of any hardware not kept by owner.

1.06 QUALITY ASSURANCE

A. Manufacturers: Companies specializing in manufacturing door hardware with minimum three years documented experience.

B. Hardware Supplier: Company specializing in supplying institutional door hardware with minimum three years documented experience.

C. Hardware Supplier Personnel: Employ a certified Architectural Hardware Consultant (AHC) to assist in the work of this Section.

D. Hardware Installer Personnel: All hardware must be installed by a qualified factory certified installer with a minimum of 5 years installation experience of door hardware. Individual(s) must be approved prior to start of work.

E. Mandatory pre-installation meeting required with manufacturer representatives, Inspector of Record and Construction Manager.

1.07 SUBMITTALS

A. Schedules to be in vertical format, listing each door opening, and organized into "hardware sets" indicating complete designations of every item required for each door opening to function as intended. Hardware schedule shall be submitted within two (2) weeks from date the purchase order is received by the finish hardware supplier. Furnish four (4) copies of revised schedules after approval for field and file use. Note any special mounting instructions or requirements with the hardware schedule. Schedules to include the following information:

1. Location of each hardware set cross-referenced to indications on drawings, both on floor plans and in door and frame schedule.

2. Handing and degree of swing of each door.

3. Door and frame sizes and materials.

4. Keying information.

5. Type, style, function, size, and finish of each hardware item.

6. Elevation drawings and operational descriptions for all electronic openings.

7. Name and manufacturer of each hardware item.

8. Fastenings and other pertinent information.

9. Explanation of all abbreviations, symbols and codes contained in schedule

10. Mounting locations for hardware when varies from standard.

B. Submit schedule, shop drawings, and product data.

C. Indicate locations and mounting heights of each type of hardware.

D. Provide product data on specified hardware.

E. Submit manufacturer's parts lists, templates, and installation instructions under provisions of Section 00 72 00.

F. Perform field measurements for contractor determined heights of stop/hold open devices prior to submitting the hardware submittal.

G. Provide submittal for proposed installer(s) with statement of qualifications.

1.08 OPERATION AND MAINTENANCE DATA

A. Submit operation and maintenance data under provisions of Section 00 72 00.

B. Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

C. Include parts list.

D. Include key cut schedule.

1.09 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 00 72 00.

B. Store and protect products under provisions of Section 00 72 00.

C. Package hardware items individually, label and identify all hardware with door opening code and hardware group/number to match hardware schedule. Ensure each package contains all screws, and miscellaneous items required for a complete and operational scheduled installation.

D. Deliver Schlage PRIMUS permanent keys, Schlage PRIMUS permanent cylinders, and Schlage Standard permanent cylinders to the designated location as specified by the Construction Manager.

E. Protect hardware from theft and/or damage by cataloging and storing in secure area. Temporary storage facilities are to be provided by the Contractor.

1.10 MAINTENANCE MATERIALS

A. Provide special wrenches and tools applicable to each different or special hardware component.

B. Provide maintenance tools and accessories supplied by hardware component manufacturer.

1.11 WARRANTY

A. Provide unconditional two (2) year installation warranty commencing on recordation date of the Notice of Completion for all hardware.

B. Provide longer unconditional installation warranty periods from hardware supplier as follows:

1. Schlage Locks: seven (7) year warranty

2. Von Duprin: three (3) year warranty

3. LCN: ten (10) year warranty

4. Continuous Hinges: Lifetime

C. As a condition to end installation warranty period, Contractor shall provide a site review with the designated District representative prior to expiration of warranty.

1.12 COMMISSIONING:

A. Provide complete hardware testing and two (2) site staff training sessions including post occupancy reviews and final testing and adjustments prior to expiration of warranty.

B. Include instructions to the District's maintenance and operations staff in the operation, adjustment, and maintenance of hardware.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Continuous Hinges: Heavy-duty, full mortise, geared aluminum (or stainless steel at rated applications) hinge with mill finish as manufactured by PEMKO; Roton or approved equal.

1. Pemko CFM SLF HD1 or Roton 780-224HD (Standard throw).

2. Pemko WTCFM HD1 (Wide throw up to 2 13/16") or Roton 780-235HD.

B. Butt Hinges: wide throw ball bearing hinge for doors requiring throw in excess of 2 13/16" as manufactured by Hager Model No. BB1168 x 626 x NRP; Stanley; McKinney; or approved equal.

1. Furnish a minimum of four butts per door. For doors over seven feet provide additional butt for every 30" in height.

2. Unless otherwise noted or specified, the size of the butts will be determined by the following table:

a. Hinge Height:
Doors 1-3/4" thick and up to 36" wide, 4-1/2"
Doors 1-3/4" thick and 37" to 48" wide, 5"

b. Hinge Width: Provide widths sufficient to clear trim and/or veneer projection when door swings 180 degrees.

3. Provide non-removable pins at all exterior out-swinging doors and where required by owner for security reasons.

C. Locksets and Latch Sets: Schlage ND Series. No or-equals or substitutions allowed.

1. Locks: Schlage ND Series with "Rhodes" design and "Vandlgard" lever at all exterior applications and "Non Vandlgard" at all interior applications. No "or equals" or "substitutions" allowed. (All locksets shall be ANSI 156.2 Series 4000, Grade 1 Certified. All locksets shall be tested to ten million cycles without noticeable lever sag and shall be able to withstand 3000 inch pounds of torque applied to the locked lever without gaining access. Locksets shall fit a standard 2 1/8" bore without the use of thru bolts. Standard rose size shall be 3-1/2" diameter. Levers shall be made of solid material with no plastic fillers. Latch bolt head shall be one piece stainless steel and must be encased within the

lock body.)

a. Schlage ND60PD (Interior)

b. Schlage ND93PD (Exterior)

2. Locks at Student Toilet rooms:

a. In-swinging Doors: Schlage Mortise lock, L9460P 503 x 06A x less O/S lever x XL11-886-526 SC and Vandal Resistant trim VR900LLP (less latch guard @ end of trim, special order for in-swinging door).

i. Lock thrown or retracted by key outside. Lock only retracted by inside lever. Exterior Vandal Resistant Trim by Ives replaces outside lever.

ii. Include push plate around exterior lever with cut-out.

b. Out-swinging Doors: Von Duprin CD98NL-OP x VR910-NL (Ives) exit device, with 20-057 x 626 SC rim cylinder, 20-7000 1 1/4 x XQ11949 SC mortise / dogging cylinder and 826 x 32D Vandal trim.

i. Latchbolt retracted by outside key or pushing inside touch-pad. Latchbolt held retracted by dogging cylinder on the inside.

3. Locks at Single-stall Staff Restrooms: Provide “occupied” indicator with push button function inside and keyed cylinder on the other with master key override.

a. Schlage ND85PD

4. Locks at storage rooms:

a. Schlage ND80PD (Interior)

b. Schlage ND96PD (Exterior)

5. Strikes:

a. Furnish standard strikes with extended lips where required to protect trim from being marred by latch bolt.

b. Provide strike cup in hollow metal frames.

c. Verify whether standard or ANSI cutouts are provided in metal frames.

D. Door Closers: LCN (Ingersoll-Rand Company) model number 4041EDA-TB. No equals or substitutions allowed.

1. Door closers must be sized according to manufacturer's recommended schedule of sizes.

2. Provide optional Extra Duty Arms at all closers. Standard duty arms are not acceptable. Closer shall not be used as a door hold open or stop. Doors shall be provided with floor or wall stops.

3. Supply drop plates at narrow top rail doors and parallel-arm closers at reverse bevel doors and where doors swing a full 180 degrees.

4. Provide long-arm at doors with wide-throw hinges, LCN Model No. ST-2456. Long-arm requires field verification of pivot offset. Both main arm and forearm are required to be cut and extension piece welded in, finished, and repainted. Extra charge and long-lead item.

E. Exit Devices: Von Duprin (Ingersoll-Rand Company) Surface mounted 99 Series. No other substitutions are allowed.

1. At all areas(including classroom entry doors) where positive latching is not required, provide the following:

   a. Von Duprin CD99NL-OP x VR910-NL (Ives).

2. At all areas(including classroom entry doors) where positive latching is required provide the following:

   a. Von Duprin 99L-F x 994L

3. At pairs of doors where positive latching is not required provide the following:

   a. Von Duprin CD99NL-OP x VR910-NL (Ives) x CD98EO.

4. At pairs of doors where positive latching is required provide the following:

   a. Von Duprin 99L-F x 98EO-F.

F. Door stops/hold opens: Ives or approved equal.

1. Stops:

   a. Interior Floor Stops: FS436/R435

   b. Security Floor Stops: FS18S

   c. Wall Bumpers: WS401/WS402

2. Holders:

   a. Wall mounted automatic holders and stops: WS45

   b. Floor mounted automatic holders and stops: FS43

3. Provide risers for exterior stops as required.

4. Overhead stops must be sized according to manufacturer's recommendations.

5. Floor mounted door stops shall not be located in the path of travel and shall be maximum 4” from wall.

G. Kick-plates Plates: TRIMCO; Ives, Quality; Sargent; or approved equal.

1. 304 Stainless steel, .050” x 12” high: Trimco model #K0050.

2. Plastic spacer behind stainless steel kick-plate equal to Trimco model #K6000. At doors that have a stop/hold open with thru-bolts installed, plastic spacer is required so that bolts heads are completely covered by stainless steel kick-plate. Contractor shall pre-drill plastic spacer for bolt heads and kick-plate screws occur. Kick-plate surface is required to be completely smooth and uninterrupted.

H. Weatherstrip: PEMKO; National Guard Products; or approved equal.

1. Jamb and Head brush-style: PEMKO model #45041CP.

I. Door Sweep: PEMKO; National Guard Products; or approved equal.

1. Surface mounted door bottom, brush-style: PEMKO model #309AP

2. Channel mounted door bottom, brush style: PEMKO model #90100CP

J. Thresholds, Floor Plates: PEMKO; National Guard Products; Zero; or approved equal.

1. PEMKO, ADA compliant, 158, 2727, or 270 Series

K. Removable Mullions: Von Duprin or Detex. No or-equals or substitutions allowed.

1. Von Duprin Model #KR4954x154, with cylinder keyed.

2. Detex Model # 90KR, with cylinder keyed.

L. Push/Pulls: Ives #VR910-NL or #VR910-DT.

M. Lock Protector: TRIMCO; or known equal per facility design standards.

1. Trimco 1082-6. Furnish at all exterior doors with Schlage ND-series, L-series and S-series locksets.

N. Manual Flush Bolts: Trimco; or approved equal.

1. Wood Doors: Trimco #3913.

2. Metal Doors: Trimco #3915.

O. Astragals: Trimco; or approved equal.

1. Trimco #359_SS, stainless steel astragal with thru-bolts. Use on all un-even pair of doors with active/non-active leaves.

P. Fasteners: Furnish necessary screws, bolts, nuts and other items as required, per manufacturers installation instructions.

1. Fasteners shall match hardware materials and finish.

2. Furnish required expansion shields, sex bolts, toggle bolts, and other anchors as recommended by the hardware manufacturer.

3. Furnish only machine screws on hollow metal doors, except door closers and lock protectors attachment (sex bolts).

4. Epoxy “all-thread” stainless steel fasteners for door stop/hold opens as follows:

a. For floor (concrete) mounted type, use HILTI HY150 2-part.

b. For wall (brick/block) mounted type, use HILTI HY20 2-part epoxy.

Q. Rim Cylinders - Provide PRIMUS I/C # 20-757 and/or 20-763 1-1/4 x XO 11949 cylinders for use with rim panic devices.

1. Provide 10 percent of job’s total cylinder count as extra stock, minimum (2).

R. Dogging cylinders used in Panic Devices - Provide Schlage cylinder # 20-763 1-1/4 x XO 11949. Key same as door.

1. Provide 10 percent of job's cylinder count as extra stock, minimum (2).

S. Wrap Plates: Trimco; or approved equal.

1. Trimco 5202-8.630, stainless steel, 4-1/4" x 9", 2-1/8" bore size

T. Substitutions and "or equals": See provisions under Section 00 72 00.

2.02 KEYS AND KEYING

A. Permanent Key Cylinders: Schlage Everest (Ingersoll-Rand Company). No or-equals or substitutions allowed. The District has standardized on Primus cylinders in Schlage locksets.

B. Key cylinder locks in accordance with the owner's instructions as shown in the keying schedule.

C. Permanent cylinders to be packaged separate from permanent keys (PKI). All permanent keys and all permanent cylinders are to be labeled with the door location and keying code. The permanent keys are to be delivered directly from the Schlage factory to the Construction Manager. All of the permanent cylinders are to be delivered to the hardware supplier for order verification, and then be delivered to the Construction Manager. The Contractor is responsible to coordinate the Schlage Primus "Facesheet" with the hardware supplier and Construction Manager before the cylinders are ordered.

D. Cylinders will be a mixture of Schlage Standard and Schlage PRIMUS as directed by the hardware and/or keying schedule. Key section for all cylinders will be either "C" (Standard) or "CP" (PRIMUS).

E. Keying schedules to be supplied by the Owner.

F. Construction Keying:

1. Contractor to furnish and install temporary construction cylinders for each phase of work, per the construction schedule. At start of actual construction, Contractor shall immediately re-key existing toilet room locksets/deadbolts to a construction key prior to any work being performed. At door hardware to remain, Contractor to reinstall existing cylinder only after all work has been completed. At new door hardware, Contractor shall install new site-keyed cylinders only after all work has been performed.

2. Contractor to install permanent cylinders (Both Schlage Standard and Primus) at the conclusion of each phase of work, per the construction schedule.

3. Contractor to coordinate timing of temporary construction/permanent cylinder installation with the Construction Manager.

4. Locksets to be ordered/shipped less permanent cylinders.

G. Refer to the keying schedule for quantity of cut keys to be supplied. Package Keys Independently (PKI). All keys to be PRIMUS # 48-053-CP.

H. Quantity of blank keys to be supplied under this contract:

1. Provide twenty (20) each PRIMUS # 35-053 (Unembossed one side) or 4 blanks per each door of contract, whichever is greater.

I. Quantity of Interchangeable Core Control Keys / School Site:

1. 12 PRIMUS # 35-052 Blanks

2. 2 Construction # 48-056 Cut Keys

J. It is the responsibility of the Contractor to contact the District to obtain the Schlage Registry Number prior to releasing Schlage cylinder order. The Registry Number is unique to the School District.

2.03. FINISHES

A. Finish on hardware shall match 626 (dull chrome) unless specified otherwise.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify that doors and frames are ready to receive work and field verified dimensions are as indicated on shop drawings.

B. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Conduct mandatory pre-installation meeting with manufacture representatives, inspector of record and construction manager.

B. Install all hardware including Schlage cylinders in accordance with manufacturer's installation instructions and requirements of SDI.

C. Use the templates provided by hardware item manufacturer. Mounting heights for hardware from finished floor to centerline of hardware item shall be between 34” to 44” and conform to ANSI standards.

D. Field measure latch to strike distance prior to mounting Exit Devices.

E. Conform to Title 24 and 2016 CBC, Chapter 11B for positioning requirements of the disabled.

F. Hinge Installation:

1. The Contractor is to provide a “Dutchman” to fill abandoned hinge preps in existing wood frames. Shim for mortise door hinge and repair existing frame as required for squaring opening.

2. The Contractor is to provide a “Dutchman” to fill abandoned hinge preps in existing metal frames where butt hinges are being removed and replaced with single continuous hinge. Pieces shall fit tightly in abandoned prep and shall be curved on one side to completely close gap on visual face of frame. Prime and paint.

3. All fasteners for hinge in existing wood frame preps are to penetrate a minimum of 2” into solid wood (structural framing).

4. All fasteners for hinge in new metal frame are to be install per manufacture typical installation recommendations into appropriate steel backing required under section 08 11 00.

G. Lockset, Latchset & Exit Device Installation:

1. Where new doors are being installed in existing frames, the new mounting heights for strike may not align with the existing preps, the Contractor is to provide new “Dutchman” to fill abandoned strike openings/preps in the existing frames.

2. Where new hardware is being installed at existing doors, provide a stainless steel saddle

to completely cover existing openings/preps.

3. At existing doors to remain that receive new hardware, the new mounting heights for the strike will not align with the existing preps. The Contractor is too provide new 'Dutchman' to fill abandoned strike opening/preps in existing frames. Furthermore, the Contractor shall cut in a new location for new strike/prep as required by new hardware.

H. Door Closer Installation:

1. Sex bolts are mandatory for attachment of closer to door. (Door must be prepared with spacer at closers to prevent dimpling of doors.)

2. Closers to be fitted with appropriate length arm to accommodate throw of hinge and enable door to open 180 degrees. See Paragraph 2.01-D-3 for more information.

3. Closers Push & Pull effort - must meet disable access requirements:

a. Exterior and Interior: 5 pounds maximum.

b. Rated Doors: The Authority having Jurisdiction, may increase the maximum effort to operate fire doors to achieve positive latching, but not to exceed 15 lbs. maximum.

c. Door closers and gate closers shall be adjusted so that from an open position of 90 degrees, the time required to move the door to a position of 12 degrees from the latch is 5 seconds minimum.

4. All fasteners for door closer fasteners in existing wood frame are to penetrate a minimum of 2" into solid wood (structural framing).

I. Attachment of door stop / hold-open devices:

1. Shim strike bar with manufacture plates as required for proper, vertical, plumb, alignment with receiver.

2. Do not secure to concrete or masonry with manufacture provided bolts. Fasten with stainless steel all-threads set in epoxy a minimum of 3" and stainless steel nut. Trim excess length of all-thread. Tack weld nut to all-thread. De-burr weld.

3. Rockwood 464 rubber bumper shall be mounted flush to top of concrete. Set lead shield in full bed of epoxy prior to tightening lag screw. Metal strike/catch mounted on door 2-3/4" above finish floor to underside side of strike/catch to allow swivel latch to properly latch. Do NOT use the supplied SMS for attachment of strike/catch to door. Provide and install strike/catch using sex bolts.

4. At wall mounted door stops, anchor wall portion of stop to solid wood backing. If backing does not align with door stop, provide 1/4" thick galvanized steel plate surface mounted to face of building spanning to backing on both sides.

J. Weather-stripping Installation:

1. Install with manufacture screws within 1" from all ends. If trimming is required, cuts shall be smooth, burr-free, and metal material shall not be warped or deformed. Cleanly cut weather-stripping material.

K. Lock Protector Installation:

1. Install with sex bolts for flush installation.

3.03 ADJUST AND CLEAN

A. Check each operating item of hardware and each door to ensure proper operation or function of every unit. Lubricate moving parts with lubrication type recommended by the manufacturer. Replace units, which cannot be adjusted and lubricated to operate freely and smoothly as intended for the application made.

B. At completion of the work all protective coverings shall be removed and all hardware shall be cleaned and polished.

C. Check and re-adjust operation of all finish hardware just prior to final inspection. Leave work in complete and proper operating condition.

3.04 SCHEDULES:

A. The following hardware groups and keying schedule refers to types of hardware required for the project. The contractor and hardware supplier shall confirm field measurements and field conditions necessary to facilitate the coordination of work of this and related sections, prior to submittal of finish hardware. The Contractor and hardware supplier shall be responsible for making their own take-off. Hardware for a complete installation is required, whether specifically mentioned or not. Any discrepancies shall be brought to the attention of the Architect in the hardware submittal. Hardware part numbers refer to listed manufacturer's underlined in Paragraph 2.01. Refer to the door schedule and/or floor plans and/or sill details for threshold types.

(Hardware Groups Follow)

SITE GATES

Hardware Group G01: (new exterior ornamental iron fence out-swinging single pedestrian gate)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	1	CD99NL-OP	626	
Cylinder	Schlage – Primus	1	I/C #20-057	626	
Cylinder	Schlage – Primus	1	I/C #26-091 1-1/4 x XO11949	626	
Exterior Pull	Ives	1	VR910-NL	US32D	
Stop/Hold Open	IVES	1	FS 43	626	
Hinge	D&D Sureclose	2	75057214 Self-Closing	Factory Paint	
Hinge	D&D Sureclose	1	75001214 Dummy	Factory Paint	
Silencer	Ives	2	SR64	--	

*See gate details on drawings for additional gate and hardware information.

Hardware Group G02: (new exterior ornamental iron fence out-swinging double pedestrian gate)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	2	CD99NL-OP	626	
Cylinder	Schlage – Primus	2	I/C #20-057	626	
Cylinder	Schlage – Primus	2	I/C #26-091 1-1/4 x XO11949	626	
Exterior Pull	Ives	2	VR910-NL	US32D	
Stop/Hold Open	IVES	2	FS 43	626	
Hinge	D&D Sureclose	4	75057214 Self-Closing	Factory Paint	
Hinge	D&D Sureclose	2	75001214 Dummy	Factory Paint	
Silencer	Ives	4	SR64	--	

*See gate details on drawings for additional gate and hardware information.

Hardware Group G03: (new exterior ornamental iron fence out-swinging double service gate)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Hinge	D&D Sureclose	4	75057214 Self-Closing	Factory Paint	

*See gate details on drawings for additional gate and hardware information.

EXTERIOR DOORS

Hardware Group E01: (new mutli-accommodation toilet room single door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	1	CD99NL-OP	626	
Cylinder	Schlage – Primus	2	I/C #20-757	626	
Exterior Pull	Ives	1	VR910-NL	US32D	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	90100CP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	
Threshold	Pemko	1	158A	mill	

Hardware Group E02: (new single-accommodation toilet room single door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND85PD	626	
Lockset Protector	Trimco	1	1082-6	SS	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	90100CP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	
Threshold	Pemko	1	158A	mill	

Hardware Group E03: (existing exterior multi-purpose room pair doors)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	2	CD99NL-OP	626	
Cylinder	Schlage – Primus	4	I/C #20-757	626	
Exterior Pull	Ives	2	VR910-NL	US32D	
Closer	LCN	2	4041EDA-TB	626	
Hinge	Pemko	2	CFM SLF HD1	mill	
Stop/Hold Open	IVES	2	FS 43	626	
Weather-strip	Pemko	2	45041CP	mill	
Door sweep	Pemko	2	309AP	mill	
Kickplate	Trimco	2	K0050x2”LDW	SS	
Threshold	Pemko	2	158A	mill	

Hardware Group E03N: (existing exterior multi-purpose room pair doors, no threshold)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	2	CD99NL-OP	626	
Cylinder	Schlage – Primus	4	I/C #20-757	626	
Exterior Pull	Ives	2	VR910-NL	US32D	
Closer	LCN	2	4041EDA-TB	626	
Hinge	Pemko	2	CFM SLF HD1	mill	
Stop/Hold Open	IVES	2	FS 43	626	
Weather-strip	Pemko	2	45041CP	mill	
Door sweep	Pemko	2	309AP	mill	
Kickplate	Trimco	2	K0050x2”LDW	SS	

Hardware Group E04: (existing exterior exit single door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	1	CD99NL-OP	626	
Cylinder	Schlage – Primus	2	I/C #20-757	626	
Exterior Pull	Ives	1	VR910-NL	US32D	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	
Threshold	Pemko	1	158A	mill	

Hardware Group E04N: (existing exterior exit single door, no threshold)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	1	CD99NL-OP	626	
Cylinder	Schlage – Primus	2	I/C #20-757	626	
Exterior Pull	Ives	1	VR910-NL	US32D	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	

Hardware Group E05: (existing exterior custodian/storage single door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND96PD	626	
Lockset Protector	Trimco	1	1082-6	SS	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	
Threshold	Pemko	1	158A	mill	

Hardware Group E05N: (existing exterior custodian/storage single door, no threshold)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND96PD	626	
Lockset Protector	Trimco	1	1082-6	SS	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	

Hardware Group E06: (existing exterior single door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND93PD	626	
Lockset Protector	Trimco	1	1082-6	SS	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	
Threshold	Pemko	1	158A	mill	

Hardware Group E06N: (existing exterior single door, no threshold)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND93PD	626	
Lockset Protector	Trimco	1	1082-6	SS	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	

Hardware Group E07: (existing exterior custodial double doors)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	2	ND96PD	626	
Lockset Protector	Trimco	2	1082-6	SS	
Cylinder	Schlage – Primus	2	I/C #20-757	626	
Closer	LCN	2	4041EDA-TB	626	
Hinge	Pemko	2	CFM SLF HD1	mill	
Stop/Hold Open	IVES	2	FS 43	626	
Weather-strip	Pemko	2	45041CP	mill	
Door sweep	Pemko	2	309AP	mill	

Hardware Group E08: (existing single-accommodation toilet room single door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND85PD	626	
Lockset Protector	Trimco	1	1082-6	SS	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	
Threshold	Pemko	1	158A	mill	

Hardware Group E09: (existing multi-accommodation toilet room single door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	1	CD99NL-OP	626	
Cylinder	Schlage – Primus	2	I/C #20-757	626	
Exterior Pull	Ives	1	VR910-NL	US32D	
Closer	LCN	1	4041EDA-TB	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	
Threshold	Pemko	1	158A	mill	

Hardware Group E09X: (existing multi-accommodation toilet room single door, NO CLOSER)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND85PD	626	
Lockset Protector	Trimco	1	1082-6	SS	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Hinge	Pemko	1	CFM SLF HD1	mill	
Stop/Hold Open	IVES	1	FS 43	626	
Weather-strip	Pemko	1	45041CP	mill	
Door sweep	Pemko	1	309AP	mill	
Kickplate	Trimco	1	K0050x2”LDW	SS	

Hardware Group E10: (existing exterior multi-purpose room pair doors, removable mullion)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	2	CD99NL-OP	626	
Cylinder	Schlage – Primus	5	I/C #20-757	626	
Exterior Pull	Ives	2	VR910-NL	US32D	
Closer	LCN	2	4041EDA-TB	626	
Hinge	Pemko	2	CFM SLF HD1	mill	
Stop/Hold Open	IVES	2	FS 43	626	
Weather-strip	Pemko	2	45041CP	mill	
Door sweep	Pemko	2	309AP	mill	
Kickplate	Trimco	2	K0050x2”LDW	SS	
Removeable Mullion	Von Duprin	1	KR4954x154	626	
Threshold	Pemko	2	158A	mill	

Hardware Group E10N: (existing exterior multi-purpose room pair doors, removable mullion, no threshold)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Exit Device	Von Duprin	2	CD99NL-OP	626	
Cylinder	Schlage – Primus	5	I/C #20-757	626	
Exterior Pull	Ives	2	VR910-NL	US32D	
Closer	LCN	2	4041EDA-TB	626	
Hinge	Pemko	2	CFM SLF HD1	mill	
Stop/Hold Open	IVES	2	FS 43	626	
Weather-strip	Pemko	2	45041CP	mill	
Door sweep	Pemko	2	309AP	mill	
Kickplate	Trimco	2	K0050x2”LDW	SS	
Removeable Mullion	Von Duprin	1	KR4954x154	626	

INTERIOR DOORS

Hardware Group I01: (new interior restroom door, non-rated)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND85PD	626	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Hinge	Hager	4	BB 1168, SS	630	
Closer	LCN	1	4041EDA-TB	626	
Kickplate	Trimco	1	K0050x2”LDW	SS	
Threshold	Pemko	1	270A	626	
Coat Hook					

Hardware Group I02: (new interior closet door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND60PD	626	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Hinge	Hager	4	BB 1168, SS	630	
Coat hook					

Hardware Group I03: (new interior office single door)

Item:	*Manufacturer:*	*Quantity:*	*Model No.:*	*Finish:*	*Notes:*
Lockset	Schlage	1	ND60PD	626	
Cylinder	Schlage – Primus	1	I/C #20-757	626	
Hinge	Hager	4	BB 1168, SS	630	

[END OF SECTION 08 71 00]

SECTION 09 21 16

GYPSUM BOARD SYSTEMS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Gypsum board.

B. Taped and sanded joint treatment.

C. Accessories.

1.02 RELATED WORK

A. General Conditions.

B. Section 06 10 00: Rough Carpentry.

C. Section 07 90 00: Joint Sealants.

D. Section 08 11 00: Metal Doors and Frames.

E. Section 09 90 00: Painting.

F. Section 10 28 00: Toilet and Bath Accessories.

1.03 REFERENCES

A. ANSI/ASTM C1396 / C1396M-14a- Gypsum Wallboard.

B. ANSI/ASTM C514-04(2014) - Nails for the Application of Gypsum Wallboard.

C. ANSI/ASTM C630/C630M-03 - Water Resistant Gypsum Backing Board.

D. Gypsum Association GA-216 - Application and Finishing of Gypsum Board Products.

E. ASTM C645-14e1 - Non-Load Bearing (Axial) Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.

F. ASTM C840-16 - Application and Finishing of Gypsum Board.

G. ASTM C955-15e1- Load Bearing (Transverse and Axial) Steel Studs, Runners (Track) and Bracing or Bridging, for Screw Application of Gypsum Board.

H. ASTM C1002-14 - Steel Drill Screws for the Application of Gypsum Wallboard.

I. ASTM C1047-14a - Accessories for Gypsum Wallboard and Gypsum Veneer Base.

1.04 QUALITY ASSURANCE

A. Applicator: Company specializing in gypsum board systems work with minimum five years experience.

1.05 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver: All materials shall be delivered in original packages or bundles with the manufacturer's labels intact and legible.

B. Handling and Storage: Materials shall be kept dry, stacked off the ground and properly supported and protected from weather. Protect all edges and surfaces. Stack wallboard flat.

1.06 JOB CONDITIONS

A. Building Temperature and Ventilation: Do not install wallboard and joint compounds if building temperature is below 55 degrees F and proper ventilation is not provided to eliminate excessive moisture from building.

B. Protect work in progress as well as work of other trades. Clean surfaces that have been spotted during wallboard application.

C. Contractor shall remove and reinstall all existing conduit, wiremold, light fixtures, fire alarm devices, etc. as required to perform work as listed in this specification. Suspend all wiring as required during work where equipment cannot be disconnected.

1.07 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 00 72 00.

B. Provide product data on metal framing, gypsum board, joint tape, and topping compound.

C. Submit manufacturer's installation instructions under provisions of Section 00 72 00.

D. Submit 2' x 2' sample of machine applied drywall texture finish.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - GYPSUM BOARD SYSTEM

A. U.S. Gypsum Co.

B. Other acceptable manufacturers offering equivalent products:

1. Pabco Gypsum Co.

2. Domtar America, Inc.

3. Gold Bond Building Products.

4. Georgia-Pacific Corp.

5. National Gypsum.

6. Or approved equal.

C. Substitutions: Under provisions of Section 00 72 00.

2.02 GYPSUM BOARD MATERIALS

A. Mold Tough Firecode Cores Gypsum Wallboard: ASTM C473, ASTM D3273, ASTM C1396 and ASTM C630, Firecode Core(Type X), 5/8 inch thick, with tapered and wrapped edges. Provide on entire wall where moisture will be present such as toilet rooms, janitor rooms, kitchens, behind new ceramic wall tile and other areas where water will be present. Also provide within 5 feet of all sinks and drinking fountains. USG Model No. WB2390.

B. Regular Firecode Cores Gypsum Wallboard: ASTM C1396, ASTM C840, 5/8 inch thick, Firecore Core(Type X), maximum permissible length; ends square cut, tapered edges. USG Model No.

WB1473.

2.03 ACCESSORIES

A. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board; "Acoustical Sealant" manufactured by Tremco.

B. Corner Beads: Fine mesh expanded metal wing type, zinc coated in conformance with ASTM A525, G90 coating designation.

C. Edge Trim: GA 216; Type "J" bead.

D. Joint Materials: GA 216; reinforcing tape, joint compound, adhesive, water, and fasteners.

E. Fasteners: General provide specific fasteners required for fire rated assemblies.

1. Use Type S screws for gypsum board attachment to light steel framing.

2. Use Type S screws for gypsum board attachment to 20 gauge and heavier steel framing.

3. Use Type W screws for gypsum board attachment to wood framing.

4. Use Type G screws for gypsum board attachment to gypsum board.

5. Use Annular ring nails, conforming to ANSI/ASTM C514, sufficient length to provide a minimum of 3/4 inch penetration into framing members.

F. Setting Compound: Durabond as manufactured by USG. For use at all locations where gypsum board is in direct contact with concrete curbs.

G. Electrical Box Sealer: Lowry's "Electrical Box Pads", 6" x 8" x 1-1/8" resilient sealer pads.

H. Provide new stainless steel duplex outlet covers and light switch covers at all existing and new devices. No plastic covers accepted. Minimum (2) light switch covers per room and (6) electrical outlet covers per room.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify that site conditions are ready to receive work and opening dimensions are as indicated on shop drawings.

B. Check framing for accurate spacing and alignment.

C. Do not proceed with installation of wallboard until deficiencies are corrected and surfaces to receive wallboard are acceptable.

D. The Painting Contractor shall not be required to accept the gypsum wallboard installation until after he has applied sealer. At that time he shall inspect the installation and report to the General Contractor, with a letter to the Architect, of any surface damage, defects or uneven walls. Uneven walls shall mean those that are not straight, plumb or of an even, true plane. All such discrepancies shall be the responsibility of gypsum wallboard installer, and shall be connected by him prior to application of further wall decoration.

E. Beginning of installation means acceptance of existing surfaces substrate.

F. At all existing gyp. board surfaces to be refinished as shown on the drawings, Contractor shall rough sand all surfaces prior to skim coat for acceptable adhesion.

3.02 ACOUSTICAL ACCESSORIES INSTALLATION

A. Install acoustical sealant within partitions in accordance with manufacturer's instructions.

B. Install resilient sealer pads over backs and sides of electrical junction boxes.

3.03 GYPSUM BOARD INSTALLATION

A. Prior to installation of any gypsum board product, Contractor shall review locations of all toilet room accessories with owner as required by Section 10800 to place all backing required.

B. Install gypsum board in accordance with GA 216 and ASTM C840.

C. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing.

D. Use screws when fastening gypsum board to metal furring or framing, or 1x framing.

E. Use screws when fastening gypsum board to wood furring or framing.

F. Fasteners for all vertical gypsum boards shall be placed at 8” at the perimeter and 12” in field U.O.N. on drawings.

G. Treat cut edges and holes in moisture resistant gypsum board with sealant.

H. Place control joints consistent with lines of building spaces as indicated by Architect.

I. Place corner beads at external corners. Use longest practical length. Place edge trim where gypsum board abuts dissimilar materials.

J. Contractor shall provide new mud ring extensions for all electrical switch and outlets to allow device to flush with face of new gypsum board surface.

K. At all locations where gypsum board extends past bottom sill plate and contacts face of curb, apply Durabond product to back side of gypsum board per manufacturer’s recommendations to secure to face of concrete curb. Provide moderate pressure and temporary nailing or shoring to ensure adequate bond.

3.04 JOINT TREATMENT AND FINISH TEXTURE

A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.

C. At toilet room areas, kitchen areas and custodial rooms finish smooth, ultralite orangepeel texture. Gyp. board shall be finished to Level 5 as described the USG Corporation. Where existing gypsum board remains in toilet rooms, kitchens and custodial rooms it shall be skim-coated as required to match adjacent new gypsum board. Existing and/or new ceiling system shall be skimmed to match Level 5 finish for consistent finish from wall to ceiling. Contractor shall remove and reinstall all devices/equipment from ceiling as required to provide work as required.

D. All new non-toilet room drywall surfaces to receive finish painting shall be finished to Level 4 as described by the USG Corporation and receive a spray applied, light orangepeel texture; where new gypsum board abuts existing finish to match existing adjacent texture.

3.05 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

3.06 ADJUST AND CLEAN

A. Cleaning and Repair: Clean surfaces that have been spotted or soiled during wallboard application. Contractor shall clean all light fixture lenses, fire alarm devices, electrical outlets, as performing work.

B. Defective Work: Remove and replace defective work which cannot be satisfactorily repaired, at the direction of the Architect, with no additional cost to the Owner.

C. Protection: Protect installed work against damage from other construction work.

3.07 CLEAN-UP

A. Upon completion of the work under this Section, remove all surplus material, rubbish and debris from the premises and leave floors "broom clean".

[END OF SECTION 09 21 16]

SECTION 09 22 00

METAL LATH AND PORTLAND CEMENT PLASTER

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Metal furring and lathing.

B. Three-coat Portland cement plaster system with integral color stucco finish coat.

C. Patching of interior plaster, with smooth finish coat.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 09 90 00: Painting.

1.03 REFERENCES

A. ANSI/ASTM C1063-16c - Installation of Lathing and Furring to Receive Interior and Exterior for Portland Cement-Based Plaster.

B. ANSI/ASTM C91 / C91M-12 - Masonry Cement.

C. ASTM C150 / C150M-16e1 - Portland Cement.

D. ANSI/ASTM C206-14 - Finishing Hydrated Lime.

E. ASTM C847-14a - Metal Lath.

F. ANSI/ASTM C897-15 - Aggregate for Job-Mixed Portland Cement-Based Plasters.

G. ANSI/ASTM C926-16b - Application of Portland Cement-Based Plaster.

H. FS-UU-B-790 - Building Paper, Vegetable Fiber (kraft, waterproofed, water repellant and fire resistant).

1.04 QUALITY ASSURANCE

A. Applicator: Company specializing in cement plaster work with five years experience.

B. Apply cement plaster in accordance with ASTM C926.

1.05 SUBMITTALS

A. Submit product data under provisions of Section 00 72 00.

B. Provide product data on furring and lathing components, plaster materials, characteristics and limitations of products specified, and plastering accessories.

C. Submit manufacturer's installation instructions under provisions of Section 00 72 00.

D. Submit color charts for selection of integral color finish coat from manufacture’s standard range of a minimum of twelve colors. (Note that the plaster is also required to be painted under Section 09900).

E. Submit sample of selected color and texture to match existing finish.

1.06 PRODUCT HANDLING

A. Delivery, storage and handling in accordance with provisions of Section 00 72 00.

1. Deliver manufactured products to job site in their original unopened containers with labels intact and legible at the time of use.

2. Do not permit scattering of materials or equipment but use necessary means to ensure neatness of the site and structure at all times.

3. Perform cleaning of tools and equipment only in the area designated for that purpose.

B. Protection: Use means necessary to protect lath and plaster materials before, during and after installation and to protect the installed work and materials of other trades.

C. Replacements: In the event of damage, immediately make repairs and replacements necessary to the approval of the Architect and at no additional cost to Owner.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Do not apply plaster when substrate or ambient air temperature is less than 50 degrees F. nor more than 90 degrees F. If freezing is expected, do not apply plaster beyond period of day necessary for hydration.

B. Maintain minimum ambient temperature of 50 degrees F. during and after installation of plaster.

C. Protect plaster from uneven and excessive evaporation during any weather.

PART 2 – PRODUCTS

2.01 PLASTER MATERIALS

A. Cement: ASTM C150, Normal - Type I, low alkali; grey color; Portland Cement.

B. Admixture: PRF Admixture as manufactured by Gibco, Inc.

C. Aggregate: In accordance with ANSI/ASTM C897-05(latest edition), except that gradation shall meet the following requirements:

Sieve Size	Percent Retained on each sieve (by weight)	
	Maximum	Minimum
No. 4	0	-
No. 8	10	0
No. 16	40	10
No. 30	65	30
No. 50	90	70
No. 100	100	90-95

1. The sand should not have more than 50% retained between any two consecutive sieves nor more than 25% between Nos. 50 and 100 sieves.

D. Water: Clean, fresh, potable and free of mineral or organic matter which can affect plaster.

E. Pre-Mixed Finish Coat (Stucco): Acrylic modified water-repellent Portland cement base with integral color prepared in accordance with specifications of the Stucco Manufacturers Association. Acceptable Manufacturers: Peerless Stucco, La Habra, or approved equal. Texture to match existing. Color as selected by Architect from Manufacturer's standard range of a minimum of

twelve colors.

F. Acrylic Modifier for Finish Coat: Acryl 60 as manufactured by Thoro Systems Products(BASF).

2.02 FURRING AND LATHING

A. General: All metal to be galvanized steel or zinc alloy.

B. Metal Lath: Hot dipped galvanized, ASTM A653 / A653M, G60 coating designation for use over solid substrate. Provide and install self-furring lath and furring nails.

C. Expanded Metal Lath: ASTM C847.

1. Vertical Walls: Self-furring diamond mesh weighing 3.4 pounds per square yard, with evenly spaced furring nails to hold lath 1/4 inch away from substrate. Insure self-furring ribs have not been collapsed during shipping and installation. Lath must maintain a ¼ inch clearance from substrate.

2. Horizontal Areas: 3/8 inch Rib Lath: 3.4 pounds per square yard, fabricate in herringbone mesh pattern with 3/8 inch deep ribs for use at suspended plaster ceilings and soffits.

D. Building Paper: FS-UU-B-790, Style 2, Grade D.

E. Fasteners: Provide types and sizes required in CBC, 2016 edition, Table 2507.2. Lath on solid substrates to be attached with furring nails.

F. Metal Accessories: General: Minimum 26-gauge galvanized steel or zinc alloy, perforated or expanded flanges as manufactured by USG, Clark Western, Keene/Metelex or approved equal. Use longest possible length; sized and profiled to suit application. Other special products, shapes and sizes as identified in the drawings.

1. Corner beads: Small-nose type.

2. Casing Beads: No. 66 square edge.

3. Expansion Screed: Accordion profile,: Clark Western #XJ15 unless special shapes are detailed.

4. Sill Screed: Clark Western No. 7 Foundation sill screed.

5. Soffit Vent Screed: Clark Western, 26 GA., perforated soffit vent of profile indicated.

6. Corner Reinforcement: Cornerite, minimum 1.75-pounds per square yard expanded metal lath with minimum 2-inch legs.

7. Strip Reinforcement: For reinforcing joints of dissimilar materials and diagonal reniforcement at opening corners, minimum 1.75-pounds per square yard.

8. Woven Glass Fiber Fabric: Perma Glas-Mesh Corporation's #207A, 6 inches wide, adhesive backed, 10x10 mesh.

2.03 CEMENT PLASTER MIXES

A. Mix and proportion cement plaster as follows:

1. Scratch coat proportions: One part Portland cement, 4 parts aggregate and 3 ounce PRF admixture. Provide glass fiber reinforcing fibers equal to Fibermesh 150-e3 as manufactured by Propex in quantities as recommended by manufacturer to control cracking.

2. Brown coat proportions: One part Portland cement, 5 parts aggregate, and 3 ounces PRF admixture.

B. Mix only as much plaster as can be used in one hour.

C. Mix materials dry, to uniform color and consistency, before adding water.

D. Protect mixtures from frost, contamination, and evaporation.

E. Do not retemper mixes after initial set has occurred.

2.04 PATCHING MATERIAL

A. 2" wide self-adhering nylon tape.

PART 3 – EXECUTION

3.01 INSPECTION

A. Verify that surfaces and site conditions are ready to receive work.

B. Inspect the installed work of other trades and verify that such work is complete to the point work of this section may begin.

C. Verify that substrate is plumb, level, square and aligned.

D. Report in writing conditions which might adversely affect the performance of installed lath and plaster to the General Contractor with a copy to the Architect.

E. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Protect surfaces near the work of this Section from damage or disfiguration.

B. Saw cut back all existing plaster, careful nor to damage existing building paper, to accommodate 6” lap with new building paper.

3.03 INSTALLATION - LATHING MATERIALS

A. Install metal plaster bases and accessories in conformance with CBC, 2016 edition, Section 2507 and ANSI C1063.

B. Apply two layers of building paper underlayment, weatherlap edges 2 inches minimum horizontal and 6 inches minimum vertical laps. Continue building paper minimum 6 inches around inside and outside corners.

C. Attach lath to wood supports using nails at maximum six inches on center.

D. Continuously reinforce internal angles with corner mesh, except where the metal lath returns 3 inches from corner to form the angle reinforcement. Fasten at perimeter edges only.

E. Place external angle with mesh at corners. Fasten at outer edges only.

F. Place strip mesh diagonally at corners of lathed openings. Secure rigidly in place.

G. Place 4 inch wide strips of glass fiber mesh over scratch coat centered on point of corner at doors, windows, recesses, and other angular openings in building wall. Extend minimum 8 inches

diagonally from point of corner.

H. Place casing beads at terminations of plaster finish. Butt and align ends. Secure rigidly in place.

I. Install accessories to lines and levels.

J. Install expansion screeds over all building joints and at intervals recommended by the Lath and Plaster Bureau, and where shown.

3.04 PLASTERING

A. General: When complete, plaster surfaces shall be flat, true to plane, free from defects and shall be uniform in texture.

B. Apply plaster in accordance with ASTM C926.

C. Apply scratch coat to a nominal thickness of 3/8 inch over metal reinforcement. Cover metal reinforcement.

1. After application, lightly score scratch coat horizontally.

2. If brown coat cannot be applied within 4 hours, keep scratch coat moist for 48 hours.

D. Apply brown coat to a nominal thickness of 3/8 inch over scratch coat. Rod brown coat straight and true in all directions.

E. Moist cure brown coat for minimum 14 days. Areas shall be thoroughly moistened by use of a fine mist at a minimum of three times daily and as may be required due to weather conditions, per the Lath and Plaster Bureau recommendations.

3.05 STUCCO FINISH

A. Dampen brown coat evenly before applying finish coat.

B. Mix integrally colored manufactured stucco finish with solution of 1 part acrylic modifier and 3 parts water. Use only sufficient solution to produce plastic mortar. Apply entire panels of finish coat without joints with necessary joints occurring at natural breaking points and control joints.

C. Apply machine applied finish coat approximately 1/8 inch thickness.

D. Texture: Best match existing adjacent.

3.06 STUCCO PATCHING AT WALL CRACKS

A. Scrape existing finish smooth a minimum of 4" on each side of crack. Acid wash areas stained due to water damage.

B. Apply nylon tape over full length of crack.

C. Apply bonding agent over entire area to receive new finish coat of stucco.

D. Apply stucco finish coat over area, matching existing. Extend evenly into existing wall finish.

3.07 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 5 feet, properly meeting adjacent surfaces and materials.

3.08 CLEANING

A. Remove plaster and protective materials from control and expansion joints, perimeter beads and adjacent surfaces. Remove stains that would adversely affect subsequent finishes on plaster.

[END OF SECTION 09 22 00]

SECTION 09 30 13

CERAMIC TILE WORK

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Ceramic tile wall and base finish using the thin-set application method TCA W242 U.O.N.

B. Ceramic tile repair work.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 07 90 00: Joint Sealers.

C. Section 09 21 16: Gypsum Board.

D. Section 09 96 56: Epoxy Flooring and Base System.

1.03 REFERENCES

A. ANSI/TCA A118.4 - Latex-Portland Cement Mortar.

B. ANSI/TCA A137.1 - Specifications for Ceramic Tile.

C. TCA (Tile Council of America) - Handbook for Ceramic Tile Installation.

D. ASTM C144-11 - Aggregate for Masonry Mortar.

E. ASTM C150 /C150M-16e1 - Portland Cement.

F. ASTM C171-16 - Sheet Materials for Curing Concrete.

G. ASTM C226-12 - Asphalt-Saturated Organic Felt used in Waterproofing.

H. ISO 13007 – Standards for ceramic tiles, grouts and adhesives.

1.04 SUBMITTALS

A. Submit shop drawings indicating tile layout, perimeter conditions, junctions with dissimilar materials, thresholds, and setting details.

B. Submit product data under provisions of Section 00 72 00.

C. Submit product data indicating material specifications, characteristics, and instructions for using adhesives and grouts.

D. Submit samples under provisions of Section 00 72 00. Provide existing tile sample with new sample for comparison at patch repair work.

E. Submit manufacturer's installation instructions under provisions of Section 00 72 00.

F. Submit maintenance data under provisions of Section 00 72 00.

G. Include recommended cleaning and stain removal methods, and cleaning materials.

1.05 QUALITY ASSURANCE

A. Conform to ANSI/TCA A137.1

B. Conform to TCA Handbook for Ceramic Tile Installation, latest edition.

1.06 QUALIFICATIONS

A. Manufacturer: Company specializing in the manufacture of products specified in this Section with minimum three years experience.

B. Installer: Company specializing in applying the work of this Section with minimum three (3) years' experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site under provisions of Section 00 72 00.

B. Store and protect products under provisions of Section 00 72 00.

C. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not install adhesives in a closed, unventilated environment.

B. Maintain 50 degrees F during installation of mortar materials.

PART 2 – PRODUCTS

2.01 MANUFACTURERS - TILE

A. DAL-TILE

B. AMERICAN OLEAN

C. Substitutions: Under provisions of Section 00 72 00.

2.02 TILE MATERIAL

A. Repair work: Ceramic Tile to match existing size, texture and color. If no matching color is available, Architect will make a selection from the tile manufacturer's full range of colors.

B. New Ceramic Wall Tile: ANSI/TCA A137.1, conforming to the following:

Size	4.25" x 4.25" x ¼"
Edge	Cushioned
Surface Finish	Semi-Gloss-walls, Matte Glazed-floor, Smooth
Color	As selected by Architect from Manufacturer's full range of colors and finish textures. Field Color within color groups 1 and 2. Accent Color within color groups 3 and 4. (See Color Scheme Schedule Below.)

C. New Ceramic Tile Wall Base: Shall match wall tile and where new epoxy flooring and base system is being installed, new ceramic tile base shall be un-glazed type for full height of epoxy base to promote adhesion of epoxy system.

D. New Ceramic Floor Tile: Typically not used. For District Signature Projects, floor tile requires District approval.

2.03 ADHESIVE MATERIALS

A. Latex White Multi-Mastic Type 2 (Laticrete 15) for walls, ANSI A136.1.

B. MAPEI, Type 1 Mastic-ANSI A136.1 and ISO 13007; DT1E.

C. Ardex D-14.

2.04 GROUT MATERIALS

A. Wall Grout: 100% solids epoxy, Laticrete SpectraLock 2000 IG or Laticrete SpectraLOCK PRO Grout. Color to be Bright White.

B. MAPEI; Kerapoxy - ANSI A118.3 and ISO 13007; RG.

2.05 GROUT MIX

A. Mix and proportion pre-mix grout materials in accordance with manufacturer's instructions. Grout shall be manufactured by Laticrete International, Inc. Colors as selected by Architect.

2.06 ACCESSORIES

A. Cleavage Membrane: ASTM C226 No. 15 asphalt saturated felt or ASTM C171 4 mil. thick polyethylene film.

B. Reinforcing Mesh: 2x2 inch size weave of 16/16 wire size; welded fabric, galvanized. Conform to ASTM A82 & A185.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive Work.

B. Beginning of installation means installer accepts condition of existing substrate.

3.02 PREPARATION

A. Protect surrounding work from damage or disfiguration.

B. Vacuum clean existing substrate and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Apply sealer to surfaces as recommended by adhesive manufacturer.

3.03 INSTALLATION

A. All ceramic tile floor slopes and cross slopes shall be a maximum of 1.5% and minimum of .5% slope.

B. Install all tile in accordance with TCA Handbook, latest edition, for Ceramic Tile Installation.

C. Request tile pattern from Architect if not shown. Do not interrupt tile pattern through openings.

D. Cut and fit tile tight to penetrations through tile and provide caulk joint. Form corners and bases neatly. Align floor, base, and wall joints.

E. Place tile joints uniform in width. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

F. Sound tiles after setting and replace any hollow units.

G. Allow tile to set for a minimum of 48 hours prior to grouting.

H. Provide control joints around all dissimilar materials, penetrations, transition at wall to ceiling and walls to floor, inside corners, over existing building joints and in field at TCA recommended intervals. All control joints shall extend through setting bed and be caulked with sanded sealant to match grout joints.

I. Jointing Pattern at Interior Corners: Unless otherwise shown, tile color shall not wrap at interior corners. Start with alternate color to not interrupt pattern. See pattern detail in drawings for pattern reference.

3.04 CLEANING

A. Clean work under provisions of 00 72 00.

B. Clean tile surfaces.

3.05 PROTECTION

A. Protect finished installation under provisions of Section 00 72 00.

B. Do not permit traffic over finished floor surface.

[END OF SECTION 09 30 13]

SECTION 09 53 00

SUSPENDED ACOUSTICAL CEILINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system and perimeter trim.

B. Acoustical panels.

C. Non-fire rated assembly

1.02 RELATED SECTIONS

A. General Conditions.

B. Division 22: Mechanical.

C. Division 26: Electrical.

1.03 REFERENCES

A. ASTM C635 / C635M-13a - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings.

B. ASTM C636 / C636M-13 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

C. ASTM E580 / E580M-14 - Practice for Application of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Requiring Seismic Restraint.

D. ASTM E1264-14 - Classification of Acoustical Ceiling Products.

E. Ceilings and Interior Systems Contractors Association (CISCA) - Acoustical Ceilings: Use and Practice.

F. UL - Fire Resistance Directory and Building Material Directory.

G. Division of the State Architect - Interpretations of Regulations, IR 25-5 - Metal Suspension Systems for Lay-in Panel Ceilings.

1.04 SYSTEM DESCRIPTION

A. Suspension system to rigidly secure acoustical ceiling system including integral mechanical and electrical components with a maximum deflection of 1/360.

1.05 SUBMITTALS

A. Submit under provisions of Section 00 72 00.

B. Shop Drawings: Indicate grid layout and related dimensioning, junctions with other work or ceiling finishes, interrelations of mechanical and electrical items related to system.

C. Product Data: Provide data on main grid system components and acoustical units.

D. Samples: Submit two samples 6 x 12 inch in size illustrating material and finish of acoustic units.

E. Samples: Submit two samples each, 12 inches long, of suspension system main runner, cross runner and edge trim.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.06 QUALIFICATIONS

A. Grid Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience and pre-approved by the Division of the State Architect (DSA).

B. Acoustical Unit Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

C. Applicator: Company specializing in performing the work of this section with minimum three years documented experience. Applicator shall be familiar with DSA suspended grid system requirements.

1.07 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

1.08 SEQUENCING

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust-generating activities have terminated, and overhead work is completed, tested, and approved.

B. Install acoustic units after interior wet work is dry.

1.09 EXTRA MATERIALS

A. Furnish under provisions of Section 00 72 00.

B. Provide 2 percent extra panels to Owner.

PART 2 – PRODUCTS

2.01 MANUFACTURERS - ACOUSTIC UNITS

A. USG Interiors, Inc.

B. Armstrong Contract Interiors.

C. Chicago Metallic.

D. Substitutions: Under provisions of Section 00 72 00.

2.02 SUSPENSION SYSTEM MATERIALS

A. Non-fire Rated Grid: ASTM C635, heavy-duty, exposed "tee"; components die cut and interlocking.

B. Metal Grid Materials: 1-1/2 inch high structural "tee" main and cross members, commercial quality cold rolled steel with coating to meet ASTM C635. Acceptable manufacturers:

	Main Runner Catalog No.	Cross-Runner Catalog No.

Armstrong	7301D	XL7341
USG Interiors, Inc.	DX26	DX424
Chicago Metallic	200	1204

C. Grid Finish: White.

D. Accessories: Stabilizer bars, clips, splices, edge moldings and hold down clips required for complete suspended grid system.

E. Support Channels and Hangers: Galvanized primed steel; size and type to suite application and to meet seismic requirements, and ceiling system flatness requirements specified under 1.04 hereinbefore.

2.03 MANUFACTURERS - ACOUSTICAL UNITS

A. Armstrong, Product: Ultima High NRC, Lay-In.

B. USG Interiors, Inc.: Pebbled Panels - 4800.

C. Substitutions: Under provisions of Section 00 72 00.

2.04 ACOUSTIC UNIT MATERIALS

A. Acoustic Panels:

1. Size: 24 x 48 inches.

2. Thickness: 7/8 inches.

3. Composition: Wet-formed Mineral Fiber with DuraBrite acoustical membrane

4. Light Reflectance: 0.87.

5. NRC: 0.80

6. CAC: 35 minimum.

7. Flame Spread: 25 minimum, Class A.

8. Smoke Developed Index: 50 minimum.

9. Edge: Square cut.

10. Surface Color: White.

11. Surface Finish: "Fine Fissured”, or approved equal per facility design standard.

12. Exposed Grid Surface Width: 15/16 inches.

2.05 ACCESSORIES

A. Touch-up Paint: Type and color to match acoustical units and grid.

B. Edge Trim at Acoustical Tiles: PVC channel, manufacturer's standard. Color to match grid.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that layout of hangers will not interfere with other work, either new or existing.

3.02 INSTALLATION - LAY-IN GRID SUSPENSION SYSTEM

A. Install system in accordance with ASTM C636 / C636M, DSA IR 25-5 and as supplemented in this section.

B. Install system capable of supporting imposed loads to a deflection of 1/360 maximum.

C. Install after major above ceiling work is complete. Coordinate the location of hangers with other work.

D. Locate system on room axis according to reflected ceiling plan. At infill areas within existing grid, layout as identified on the reflected ceiling plan.

E. Hang suspension system impendent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, provide trapeze or other supplementary support members at obstructions to main hanger spacing. Provide additional hangers, struts or braces as required at all ceiling breaks, soffits or discontinuous areas. Hanger wires that are more than 1 in 6 out of plumb are to have counter-sloping wires.

G. Flush or recessed light fixtures and air terminals or services weighing less than 56 pounds may be supported directly on the runners of a heavy duty grid system but, in addition, they must have a minimum of two 12 ga. slack safety wires attached to the fixture at diagonal corners and anchored to the structure above. All 4 ft. x 4ft. light fixtures must have slack safety wires at each corner.

H. All flush or recessed light fixtures and air terminals or services weighing 56 pounds or more must be independently supported by not less than four taught 12 ga. wires each attached to the fixture and to the structure above regardless of the type of ceiling grid system used.

I. The four taught 12 ga. wires including their attachment to the structure above must be capable of supporting four times the weight of the unit.

J. Do not eccentrically load system or produce rotation of runners.

K. Install edge molding at intersection of ceiling and vertical surfaces using longest practical lengths without splices. Miter all corners. Provide edge molding at all junctions with other interruptions.

L. Attach all light fixtures and ceiling mounted air terminals or services to the ceiling grid runners to resist a horizontal force equal to the weight of the fixtures.

M. Separate all ceiling hanging and bracing wires at least 6 inches from all unbraced ducts, pipes, conduits, etc. It is acceptable to attach lightweight items such as single electrical conduit not exceeding 3/4 inches nominal diameter to hanger wires using connectors acceptable to DSA.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Lay direction patterned units one way with pattern parallel to the longest room axis. Fit border trim neatly against abutting surfaces.

D. Install units after above ceiling work is complete and accepted.

E. Install acoustical units level, in a uniform plane, and free from twists, warps and dents.

F. Cut panels to neatly fit irregular grid and perimeter edge trim.

G. Install hold-down clips to retain panels tight to grid system within 10 feet of an exterior door.

H. At all ceiling attachments for suspended lights where cable has an escutcheon that conflicts with tegular ceiling tiles, contractor shall neatly score acoustic panel to all tile to sit fully in t-bar grid. Paint raw edge of tile to match tile face color.

3.04 ERECTION TOLERANCES

A. Maximum variation from flat and level surface: 1/8 inch in 10 feet.

B. Variation from plumb of grid members caused by eccentric loads: Two degrees maximum.

[END OF SECTION 09 53 00]

SECTION 09 65 00

RESILIENT FLOORING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Vinyl Composition Tile and game stripping in Multi-purpose rooms.

B. Resilient sheet vinyl flooring.

C. Resilient accessories.

D. Subfloor testing and preparation.

E. Installation of vapor retarder.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 03 30 00: Cast-in-Place Concrete

C. Section 06 10 00: Rough Carpentry

D. Section 07 26 00: Vapor Retarders.

E. Section 09 21 16: Gypsum Board Systems.

1.03 REFERENCES

A. FS L-F-1641 - Floor Covering, Translucent or Transparent Vinyl Surface, with Backing.

B. FS L-F-475A - Floor Covering, Vinyl Surface (Tile and Roll), with Backing.

1.04 QUALITY ASSURANCE

A. Flooring Contractor Installer Qualifications:

1. Flooring Contractor to be an established firm experienced in the installation of the specified product and shall have access to all manufacturers' required technical, maintenance, specifications and related documents.

2. Floor covering installer must be factory trained and certified for the installation of the specific products being installed.

3. Installer to provide project inspector proof of certification prior to starting work.

4. Certified installer must be present on job site while work is in progress.

B. Pre-Floor Covering Installation Meeting:

1. Contactor to notify Construction Manager with a minimum of 5-days notice when anticipated to be ready for pre-floor covering installation meeting. (After subfloor preparation is complete and ready for floor covering installation.)

2. Contractor, installer and manufacturer representative are required to attend pre-floor covering meeting. Contractor is responsible for coordinating and scheduling their

attendance.

3. Construction Manager will schedule meeting with Contractor team, Project Inspector, and Architect.

4. Purpose of Meeting: To review subfloor preparation, verification of readiness for floor covering installation and use of correct products, verification of the acclamation of correct finish materials and review installation requirements.

C. Manufacturer's Field Services:

1. Manufacturer representative to attend the "Pre-Flooring" meeting.

2. Upon Owner or Architect's request, and with at least 72 hour notice, provide manufacturer's representative site visit(s) for inspection of product installation.

3. At Owner's request manufacturer representative to attend operation and maintenance training meeting for Owner's custodial staff prior to acceptance of floor covering installation.

D. Testing Laboratory Qualifications:

1. Certified, bonded, qualified and experienced agency to perform pH and moisture vapor emission tests.

1.05 SUBMITTALS

A. Provide a complete submittal package with all components required within this section. Submit per Section 00 72 00.

1. Product Data: Provide product data describing physical and performance characteristics, sizes, patterns, colors, material safety data sheets and manufacture's installation instructions for all proposed products.

2. Shop Drawings:

a. Provide a floor plan indicating all proposed seam locations.

b. Provide a game stripping plan indicating court layouts and colors.

3. Samples:

a. Submit samples for color selection illustrating color and pattern for floor material with samples of matching welding rod seams, rubber base and transition material proposed for installation.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit cleaning and maintenance data under provisions of Section 00 72 00.

B. Include maintenance procedures, recommended maintenance materials, and suggested schedule and products for cleaning, stripping, and re-waxing.

C. At the request of the Owner, provide in-service training with Owner's custodial staff prior to acceptance of flooring for proper care and maintenance of floor covering.

1.07 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with

identification labels intact.

B. Storage and Protection: Store materials protected for exposure to harmful weather conditions and at a temperature and humidity conditions recommended by manufacturer. Materials should be stored in areas that are fully enclosed, weather tight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 72 hours prior to, during and after installation.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65ºF (18ºC) and a maximum temperature of 100ºF (38ºC) [85ºF (29ºC)] for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55ºF (13ºC) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

B. Prior to testing for moisture vapor emission rate, space shall be enclosed, fully weather-tight, wet-work in space shall be completed and nominally dry, work above ceilings finished. The test site should be at the same temperature and humidity expected during normal use.

C. Maintain lighting at a minimum uniform level of 50 or more foot candles in areas where the floor system is being installed.

1.09 CONCRETE SUBFLOOR TESTING

A. The Contractor shall be responsible for conducting calcium chloride test. Three (3) tests are required for the first 1,000 square feet and one additional test for every 1,000 square feet thereafter to ensure concrete moisture emissions do not exceed manufacturer's requirements for different product types specified under this section per 1,000 square feet within a 24-hour period for areas to receive linoleum.

1. F1869-98 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride. This test method covers the quantitative determination of the rate of moisture vapor emitted from below-grade, on-grade, and above-grade (suspended) concrete floors.

B. The Flooring Contractor shall verify in writing to the Owner, a minimum of thirty (30) days prior to scheduled resilient flooring installation, the following substrate conditions:

1. Moisture: Initial emission rate, as tested with a calcium chloride test kit, per ASTM F1869-16 requirements.

2. Alkalinity: pH level.

C. Moisture and /or Alkalinity Readings:

1. New Construction (New Concrete Slab)

a. If the Contractor's test results indicate that the slab moisture and/or alkalinity readings are below those of flooring manufacturer's requirements, the Owner's representative will initiate independent testing to confirm results and will initiate additional testing using petrographic analysis to determine if the Water Cement Ratio and sufficient hydration has taken place.

1) Once it is determined that the Specifications were followed in their entirety, water/cement ratio (as specified), and or the concrete surface has been adequately hydrated; then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in section 07 26 00 that were not installed.

2. Modernization Construction (Existing Concrete Slab)

a. If the Contractor's test results indicate that the slab moisture and/or alkalinity readings are below those of flooring manufacturer's requirements, the Owner's representative will initiate independent testing to confirm results.

1) If the independent test results do not substantiate the Contractor's findings, then the Contractor will be directed to proceed with the Vaper Retarder installation and the retesting cost will be back-charged to the contractor.

2) If the independent test results confirm the Contractor's findings, then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in section 07 26 00 that were not installed.

1.10 EXTRA MATERIALS

A. Provide a minimum of 40 sq ft of each type and color of flooring and 10 lineal feet of base and transition pieces of each material and color specified or 2 % whichever is greater.

B. Provide 1-year of all required maintenance products commencing on the recordation date of the Notice of Completion. Maintenance products are to be clearly identified and left on site in area designated by District representative.

1.11 WARRANTY

A. Installation Warranty: Two (2) year installation warranty commencing on recordation date of the Notice of Completion.

B. Manufacturer's Warranty: Five (5) year manufacturer warranty commencing on recordation date of the Notice of Completion.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Vinyl Composition Tile, General: ASTM F1066, Coefficient of Friction per ASTM D2047 meets recommended value of 0.6. Composition 1, 12 inch x 12 inch x 1/8 inch gauge. Pattern and color to match existing at repair areas or as selected by Owner Representative from Manufacturer's standard range for new or replacement floors.

1. Armstrong Excelon.

2. Azrock Cortina.

3. Approved equal.

B. Sheet Vinyl Flooring: General: ASTM 1913; Coefficient of Friction per ASTM D2047 meets recommended value of 0.6. 6 foot width; .080 inch (2mm) overall gauge; self coving base, color as selected by Owner Representative from Manufacturer's standard range with matching weld rod for fully welded seams. Use at interior spaces where water is present.

1. Armstrong, MEDINTECH homogeneous

2. Approved equal.

C. Rubber Wall Base: General: FS-SS-W-40, Type 1 with matching end stops. 4" high and 1/8 inch

gauge. No manufactured corners.

1. Burke Industries, Type TS.

2. Flexco Floors, Wallflowers Series.

3. Roppe Rubber Corp, Pinnacle Series.

4. Approved equal.

D. Accessories:

1. Resilient Edge Strips: 1/8 inch thick, tapered or bullnose, minimum of 1 inch wide, color to be selected.

   a. Burke Mercer, Carpet to Resilient Transition, #152

   b. Johnsonite, Adaptor, CTA-XX-A

   c. Or approved equal.

2. Adhesive: Waterproof, EPA acceptable and as recommended by manufacturer.

3. Primer: Non-staining type as recommended by flooring manufacturer.

4. Leveling and Patching Compounds: Latex type as recommended by flooring manufacturer.

5. Metal Trim Cap: Provide at top edge of sheet vinyl cove.

6. Sealer and Wax wear coats: As recommended by manufacturer.

E. Underlayment: Provide “Halex Plywood Underlayment” as manufactured by Halex Corporation. Thickness shall be ¼” minimum.

PART 3 – EXECUTION

3.01 EXAMINATION

A. New Construction (New Concrete Slab)

1. Installer must examine areas and conditions under which resilient flooring and accessories are to be installed and must notify General Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Owner and Architect.

2. The Contractor shall be responsible for conducting calcium chloride test. Three (3) tests are required for the first 1,000 square feet and one additional test for every 1,000 square feet thereafter to ensure concrete moisture emissions do not exceed 5.0 lbs per 1,000 square feet within a 24-hour period for areas to receive flooring. Submit test results a minimum of thirty (30) days prior to scheduled resilient flooring installation to Owner’s representative.

3. Verify that new surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft, and are ready to receive work.

4. Beginning of installation on new substrates means acceptance of substrate. The existing substrates will require as much preparation as necessary to provide proper installation of

new materials.

B. Modernization Construction (Existing Concrete Slab)

1. If existing flooring was determined to be asbestos containing and required abatement, verify that the abatement work has been accepted by the Owner's representative prior to commencing work.

2. The Contractor shall be responsible for conducting calcium chloride test. Three (3) tests are required for the first 1,000 square feet and one additional test for every 1,000 square feet thereafter to ensure concrete moisture emissions do not exceed 5.0 lbs per 1,000 square feet within a 24-hour period for areas to receive flooring. Submit test results a minimum of thirty (30) days prior to scheduled resilient flooring installation to Owner's representative.

3.02 PREPARATION

A. New Construction (New Concrete Slab)

1. Install vapor retarder system (unless verified that moisture content meets requirements of Section 1.09-C).

2. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

3. Apply, trowel, and float filler to leave a smooth, flat, hard surface.

4. Prohibit traffic from area until filler is cured.

5. Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum clean substrate.

6. Apply primer to concrete surfaces.

B. Modernization Construction (Existing Concrete Slab)

1. Remove existing finishes, adhesives and other materials as necessary to properly prepare existing substrates. (Refer to asbestos abatement procedures.)

2. Install vapor retarder system (unless verified that moisture content meets requirements of Section 1.09-C).

3. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

4. Fill low spots, cracks, joints, holes and other defects with filler prior to flooring installation.

5. Apply, trowel, and float filler to leave a smooth, flat, hard surface.

6. Prohibit traffic from area until filler is cured.

7. Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum clean substrate.

8. Apply primer to concrete surfaces.

3.03 VINYL COMPOSITION TILE INSTALLATION

A. Install in accordance with manufacturers' instructions.

B. Spread only enough adhesive to permit installation of materials before initial set.

C. Set flooring in place, press with heavy roller to attain full adhesion.

D. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

E. Install edge strips at unprotected or exposed edges, and where flooring terminates.

3.04 SHEET VINYL INSTALLATION

A. Install in accordance with manufacturers' instructions and recommendations with fully welded seams.

B. Install flooring square with room axis and in accordance with approved shop drawing.

C. Layout sheet goods in a manner to minimize seams and avoid seams in traffic areas. Avoid cross seams, filler pieces and strips. Match edges for color shading and pattern at the seams in compliance with the manufacturer recommendations.

D. Spread only enough adhesive to permit installation of materials before initial set.

E. Apply adhesive using 1/16” x 1/16” x 1/16” square notch trowel and lay flooring into wet adhesive and roll with a 100 pound roller.

F. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

G. Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture, including pipes, outlets, edgings, thresholds, nosing and cabinets

H. Install edge strips at unprotected or exposed edges, and where flooring terminates.

I. Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.

J. Adhere flooring to prepared substrate without producing open cracks, voids, raising and puckering at joints, telegraphing to adhesive spreader marks, or other surface imperfections in completed installation

K. Fully fuse all seams with color coordinated welding rod.

3.05 INSTALLATION – INTEGRAL COVED BASE

A. Install all sheet vinyl flooring with integral coved based with backer rod at cove. Install coved base on entire wall perimeter including toe spaces and open ends of cabinets. Set in adhesive as recommended by the manufacturer. All joints shall be plumb, flush, mitered, tightly fitted and inconspicuous. Install with metal trim piece.

3.06 INSTALLATION – TOP SET RUBBER BASE MATERIAL

A. Install VCT with resilient wall base on entire wall perimeter including toe spaces and open ends of cabinets. Set all bases in adhesive as recommended by the manufacturer. All joints in bases, shall be plumb, flush, tight and inconspicuous. Seat top edge and back of base firmly against the wall. Wrap base around all outside corners and no seams within 12” of corners. Interior corners shall be mitered and tightly fitted.

3.07 PROTECTION

A. Prohibit traffic on floor finish for 5-days after installation and prior to cleaning.

B. Prohibit traffic on floor for a minimum of 24 hours after sealed and waxed.

C. Protect flooring from damages by other trades prior to owner occupancy.

3.08 INITIAL CLEANING

A. Cleaning: After new floor finish has set for a minimum of 5-days, remove excess adhesive from floor, base, and wall surfaces. Contractor to be responsible for performing initial maintenance requirements based on procedures listed below:

1. Sweep or dust all floors.

2. Scrub floor using a neutral cleaner. Do not remove manufacturer's coating.

3. Rinse floor thoroughly.

4. Apply two (2) coats of sealer. Allow 45 minutes between coats.

5. Apply three (3) coats of wax. Allow 45 minutes between coats.

[END OF SECTION 09 65 00]

SECTION 09 68 00

CARPET

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Broadloom and carpet tile.

B. Integrated walk-off mats

C. Base finish and accessories

D. Subfloor testing and preparation.

E. Installation of vapor retarder.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 06 10 00: Rough Carpentry.

C. Section 07 26 00: Vapor Retarders

D. Section 09 21 16: Gypsum Board Systems

E. Section 09 65 00: Resilient Flooring.

F. Section 09 96 56: Epoxy Floor Systems.

G. Section 32 13 13: Concrete: Subfloor surface.

1.03 REFERENCES

A. ANSI/ASTM E648-15e1 - Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source.

B. ASTM F1869-16 – Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride.

C. California Building Code 11B-302.2 Carpet. Carpet or carpet tile shall be securely attached and shall have a firm cushion, pad, or backing or no cushion or pad. Carpet or carpet tile shall have a level loop, textured loop, level cut pile, or level cut/uncut pile texture. Pile height shall be ½ inch (12.7 mm) maximum. Exposed edges of carpet shall be fastened to floor surfaces and shall have trim on the entire length of the exposed edge. Carpet edge trim shall comply with Section 11B-303.

1.04 QUALITY ASSURANCE

A. Manufacturer, Contractor and Installer Qualifications:

1. Manufacturer: Company specializing in contract flooring with ten-years minimum experience.

2. Flooring Contractor: Company with five years minimum documented experience, approved by manufacturer for the installation of the specified products and shall have access to all manufacturers' required technical, maintenance, specifications and related

documents.

3. Installer:

a. Floor covering installer must be factory trained and certified for the installation of the specific products being installed.

b. Installer to provide project inspector proof of certification prior to starting work.

c. Certified installer must be present on job site while work is in progress.

4. Testing Laboratory:

a. Certified, bonded, qualified and experienced agency to perform pH and Relative Humidity (RH) emission tests.

B. Pre-Floor Covering Installation Meeting:

1. Contactor to notify Construction Manager with a minimum of 5-days notice when anticipated to be ready for pre-floor covering installation meeting. (After subfloor preparation is complete and ready for floor covering installation.)

2. Contractor, installer and manufacturer representative are required to attend pre-floor covering meeting. Contractor is responsible for coordinating and scheduling their attendance.

3. Construction Manager will schedule meeting with Contractor team, Project Inspector, and Architect.

4. Purpose of Meeting: To review subfloor preparation, verification of readiness for floor covering installation and use of correct products, verification of the acclamation of correct finish materials and review installation requirements.

C. Manufacturer's Field Services:

1. Manufacturer representative to attend the "Pre-Flooring" meeting.

2. Upon Owner or Architect's request, and with at least 72-hour notice, provide manufacturer's representative site visit(s) for inspection of product installation.

3. At the Owner's request, manufacturer representative to attend operation and maintenance training meeting for Owner's custodial staff prior to acceptance of floor covering installation.

1.05 SUBMITTALS

A. Provide a complete submittal package with all components required within this section. Submit per Section 00 72 00.

1. Product Data: Provide product data describing physical and performance characteristics, sizes, patterns, colors, material safety data sheets, and method of seaming and manufacture's installation instructions for all proposed products.

2. Shop Drawings:

a. Provide a floor plan indicating all proposed seam locations and integrated walk-off mats. Indicate method of joining seams, and direction of carpet.

3. Samples:

a. Submit samples for color selection illustrating color and pattern for floor material with samples of matching walk-off mats, rubber base and transition material proposed for installation.

b. Submit sample of solvent welded seam.

1.06 OPERATION AND MAINTENANCE DATA

A. Submit cleaning and maintenance data under provisions of Section 00 72 00.

B. Include maintenance procedures, recommended maintenance materials, and suggested schedule and products for cleaning.

C. Provide in-service training with Owner's custodial staff prior to acceptance of flooring for proper care and maintenance of carpet. Also review and provide recommended type of furniture casters and glides.

1.07 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.

B. Storage and Protection: Store materials protected for exposure to harmful weather conditions and at a temperature and humidity conditions recommended by manufacturer. Materials should be stored in areas that are fully enclosed, weather tight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 72 hours prior to, during and after installation.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Store materials for three days prior to installation in area of installation to achieve temperature stability.

B. Maintain minimum 70 F ambient temperature at floor level three days prior to, during, and 24 hours after installation of materials.

C. Prior to testing for moisture vapor emission rate, space shall be enclosed, fully weather-tight, wet-work in space shall be completed and nominally dry, work above ceilings finished. The test site should be at the same temperature and humidity expected during normal use.

D. Maintain lighting at a minimum uniform level of 50 or more foot candles in areas where the floor system is being installed.

1.09 CONCRETE SUBFLOOR TESTING

A. Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170, not to exceed manufacturer's requirements (ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes).

B. The Flooring Contractor shall verify in writing to the Owner, a minimum of thirty (30) days prior to scheduled carpet installation, the following substrate conditions:

1. Moisture: Initial emission rate, as tested with in-situ probes, per ASTM F 2170.

2. Alkalinity: pH level. Testing the pH at the surface of a concrete slab must be conducted in accordance with the current version of ASTM F710, not to exceed manufacturer's requirements (ASTM F710 – Standard Practice for Preparing Concrete Floors to Receive

Resilient Flooring.)

C. High Moisture and /or Alkalinity Readings:

1. New Construction (New Concrete Slab)

a. If the Contractor's test results indicate that the slab relative humidity (RH) readings are below those of flooring manufacturer's requirement, then the Owner's representative will initiate independent testing to confirm results and will initiate additional testing using petrographic analysis to determine if the Water Cement Ratio and sufficient hydration has taken place.

1) If it is determined that the Specifications were followed in their entirety, water/cement ratio (as specified), and or the concrete surface has been adequately hydrated; then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in section 07 26 00 that were not installed.

2. Modernization Construction (Existing Concrete Slab)

a. If the Contractor's test results indicate that the slab relative humidity (RH) readings are below those of flooring manufacturer's requirement, then the Owner's representative will initiate independent testing to confirm results.

1) If the independent test results do not substantiate the Contractor's findings, then the Contractor will be directed to proceed with the Vapor Retarder installation and the retesting cost will be back-charged to the contractor.

2) If the independent test results confirm the Contractor's findings, then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in section 07 26 00 that were not installed.

1.08 EXTRA MATERIALS

A. Provide a minimum of 4 square yards of each color installed. In addition, provide all usable scraps one sq. yd. or larger in size. Remnants shall be packaged, identified and delivered to the Owners Representative, who will retain any he chooses for future repairs before they are removed from the job site.

B. Provide a minimum of 10 lineal feet of base and transition pieces of each material and color specified or 2 % whichever is greater.

1.09 WARRANTY

A. Manufacturer's Warranty: Twenty (20) year manufacturer warranty commencing on recordation date of the Notice of Completion.

1. Should carpet, tend to creep or bulge, be defective in manufacturing or show a substantial amount of wear, carpet shall be replaced with new carpeting at no cost to the Owner. Manufacturer to submit written warranty covering the following:

a. 20 Year, non-prorated Guarantee shall also include:

1) No resiliency loss of backing.

2) No zippering.

3) Static protection (will not lose static property—will not give static discharge above 3.5KV).

4) No edge ravel or zippering.

5) Delamination.

6) Surface wear (maintains at least 90% surface pile weight).

7) No staining.

8) Dimensional Stability.

9) Moisture Resistance.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Carpet (Vinyl Cushioned Tufted Textile) and integrated walk-off mats: Color as selected by Owner Representative from Manufacturer's standard range.

1. Tandus Centiva.

a. C&A FlexAire Cushion Aftermath II Series, 6'-0" roll, glue down. Powerbond cushion RS vinyl backing system - Infinity series with fully solvent welded seams.

b. C&A FlexAire Cushion Aftermath II Series, 24"x24" tiles, glue down. Flex-Aire Cushion Modular RS.

c. C&A "Abrasive Action II" walk-off system at all exterior doors in carpeted rooms. Color to be coordinated with carpet color selection.

2. Mohawk Group (Division of Mohawk Industries, Inc.)

a. Mohawk Group "Faculty Remix", Broadloom 12' Material, Unibond Plus Bloc Backing

i. Performance
- 25oz/ sq yd.
- Solution dyed/ Yarn dyed.
- Duracolor premium nylon.

b. Mohawk Group "Rookie & Newcomer", 24" x 24" tiles, EcoFlex NXT Backing

i. Performance
- 25 oz/sq yd.
- Solution Dyed/ Yarn Dyed.
- Duracolor premium nylon– Inherent Stain Resistance.
- Lifetime Warranty.
- Stain Warranty.

c. Mohawk Group "Tuff Stuff II" Walk-Off Carpet Tile, 24"x 24" tiles, at all exterior doors in carpeted rooms. Color to be coordinated with carpet color selection.

i. Performance:
- 30 oz. Face Fiber.
- Duracolor premium Fiber – Inherent Stain Resistance.
- Lifetime Warranty.

- Stain Warranty.

B. Rubber Wall Base: Cove style, conforming to ASTM F 1861 or FS-SS-W-40, Type 1. 4” high and 1/8 inch (3.2mm) gauge. No manufactured corners.

1. Burke Industries.

2. Armstrong.

3. Musson Rubber Co.

4. Roppe Rubber Corp.

5. Approved equal.

C. Resilient Edge and Adapter/Transition Strips: 1/8 inch thick, tapered or bullnose, minimum of 1 inch wide.

1. Roppe

2. Johnsonite

3. Flexco Floors

4. Approved equal.

D. Leveling and Patching Compounds:

1. White premix latex; type recommended by carpet manufacturer. Install as recommended by manufacturer for specific application.

E. Primer: C&A C-36 primer.

F. Adhesives: Low VOC, waterproof, and as recommended by product manufacturer.

PART 3 – EXECUTION

3.01 EXAMINATION

A. New Construction (New Concrete Slab)

1. Installer must examine areas and conditions under which resilient flooring and accessories are to be installed and must notify General Contractor in writing of conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Owner and Architect.

2. Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170, not to exceed manufacturer’s requirements (ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes).

3. Verify that new surfaces are smooth and flat with maximum variation of 1/8 inch in 10 ft, and are ready to receive work.

4. Beginning of installation on new substrates means acceptance of substrate. The existing substrates will require as much preparation as necessary to provide proper installation of new materials.

B. Modernization Construction (Existing Concrete Slab)

1. If existing flooring was determined to be asbestos containing and required abatement, verify that the abatement work has been accepted by the Owner's representative prior to commencing work.

2. Testing for internal relative humidity of concrete slabs must be conducted in accordance with the current version of ASTM F2170, not to exceed manufacturer's requirements (ASTM F2170 – Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using In-Situ Probes).

3.02 PREPARATION

A. New Construction (New Concrete Slab)

1. Install underlayment where flooring is being installed on a wooden subfloor per the manufacturer's instructions.

2. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with manufacturer recommended subfloor filler.

3. Apply, trowel, and float filler to leave a smooth, flat, hard surface.

4. Prohibit traffic from area until filler is cured.

5. Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum clean substrate.

6. Apply primer to concrete surfaces.

B. Modernization Construction (Existing Concrete Slab)

1. Remove existing finishes, adhesives and other materials as necessary to properly prepare existing substrates. (Refer to asbestos abatement procedures.)

2. Install underlayment where flooring is being installed on a wooden subfloor per the manufacturer's instructions.

3. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with subfloor filler.

4. Fill low spots, cracks, joints, holes and other defects with filler prior to flooring installation.

5. Apply, trowel, and float filler to leave a smooth, flat, hard surface.

6. Prohibit traffic from area until filler is cured.

7. Prepare floor substrate to be smooth, rigid, flat, level, permanently dry, clean and free of foreign materials such as dirt, paint, grease, oils, solvent, curing and hardening compounds, sealers, asphalt and old adhesive residue. Vacuum clean substrate.

8. Apply primer to concrete surfaces.

3.03 CARPET INSTALLATION

A. Install in accordance with manufacturers' instructions and recommendations with fully welded seams.

B. Install flooring square with room axis and in accordance with approved shop drawing.

C. Layout roll-goods in a manner to minimize seams and avoid seams in traffic areas. End butt joints shall be kept to a minimum, shall be staggered, and shall occur where approved on detail plan layout. Use the largest sections possible to minimize seams. Avoid cross seams, filler pieces and strips. Match edges for color shading and pattern at the seams in compliance with the manufacturer recommendations.

D. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

E. Scribe, cut, fit flooring to butt tightly to vertical surfaces, permanent fixtures, and built-in furniture, including pipes, outlets, edgings, thresholds, nosing and cabinets.

F. Install edge strips at unprotected or exposed edges, and where flooring terminates.

G. Install flooring on covers for telephone and electrical ducts, and similar items occurring within finish floor areas. Maintain overall continuity of color and pattern with pieces of flooring installed on these covers.

H. Adhere carpet to prepared substrate without producing open cracks, voids, raising and puckering at joints, telegraphing to adhesive spreader marks, or other surface imperfections in completed installation.

I. Fully solvent weld all seams. Seams shall be unnoticeable in finished installation.

J. Verify carpet match before cutting to ensure minimal variation between dye lots.

K. Double cut carpet, to allow intended seam and pattern match. Make cuts straight, true, and unfrayed.

L. Lay carpet on floors with run of pile in same direction as anticipated traffic.

M. Do not change run of pile in any room where carpet is continuous through a wall opening into another room. Locate change of color or pattern between rooms under door centerline.

N. Complete installation shall conform to the Carpet Installation Standard of Carpet and Rug Institute (CRI).

3.03 INTEGRATED WALK-OFF MAT INSTALLATION

A. Install in accordance with manufacturers' instructions and recommendations.

B. Install modular tile like any “dry-back” modular with a full-spread wet adhesive.

C. Installation instructions for C&A Floorcoverings’ Powerbond Non-RS (dry-back) Modules can be used as “reference only.”

D. Three adhesives are offered to install modular tile product based upon application and intended use:

1. #024 Solvent Free Outdoor Adhesive (Tandus SKU/Style # 919)

2. #002 Premium Grade Multi-Purpose Adhesive (Tandus SKU/Style # 920)

3. PS100 Pressure Sensitive Releasable Adhesive (Tandus SKU/Style # 923)

E. Modular tile should be securely attached to the sub-floor in compliance with ADA Accessibility Guidelines, latest edition, for Building & Facilities, Section 4.5.3.

F. Provide integrated walk-off mats at all exterior door location where carpet is indicated to be installed. The walk-off mats shall extend a minimum of the door width plus six inches (6”) and six feet (6’-0”) in the direction of travel or as indicated on the drawings.

3.04 INSTALLATION - BASE MATERIAL

A. Install resilient wall base on entire wall perimeter including toe spaces and open ends of cabinets. Set all bases in adhesive as recommended by the manufacturer. All joints in bases shall be plumb, flush, tight and inconspicuous. Seat top edge and back of base firmly against the wall. Wrap base around all outside corners and no seams within 12” of corners. Interior corners shall be mitered and tightly fitted.

3.05 PROTECTION

A. Prohibit traffic from carpet areas for 24 hours after installation.

B. Protect flooring from damages by other trades prior to owner occupancy.

3.06 FINAL CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage. Remove and dispose of all small scraps, cartons and rubbish upon completion of the work. Remove all loose threads with sharp scissors.

B. Clean carpet of all spots with proper spot remover, and vacuum carpet surfaces.

[END OF SECTION 09 68 00]

SECTION 09 70 00

VINYL WALL COVERING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Vinyl wallcovering on new gypsum board.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 09 21 16: Gypsum Board Systems.

1.03 SCOPE

A. Furnish a vinyl wallcovering as specified in the contract documents.

1.04 SAMPLE

A. Submit a sample of each type and color to be installed for the architect's approval.

1.05 CERTIFICATE OF COMPLIANCE

A. Submit manufacturer's certification that wallcovering furnished meets or exceeds the architect specification requirements.

1.06 WARRANTIES

A. Furnish a written warranty against defective workmanship that may develop within one (1) year from date of installation and 5 years against manufacturing defects.

1.07 PRODUCT DELIVERY STORAGE AND HANDLING

A. Deliver vinyl wallcovering and adhesive to the job site in unbroken or undamaged containers and clearly marked with the supplier's identification label. Store vinyl wall coverings in a flat position to avoid damage to roll ends. Store materials in a clean, dry storage area with temperature maintained above 550F with normal humidity. DO NOT CROSS STACK THIS MATERIAL.

1.08 PROJECT CONDITIONS

A. Areas where wallcovering will be installed shall have a constant minimum temperature of not less than 60 degrees F for at least seven days prior to and throughout installation period and for seven days thereafter.

PART 2 – PRODUCTS

2.01 VINYL WALLCOVERING

A. Manufacturer: Koroseal – Harborweave II

B. Vinyl Wallcovering shall meet Federal Specification CCC-W-408A and the CFFA-W-101-D, Quality Standard for Vinyl Coated Fabric Wallcovering. The wallcovering Type I, Type II or Type III desired shall be specified. The vinyl wallcovering shall contain mildew inhibitors.

1. Total Weight: 21.0 oz PLY

2.	Roll Width:	53/54 in.
3.	Gauge:	9 mils
4.	Fabric:	Osnaburg
5.	Tensile (Minimum):	50 x 55 lb
6.	Tear (Minimum):	25 x 25
7.	Federal Spec:	CCC-W-408A, Type II
8.	CFFA Spec:	CFFA-W-101-D, Type II
9.	Fire Testing:	NFPA 101 Life Safety Code
		NFPA A255 (UL 723, CAN S102M) Tunnel Test Class A Rating
		NFPA 286 Corner Burn Test Meets Requirements for Flame Spread, Smoke Developed and Flashover
		UL Labeled and Listed
10.	Repeat:	Vertical – N/A
		Horizontal – N/A
		Match Information – Random Match, Reverse Hang

2.02 BURNING CHARACTERISTICS

A. The manufacturer shall certify at the time of shipment that the materials furnished meet the published flame spread and smoke development Fire Hazard Classification Rating(s) of those products when tested according to ASTM-E84-16 Tunnel Test.

2.03 UL LABEL

A. All products shall be UL labeled assuring complete compliance with all specifications and requirements through continuous inspection by UL inspectors.

2.04 FIRE DETECTION CHARACTERISTICS

A. The vinyl wallcovering shall contain the Early Warning Effect formulation which provides early warning to potential fire conditions. The vinyl wallcovering shall contain thermoparticulating ingredients which, when heated to approximately 300 degrees F, emit a colorless, odorless, vapor that activates ionization smoke detection when installed according to manufacturer's specifications. Evidence of the Early Warning Effect shall be based on the ASTM E603-13 standards guide for room fire experiments.

2.05 PROTECTIVE COATING

A. The vinyl wallcovering shall have a protective coating applied to its surface to minimize migration of stains into the vinyl and, therefore, offer stain protection from a variety of staining agents and provide greater ease of clean ability.

2.06 ADHESIVE

A. The adhesive used must be manufacturer's recommended adhesive and must contain mildew inhibitors. When applied to 5/8” Type-X gypsum board, A-848-B adhesive is recommended by manufacturer.

2.08 PRIMERS

A. The primer used must be manufacturer's recommended primer.

2.09 GYPSUM BOARD FINISH

A. The recommended finish level before commercial-grade wall covering is applied for final decoration is Level 3. The prepared surface shall be coated with a drywall primer prior to the application of final finishes. See 2.08 Primers.

PART 3 – EXECUTION

3.01 INSPECTION

A. Installer shall inspect all areas and conditions under which vinyl wallcoverings are to be installed. Installer shall notify the contractor and architect in writing of any conditions detrimental to the proper and timely completion of the installation; work will proceed only when conditions have been corrected and accepted by the installer.

B. Substrate shall be checked with a suitable "Moisture Meter.” Moisture shall not exceed 4%.

3.02 SURFACE PREPARATION

A. Wall surfaces shall be free from defects and imperfections that could show through the finished covered surface.

B. Sand-finished plaster shall be smoothed cinder or cement blocks shall be plastered, or otherwise rendered smooth and old wallcoverings shall be removed.

C. For new drywall construction, manufacturer recommended primer should be used before application of wallcovering for ease of future removal when redecorating.

D. Glossy surfaces shall either be sanded to dull surface or a coat of manufacturer's recommended primer applied prior to installation of wallcovering.

E. If there is any evidence of mildew, it must be removed and the wall surface treated to inhibit further mildew growth.

F. All painted surfaces should be evaluated for the possibility of pigment bleed-through. If there is any possibility, a coat of sealer, recommended by the manufacturer, should be applied before application of the wallcovering.

G. Do not install vinyl wallcovering over oil based wood stains as a bleed-through may occur.

3.03 INSTALLATION

A. Wallcovering shall be installed by experienced workers and contractors in strict accordance with the manufacturer's oriented instructions using vinyl wallcovering adhesive recommended by the manufacturer (WHEAT PASTE SHALL NOT BE USED). It is absolutely imperative that installer read the manufacturer's instruction sheet in each roll before installing the vinyl wallcovering. Permanent building light shall be available for installation.

B. Installer before cutting shall examine pattern and color and determine that they are the correct pattern and color as specified.

C. Installer shall install each roll in sequence starting with largest roll number and each strip in same sequence as cut from roll. If pattern is not random, examine for repeat design. Some patterns should be lined up, matched or reversed for best results. If necessary, trim selvage deep enough to assure color uniformity.

D. After application of three strips, an inspection should be made and if there ^re any variations in color or pattern which are felt to be excessive, the wallcovering distributor or manufacturer's representative should be notified for his inspection before any further wallcovering is installed.

E. Always bring material six (6) inches around inside and outside corners being sure to fir into corners to avoid bridging or spanning.

F. The wallcovering should be smoothed to the hanging surface with a sriff bristled sweep brush or a flexible broad-knife to eliminate air bubbles.

G. Remove excess adhesive along finished seam immediately after each wallcovering strip is applied. Use of clean, warm water, a natural sponge and clean towels are recommended for this use. It is very important to change water often to maintain cleanliness.

3.04 CLEAN-UP COMPLETION

A. Upon completion of work, remove surplus materials, rubbish and debris, resulting from the wallcovering installation. Leave areas in neat, clean and order condition.

[END OF SECTION 09 70 00]

SECTION 09 72 00

ACOUSTICAL WALL PANELS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Acoustic Wall Panels.

B. Accessories.

1.02 SUBMITTALS

A. Submit shop drawings showing installation and fastening detail requirements, all in accordance with the manufacturer's installation instructions and procedures.

B. Provide product data on wall panels, describing physical and performance characteristics, sizes, and color.

C. Submit two samples, 12 x 12 inches, illustrating color and texture of material specified under provisions of Section 00 72 00.

D. Submit manufacturer's installation instructions under provisions of Section 00 72 00.

E. Submit test data showing conformance with California Building Code, 2016 edition, Section 803.

1.03 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Store materials for 24 hours prior to installation to achieve temperature stability.

B. Store product in a dry place. Do not let product come into contact with water.

C. If covered, product must be allowed to breathe, so as to prevent moisture condensation.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Tectum Inc.

2.02 ACOUSTICAL WALL PANELS

A. Tectum Fabri-Tough Wall Panel System, color as selected by Architect.

B. Panels, 1" thick, square edge, cloth surface, color as selected by Architect.

C. Incombustibility: Class A/ASTM E-84-16, Flame spread <25 and smoke density <450.

D. CBC Standard 8-2 fire test for non sprinklered areas.

2.03 ACCESSORIES

A. Fasteners and Metal Trim: As recommended by manufacturer for attachment to existing concrete masonry or wood framed walls.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are smooth and flat with maximum variation of 1/8 inch in 10 foot, and are ready to receive work of this section.

B. Beginning of installation means acceptance of existing substrate.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Installation system shall be a concealed spline.

C. Contractor shall remove, relocate and reinstall existing wall mounted items such as conduit, switches, clocks, speakers, outlets, etc. which are in conflict with the acoustic wall panel locations.

D. Contractor shall provide and install extensions for items such as outlet and switch backboxes to remain in place where new acoustical wall panels are to be installed.

E. Cut and trim acoustic wall panels around surface mounted items which are not shown to be or cannot physically be relocated.

[END OF SECTION 09 72 00]

SECTION 09 90 00

PAINTING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Surface preparation

B. Surface finish schedule includes painting of all exposed surfaces, except as otherwise specified or indicated.

C. Painting of all new and existing piping, ductwork, conduit and supports to match interior/exterior paint finishes.

1.02 RELATED SECTIONS (Listing is for the Contractor's convenience and may not be complete.)

A. Section 02 51 33.16: Sandblasting.

B. Section 05 50 00: Metal Fabrications: Shop Primed Surfaces.

C. Section 06 20 00: Finish Carpentry.

D. Section 07 62 00: Sheet Metal Flashing and Trim.

E. Section 07 71 23: Gutters and Related Flashings.

F. Section 08 11 10: Metal Doors and Frames.

G. Section 08 14 00: Flush Wood Doors.

H. Section 09 22 00: Metal Lath and Portland Cement Plaster.

I. Section 09 21 16: Gypsum Wallboard System.

J. Section 09 51 00: Acoustical Ceilings.

K. Section 09 96 23: Graffiti Resistant Coatings

L. Section 22 05 00: Mechanical.

M. Section 26 00 00: Electrical.

1.03 DEFINITIONS

A. Conform to ANSI/ASTM D16-08 for interpretation of terms used in this Section.

B. ASTM D4442-15 - Direct Moisture Content Measurement of Wood and Wood-Base Materials.

1.04 QUALITY ASSURANCE

A. Product Manufacturer: Company specializing in manufacturing quality paints and finish products with five years experience.

B. Applicator: Company specializing in commercial painting and finishing with five years experience.

1.05 REGULATORY REQUIREMENTS

A. Conform to California Building Code for flame/spread/smoke density rating requirements for finishes.

B. Furnish certification that all paint coatings furnished for project work comply with the EPA clean air act for permissible levels of volatile organic content for architectural coatings applied in California as designated by California Air Resources Board (CARB).

1.06 SUBMITTALS

A. Submit product data under provisions of the General Conditions.

B. Provide product data on all finishing products. Product data shall include the paint manufacturers recommended mil thickness application of each coat for each type of paint specified.

C. Submit four brush-out samples 8x10 inch in size illustrating color and sheen selected for each surface-finishing product shown in the finish schedule.

D. Field Sample: Furnish sample of actual paint colors selected on portion of building item to receive paint as directed by Architect, prior to beginning interior and exterior painting.

E. All shop-primed materials will be re-primed in the field with the specified materials as scheduled below.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in manufacturer's original unopened, labeled containers, inspect to verify acceptance.

B. Store and protect products from abuse and contamination.

C. Container labeling to include manufacturer's name, type of paint, brand name, brand code, coverage, surface preparation, drying time, cleanup, color designation, and instructions for mixing and reducing.

D. Store paint materials at minimum ambient temperature of 45 degrees F and a maximum of 90 degrees F., in well-ventilated area, unless required otherwise by manufacturer's instructions.

E. Take precautionary measures to prevent fire hazards and spontaneous combustion.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Provide continuous ventilation and heating facilities to maintain surface and ambient temperatures above 45 degrees F for 24 hours before, during, and 48 hours after application of finishes, unless required otherwise by manufacturer's instructions.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is above 50 percent, unless required otherwise by manufacturer's instructions.

C. Minimum Application Temperatures for Latex Paints: 50 degrees F. for exterior work; 45 degrees F for interior work, unless required otherwise by manufacturer's instructions.

D. Provide lighting level of 80-foot candles measured mid-height at substrate surface.

E. Apply all alcohol-based primers, vanishes, lacquers or other products that produce excessive fumes after school hours or on weekends.

1.09 EXTRA STOCK

A. Provide a one FIVE gallon (unopened) container of each color to Owner.

B. Label each container with color and sheen in addition to the manufacturer's label.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Kelly Moore

B. Pittsburgh Paints.

C. Sherwin Williams.

2.02 MATERIALS

A. Coatings: Ready mixed manufacturers paint. Process pigments to a soft paste consistency capable of being readily and uniformly dispersed to a homogeneous coating.

B. Coatings: Good flow and brushing properties capable of drying or curing free of streaks or sags.

C. Accessory Materials: All other materials not specifically indicated but required to achieve the finishes specified, of commercial quality.

2.03 FINISHES

A. Refer to schedule at end of Section for surface finish schedule. Refer to drawings for finish schedule. Construction Manager to provide Owner selected colors.

B. Product numbers listed are as manufactured by ICI unless indicated otherwise (equivalent products of other manufacturers listed hereinbefore are also acceptable).

C. Sheens shall be as follows:

1. Exterior Surfaces:

a. Wood:

1) Wall Surfaces: Low Sheen. Semi-gloss only where matching existing systems.

2) Overheads: Low Sheen.

3) Trim: Low Sheen. Semi-gloss only where matching existing systems.

b. Stucco/Masonry:

1) Wall Surfaces: Low Sheen. Semi-gloss only where matching existing systems.

2) Overheads: Low Sheen.

c. Metals:

1) All Surfaces: Low Sheen. Semi-gloss only where matching existing systems.

d. Galvanized Surfaces:

1) Match background sheen

e. Window frames:

1) All Surfaces: Match wall sheen.

f. Ductwork:

1) Low Sheen. Semi-gloss only where matching existing systems.

2. Interior Surfaces:

a. Walls:

1) Low-sheen at all spaces except as noted below.

2) Semi-gloss at Kitchens, toilet rooms, custodian rooms.

b. Trim & Casework:

1) Semi-gloss

c. Ceilings:

1) Flat at all spaces except as noted below.

2) Semi-gloss at ceilings at Toilet Rooms, Kitchens, and other “wet” areas.

d. Ductwork:

1) Semi-gloss

D. Contractor shall include in bid to allow for separate walls and ceiling colors. Colors shall be selected by Architect.

PART 3 – EXECUTION

3.01 INSPECTION

A. Carefully examine all surfaces to receive painting. Verify that all new work is acceptable and has been properly prepared in accordance with associated specification section. Field verify existing conditions of all existing surfaces to receive paint finish prior to bid. Provide all necessary surface preparation as required under this section to provide proper finish.

B. Contractor to arrange for Inspector’s verification of proper surface preparation prior to start of painting and between each coat.

C. Measure moisture content of surfaces using an electronic moisture meter. Provide de-humidifiers and heat as necessary to obtain required environmental conditions for interior paint applications. Do not apply finishes unless moisture content of surfaces is below the following maximums:

1. Plaster, Gypsum Wallboard: 18 percent.

2. Interior Located Wood: 15 percent, measured in accordance with ASTM D4442.

3. Exterior Located Wood: 7 percent measured in accordance with ASTM D4442.

D. Beginning of paint application to any new surface means acceptance of surfaces prepared under separate specification section.

3.02 PREPARATION

A. Remove electrical plates, hardware, light fixture trim, and fittings prior to preparing surfaces for finishing.

B. Remove all loose and pealing paints (see exhibit “A” for lead based paint abatement).

C. Correct all defects on existing surfaces including patching holes in walls and ceilings, skimming surfaces, repairing cracks, puttying, sanding, etc. to restore original wall finish and provide a uniform texture. Spot prime all areas of repair.

D. Clean all surfaces thoroughly with TSP or approved cleaning product. Rinse thoroughly and allow to completely dry before coating.

E. Remove or seal marks which may bleed through surface finishes with B-I-N Primer (additional coats may be required).

F. Impervious Surfaces: Remove mildew by scrubbing with solution of tri-sodium phosphate and bleach. Rinse with clean water and allow surface to dry. Repeat process if necessary.

G. New Galvanized Surfaces: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

H. New Shop Primed Steel Surfaces: Sand, scrape and feather all edges. Remove loose primer and rust. Clean surfaces with solvent. Completely re-prime entire surfaces.

I. Existing Metal Surfaces

1. Remove loose primer, paint and rust.

2. Sand, scrape and feather all edges.

3. Clean surfaces with a solvent approved by paint system manufacturer. Solvent shall be compatible with new paint system materials.

4. Completely re-prime entire surfaces.

5. Use an approved primer that will be compatible and warranted by the selected paint manufacturer over any surface that has been previously painted with an oil-base finish.

J. Interior Wood Items: Thoroughly clean all surfaces with suitable cleaner and solvent prior to priming. Repair any damage, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats.

1. At woodwork with transparent finish - nail holes, cracks or defects shall be filled with wood filler tinted to match color of stain.

2. All existing wood that is currently painted is to be repaired, cleaned, primed and repainted. All existing wood that is currently stained is to be repaired, cleaned, re-stained and either lacquered or varnished to match existing finish.

K. Sandblast per Specification Section 02 51 33.16 if necessary to remove all loose, peeling paint or foreign material.

3.03 PROTECTION

A. Protect elements surrounding the work of this Section from damage or disfiguration.

B. Repair damage to other surfaces caused by work of this Section.

C. Furnish drop cloths, shields, and protective methods to prevent spray or droppings from disfiguring other surfaces.

D. All IDF's are to be properly protected in a manner that allows ventilation adequate to prevent damage to equipment. At completion of painting work, all IDF's must be professionally cleaned by an approved technician with a minimum of 3-years experience in computer cleaning.

E. Remove all debris from site and properly dispose of in lawful manner.

F. Do not use storm drain system for clean-up.

3.04 APPLICATION

A. Apply all alcohol-based primers, vanishes, lacquers or other products that produce excessive fumes after school hours or on weekends.

B. Apply products in accordance with manufacturer's instructions. Provide coats in appropriate mill thickness to provide suitable cover. Additional coats may be required to provide an acceptable finish depending on base tint and existing color bleed through.

C. Do not apply finishes to surfaces that are not dry.

D. Apply each coat to uniform finish. Number of coats in schedule are the minimum required, additional coats shall be applied as required to achieve a uniform final finish.

E. Apply each coat of paint slightly darker than preceding coat unless otherwise approved.

F. Sand lightly between coats to achieve required finish.

G. Allow applied coat to dry before next coat is applied.

H. Where clear finishes are required, tint fillers to match wood. Work fillers into the grain before set. Wipe excess from surface.

I. Prime back surfaces of interior and exterior woodwork with primer paint as recommended by manufacturer.

J. Prime back surfaces of interior woodwork scheduled to receive stain or varnish finish with gloss varnish reduced 25 percent with mineral spirits.

K. Interior face of exterior doors to be painted with the "exterior" finish system.

L. All painted text on interior door face shall be uppercase Cooper font, 4 inch high numbers, 3 inch high text.

3.05 FINISHING MECHANICAL AND ELECTRICAL EQUIPMENT

A. Paint interior surfaces of air ducts and convector heating cabinets that are visible through grilles and louvers with one coat of flat black paint, to limit of sight line. Paint dampers exposed behind grilles, to match face panels. Paint all new conduit, pipes and conduit/pipe supports in exposed interior and exterior locations. Paint all new interior and exterior exposed ductwork and ductwork supports.

B. At all locations where new exposed duct work is to be painted, Contractor shall paint duct work at floor level prior to installing on wall. Once painted, protect duct work from overspray and other construction related debris. Ductwork finish shall be smooth and without blemishes. Once installed, carefully touchup any areas scratched during install.

C. Replace electrical plates, hardware, light fixture trim, and fittings removed prior to finishing.

D. Do not paint factory finished mechanical and electrical equipment.

3.06 CLEAN UP

A. As Work proceeds, promptly remove paint where spilled, splashed, or spattered.

B. During progress of Work, maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

C. Collect cotton waste, cloths, and material which may constitute a fire hazard, place in closed metal containers and remove daily from site.

D. Upon completion of the work of this section, remove all surplus material and related debris from the site.

3.07 SCHEDULE - EXTERIOR SURFACES
Descriptions in schedule apply to new and previously painted surfaces. Number of coats listed are a minimum, additional coats may be required to provide suitable uniform finish.

A. Ferrous Metal (Semi-Gloss Enamel) Re-prime all shop primed items in field
1st coat – Rust-Oleum CV740 Primer
2nd and 3rd coats – Devcryl 1448 Acrylic Semi-Gloss Enamel

B. Metal Deck (underside) and Supporting Structural Steel Members
1st coat – Devcryl 1440 DTM Primer/Finish
2nd coat & 3rd coats – Devcryl 1448 Acrylic Semi-Gloss Enamel

C. Galvanized Metal Railings (Gloss Urethane Enamel)
1st coat – Etch and clean with solvent new galvanized finishes
2nd coat – Sierra Performance Metal Max DTM Acrylic Enamel
3rd and 4th coats – Sierra Performance Beyond Gloss Acrylic Enamel

D. Galvanized Metal Non-Railings (Misc. Galvanized metals, underside of metal decking, flashings, etc.) (Semi-Gloss Enamel)
1st coat – Etch and clean with solvent new galvanized finishes
2nd coat - Devcryl 1440 DTM Primer/Finish
3rd and 4th coats – Devcryl 1448 Acrylic Semi-Gloss Enamel

E. Cement Plaster (Modified Acrylic Elastomeric Coating):
1st coat: - KM 247 Acry-Shield 100% Acrylic Exterior Masonry Primer
2nd coat: - KM 1119 Elastakote 100% Acrylic Elastomeric Coating Low Sheen
3rd coat: - KM 1119 Elastakote 100% Acrylic Elastomeric Coating Low Sheen

F. Wood (Semi-gloss)
1st coat - KM 295 Kel-Bond Universal Primer
2nd and 3rd coats - KM 1215 Color Shield Exterior Acrylic Semi-Gloss Finish

G. New Concrete Block (Semi-Gloss)
1st coat - Devoe Coatings,Bloxfil 4000 Interior/Exterior Heavy Duty Acrylic Block Filler - KM 521 Color Shield Prime & Fill Acrylic Block Filler
2nd and 3rd coats - KM 1215 Color Shield Exterior Acrylic Semi-Gloss Finish

H. Existing Concrete Block (Semi-Gloss)
1st coat - KM 295 Kel-Bond Universal Primer
2nd and 3rd coats - KM 1215 Color Shield Exterior Acrylic Semi-Gloss Finish

I. Aluminum In-Fill Panels:

1st coat – Facory Prime coat (Touch up if abraded)
2nd and 3rd coats – Devcryl 1448 Acrylic Semi-Gloss Enamel

J. Cementitous Siding:
1st coat – KM 295 KelBond Universal Primer
2nd and 3rd coat - KM 1200 Color Shield Exterior 100% Acrylic Flat.

3.08 SCHEDULE - INTERIOR SURFACES
Descriptions in schedule apply to new and previously painted surfaces. Number of coats listed are a minimum, additional coats may be required to provide suitable uniform finish.

A. New Gypsum Board (Low sheen at Walls and Flat at Ceilings, Enamel)
1st coat - KM 971 Acry-Plex Zero VOC Interior PVA Sealer
2nd and 3rd coats. (Typical paint system at classrooms, toilet rooms, storage rooms, and kitchens.) –
KM 1007 Professional Zero VOC.
At toilet rooms, kitchens, custodian rooms – KM 1685 Dura-Poxy 100% Acrylic Semi-Gloss Enamel.

B. Existing Gypsum Board (Low sheen at Walls and Flat at Ceilings, Enamel)
1st coat - KM 295 Kel-Bond Universal Primer. Or B-I-N Primer-Sealer Stain-Killer if necessary.
2nd and 3rd coats. (Typical paint system at classrooms, toilet rooms, storage rooms, and kitchens.) –
KM 1007 Professional Zero VOC.
At toilet rooms, kitchens, custodian rooms – KM 1685 Dura-Poxy 100% Acrylic Semi-Gloss Enamel.

C. New or Existing Painted Wood (Semi-Gloss Enamel)
1st coat - KM 295 Kel-Bond Universal Primer-or B-I-N Primer-Sealer Stain-Killer if necessary.
2nd and 3rd coats. - KM 1050 Professional Zero VOC Semi-Gloss Enamel

D. New Wood to Receive Transparent Finish (Stain and Lacquer)
1st coat - Gemini 200-0012 Sanding Sealer
2nd and 3rd coats - Gemini 500-0035 Satin Lacquer

E. Existing Stained Wood (Varnish Finish)
1st coat – Stain to provide uniform finish, match existing tone- Old Masters Wiping Stain
2nd and 3rd coats. - Old Masters Water Based Polyurethane Satin

F. Existing Stained Wood (Lacquer Finish)
1st coat - Old Masters Wiping Stain
2nd and 3rd coats - 91657 Satin Lacquer-Gemini 200-0012 Satin Lacquer

G. Ferrous Metal (Semi-Gloss Enamel) – Re-prime all shop primed items in field.
1st coat – Rust-Oleum CV740 Primer
2nd and 3rd coats –, Industrial Acrylic, Semi-Gloss Enamel Typical paint system at all hollow metal doors and frames. - Devcryl 1448 Acrylic Semi-Gloss Enamel

H. Cement Plaster and Exposed Concrete (Semi-Gloss at Walls and Flat at Ceilings, Enamel)
1st coat – KM 295 Kel-Bond Universal Primer-or B-I-N Primer-Sealer Stain-Killer if necessary
2nd and 3rd coats - KM 1050 Professional Zero VOC Interior Semi-Gloss Enamel

I. Acoustical Ceiling Tiles (Flat)
1st coat – KM 295 Kel-Bond Universal Primer- or B-I-N Primer-Sealer Stain-Killer.
2nd and 3rd coats - KM 485 Commercial Flat wall Paint

J. Galvanized and Zinc Alloy Metal, (Semi-Gloss Enamel).
1st coat – Etch and clean with solvent new galvanized finishes
2nd coat - KM 295 Kel-Bond Universal Primer

3rd and 4th coats – Devcryl 1448 Acrylic Semi-Gloss Enamel

K. Concrete Block (Semi-Gloss)
1st coat - KM 295 Kel-Bond Universal Primer
2nd and 3rd coats - KM 1050 Professional Zero VOC Interior Semi-Gloss Enamel

[END OF SECTION 09 90 00]

SECTION 09 96 23

GRAFFITI-RESISTANT COATINGS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Application of Graffiti-Resistant coatings on exterior sides of Masonry.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 04 01 20.91: Masonry Restoration and Cleaning.

1.03 SUBMITTALS

A. Product Data: Manufacturer's product literature.

B. Samples: Minimum 8-inch square samples of each color of coating for verification purposes after initial color selection has been made.

C. Certification: Duplicate copies of manufacturer's affidavit with each shipment of materials delivered to the Project site certifying that materials furnished comply with specified requirements.

D. Sample Panel: Apply specified finish on approximately 10-square feet of wall area where directed by the Architect. Obtain Architect's approval before proceeding with coating application. Approved sample shall be used as a standard for the Project.

E. Maintenance Materials and Instructions:

1. Furnish one identified unopened 5-gallon container of each color of coating used, and one 5-gallon container of solvent to be used for graffiti removal.

2. Coating and solvent shall not be used for recoating of touching-up damaged surfaces before final acceptance of the work.

3. Furnish Owner with instructions for graffiti removal and maintenance instructions.

1.04 JOB CONDITIONS

A. Environmental Requirements: Comply with coating manufacturer's recommendations for environmental conditions regarding coating application. Do not apply coating in areas where dust is being generated.

B. Provide drop cloths, shields, barricades and other protection necessary to safeguard adjacent surfaces not to be painted. Post signs immediately after coating application.

C. Provide and maintain protection as required to protect finished work from damage until final acceptance.

D. Protect landscape items and adjacent surfaces not scheduled to receive graffiti-resistant coating. Contractor shall repair or replace areas damaged by work at no additional cost to Owner.

E. Remove, mask or otherwise protect murals and signage indicated on the Drawings as not to receive graffiti-resistant coating.

PART 2 – PRODUCTS

2.01 ANTI-GRAFFITI COATING

A. Approved Manufacturers: Tex-Cote, Textured Coatings of America, Inc. “Rainstopper 2000W” base coat with “Sacrificial Graffiti Guard System” finish coat or approved equal.

B. Color: Clear, flat sheen.

PART 3 – EXECUTION

3.01 PREPARATION

A. Power wash all existing untreated surfaces with medium pressure hot water and mild tri-sodium phosphate solution or other approved cleaning agent. Hand scrub areas of hardened dirt. Allow surfaces to completely dry prior to application of product.

B. Surfaces shall be clean, free of dust, dirt, oils, scale, and rust.

C. Treat or clean alkali or efflorescence on the surfaces to be coated with a neutralizing agent recommended by coating manufacturer.

D. Power wash all surfaces currently containing graffiti-resistant coating system with medium pressure hot water (190-195 degrees) to remove layers of existing sacrificial coating down to sealed base material. Do not exceed 190 degrees or allow water to steam or coating layers may curdle and set in place making removal extremely difficult. Strictly follow manufacturer's written instructions for the removal of existing sacrificial coating **AND** consult with local manufacturer's representative prior to the start of stripping. Local manufacturer’s representative shall visit the site and review a sample stripped area prior to the installation of sacrificial coating layers. Architect shall be made aware of scheduled visit by manufacturer’s representative in advance. Local representative is:

Mr. Bill Borchert
Spec-West-Reps
P.O. Box 3458
San Leandro, CA
cell #: (510) 206-8030
e-mail: specwestreps@aol.com

3.02 APPLICATION

A. Apply coating by brush, roller or sprayer set at normal painting pressures, tip size as recommended by coating manufacturer.

B. Apply sealer and sacrificial coating system in accordance with manufacturer’s instructions, allowing for drying between each coat as recommended by coating manufacturer.

3.03 CLEAN-UP

A. As work proceeds, promptly remove coating where spilled, splashed, or spattered. Contractor will be responsible for cleaning, repairing or replacing areas damaged by overspray, drips or spills at no cost to the Owner.

B. During progress of work, maintain premises free of unnecessary accumulation of tools, equipment, surplus materials, and debris.

C. Upon completion of the work of this section, remove all surplus material and related debris from the site.

[END OF SECTION 09 96 23]

SECTION 09 96 56

EPOXY FLOORING AND BASE SYSTEM

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Epoxy floor with 10-lb vapor control primer, highly abrasion resistant polyaspartic sealer and integral base finish system installed over existing ceramic tile and/or concrete.

B. Work of this Section includes all labor, materials, equipment and services necessary to complete the slope for drainage underlayment, antimicrobial/antibacterial epoxy mosaic composition flooring and integral base installed over existing ceramic tile and/or concrete as scheduled on the drawings and/or specified herein.

C. Subfloor vapor transmission testing and vapor control sealer (if determined necessary by required testing).

D. Subfloor preparation.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 00 72 00 - Exhibit C: Abatement of Hazardous Materials.

C. Section 03 30 00: Structural Concrete.

D. Section 07 90 00: Joint Sealers.

E. Section 09 30 13: Ceramic Tile Work.

1.03 REFERENCES

A. ASTM F710-11-Practice for Prepping Concrete Floors to Receive Resilient Flooring.

B. ASTM F2170-16 - Standard Test Method for Determining Relative Humidity in Concrete Floor Slabs Using in situ Probes.

C. Compression Strength: ASTM C 579-01(2012)

D. Tensile Strength: ASTM C 307-03(2012)

E. Flexural Strength: ASTM C 580-02(2012)

F. Abrasion Resistance: ASTM D 4060-10

G. Adhesion: ACI 503R

H. Abrasion Resistance: ASTM D 4060-14, wheel test.

I. Flammability: Self-extinguishing per ASTM D 635-14

J. Optical Smoke Density: ASTM E 662-15a

K. Critical Radiant Flux: ASTM E 648-15e1

1.04 INSTALLERS PRE-BID REQUIREMENTS

A. Prior to placing bid on flooring work, contractor and flooring subcontractor/installer shall complete the following:

1. Walk all rooms indicated on the Drawings where new epoxy floors will be installed.

2. Be responsible for reviewing and confirming all floor slopes prior to bidding work. This includes all slopes to drains, negative slope areas, and areas requiring a buildup of material. This review shall be in addition to areas where floor repair and drain elevation changes are shown on the Drawings and shall include all incidental areas.

3. Include in bid price all necessary labor and materials to build up floor as required to maintain all existing drainage patterns even when floor drains may need to be raised to accommodate new epoxy flooring. If additional epoxy material is required to build-up flooring to maintain existing slope to drain patterns and to diminish any existing slopes that exceed 2% in any direction, then that cost shall be figured into the contractor's bid price.

4. No floor slope shall exceed 2% in any direction.

5. Coordinate pre-bid walk with Construction Manager. Failure to perform walk does not relieve installer from providing new flooring system and any additional buildup materials as needed.

1.05 QUALITY ASSURANCE

B. Floor Covering Manufacturer Qualifications:

1. Manufacturer to have a minimum of 10 years verifiable experience providing the complete system as proposed by the installing contractor.

2. Single Source - Obtain all epoxy flooring materials including (primer, resins, hardening agent, aggregate and finish or seal coats), underlayments, vapor barrier, anti-fracture membrane and waterproofing membrane from a single primary manufacture with a minimum of 10 years verifiable experience.

3. Only 100% solids, zero VOC (volatile organic content), low odor systems are permitted.

C. Floor Covering Installer Qualifications:

1. Flooring installation contractor to be an established firm with a minimum of 5 years of experience in the installation of the specified product and shall have access to all manufacturers' required technical, maintenance, specifications and related documents. Installation Contractor shall provide addresses of accessible installations of their proposed system that are at least 5 years old and within 25 miles of the subject project. District will visit these existing sites as needed to determine if past installations by installer are consistent with the District's needs for a successful floor installation. If District determines that past installations are unacceptable for workmanship, installer will be rejected.

2. Actual installation must be performed by skilled mechanics having not less than five years documented satisfactory experience in the installation of the type of system specified in this section. The 5-years experience must be certified in writing by the manufacturer of epoxy floor system. All personnel responsible for the applications of the system in the field must meet the 5-year certification requirements specified.

3. Installer shall provide with submittals as per section 01300 a written letter from the manufacturer offering a joint applicator/manufacturer labor and material warranty on this specific project with this specific installing contractor.

D. Pre-Floor Covering Installation Meeting:

1. Contactor to notify Construction Manager with a minimum of 5-days notice when anticipated to be ready for pre-floor covering installation meeting. (After subfloor preparation is complete and ready for floor covering installation.)

2. Contractor, installer and manufacturer representative are required to attend pre-floor covering meeting. Contractor is responsible for coordinating and scheduling their attendance.

3. Construction Manager will schedule meeting with Contractor team, Project Inspector, and Architect.

4. Purpose of Meeting: To review subfloor preparation, verification of readiness for floor covering installation and use of correct products, verification of the acclamation of correct finish materials and review installation requirements.

E. Manufacturer's Field Services:

1. Manufacturer representative to attend the "Pre-Flooring" meeting.

2. Upon Owner or Architect's request, and with at least 72-hour notice, provide manufacturer's representative site visit(s) for inspection of product installation.

3. At Owner's request manufacturer representative to attend operation and maintenance training meeting for Owner's custodial staff prior to acceptance of floor covering installation.

F. Vapor Transmission Testing Laboratory Qualifications:

1. Certified, bonded, qualified and experienced agency to perform pH and moisture vapor emission tests.

G. Epoxy Flooring Application Testing:

1. At the owner's discretion and under his supervision, the contractor shall take two (2) - 1" random cores per 1,000 sq. ft. through the system into the substrate to verify proper system thickness. Cored areas less than specified thickness shall be removed and replaced or increased in thickness by the installing contractor, in a manner that does not affect the performance or integrity of the system. Cored areas which comply with the recommended system thickness shall be built up to match the surrounding surface elevation prior to applying the seal coat(s). Cores taken and patched will be noticeable, therefore, cores should be taken from areas where aesthetics are less critical.

1.06 SUBMITTALS

A. Provide a complete submittal package with all components required within this section. Submit per Section 00 72 00.

1. Product Data: Provide product data describing physical and performance characteristics, sizes, patterns, colors, material safety data sheets and manufacture's installation instructions for all proposed products. Complete floor system including vapor control primer shall be from a single source manufacturer.

2. Submit Manufacturer's technical data for vapor control system proposed to be used if needed or not as determined by required testing. Vapor control system must be made by the manufacturer of the epoxy mosaic composition flooring system and capable of being warranted by the epoxy flooring manufacturer as a complete system (NO EXCEPTIONS).

Vapor control system shall be engineered to prevent debonding resulting from relative humidity values over 75% when tested in accordance with ASTM F2170 or Alkalinity levels up to 14.

3. Submit Manufacturer's technical data for semi-rigid polymeric joint/crack striping and antifracture material that that is to be used in conjunction with vapor control system. Rigid or fiberglass-reinforced materials are not acceptable.

4. Submit Base Manufacturer's EPA licensing documentation and permitting for Antimicrobial/Antibacterial System as well as base manufacturer's documentation showing the Antimicrobial/Antibacterial has long-term service life in the cured epoxy is not simply an "in-can preservative" and is effective against bacteria, microbes, fungi and mildew.

5. Samples:

   a. Submit a minimum of (4) four samples of manufacturer's proposed match to color chosen from Dex-O-Tex's 21 color line. Color(or as chosen by Owner), pattern, texture and sheen must match Owner's control samples for acceptance. Owner/Architect shall make determination of adequacy of match. Contractor will be responsible for providing specified product if proposed "equals" are not determined to match specified product. This shall be done at no additional cost to the project.

   b. Mock-up – Provide minimum 4' x 4' test section installed in the field on actual floor location or on disposable mock-up panel of selected color and finish system. Mock up shall include integral cove base. Mock up shall be prepared by actual experienced and approved individual or persons who will be responsible for the project's complete installation. Mock up shall be reviewed and approved by Architect/Owner prior to installation of remainder of epoxy system. Actual installer shall be present at review of mock up. Multiple mock ups may be required until acceptable installation is achieved. Approved mock up shall become the standard of quality and appearance for the remainder of the work. Conditional acceptance of mock ups will not be allowed.

   c. SUBMIT NON-SLIP TEXTURE SAMPLES OF FINISH COATS for owner's review and approval. Samples must be submitted in matching pairs, minimum 12" x 12". Owner signs the back of both approved samples, retains one and returns the second to the installation contractor.

6. Installer Qualifications:

   a. The contractor shall furnish a list of similar projects within 25 miles of this project's location using their proposed system that his Company has installed over 5 years ago. Information shall include project name, square footage, resumes detailing the experience of key personnel including supervisors and mechanics. The contractor shall be approved in writing by the material manufacturer for the system being installed. At least one of the referenced projects shall include the specified product installed over existing ceramic tile (NO EXCEPTIONS). District will visit these existing sites as needed to determine if past installations by installer are consistent with the District's needs for a successful floor installation. If District determines that past installations are unacceptable for workmanship, installer will be rejected.

B. Prior to installation, the contractor shall submit a copy of the manufacturer's packing slip, tagged for this specific job, along with calculations, signed by an officer of the primary material supplier demonstrating that the quantity of material furnished for the project will achieve the specified coverage and mil thickness.

1.07 OPERATION AND MAINTENANCE DATA

A. Submit cleaning and maintenance data under provisions of Section 00 72 00.

B. Include maintenance procedures, recommended maintenance materials, and suggested schedule and products for cleaning.

C. At the request of the Owner, provide in-service training with Owner's custodial staff prior to acceptance of flooring for proper care and maintenance of floor covering.

1.08 DELIVERY, STORAGE AND HANDLING

A. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact. Each container shall be clearly marked with the following:

1. Product name(s) and/or Number(s).

2. Manufacturer's name.

3. Component designation (A, B, etc.).

4. Product Mix Ratio.

5. Health and Safety Information.

6. CHEMTREC Emergency Response Information.

B. Do not use materials, which exceed the manufacturer's maximum recommended shelf life.

C. Storage and Protection: Store materials protected for exposure to harmful weather conditions and at a temperature and humidity conditions recommended by manufacturer. Materials should be stored in areas that are fully enclosed, weather tight with the permanent HVAC system set at a uniform temperature of at least 68 degrees F (20 degrees C) for 72 hours prior to, during and after installation.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65ºF and a maximum temperature of 85ºF for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55ºF in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

B. Prior to testing for moisture vapor emission rate, space shall be enclosed, fully weather-tight, wet-work in space shall be completed and nominally dry, work above ceilings finished. The test site should be at the same temperature and humidity expected during normal use.

C. Maintain lighting at a minimum uniform level of 50 or more foot candles in areas where the floor system is being installed.

D. Lighting and HVAC shall be in full operation prior, during and after installation of epoxy flooring.

1.10 CONCRETE SUBFLOOR VAPOR EMISSION TESTING

A. The Contractor shall be responsible for conducting Relative Humidity Probe Tests according to ASTM F2170 protocol and substrate surface pH tests. These tests shall cover the quantitative determination of the rate of relative humidity and pH values emitted from below-grade, on-grade, and above-grade (suspended) concrete floors.

B. The Flooring Contractor shall verify in writing to the Owner, a minimum of thirty (30) days prior to scheduled resilient flooring installation, the following substrate conditions:

1. Relative Humidity: Initial percentage, as tested with an in situ probe test kit, according to ASTM F2170 protocol.

2. Alkalinity: pH level.

C. High Relative Humidity and /or Alkalinity Readings:

1. New Construction (New Concrete Slab)

a. If the Contractor's test results indicate that the slab relative humidity and/or alkalinity readings are below those of flooring manufacturer's requirements, the Owner's representative will initiate independent testing to confirm results and will initiate additional testing using petrographic analysis to determine if the Water Cement Ratio and sufficient hydration has taken place.

1) Once it is determined that the Specifications were followed in their entirety, water/cement ratio (as specified), and/or the concrete surface has been adequately hydrated; then the Contractor shall initiate a credit to the Owner for the cost of installation of the Vapor Retarders as specified in Section 07 26 00 that were not installed.

1.11 WARRANTY

A. The contractor and the manufacturer shall furnish a joint applicator/manufacturer labor and material warranty for the epoxy floor system for a period of two years minimum after recordation date of the Notice of Completion. The labor and material guarantee shall include chemical resistance, loss of bond and wear-through to the concrete substrate from normal use. Same warranty shall also be required and effective in conjunction with Vapor Emission Control System if used. Warranty shall include all labor and materials required to remove and reinstall epoxy floor system and vapor emission control system at no cost to the Owner.

PART 2 – PRODUCTS

2.01 MATERIALS:

A. Single-Source Responsibility: Obtain epoxy mosaic composition flooring materials, including underlayments, primers, resins, hardening agents, quartz aggregates and finish or sealing coats, from a single manufacturer - NO EXCEPTIONS.

B. Epoxy Flooring System for Toilet Rooms: Only clear silica aggregate troweled floors with mosaic highlights shall be acceptable. Colored quartz, limestone varieties, dolomite and other aggregates with Moh hardness less than 7 are not acceptable. Broadcast or "quartz floors" (including "ceramic" floors) or any other form of color-coated sand aggregates will not be accepted.):

1. Acceptable Manufacturers:

a. Dex-O-Tex, "Terracolor", Troweled Epoxy Floor (Specified):

1) The 3/16" to ¼" decorative high build decorative troweled mortar resurfacing system utilizing a clear 100% solids epoxy binder resin and a chemical resistant grout and seal coats.

b. Or Approved Equal (no known equal). The District has heavily invested in standardizing products used throughout the all campuses. This maintains a uniform look and feel along with ease of maintenance and repairs.

2. Performance Characteristics (Epoxy Mosaic Mortar System):

   a. Only low VOC (volatile organic content), low odor systems are permitted.

   b. Compression Strength: 10,000 p.s.i. per ASTM C 579-01(2012).

   c. Tensile Strength: Resin, Hardener & Aggregate = 1,395 p.s.i. min. per ASTM C 307-03(2012), Resin & Hardener = 5,000 p.s.i. per ASTM D-638-14.

   d. Flexural Strength: 4,300 p.s.i. min. per ASTM C 580-02(2012).

   e. Surface Hardness: 80-85 per ASTM D2240-15, Shore D.

   f. Abrasion Resistance: 100 milligrams lost per ASTM D-4060-14, CS-17 Wheel, 1,000 cycles.

   g. Adhesion: >4000 p.s.i. per ASTM D4541-09e1, 100% concrete failure.

   h. Flammability: Self-extinguishing over concrete per ASTM D635-14.

   i. Impact Resistance: No cracking or detachment per Gardner Impact Test (160 lbs.).

   j. Microbial Resistance: Pass per ASTM G21-15.

   k. Aggregate Hardness: Moh Scale 7 (minimum)

   l. Specific Optical Density of Smoke Density per ASTM E 662: Less than 450.

   m. Critical Radiant Flux of Floor Covering per ASTM E 648: In compliance.

C. Joint, Leveling and Patching Compounds:

1. Leveling and Patching: Epoxy filler as recommended and warrantable by flooring manufacturer as part of the complete flooring system.

2. Cracks and Non-Expansion Joints: Flexible epoxy membrane as recommended and warrantable by flooring manufacturer as part of the complete flooring system.

D. Vapor Emission Control System:

1. Provide negative side vapor emissions system as recommended and warrantable by the epoxy flooring manufacturer. System shall be compatible with all components of the epoxy flooring system and capable of acting as a unified system and warranted as such. Systems shall be available to reduce emissions of up to 10 lbs to below 3 lbs and levels acceptable to the manufacturer of the epoxy mosaic flooring system.

E. Accessories:

1. Manufacturer recommended transitions strips and/or termination bars as required.

F. Color and Finish:

1. Color shall be from Dex-O-Tex's Rich Swan's 21 color chart. If alternative manufacturer other than that specified is accepted, color may be required to be a custom color and shall be provided at no additional cost to the project.

2. Top finish shall be high-gloss finish with none to light abrasive qualities. Mock-up will be used to finalize level of abrasive surface finish.

3. Samples shall match Dex-O-Tex's Rich Swan's 21 color chart. Contractor is required to match color, pattern, texture and sheen to the satisfaction of the Owner. If a custom color is required to provide match, contractor shall provide at no additional cost to the Owner.

G. Sealer shall be high abrasion resistant polyaspartic sealer applied in two coats.
Performance Characteristics (Quik-Glaze):

1.	Tear Strength ASTM D624, Die C	879 lbs/in
2.	Flexibility ASTM D1737	Passes
3.	Tensile Strength ASTM D412	2,400 psi
4.	Tensile Elongation ASTM D412	100%
5.	Taber Abrasion ASTM D4060	0.008 gram loss
6.	Impact Resistance ASTM D2794,	Direct 160in/lbs Reverse 160in/lbs
7.	Hardness ASTM D2240 Shore A	85-90
8.	Solid Percent by Weight (calculated)	95%
9.	Gloss ASTM D523	90+
10.	Coefficient of Friction ASTM D2047	0.67 dry, 0.82 wet
11.	Microbial Resistant ASTM G21	Passes

PART 3 – EXECUTION

3.01 EXAMINATION

A. If existing flooring was determined to be asbestos containing and required abatement, verify that the abatement work has been accepted by the Owner's representative prior to commencing work.

B. Refer to Article 1.10 in this Section for concrete subfloor testing requirements. Submit test results a minimum of thirty (30) days prior to scheduled resilient flooring installation to Owner's representative.

3.02 PREPARATION

A. Prepare substrate in accordance with ASTM F710 and flooring manufacturer's recommendations.

B. Install vapor retarder system (unless verified that relative humidity and pH values meet requirements of Article 1.10 in this Section).

C. Prepare concrete to "open" the surface pores by means of vacuum bead blasting and/or abrasive grinding, removing all contaminating or bond breaking substances including but not limited to tile glaze, dust, laitance, curing compounds, coatings, sealers, oils and grease. Any oil or grease not removed by grit blasting must be chemically removed. Spalled, delaminated or deteriorated concrete shall be mechanically removed by scabbling or chipping hammers. Areas to be patched should be saw cut to a minimum ½" deep at the perimeters and keyed to the existing concrete. Comply with manufacturer's instructions regarding preparation of concrete and non-concrete

substrates. Existing ceramic tile shall be tight and solidly adhered to the existing concrete subfloor. Where existing tile or grout is found to be loose, broken or missing, remove loose or broken tiles and grout, clean substrate and install new filler tiles and grout to provide a smooth tile substrate.

D. At floor drains, cleanouts or other floor accessories, remove existing ceramic tile down to concrete substrate, or remove bare concrete approximately 6 inches away from accessory to accommodate smooth transition with new epoxy flooring.

E. At door threshold transitions where door swings into room, remove existing ceramic tile down to concrete substrate, or remove bare concrete by approximate length and width of door swing to allow door to open inwards freely over new epoxy floor.

F. Repair any base conditions with either new ceramic tile to match existing where existing is to remain, or patch and repair existing gypsum wallboard or plaster walls for a smooth, solid and secure substrate for new epoxy wall base.

G. Cracks and Non-Expansion Joints:

1. Cracks and joints less than 1/16” wide do not need to be treated.

2. Joints which are larger than 1/16” wide after surface preparation shall be routed ¼” by ¼” minimum and—after installation of vapor control primer, if required-- filled with specified filler, striped out 3” wide on each side of the joint or crack, mixed and applied as recommended by the manufacturer.

H. Isolation/Expansion and Other Joints Subject to Movement

1. Joints or cracks that are designated in the construction documents as moving shall be isolated from the Epoxy Flooring system and filled with concrete expansion joint sealant.

I. Prohibit traffic from area until filler is cured.

J. At locations where ceramic coved base tile has been removed from concrete curb creating a small trough(void) along edge of wall, Installer shall fill trough with suitable material to provide a smooth transition from floor to base.

3.03 EPOXY FLOORING INSTALLATION

A. Install in accordance with manufacturers' instructions and recommendations:

1. Shotblast or grind floor to create open, absorbable substrate

2. Rout out all cracks and non-moving joints over 1/16” in width to a minimum ¼” x ¼”

3. Prime the floor with 10-lb vapor control primer

4. Fill routed-out cracks with antifracture membrane and stripe out to 6” wide

5. Install epoxy mosaic flooring mortar

6. Apply not less than two coats of grouting material by either method below:

a. Squeegee a heavy coat of grout over the surface and trowel it. –OR—

b. Squeegee a heavy coat of grout over the surface, allow to soak in for a minimum of 10 minutes

c. After application of the grout it must be completely squeegied off.

d. Grouting operations are not complete until the surface texture of the trowelled mortar has been completely filled in and has become non-absorbent, permitting a continuous, glass-smooth finish coat installation.

e. More than 2 coats of grout may be necessary for satisfactory finish.

7. Apply initial finish coat of Polyaspartic Sealer.

8. Apply final finish coat of Polyaspartic Sealer.

9. Polyaspartic sealer to incorporate nonslip aggregate as selected by the owner.

B. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar or up against existing door thresholds for a smooth and flush transition.

C. Install edge strips at unprotected or exposed edges, and where adjacent flooring terminates.

D. Install flooring flush with rim of floor accessories for a smooth transition.

E. Install flooring to prepared substrate without producing open cracks, voids, dimples or other surface imperfections in completed installation. Finished surface is to be continuous, completely flood-coated, flat and glass smooth prior to application of final finish coat incorporating non-slip aggregate if aggregate is required by owner. It is understood that minor finish imperfections (“trowel licks” or waviness) are acceptable and will be exaggerated by the high gloss finish.

F. Only apply odorous products during non-occupied times.

G. In order to maintain a consistent blend of dry aggregate prior to mixing with epoxy liquid, contractor shall provide a cement mixer on site of a large enough capacity to continuously mix aggregate for an entire room. The aggregate shall be continuously turned and shall be poured from mixer only as needed for small batch of mixing with epoxy liquid. The remaining aggregate shall continue to be mixed. The reason for this requirement is to help contractor maintain better uniformity of different colored aggregate in floor.

H. After installation of epoxy floor system including finish coats, the Owner shall review floor for acceptance grading floor installation on distribution/consistency of aggregate, application of finish coat, milky-ness of finish coat, application of coved base. Any floor that is rejected shall be completely removed and reinstalled by Contractor at no cost to the owner.

3.04 INSTALLATION – INTEGRAL COVED BASE

A. Install all epoxy flooring with integral coved based. Install coved base on entire wall perimeter including toe spaces and open ends of cabinets.

B. Where integral base is installed in room with existing ceramic wall tile, contractor shall remove first/lowest course for ceramic tile, plus/minus 6 inches. Then extend epoxy base up wall to first horizontal ceramic tile joint, feather to joint and provide clean horizontal edge termination.

C. Where integral base is installed to butt underside of ceramic tile, extend epoxy base over gypsum wall board or existing concrete curb. Finish epoxy base directly to underside of tile, sealant joint is not acceptable. Contractor to fully protect bottom course of ceramic tile. Any damaged tiles due to abrasion from floor installation or grinder shall be replaced at no cost to the owner.

3.05 PROTECTION

A. Allow the epoxy floor system to cure in compliance with manufacturer’s directions, taking care to prevent contamination during stages of the installation and prior to completion of the curing process.

B. Protect the epoxy floor system from damage and wear during other phases of the construction operation, using temporary coverings as recommended by the manufacturer. Remove temporary covering just prior to final inspection.

C. Protect the floor from spills for a minimum of 4 days after installation is complete. Water stains on the floor are not the responsibility of the installation contractor and costs to repair will be the responsibility of the General Contractor.

D. Floor shall not be mopped or flooded with water for a minimum of 4 days after installation is complete.

3.06 INITIAL CLEANING

A. Clean the epoxy floor system just prior to final inspection, using materials and procedures suitable to the system manufacturer.

B. Reinstall all removed equipment and test for in presence of Project Inspector to ensure proper operation.

[END OF SECTION 09 96 56]

SECTION 10 14 00

SIGNAGE

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Provision and installation of interior and exterior room identification signs, geometric restroom signs and interior and exterior directional and informational signs including signs for accessible features and regulatory signs.

B. Metal signs

C. Decals

D. Support posts

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 06 10 00: Rough Carpentry.

C. Section 08 11 00: Metal Doors and Frames.

D. Section 09 90 00: Painting.

1.03 RELATED CODES AND STANDARDS

A. Accessible signs shall conform with the following requirements as indicated:

1. California Building Code (CBC) Title 24, 2016 Edition.

2. ADA Accessibility Guidelines (ADAAG, latest adopted edition).

3. Contracted Grade 2 Braille shall be used whenever Braille symbols are specifically required (CBC Section 11B-703.3 Braille).

4. Means of Egress Identification: CBC 11B-216.1 &11B-703.1.

5. Tactile Exit Signs: CBC 1013.4.

6. Restroom Identification Symbols: CBC 11B-216.8 &11B-703.7.2.6.

7. Signs and Identification: CBC 11B-216.1 &11B-703.1.

8. International Symbol of Accessibility: CBC 11B-703.7.2.1.

9. Direction and Information Signs: CBC 11B-703.1.

10. Symbols of Accessibility: CBC 11B-703.7.

11. Finish and Contrast: CBC 11B-703.5.1.

12. Character Proportions: CBC 11B-703.2.4.

13. Character Height: CBC 11B-703.2.5.

14. Raised Characters and Pictorial Symbol Signs: CBC 11B-703.2 & 11B-703.6.

15. Braille: CBC 11B-703.3.

16. Mounting Height and Location: CBC 11B-703.4.1 & 11B-703.4.2.

17. Symbols of Accessibility: CBC 11B-703.7.2.

18. Color of Symbol: CBC 11B-703.7.2.1.

19. Entrance Signs: CBC 11B-216.6.

1.04 SUBMITTALS

A. Submit manufacturer's technical data and installation for each type of sign required.

B. Submit shop drawings listing sign size, type style and letter heights and construction detail.

C. Submit one full size sample sign with tactile characters, Braille and subsurface text or pictogram to demonstrate fabrication technique and Braille measurements which shall be used on proposed project.

D. Submit samples of background colors, character colors, and one inch high print outs of "I," "O" and "X" from proposed type styles. Indicate which type styles shall be used for required tactile characters and for required visual characters.

E. Submit proposed sign schedule to comply with scoping requirements above.

F. Submit under provisions of Section 00 72 00.

G. All signage shall be designed and constructed to comply with signage specifications and drawings.

1.05 QUALITY ASSURANCE, MATERIALS AND FABRICATION TECHNIQUES

A. QUALITY ASSURANCE

1. Manufacturers shall submit 3 references showing products for projects completed within the last 6 years. Both tactile and non-tactile signage shall be included in the work.

2. Manufacture's Two-Year Warranties.

3. Contractor shall provide labor and materials to repair or replace defective signs as directed by Owner. Defects shall include:

a. Tactile characters and/or Braille dots which come off or are removed.

b. Discoloration, wear and scratching off of the surface color.

c. All signs and sign components, except for damage by mishandling by Owner, including installation by Owner, or vandalism.

4. Inspection – All new tactile signage shall be field inspected after installation per 11B-702.1.1.3.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Deliver to project site in manufacturer's original, unopened and undamaged packaging. Store in original packaging under protective cover and protect from damage. Handle materials in such a

manner as to prevent damage to products or finishes.

PART 2 – PRODUCTS

2.01 GENERAL SIGN DESIGN CRITERIA

A. Sign Material

1. Wall-mounted Room Identification Signs, 0.125 inch thick, aluminum, magnesium, or Type 304 stainless steel.

   a. Finish: Electrostatic powder coat with a dark background with light text or light background with dark text, numerals and graphics/pictogram that provides a minimum of a 70% contrast.

   b. Blue(if used) shall be equal to Federal Blue No. 15980 in Federal Specifications 595C.

   c. Metal room identification signs will have 1/8 inch radius unless otherwise shown on Drawing. Corners die cut with burr on rear side of sign with mounting holes (quantity of holes as shown on Drawings).

2. Parking lot signs shall be .080 aluminum with white reflective graphics.

3. Door-mounted Restroom gender use sign shall be a total of ¼" thick aluminum, magnesium, or 304 stainless steel

4. Non-glare (non-reflective) materials shall be used for all signs which identify, direct to, or give information about facilities and their use. Exception: Parking, traffic signs, and exterior safety signs shall use reflective materials. Identification signs for accessible parking spaces shall use reflective materials for graphics.

5. Decals shall be a heavy gauge sticker.

B. Fonts and Characters

1. Characters shall have a minimum of 70 percent contrast with their backgrounds on all signs which identify, direct to, or give information about facilities and their use.

2. Characters on all signs which identify, direct to, or give information about facilities and their use shall comply with CBC 11B-703.2.4 & 11B-703.2.6.

3. Type styles of characters on all signs which identify, direct to, or give information about facilities and their use shall not be italic, oblique, or decorative in style.

4. Non-tactile characters (letters, numbers and symbols) shall be Helvetica Regular.

5. Characters shall be uppercase unless otherwise shown on Drawings.

6. Upper case letters shall be 1 inch high (unless otherwise shown on Drawings, maximum 1 1/4 inch high).

7. Height of lower case letters (where shown on Drawings) shall be proportional to height of upper case letter.

8. Numerals and upper case letters on metal signs will be minimum 1 inch high (vertical dimension unless otherwise shown on Drawings) embossed text and numerals shall comply with CBC 11B-703.2 & 11B-703.6. Vertical dimension of lower case letters shall be proportional to height of upper case letters.

9. TACTILE CHARACTERS

a. Characters required to be tactile shall be San Serif.

b. Characters shall be raised 1/32 inch minimum and a maximum of 1/16 inch from the background.

c. Raised tactile characters shall have beveled edges.

d. Characters shall be uppercase unless otherwise shown on Drawings. Signs shall have tactile characters where shown on Drawings.

e. Upper case tactile letters shall be 1 inch high (unless otherwise shown on Drawings, maximum 1-1/4 inch high).

f. Height of lower case letters (where shown on Drawings) shall be proportional to height of upper case letter.

g. Exception: Characters required by code to exceed 1 1/4 inches, such as elevator hoistway characters, shall not exceed 2 inches in height. Characters on elevator control panels shall not be less than 5/8 inches high.

h. A minimum of 1/8” space between the top surfaces of adjacent characters measuring between the two closest points shall be provided.

i. Drawing Coordination: Sign size, text, mounting locations requirements and other requirements shall be as stipulated in this Specification Section unless other shown on Drawings.

10. NON-TACTILE GRAPHICS AND TEXT

a. Non-tactile graphics/pictogram and text shall screen printed on the surface and complying with Paragraph 2.01.A.1.a of this Specification Section.

b. Identifying pictograms shall be located above the tactile text in a clear, six inch high field.

c. Non-tactile text shall be upper case and one inch high (unless otherwise shown on Drawings), and shall comply with CBC 11B-703.2.4, 11B-703.2.6, 11B-703.5.1, 11B-703.5.4, 11B-703.5.5, & 11B-703.6.2.

C. BRAILLE

1. Braille text shall comply with CBC 11B-703.3.

2. Braille on metal signs shall be embossed domed California Contracted Grade 2 Braille. All Braille shall be fabricated by a method which produces a rounded or domed dot shape. All Braille dots shall be solid or filled from behind so they cannot be crushed or indented.

3. Braille dot, cell spacing and dot height shall follow specifications as per CBC11B-703.3 & 11B-703.3.1.

4. There shall be no Braille indication of capital letters except for proper names, individual letters or acronyms, or beginnings of sentences.

5. Braille shall be centered directly below raised print characters.

6. Braille shall be located on the sign 3/8 inch below the corresponding tactile characters,

flush left or centered to the characters depending on the sign layout. (CBC 11B-703.2.9 & 11B-703.3.2).

7. Spacing between Braille and raised characters shall be between 3/8” to 1/2”.

D. Fasteners

1. One-way tamper resistant screw # 90090A 155 (1.25” minimum, 1” minimum embedment into wall) for wood, masonry or concrete application and self drilling tamper resistant pan head pin in head torx (1”) #92970A for metal application with fastener anchors as appropriate for wall material.

2.02 MISCELLANEOUS

A. Furnish all items required for the proper installation of all signage including but not limited to tamper resistant fasteners, adhesives, sealants, metal sleeve spacers, etc.

B. Sign types shall be as stipulated in Specification Section 10 14 00 unless otherwise shown on the Drawings.

C. Sign sizes shall be as stipulated in Specification Section 10 14 00 unless otherwise shown on the Drawings.

D. Sign text and numeral heights shall be as stipulated in Specification Section 10 14 00 unless otherwise shown on the Drawings.

E. Signage text shall be as shown on the Drawings.

F. Other signage symbols, pictograms, etc. shall be as shown on the Drawings.

2.03 SIGN TYPES: (See Drawings for locations, post and footing design and locations, typical):

A. Accessible Parking Stall Sign (See Drawings for locations):

1. Fabricate with metal panel for each accessible parking stall as indicated on the Drawings. The sign shall display the International Symbol of Accessibility (reflectorized); text shall occur below the symbol and read “MINIMUM FINE $250”. The bottom of the regular accessible stall sign shall be mounted 80" above the finish grade. Color shall be white text on blue field. See Drawings for additional information.

a. At wall mounted application, use tamper resistant concrete screws in pre-drilled holes. See Drawings for additional information.

b. At fence mounted application, use metal rings to secure to fencing fabric. See Drawings for additional information.

B. Van Accessible Parking Stall Sign (See Drawings for locations):

1. Same as “Accessible Parking Stall Sign” described above. Install above new “Van Accessible” sign. Color shall be white text on blue field. See Drawings for additional information.

a. At wall mounted application, use tamper resistant concrete screws in pre-drilled holes. See Drawings for additional information.

b. At fence mounted application, use metal rings to secure to fencing fabric. See Drawings for additional information.

C. Accessible Parking Entry Sign (See Drawings for locations and detail 16/A016):

D. **S-1**, Room Identification Sign: See 10/A704 for sign shape, text, colors, and locations.

E. **S-4**, Women's restroom sign group: See 7/A704 for sign shape, text, colors, and locations.

F. **S-5**, Men's restroom sign group: See 7/A704 for sign shape, text, colors, and locations.

G. **S-6**, Unisex restroom sign group: See 7/A704 for sign shape, text, colors, and locations.

H. **S-9**, Assistive listening device sign: See 1/A704 for sign shape, text, colors, and locations.

PART 3 – EXECUTION

3.01 GENERAL

A. Signs shall be installed with edges horizontal and vertical and face plumb.

B. Install signs with tamper resistant screws and anchors at all wall conditions except glass.

C. Screw length shall be sufficient for minimum 1 inch embedment.

D. Signs mounted onto glass:

1. Sign shall be attached to glass with clear silicone adhesive designed to secure sign material to glass (double stick tape with cushion is not permitted). Contractor shall apply sealant around perimeter of sign.

2. Where interior and exterior signs are to be mounted, signs shall be the same size (the larger sign size shall dictate the size of the smaller sign) and located “back-to-back”.

3. Where only an interior or exterior sign is mounted, a “blank sign” (the same size as the sign) shall be installed and located “back-to-back”.

E. The Contractor is solely responsible for the identification of the material onto which signs are to be mounted. The Contractor shall furnish and install all materials necessary for the proper installation of each sign.

F. Contractor shall notify the Architect of any conflicts between the Drawings, Specifications and the requirements of the CBC and ADA prior to the submission of the Bid Form. No increase of the Contract Sum and no extension of the Contract Time shall be granted for the resolution of CBC, ADA and Contract Documents conflicts.

G. Permanent identification signs for rooms or spaces shall be installed on the wall adjacent to the latch side of the door.

3.02 ADJUST AND CLEAN

A. Clean and Touch-up: Remove all packing and protection blemishes and thoroughly clean and polish all finish surfaces. Restore any marred or abraded surfaces to their original condition by touching up in accordance with the manufacturer’s recommendations. Touch-up shall not be obvious.

B. Defective Work: Remove and replace all defective work which cannot be properly repaired, cleaned or touched-up with no additional cost to the owner.

C. Protect installed work during the construction period to prevent abuse and damage.

3.03 CLEAN-UP

A. Upon completion of the work of this section, remove all surplus materials, rubbish and debris from the premises.

[END OF SECTION 10 14 00]

SECTION 10 21 13

TOILET COMPARTMENTS AND URINAL SCREENS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Solid toilet compartments, floor mounted, overhead braced.

B. Urinal screens, wall mounted.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 06 10 00: Rough Carpentry.

C. Section 10 28 00: Toilet and Bath Accessories.

1.03 REFERENCES (including, but not limited to)

A. National Fire Protection Association 101 Life Safety Code 2006 Edition, Chapters 5, 6, 8-30.

B. ANSI A117.1-1998 Specifications for Making Buildings and Facilities Accessible to and Usable by Physically Disabled People.

C. Title 24, California Code of Regulations, Parts 2, 3, and 5, 2016 Edition.

D. ADA, Accessibility Guidelines for Buildings and Facilities, Federal Register Volume 56, Number 144, Rules and Regulations, latest edition.

E. US Green Building Council (USGBC) Leadership in Energy and Environmental Design (LEED) Program, Version 2.1

F. California Building Code, (CBC Title 24, 2016 Edition).

G. California Building Code, (CBC Title 24, 2016 Edition), Chapter 11B-604.8 Toilet Compartments, Chapter 11B-604.8.1.4 Toe Clearance.

H. American Society for Testing and Materials Standards:

1. ASTM E84-16 - Standard Test Method for Surface Burning Characteristics of Building Material.

2. ASTM D2794-93(2010) - Standard Test Method for Resistance of Organic Coatings to the Effects of Rapid Deformation (Impact).

3. ASTM D2197-13 - Standard Test Method for Adhesion of Organic Coatings by Scrape Adhesion.

4. ASTM D6578/D6578-13 - Standard Practice for Determination of Graffiti Resistance.

1.04 PERFORMANCE REQUIREMENTS

A. Graffiti Resistance: Partition material shall have the following graffiti removal characteristics when tested in accordance with ASTM D6578 Standard Practice for Determination of Graffiti Resistance in accordance with Section 9, “Graffiti Removal Procedure Using Manual Solvent Rubs”:

1. Cleanability: Five (5) required staining agents shall be cleaned off material.

B. Scratch Resistance: Partition material shall have the following characteristics when tested in accordance with ASTM D2197 Standard Test Method for Adhesion of Organic Coating by Scrape Adhesion, using Gardner Stock #PA-2197/ST pointed stylus attachment on scrape tester:

1. Scratch Resistance: Maximum Load Value shall exceed 10 kilograms.

C. Impact Resistance: Partition material shall have the following characteristics when tested in accordance with ASTM D2794 Standard Test Method for Resistance of Organic Coating to the Effects of Rapid Deformation (Impact), using .625” hemispherical indenter with 2-lb impact weight:

1. Impact Resistance: Maximum Impact Force value shall exceed 30 inch-lbs.

D. Fire Resistance: Partition material shall comply with the following requirements, when tested in accordance with ASTM E 84: Standard Test Method for Surface Burning Characteristics of Building Materials:

1. Smoke Developed Index: Not to exceed 450.

2. Flame Spread Index: Not to exceed 75.

3. Material Fire Ratings:

a. National Fire Protection Association (NFPA): Class B.

b. International Code Council (ICC): Class B.

E. LEEDs Contribution: Partition material shall contribute to the following US Green Building Council’s Leadership in Energy and Environmental Design Program Credits (USGBC LEED Version 2.1):

1. Recycled Content (MR Credit 4.1): shall contain a minimum of 5% recycled content.

2. Recycled Content (MR Credit 4.2): shall contain a minimum of 10% recycled content.

3. Low Emitting Materials (EQ Credit 4.4): shall not contain urea-formaldehyde resins.

4. Rapidly Renewable Materials (MR Credit 6.0): more than 5% of material’s value shall be harvested from plants harvested within a ten-year cycle.

1.05 SUBMITTALS

A. Comply with requirements of Contract Documents regarding submittals.

B. Manufacturer’s Data

1. Provide required number copies of:

a. Product data sheets.

b. Installation instructions.

c. Cleaning and maintenance instructions.

d. Replacement parts information.

C. Shop Drawings

1. Provide required number of copies of all shop drawings.

2. Show fabrication and erection of compartment assemblies, to extent not fully described by manufacturer's data sheets.

3. Show anchorage, accessory items and finishes.

4. Provide location drawings for bolt hole locations in supporting members for attachment of compartments.

5. Field verify all dimensions and conditions prior to preparation of Shop Drawings.

6. Hinge allows for uplift of door. Typically, at in-swinging doors, latch is mounted on door and catch is mounted on stile, right-side-up. At out-swinging doors, latch shall be mounted on stile and catch shall be mounted on door, up-side-down. This will allow outswinging doors to be opened in emergency.

D. Samples

1. When requested by Owner during the Submittal review process, furnish scale model of compartments, including stile, shoe, door, door hardware, divider panel, and mounting brackets.

2. When requested by Owner during the Submittal review process, furnish sections showing stile anchoring and leveling devices, concealed threaded inserts, panel, stile, and edge construction.

3. Furnish a 1"x4" sample of compartment materials.

4. Furnish 1 each of stainless steel fasteners, door hardware, mounting hardware and headrail as applicable.

1.06 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver items in manufacturer's original unopened protective packaging.

B. Store materials in original protective packaging to prevent physical damage or wetting.

C. Handle so as to prevent damage to finished surfaces.

1.07 WARRANTY

A. Furnish twenty five-year manufacturer's limited warranty for panels, doors, and stiles against breakage, corrosion, delamination, and defects in factory workmanship.

B. Furnish one-year manufacturer's guarantee against defects in material and workmanship for stainless steel door hardware and mounting brackets.

1.08 EXTRA STOCK

A. Provide two additional latches and associated hardware per toilet room included in scope of work.

B. Provide one additional 12 inch wide style per toilet room included in scope of work.

C. Provdie one additional 36 inch wide stall door per toilet room included in scope of work.

1.09 QUALITY ASSURANCE

A. Field Measurements: Take field measurements prior to preparation of Shop Drawings and

fabrication where possible. Allow for adjustments within specified tolerances wherever taking field measurements before fabrication might delay the work.

B. Coordination: Furnish inserts and anchorages to be built into other work: coordinate delivery to avoid delay.

C. Regulatory Requirements: Provide toilet compartments complying with the requirements for the physically disabled of the California Code of Regulations (CCR) Title 24, Part 2, 2016 edition and ADA guidelines, latest edition.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Partition, Screen Manufacturer

1. Bobrick Washroom Equipment, Inc.

2. No known equal.

B. Toilet partitions and urinal screens shall be the product(s) of a single manufacturer.

2.02 MOUNTING CONFIGURATIONS

A. Toilet Partitions: Bobrick “Overhead-Braced (1092 Sierra™ Series)”

B. Urinal Screens: Bobrick “Wall-Hung (1093 Sierra Series)”

2.03 COMPONENTS/MATERIALS

A. Stiles, Panels, Doors, and Screens

1. Stiles, Panels, Doors, and Screens shall be all be manufactured from Solid Color Reinforced Composite material.

2. Colors and patterns shall be as selected by Owner from manufacture’s full range of colors and patterns.

3. Hinge side door stiles shall not be wider than 4” unless otherwise noted on drawings.

B. Stile, Panel, Door and Screen Material

1. Shall be constructed of Solid Color Reinforced Composite material, which is composed of dyes, organic fibrous material, and polycarbonate/phenolic resins. Material shall have a non-ghosting, graffiti-resistant surface integrally bonded to core through a series of manufacturing steps requiring thermal and mechanical pressure. Color shall monolithic throughout face and core, edge banding is not acceptable.

2. Partitions constructed of High Density Polyethylene (HDPE), or High Density Polypropylene, or color-thru phenolic is not acceptable.

C. Finish Thickness

1. Stiles and doors shall be 3/4" (19 mm).

2. Panels and benches shall be 1/2" (13 mm).

D. Hardware

1. All hardware shall be Bobrick “1092.67DS Optional Institutional Hardware”. Where Specifications and/or Drawings conflict with Bobrick “1092.67 Optional Institutional Hardware” requirements, the Bobrick “1092.67 Optional Institutional Hardware” requirements shall prevail.

2. Provide optional Door Plate Bobrick Part No. 1002510 at top and bottom of each partition door.

3. All hardware to be 18-8, type-304 stainless steel with satin finish.

4. Hardware of chrome-plated “Zamak”, aluminum, or extruded plastic shall not be accepted.

E. Latch

1. Sliding door latch shall be 14 gauge (2 mm) and shall slide on nylon track.

2. Sliding door latch shall require less than 5-lb force to operate. Latch requiring twisting or grasping operation will not be acceptable.

3. Latch track shall be attached to door by machine screws into factory-installed threaded brass inserts.

4. Threaded brass inserts shall be factory installed for door hinge and latch connections and shall withstand a direct pull exceeding 1,500 lbs. per insert.

5. Through bolted, stainless steel, pin-in-head Torx sex bolt fasteners shall be used at latch keeper-to-stile connections and shall withstand direct pull force exceeding 1,500 lbs. per fastener.

F. Hinges

1. Hinge shall be 16-gauge (1.6-mm) continuous piano hinge.

2. All doors shall be equipped with self-closing hinge.

3. Continuous piano hinge shall be attached to door and stile by theft-resistant, pin-in-head Torx stainless steel machine screws into factory-installed, threaded brass inserts

4. Fasteners secured directly into the core are not acceptable.

5. Door shall be furnished with two 11-gauge (3-mm) stainless steel door stop plates with attached rubber bumpers to resist door from being kicked in/out beyond stile.

6. Door stops and hinges shall be secured with stainless steel, pin-in-head Torx machine screws into threaded brass inserts.

7. Threaded brass inserts shall withstand a direct pull force exceeding 1,500 lbs per insert.

G. Coat Hook

1. Coat Hook shall Bobrick Model B-233 and be constructed of stainless steel and shall project no more than 1-1/8" (29 mm) from face of door.

2. Coat hook shall be secured by to door by through-bolted, theft-resistant, pin-in-head Torx stainless steel screws. Through-bolted fasteners shall withstand a direct pull force exceeding 1,500 lbs. per fastener.

3. Coat Hook shall act as door bumper on in-swing doors.

4. Mounting height = 48” maximum above finished floor.

H. Door Pull: Accessible stall door shall have a compliant loop or U-shaped door pull on inside and outside of door immediately below latch.

I. Door Bumpers: Provide wall door bumper for all doors where partition door will impact wall finish. Wall bumper shall be equal to Trimco, Model No. 1270CVPV. Mount on wall at height to match partition door handle.

J. Mounting Brackets

1. Mounting brackets shall be 18-gauge (1.2- mm) stainless steel and extend full height of panel. Contractor shall file all sharp or abrasive edges to provide a smooth and non-snag finish

2. U-channels shall be furnished to secure panels to stiles.

3. Angle brackets shall be furnished to secure stiles to walls and panels to walls.

4. Fasteners at locations connecting panels-to-stiles shall utilize through bolted, stainless steel, pin-in-head Torx sex bolt fasteners. Through-bolted fasteners shall withstand direct pull force exceeding 1,500 lbs. per fastener.

5. Wall mounted urinal screen brackets shall be 11 gauge (3 mm) double thickness.

6. Where full-height stainless steel brackets extend above ceramic tile wainscot, provide plywood shim between wall and bracket to act as spacer. Shim shall be narrower than brackets to allow for sealant joint. After shim installation, provide sealant joint between wall and bracket to completely enclose edge of plywood.

K. Leveling Device: 7-gauge, 3/16" (5-mm) hot rolled steel bar; chromate-treated and zinc-plated; through-bolted to base of solid color reinforced composite stile.

L. Stile Shoe: One-piece, 4" (102-mm) high, type-304, 22-gauge (0.8-mm) stainless steel with satin finish. Top shall have 90° return to stile. Shoe will be composed of one-piece of stainless steel and capable of being fastened (by clip) to stiles starting at wall line. Contractor shall file all sharp or abrasive edges to provide a smooth and non-snag finish.

M. Headrail (Overhead Braced): Satin finish, extruded anodized aluminum (.125” / 3-mm thick) with anti-grip profile. At all locations where overhead rail is installed over clear floor space, provide double overhead rails in back-to-back configuration at each door strike and hinge side for additional overhead reinforcement of free panel ends. Fasten double rails together with screws at minimum 12” o.c.

N. Full-Height Post: At all partition panels over 5’-0” in unsupported length, provide a full-height 1-1/4”x1-1/4” stainless-steel post, Bobrick Part No. 1000070 and Anchor Package Part No. 1002703. Provide floor and ceiling saddles. Fasteners into concrete floor shall be stainless steel. The panel shall be anchored to post to help eliminate side to side flex of the panel. At locations where post is taller than 8’-0” and/or is in a high vandalism area, provide custom stainless steel post with slip-joint as detailed on drawings.

O. Grab Bar Anchors for Toilet Partitions: At all locations as shown on drawings where grab bars are mounted on partition system, provide Bobrick 2586 Series stainless steel backing plate.

Part 3 – EXECUTION

3.01 INSPECTION

A. Check areas scheduled to receive compartments for correct dimensions, plumbness of walls, and soundness of surfaces that would affect installation of mounting brackets.

B. Verify spacing of plumbing fixtures to assure compatibility with installation of compartments.

C. Do not begin installation of compartments until conditions are satisfactory.

3.02 ERECTION

A. Install compartments rigidly, straight, plumb, and level and in accordance with manufacturer's installation instructions.

B. Installation methods shall conform to manufacturer's recommendation for backing and proper support.

C. Conceal evidence of drilling, cutting, and fitting to room finish.

D. Maintain uniform clearance at vertical edge of doors.

E. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.

F. Attach panel brackets securely to walls using anchor devices. All anchors shall be into solid wood blocking. No plastic expansion sleeves will be accepted.

G. Attach panels and pilasters to bracket with through sleeve tamperproof bolts and nuts.

H. Anchor urinal screen panels to walls with continuous panel brackets. At free end, provide full-height post as noted in Paragraph 2.03-N.

I. Provide adjustment for floor variations with screw jack through steel saddles integral with pilaster. Conceal floor fastenings with pilaster shoes.

J. Equip each door with one hinge, one door latch, and one coat hook and bumper.

K. Install door strike and keeper with door bumper on each pilaster in alignment with door latch.

L. Adjust hinges to locate doors in partial opening position when unlatched. Return outswing doors to close position.

M. Contractor shall install backing/blocking as required for secure attachment.

N. Confirm all locations of full-height post and provide blocking in ceiling space. Contractor shall open ceiling as required to install 4x4 blocking for attachment of post.

O. At locations of grab bars mounted on partition system, Contractor shall carefully measure and drill panels for grab bar anchors.

P. Install overhead rails straight and plumb. Provide back-to-back rails per Paragraph 2.03-M.

3.03 ADJUSTMENT AND CLEANING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hardware for proper operation after installation.

C. Set hinge cam on all doors to hold unlatched doors in closed position.

D. Clean exposed surfaces of compartments, hardware, and fittings.

E. Remove protective maskings. Clean surfaces.

F. Field touch-up of scratches or damaged enamel finish will not be permitted.

G. Replace damaged or scratched materials with new materials.

[END OF SECTION 10 21 13]

SECTION 10 26 23.16

FIBERGLASS REINFORCED PLASTIC PANELS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Fiberglass Reinforced Plastic Panels.

B. Accessories.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 07 90 00: Joint Sealers.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Fiberglass Reinforced Plastic Panels (FRP): Marlite FRP Class 1A, or approved equal. 4 foot sheet width, .090 inch gauge. Flame spread <25, smoke generation <450, Class 1A. Pebble Surface, Color as selected by Architect.

B. Accessories and Adhesives: Manufacturer's standard adhesive, and joinery trim system which hides each vertical joint and exposed edges.

PART 3 – EXECUTION

3.01 PREPARATION

A. All surfaces to receive FRP shall be properly prepared in strict accordance with manufacturer's specifications and as specified herein. Fill all pin holes, cracks, and other surface imperfections with spackle and scrape off surface splatters and imperfections to leave substrate surfaces smooth and free of damage.

B. All other trade work that penetrates substrate shall be completed before beginning FRP application.

3.02 APPLICATION

A. FRP shall be installed with adhesive supplied by or recommended by the FRP manufacturer.

B. Apply FRP panels according to manufacturer's instructions. No horizontal seams will be permitted.

C. Install trim in longest practical lengths. “Piecing” of trim will not be allowed.

D. Remove excessive adhesive from surfaces immediately.

E. Ensure positive contact of FRP to adhesive material with all wall surfaces. Remove or replace damaged or improperly applied FRP.

F. Provide continuous bead of caulk around all penetrations and transitions to adjacent materials.

3.03 CLEAN-UP

A. Upon completion of the work of this Section, remove all surplus material, and debris from the premises.

[END OF SECTION 10 26 23.16]

SECTION 10 28 00

TOILET AND BATH ACCESSORIES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Toilet accessories.

B. Attachment hardware.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 06 10 00: Rough Carpentry.

C. Section 09 21 16: Gypsum Board Systems.

D. Section 10 21 13: Toilet Compartments and Urinal Screens.

1.03 REFERENCES

A. ASTM A167-99(2009) - Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet and Strip.

B. ASTM A269/A269M-15a - Seamless and Welded Austenitic Stainless Steel Tubing for General Service.

1.04 KEYING

A. All accessories shall be keyed alike, Bobrick Cat-74 key or equal.

1.05 REGULATORY REQUIREMENTS

A. Conform to applicable code for installing work in conformance with Title 24 Accessibility Requirements.

1.06 SUBMITTALS

A. Product Data: Manufacturer's product data and installation instructions for each toilet accessory.

B. Samples: Full-size sample of each toilet accessory item. Acceptable samples will be returned and may be used in the work.

C. Setting Drawings: Furnish setting drawings, templates, instructions, and direction for installation of anchorage devices and cut-out requirements in other work.

1.07 SEQUENCING AND SCHEDULING

A. Coordinate the work of this Section with the placement of internal wall reinforcement and reinforcement of toilet partitions to receive anchor attachments.

1.08 QUALITY ASSURANCE

A. Manufacturer: Provide products of same manufacturer for each type of accessory unit unless otherwise approved by the Architect.

1.09 PROJECT CONDITIONS

A. Coordinate accessory locations, installation, and sequencing with other work to avoid interference and to assure proper installation, operation, adjustment, cleaning, and servicing.

1.10 WARRANTY

A. Contractor shall provide a two (2) year unconditional warranty commencing on recording date of Notice of Completion in addition to the manufacturer's standard warranty.

PART 2 – PRODUCTS

2.01 MANUFACTURERS

A. Bobrick. As Represented by R.E. EDWARDS & ASSOC.

B. Gamco.

C. World Dryer.

D. Or approved equal.

2.02 MATERIALS

A. Tubing: ASTM A269/A269M-15a, stainless steel.

B. Fasteners, Screws, and Bolts: Hot dip galvanized, tamperproof.

C. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FABRICATION

A. The following model numbers are Bobrick numbers and establish a quality level:

1. Toilet Paper Dispenser **(OFCI)**:

a. Accessible Stall with stud wall construction: B-3888; 2-roll, semi-recessed, tumbler lock. Satin-finish stainless steel with dispensing mechanism for 2 rolls. Door must have flat face with protruding tumbler lock. Unit must have theft-resistant heavy-duty spindles. Unit extends 2-3/4 inches from wall. No exposed edges or sharp corners are acceptable. Provide 10 additional keys.

b. Accessible stall where dispenser is mounted on partition separating accessible stall and standard stall, provide B-386. Provide with optional theft-resistant, keyed spindles, Part No. 283-604. No exposed edges or sharp corners are acceptable. Provide 10 additional keys.

c. Accessible Stall with masonry wall construction: custom modify partition mounted dispenser, B-386 to not project more than 3" on accessible stall side; 2-roll, semi-recessed, partition mounted, with tumbler lock. Provide with optional theft-resistant, keyed spindles, Part No. 283-604. No exposed edges or sharp corners are acceptable. Provide 10 additional keys.

d. Standard Stalls: Bay West Wagon Wheel #884 or approved equal.

2. Toilet Seat Cover Dispenser **(OFCI)**: Hospitality Specialties, Model 601. Heavy Duty Plastic, ½ fold. No exposed edges or sharp corners are acceptable.

3. Paper Towel Dispenser: Bay West, Roll #89500, surface mounted **(OFCI)**.

4. Liquid Soap Dispenser: GOJO 800 Series Bag-in-Box Dispenser, Model 9037-12. Manual dispenser for 800 ml soap system.

5. Mirrors:

   a. At Student Restrooms

      1) Bobrick B-1556-1830, polished stainless-steel type 304. 22 ga. minimum.

   b. At Staff and Nurse Restrooms

      2) Bobrick B-166-1830, polished stainless steel frame and shelf with ¼" glass mirror.

6. Grab Bars: B-6806 Series; snap flange covers, configurations and sizes as indicated on drawings.

   a. At accessible toilet stalls: 42" long on back wall, 48" long on side wall or as required by drawings.

   b. Mount to solid wood blocking.

   c. At locations where grab bars are mounted to partition system, provide Bobrick Grab Bar Anchors for Toilet Partitions, Series 258 backing plate.

7. Sanitary Napkin Disposal: Bobrick B-370634C semi-recessed, free vending operation.

B. Electric Hand Dryers: American Specialties Inc, model 0195. Surface mounted sensor hand dryer with cast iron cover. Confirm correct voltage with electrical drawings for site specific application.

C. Assemblies:

1. Weld and grind smooth joints of fabricated components.

2. Form exposed surfaces from single sheet of stock, free of joints.

3. Form surfaces flat without distortion. Maintain flat surfaces without scratches or dents.

4. Shop assemble components and package complete with anchors and fittings.

5. Provide steel anchor plates, adapters, and anchor components for installation.

6. Hot dip galvanize exposed and painted ferrous metal and fastening devices.

2.04 FACTORY FINISHING

A. Bobrick Units - Satin Finish, Stainless Steel: No. 4 satin luster finish.

B. Hand Dryer Units – Cast Iron, baked enamel, White.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Verify that site conditions are ready to receive work and dimensions are as instructed by the manufacturer.

B. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site at appropriate time for building-in.

B. Provide templates and rough-in measurements as required.

C. Verify exact location of accessories for installation.

3.03 INSTALLATION

A. Prior to mounting any accessories, Contractor shall provide dimensionally correct cardboard cutouts of all accessories. Contractor shall then walk each toilet room area with District to place all accessories in acceptable locations. This shall take place PRIOR to installing new gypsum board as backing for accessories needing to be installed.

B. Install fixtures, accessories and items in full compliance with 2016 California Building Code requirements and per mounting heights and plan dimensions on architectural drawings.

C. Install plumb and level, securely and rigidly anchored to substrate. Use vandal resistant fasteners where exposed.

D. Toilet Seat Cover Dispensers: Provide at staff and nurse toilet rooms or stalls, and at gender neutral toilet rooms only. Do not provide at student toilet rooms or stalls.

E. Sanitary Napkin Disposal: Provide at staff and nurse toilet rooms or stalls, at gender neutral toilet rooms, high school girls toilet rooms, and middle school girls toilet rooms.

F. Hand Dryers: Extend power to location of hand dryer and provide necessary backbox for connection. Provide in-wall blocking for unit support. Patch and repair existing conditions as required for new backing and backbox installation.

3.04 ADJUSTING AND CLEANING

A. Adjust toilet accessories for proper operation and verify that mechanisms function smoothly. Replace damaged or defective items.

B. Clean and polish exposed surfaces of accessories in accordance with manufacturer's recommendations after removing temporary labels and protective coatings.

[END OF SECTION 10 28 00]

SECTION 10 44 16

FIRE EXTINGUISHERS

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Furnish and install fire extinguishers and wall brackets as indicated on the Drawings and specified here.

1.02 RELATED SECTIONS

A. General Conditions

1.03 QUALITY ASSURANCE

A. Single Source Responsibility: Provide specified items from one manufacturer.

B. Catalog Standards:

1. Manufacturer's catalog numbers may be included on Drawings for convenience in identifying specified items. Unless modified by notation on Drawings or specified, catalog description for indicated number constitutes requirements for the item specified.

2. The use of catalog numbers and specific requirements set forth in Drawings and Specifications does not preclude use of any other manufacturer's products or procedures which may be equivalent. Such numbers and requirements establish standards of design and quality for material, construction, and workmanship.

1.04 SUBMITTALS

A. Refer to Section 00 72 00 for submitting the following items:

1. Product Data.

2. Installation Instructions and Drawings.

1.05 STANDARDS

A. California Building Code (CBC), 2016 edition, for fire extinguisher cabinets and location.

B. California Building Code (CBC), 2016 edition, Chapter 11B.

C. Americans with Disabilities Act (ADA), latest edition.

1.06 DELIVERY, STORAGE AND HANDLING

A. Deliver undamaged products to site in manufacturer's sealed containers or wrappings with legends intact. Store on site secure from weather, soil and physical damage.

PART 2 – PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Larsen's Manufacturing Company. (Specified)

B. JL Industries.

C. Amerex

D. Badger

E. Or approved equal.

2.02 FIRE EXTINGUISHERS

A. All fire extinguisher units shall be portable and rechargeable type with stainless steel discharge lever and fixed carry handle. Valve body shall be chrome-plated brass or aluminum. All units shall have a short hose/horn, visual pressure gauge and red color. Size and model as follows:

1. Multi-purpose, 10 lb. dry chemical UL Rating 2A-10B:C; Larsen MP10, JL Industries Cosmic 10E, Amerex B424, or approved equal.

2. Kitchen specific, 6 liter, potassium acetate based agent, UL Rating 2A:K, Larsen WC-6L, JL Industries Saturn 25, or approved equal.

2.02 MOUNTING BRACKET

A. Mounting bracket shall be wall mount type constructed of heavy gauge steel with a white or red baked enamel finish. Wall bracket shall be designed to provide support at top and bottom of extinguishers. Bracket shall be equal to Model 846 wall brackets by Larsen's Manufacturing Company, Model MB846 by JL Industries, or approved equal.

2.03 FIRE EXTINGUISHERS CABINETS

A. Cold rolled steel with an electrostatically applied, thermally-fused polyester coating with recoatable white finish, and a continuous hinge. Door and frame: Steel - Cold rolled steel with recoatable white polyester finish.

1. Semi-Recessed cabinet: Potter Roemer 7022 DV-FP.

2. Surface mounted cabinet: Potter Roemer 7024 DP-FP.

B. Provide manufacturer’s die-cut lettering in contrasting color applied to face of cabinet door.

PART 3 – EXECUTION

3.01 INSPECTION

A. Prior to installation of the work of this Section, carefully inspect and verify that the installed work of all other trades is complete to the point where this installation may properly commence.

B. Verify that specified items may be installed in accordance with the approved design.

C. In the event of discrepancy, immediately notify Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

D. Wall brackets shall be screw mounted into existing wood stud, solid wood backing, existing metal stud or steel backing, or masonry.

3.02 INSTALLATION

A. Install top of cabinet or wall bracket so that pull handles or break glass bars are 48" above finish floor with latch force not to exceed 5 lbs.

B. Provide in wall blocking forming a pocket for installation of any recessed cabinet.

3.03 PROTECTION

A. Protect work and materials of this Section prior to and during installation, and protect the installed work and materials of other trades.

B. In the event of damage, immediately make all repairs and replacements necessary to the satisfaction of the Architect and at no cost to the Owner.

[END OF SECTION 10 44 16]

SECTION 10 75 16

GROUND-SET FLAGPOLES

PART 1 – GENERAL

1.01 RELATED DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.02 SECTION INCLUDES

A. Aluminum Ground-Set Flagpoles.

1.03 SUBMITTALS

A. Submit per the requirements of Division 0, General Conditions.

B. Product Data: For each type of flagpole indicated. Include installation instructions and recommended foundation design.

C. Closeout Submittals

1. O & M Manuals: Maintenance and cleaning instructions

2. Guarantee: Provide in complete form per Division 0, General Conditions.

D. Shop Drawings: Submit complete shop drawings for all materials or furnishings requiring field or shop fabrication.

1.04 QUALITY ASSURANCE

A. Review: All equipment shall be reviewed for conformance with the intent of the Contract Documents and accepted by the contractor prior to installation. All components shall be in a new, "first-class" condition, per the discretion of the District's Representative, prior to Final Acceptance.

B. Source Limitations: Obtain each flagpole as a complete unit, including fitting, accessories, bases, and anchorage devices, from a single manufacturer.

1.05 GUARANTEE

A. Provide in required form for a period of 1 year from date of acceptance by Owner.

1.06 DELIVERY, STORAGE AND HANDLING

A. Store and handle acceptable to the District's Representative and so that work or access of others is not impeded.

B. Spiral wrap flagpoles with heavy paper and enclose in a hard fiber tube or other protective container.

PART 2 – PRODUCTS

2.01 FLAGPOLES

A. General: Manufacturer’s standard tapered aluminum flagpole, with all hardware, accessories, trim pieces, footing and anchorage for a complete, finished installation. Maximum installed height shall be 34’-11”.

B. Acceptable products:

1. Item Number ESR35D72-AA as manufactured by Colonial Flag.1-877-941-3524. www.colonialflag.com

2. Approved Equal.

C. Accessories: Manufacturer's standard gold anodized aluminum top finial ball, single-sheave cast aluminum truck, No. 10 braided polypropylene rope halyard, tapered 6063-T6 aluminum alloy tube, lockable hasp box, spun aluminum flashing collar and ground set tube.

D. Finishes:

1. Manufacturer's clear anodized finish on all surfaces.

2. Seal aluminum surfaces with clear, hard-coat wax.

E. Concrete: ASTM C94 / C94M-09a; Portland Cement, minimum 3,000 p.s.i. strength at 28 days, 3 inch slump; one inch maximum sized coarse aggregate.

PART 3 – EXECUTION

3.01 SEQUENCING AND SCHEDULING

A. Coordinate construction timing of installation in conformance with all other work.

3.02 INSTALLATION

A. Concrete Footings: Install as shown in Drawings.

B. Equipment: Conform to layout shown on Drawings. Install all components in strict conformance with referenced Standards, Details, accepted Shop Drawings, and manufacturer's instructions.

3.03 CLEANING

A. Keep premises free from accumulation of waste and debris. At completion of installation remove all debris and clean adjacent surfaces as required.

B. At completion clean exposed surfaces in a manner that will not damage finish.

[END OF SECTION 10 75 16]

SECTION 22.00.00

PLUMBING GENERAL CONDITIONS

PART 1 - GENERAL

1.01 GENERAL

A. This Section specifies the Division 22 Work coordination requirements with general work provisions.

B. For convenience and reference the Division 22 Specifications are separated into Divisions and Sections. Such separations shall not operate to make the Engineer an arbitrator to establish subcontract limits between the Prime Contractor and his Subcontractors. In any case, the Prime Contractor is responsible to the owner for a complete job.

C. This section consists of General Requirements and Standard Specifications covering certain parts of work under Division 22 and is supplemented by other Division 22 sections covering additional work, requirements, and materials specifically applicable to the work of each section.
   1. Requirements of subsequent sections of the specifications, if in conflict with these General Requirements, shall govern.

D. No material installed as part of this WORK shall contain asbestos in any form.

1.02 CONDITIONS OF THE CONTRACT

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. This section is a Division-22 Basic Materials and Methods section and is a part of each Division -22 section.

1.03 DESCRIPTION OF REQUIREMENTS

A. Provide finished work, tested and ready for operation including apparatus, appliances, materials, and work. Provide incidental accessories necessary to make the work complete and ready for operation without additional expense to the Owner.

B. Before beginning work or ordering materials, consult Architect for clarification of discrepancies between, or questionable intent, of the Contract Documents.

C. Contractor shall visit the site and field survey the existing site conditions prior to bid. Any site conditions which may cause significant deviation from the design drawings shall be brought to the attention of the Owner's representative for clarification prior to bid.

1.04 REQUIREMENTS OF REGULATORY AGENCIES:

A. Provide work and materials in full accordance with the latest rules and regulations of the following:
   1. California Code of Regulations - Title 24 - Parts 2, 3, 4,5, and 9
   2. California Code of Regulations - Title 22 - Chapter 7
   3. California Building Code, 2016
   4. California Mechanical Code, 2016
   5. California Plumbing Code, 2016
   6. California Electric Code, 2016
   7. California Fire Code, 2016
   8. California Building Energy Efficiency Standards 2016
   9. California Green Building Standards 2016
   10. California Energy Code 2016

11. National Fire Protection Association
12. CAL-OSHA
13. State Fire Marshal, Title 19 CCR
14. Other applicable state laws
15. Office of Statewide Health, Planning and Development

B. Nothing in Drawings or specifications shall be construed to permit work not conforming to these codes.

C. Conform to State of California Energy Conservation Standards for all systems, equipment, and construction.

D. The above Codes and Standards define minimum requirements required for the project. Where Contract Documents differ from governing codes, furnish and install higher standard.

1.05 FEES, PERMITS, AND UTILITY SERVICES:

A. Arrange for required inspections and permits required in installation of the work.

B. The Owner will pay charges for permits required.

C. Arrange for utility connections and pay charges incurred, including excess service charges, if any.

D. Obtain the first permits to operate any compressed air tanks that are required to be furnished under this work, pay all costs, and perform all tests required to obtain permits. Post permits under glass in a conspicuous place on or near the tanks, as required by these authorities.

1.06 UTILITY CONNECTIONS:

A. Prior to start of Construction and within 30 days of award of Contract, contact local gas company representative and coordinate location of gas meter and piping. In addition, coordinate time required for installation in order to avoid delay to the project.

B. Arrange for utility connection and coordinate work with utility company.

C. Contractor to bear the cost of all construction related to utility services from the point of connection shown on the Contract Documents. This includes any piping, excavation, backfill, boring, etc.

1.07 SITE EXAMINATION:

A. Examine site, verify dimensions and locations against Drawings, and inform self of conditions under which work is to be done before submitting proposal. No allowance will be made for extra expense on account of error.

B. Information shown relative to existing services is based upon available records and data but is approximate only. Make minor deviations found necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation for new piping or its installation.

C. Exercise care in excavating near existing utilities to avoid any damage thereto. This Contractor is responsible for any damage caused by his operations.

1.08 MATERIAL LIST AND SUBSTITUTIONS:

A. Prior to commencement of work, and within 35 days after award of Contract, submit to Architect for review electronic copies of a complete list of equipment and materials to be furnished, including all substitutions. All submittals to be in electronic format as follows:
1. Submittals to be in PDF Format.
2. Individual PDF cut sheets shall be inserted into a single file for review.

3. All sheets to be “unprotected” and “writable”.

B. Provide submittal information for all materials proposed for use as part of this project. Provide standard items on specified equipment at no extra cost to the contract regardless of disposition of submittal data. Other material or methods shall not be used unless approved in writing by the Architect. The Architect’s review will be required even though “or equal” or synonymous terms are used.

C. It is the responsibility of the Contractor to assume all costs incurred because of additional work and/or changes required to incorporate the proposed substitute into the project including possible extra compensation due to the Architect. Refer to Division 1 for complete instructions.

D. Contractor to provide complete Submittal packages for all plumbing items clearly separated by system. At a maximum, submittals to be broken into the following packages:
1. Plumbing – Fixtures, Trim, Piping, Equipment, Accessories, etc.
a. When required by schedule, a separate Plumbing Underground submittal package will be reviewed upon request.
b. Incomplete submittals or submittals broken down by spec section shall be returned un-reviewed.

E. Identify each item by manufacturer, brand, trade name, model number, size, rating, or whatever other data is necessary to properly identify and review materials and equipment.
1. Where submittal sheets indicate more than one product, Contractor to clearly identify product being submitted. Contractor to cross-out information not being submitted for review.
2. Submittals that do not clearly identify submitted item will be returned to the Contractor un-reviewed.

F. Identity each submitted item by reference to specification section number and paragraph in which item is specified. Cross reference submittals by equipment ID where applicable.

G. Quantities are the Contractor's responsibility and will not be reviewed.

H. If Contractor desires to make a substitution, he shall submit complete information or catalog data to show equality of equipment or material offered to that specified.
1. Only one request for substitution will be considered on each item of material or equipment. No substitutions will be considered thereafter.
2. Scheduled Products and first named manufacturer/product forms basis of design. All other manufacturers’ products are substitutions.
3. No substitutions will be allowed unless requested and reviewed in writing.
4. The Architect shall review and take appropriate action on shop Drawings, product data, samples, and other submittals required by the Contract Documents. Such review shall be only for general conformance with the design concept and general compliance with the information given in the Contract Documents. It shall not include review of quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with the work of other trades, or construction safety precautions, all of which are the sole responsibility of the Contractor.
5. Review of a specific item shall not indicate acceptance of an assembly of which the item is a component. The Architect shall not be required to review and shall not be responsible for any deviations from the Contract Documents not clearly noted by the Contractor, nor shall the Architect be required to review partial submissions or those for which submissions for correlated items have not been received. Architect reserves right to require originally specified item.

I. Installation of reviewed substitution is Contractor's responsibility. Any changes required for installation of reviewed substituted equipment must be made without additional cost to the owner. Review by the Architect of the substituted equipment and/or dimensional Drawings do not waive these requirements.

1.09 MAINTENANCE AND OPERATING INSTRUCTIONS:

A. Instruct the Owners’ authorized representatives in the operation, adjustment, and maintenance of all mechanical equipment and systems. Provide 3 copies of certificate signed by Owner’s representatives attesting to their having been instructed.

B. Furnish Architect with three complete sets of operating and maintenance (O&M) instructions.
1. O&M manuals to be bound in hardboard binder and indexed.
2. O&M manuals to include: descriptive literature, catalog cuts, and diagrams covering all items of operation and maintenance for each and every mechanical system and piece of equipment furnished under these specifications.
3. Include in each set a copy of the air balance test report specified hereinafter.

C. Contractor must start compiling the above data (including obtaining operating and maintenance instruction data and catalog cuts and diagrams from the manufacturer of the reviewed equipment) immediately upon review of his list of materials, so as not to delay the final installation of the work.

D. Bind and index each set in a durable, hardboard binder. Final observation will not be made until booklets are submitted and have been reviewed by the Architect.

E. O&M manuals to incorporate the following:
1. Complete operating instructions for each item of plumbing equipment.
2. Test data and system balancing reports as specified.
3. Manufacturer's bulletins with parts numbers, instructions, etc. for each item of equipment. Remove information not applicable to project.
4. Typewritten maintenance instructions for each item of equipment listing in detail the lubricants to be used, frequency of lubrications, inspections required, adjustment, etc.
5. A complete list and/or schedule of all major valves giving the valve ID, location of valve, and the rooms or area controlled by the valve.
6. Provide copies of start-up reports for each piece of equipment provided as part of this work.
7. Name, address, and phone number of contractors involved in work under this Division.
8. Detailed step-by-step instructions for starting, summer operation, winter operation, and shutdown of each system.
9. Detailed maintenance instructions for starting, summer operation, winter operation, and shutdown of each system.
10. Spare parts list.
11. Full size Record as built shop drawings in hard copies and in AutoCad 2013 CAD files.
a. Contractor to incorporate field mark-ups into record drawings. Mark-up shop drawings not acceptable.

1.10 COORDINATION SHOP DRAWINGS

A. General:
1. Prepare and submit for review coordination drawings where work by separate entities requires fabrication of products and materials which must accurately interface or for which space provided is limited.
2. Coordination drawings shall indicate how the work will interface and installation will be sequenced. It is the intent of this provision to find, bring forth, and resolve potential constructability problems prior to actual construction, thereby allowing for the resolution of issues before construction cost and schedule are impacted.

B. The General Contractor shall oversee preparation of coordination drawings, assign priority space, and bring to the attention of the Architect any conflicts or interferences of an unresolved nature found during preparation of coordination drawings. Expedite conflict or interferences and submit solutions/ recommendations for approval review.

C. Drawings: Shop drawings shall include but are not necessarily limited to the following:
1. Submit 1/4" = 1'-0" minimum scale, a combined, comprehensive mechanical coordination drawing. Coordination drawing shall include all plumbing piping, HVAC ductwork, mechanical piping, sprinkler systems, and ceiling systems overlaid on structural frame and architectural plan. Shop drawings are to be coordinated with all electrical and Telecom systems.

2. Criteria: Plumbing Piping, Ductwork, mechanical piping, and sprinkler system components shall be sized as shown on Drawings. Seismic restraints shall be shown where required.
   a. Nonconforming Mechanical work installed within designated coordination areas is subject to removal and replacement by the installing contractor at no additional cost to Owner.
3. Provide sections for congested areas.
4. Identify typical areas, start preparation of coordination drawings for such areas first.

D. Coordination drawings shall be signed and dated by individual trade contractors. By act of signature and submittal of singular combined coordination drawing, each trade contractor acknowledges their coordinated portion of the work with all other mechanical, electrical, telecom, architectural, and structural work contractors.

E. After completion of coordination shop drawings signed by individual trade contractors. Submit copies to the architect for review. Once approved, provide copy at the job site for reference. No work shall be performed without the complete coordination shop drawings.

F. No request for information regarding the routing of pipes and placement of equipment will be reviewed and responded to without a completed shop drawings.

1.11 SITE CONDITIONS

A. Information of the drawings relative to existing conditions is approximate only. Deviations found necessary during progress of construction to conform to actual conditions as approved by the Architect shall be made without additional cost to the Owner. The Contractor shall be held responsible for any damage caused to existing services. Promptly notify the Architect if services are found which are not shown on the Drawings.

PART 2 - PRODUCTS

2.01 GENERAL:

A. Mention herein or on Drawings requires that this Contractor provide each item listed of quality noted or equal. Refer to subsequence division 22 specification sections for specific equipment and system materials and accessories.

B. All material shall be new, full weight, standard in all respects, and in first- class condition.

C. Provide materials of the same brand or manufacture throughout for each class of material or equipment wherever possible.

D. The grade or quality of materials desired is indicated by the trade names or catalog numbers stated herein.

E. Dimensions, sizes, and capacities shown are a minimum and shall not be changed without permission of the Architect.

F. Conform to the State Energy Conservation Standards for all material and equipment.

2.02 MATERIALS FURNISHED:

A. Identify all materials and equipment by manufacturer's name and model number. Remove unidentified materials and equipment from site.

B. Equipment specified by manufacturer's number shall include all accessories, controls, etc. listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.

C. Equipment or material damaged during transportation, installation, or operation is considered as totally damaged. Replace with new equipment. Variance from this permitted only with written consent of the Architect.

D. Deliver, Protection, and Care:
1. Deliver materials or equipment to the Project in the manufacturer's original, unopened, labeled containers.
2. Added costs associated with reordering, expediting orders, or project delays due to rejected materials shall be borne by the Contractor.
3. Protect from damage which may be caused by theft, weather, and building operations. Failure to protect materials and apparatus adequately shall be sufficient cause for rejection of any damaged material or equipment.
4. Close pipe and equipment openings to prevent intrusion of obstructions and damage.
5. Owner or Architect will require removal and replacement of such material or work from the premises which is not in accordance with Contract Documents. Replace unsatisfactory work without delay, at no additional cost to the Owner.
6. All material and equipment shall be protected against moisture, dirt and damage. Protective coverings shall be provided for bearings, open connections to pumps and tanks, coils, ducts, pipes and similar equipment that is vulnerable to grit and dirt.
7. The interior of the pipes and ducts shall be kept clean at all times.

PART 3 - EXECUTION

3.01 GENERAL:

A. General arrangement and location of piping, equipment, etc. are shown on Drawings or herein specified. Carefully examine other work that may conflict with this work. Install this work in harmony with other crafts and at proper time to avoid delay of work. Provide all offsets as required to avoid other trades at no additional cost to the owner.

B. In advance of construction, work out minor changes and relocations to suit actual conditions and work of other trades to avoid conflict therewith. This shall not be cause for additional cost.

C. Execute any work or apparatus shown on the Drawings and not mentioned in the specifications, or vice versa, the same as if specifically mentioned by both. Omission from Drawings or specifications of any minor details of construction, installation, materials, or essential specialties does not relieve this Contractor from furnishing same in place complete.

D. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and workable system.
1. Minor piping associated with instrumentation and control is generally not shown. Interconnection of sensors, transducers, control devices, instrumentation panels, is the responsibility of the contractor. Small piping associated with water cooling, drips, drains and other minor piping may not be shown to avoid confusion in the plan presentation but shall be provided as part of contract work. Drains shall be piped to the nearest floor drains.

E. Furnish materials and work at proper time to avoid delay of the work.

F. Coordinate with testing and balancing contractor to review drawings for proposed additional balancing components required for proper system testing and balancing.

3.02 ACCESS:

A. Continuously check Architectural Drawings for clearance and accessibility of equipment specified herein to be placed. No allowance of any kind will be made for negligence on part of Contractor to foresee means of installing his equipment into proper position.

3.03 CLOSING IN OF UNINSPECTED WORK:

A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected and tested. Should work be enclosed or covered up before it has been inspected and tested, uncover work at own expense. After it has been inspected and tested, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.04 PROJECT MODIFICATIONS:

A. During the progress of construction, if such conditions arise that require revisions, modifications, or relocations to any mechanical equipment or materials incorporated in this project, such alterations shall be immediately called to the attention of the Architect. Contractor shall then prepare necessary Drawings showing proposed changes. Submit proposed changes for review by the Architect prior to actual revision work in the field.

B. Two sets of Drawings showing all revisions shall be immediately presented to Architect for his records. Maintain additional copies on the project as necessary to comply with "RECORD DRAWINGS" requirement of the General Requirements.

C. Incorporate all revisions into record Drawings.

3.05 FORMING, CUTTING AND PATCHING:

A. Coordinate with other contractors as necessary to provide any special forming, recesses, chases, etc., and provide wood blocking, backing, and grounds as necessary for proper installation of mechanical work.

B. If this Contractor fails to coordinate with other contractors at proper time or fails to locate items properly, resulting in extra work, then this Contractor is responsible.

C. This Contractor is responsible for proper placement of pipe sleeves, hangers, inserts, and supports for work.

D. Cutting, patching, and repairing of existing (old) construction to permit installation of piping, etc. is responsibility of this Contractor. Repair or replace damage to existing work with skilled mechanics for each trade involved in first-class manner.

E. Cut existing construction in a neat and workmanlike manner by the use of a concrete saw. Use of pneumatic devices will not be allowed.

F. Core openings through existing construction as required for the passage of new piping and conduits. Cut holes of the minimum diameter to suit size of pipe installed and associated insulation.

3.06 DEMOLITION AND SALVAGE:

A. Provide demolition of mechanical work under this SECTION as indicated on Drawings.

B. Removed materials which will not be re-used and which are not claimed by the owner shall become the property of the Contractor and shall be removed from the premises. Consult Owner before removing any material from the premises. Carefully remove materials claimed by the owner to prevent damage. Coordinated delivery of such items to owner.

C. Removed materials which are to be reused are to be removed, cleaned, and stored in a safe location. If such items are lost or damaged by the Contractor, item shall be replaced with new item at no added cost to owner. If item is found to be damaged prior to removal, inform Architect prior to removal so that item may be examined by Architect and owner for further instructions.

3.07 WELDING FOR MECHANICAL WORK

A. All mechanical welding and inspection requirement shall be in accordance with the California Mechanical Code.

B. Qualify welding procedures, welders and operators shall be in accordance with ASME Boiler and Pressure Vessel Code, Section IX, welding and brazing qualifications. Welding procedures and testing shall comply with ANSI standard B31.9 - Standard Code for Pressure Piping, and the American Welding Society (AWS) welding handbook.

C. Soldering and brazing procedures shall conform to ANSI B9.1 standard safety code and NFPA 99.

D. All welders shall be certified by a state approved welding bureau. Fabricator shall have current and valid certificated registration by the building official for the types of welds required by the project. Prior to start of the project, the fabricator shall submit a copy of certificate of registration for approval. Prior to project close out, the fabricator shall submit a certificate of compliance that the work was performed in accordance with the approved plans and specifications to the building official and to the Engineer or Architect of record.

3.08 EXISTING SERVICES:

A. Provide and install all required connections to existing systems as required by the Drawings and specifications.

B. Integrate existing systems with all new work to provide a complete working system.

C. Provide minimum 72 hour notice to Owner of service interruptions. All service interruptions shall be kept to the minimum possible time. When requested by Owner service interruptions shall occur outside of normal working hours at no additional cost to owner.

3.09 STRUCTURAL DESIGN OF EQUIPMENT AND SEISMIC RESTRAINTS:

A. All mechanical equipment supports shall be designed by a licensed Structural Engineer and shall comply with the 2016 California Building Code, Section 1616A.1.18 through 1616A.1.26 and ASCE 7-10. Chapters 13, 26, and 30.

3.10 WARRANTY

A. Be responsible for work done and material installed under these plans and specifications. Repair or replace, as may be necessary, any defective work, material, or part which may show damage to itself or other materials, furnishing, equipment, or premises caused by such defects during this period, if in the opinion of the Architect said defect is due to imperfection of material or workmanship. Provide all such work and materials at no cost to Owner.

B. Be responsible for damage to any part of premises during guarantee period caused by leaks or breaks in work furnished and/or installed under this section. Replace refrigerant, lubricants, or gasses lost as result of defects, breaks, or leaks in work.

C. Provide manufacturer's written warranties covering defects in material and workmanship of products and equipment utilized for the project.

D. Warranties shall be for a period of 1 year from the date of substantial completion unless more stringently specified within individual Sections of this Division.

3.11 START-UP PROVISIONS FOR MECHANICAL WORK

A. General: Major equipment (such as booster pumps) start-up shall be performed by the equipment manufacturer or authorized representative.

B. Adjusting and Aligning Equipment: Adjust all equipment. Check all motors for proper rotation.

C. Lubrication:

1. Extend grease fittings on bearings to points of ready and easy accessibility.
2. Lubricate fan bearings, etc., before operation of any equipment.
3. Provide a final lubrication to equipment immediately before turning over to Owner.

D. Provide training and orientation of Owners operating staff in proper care and operation of equipment, systems and controls.

E. During test period, make final adjustments and balancing of equipment, systems, controls, and circuits so that all are placed in first-class operating condition.

F. Mark final positions of balancing valves after balancing is complete.

G. Final observation will not be made until all of the above have been completed and a preliminary copy of the balance report has been submitted and reviewed.

3.12 PLUMBING RECORD AS-BUILT DRAWINGS:

A. During the course of Project Construction, Mechanical Contractor shall maintain recorded “AS-built” information by distinctively marking up approved shop drawings prints to depict all actual work installed on a daily basis form but not limited to field conditions, addendums, architectural supplemental instructions (ASIs), instruction bulletins (IBs), change orders (COs), responses to Request For Information (RFIs), and approved product substitutions.

B. The marked-up shop drawings will be made available at the Construction Site to the Architect upon request, at any time.

C. The marked up shop drawings with the recorded information shall then be used to create Record As-built drawings at the completion of the project. Contractor shall submit the Record As-built drawings in full size hard copies and also in PDF format.
1. Provide 2 complete sets of full size drawings on 20 pound white bond paper.
2. Provide 1 CD (compact disc) or Thumb Drive with Record drawings in either AutoCAD, version 2013 or later version.
3. Record as-built drawings are to be full size drawings (same size as Contract Documents) and all plans are to be to standard engineering scale. The minimum drawing scale to match those provided within the Contract Documents.

3.13 CLEANING UP:

A. Remove tools, scaffolding, surplus materials, barricades, temporary walks, debris, and rubbish from the Project promptly upon completion of the work of each Section. Leave the area of operations completely clean and free of these items.

END OF SECTION

SECTION 22.05.10

COMMON WORK FOR PLUMBING

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes general mechanical materials and methods required within the project. Items included within this specification section include:
1. Piping Supports
2. Access Doors
3. Valve Boxes
4. Dielectric Unions
5. Pipe and Equipment Identification
6. Fireproofing
7. Painting
8. Concrete
9. Excavating And Backfill
10. Electrical Work
11. Commissioning and preliminary operational tests

1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of plumbing piping systems products, of types, materials, and sizes required whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with piping systems work similar to that required of project.

1.03 SUBMITTALS:

A. Product data: submit complete data of materials proposed including:
1. Manufacturer and model number
2. Clearly indicate all options, trim, and accessories.
3. Cross reference manufacturer's cut sheet to specification section on submittal sheet.

B. Operation and Maintenance Data: where applicable, submit complete O&M data including:
1. Maintenance data and parts lists for each component.
2. Provide "trouble- shooting" maintenance guide
3. Include this data within maintenance manual

PART 2 - PRODUCTS

2.01 PIPING SUPPORTS:

A. All mechanical equipment supports shall be designed by a licensed Structural Engineer and shall comply with the 2013 California Building Code, Section 1616A.1.18 through 1616A.1.26 and ASCE 7-10, chapters 13, 16, and 30.

B. Mechanical equipment supports shall be designed by a licensed Structural Engineer.

C. Provide seismic sway bracing for all suspended piping and ductwork in accordance with the Seismic Restraint System Guidelines, OPM-0052-13 by Cooper B-Line / Tolco or equivalent OPM-0043-13 by Mason.

D. Provide all piping and ductwork with seismic restraints using seismic hazard level (SHL) "A" as called for in SMACNA's Seismic Restraint Manual Second Edition 1998.

E. Acceptable Manufacturer:
   1. B-Line
   2. Mason
   3. Or Equal

F. Vertical Piping:
   1. Support vertical piping risers securely with riser clamps, B-Line B3373, or equal. Attach clamps to the pipe above each concrete floor slab, with the arms of the clamp resting on the slab or the structural supports. Provide Superstrut B3373C, or equal clamp when used on copper piping.
   2. Support pipe lines passing up through the building at each floor of the building.

G. Horizontal Piping:
   1. Use B-Line B3100, or equal, steel strap hanger for uninsulated steel or cast-iron pipe through 8-inch size, and for insulated steel or cast-iron pipe through 4-inch size.
   2. Use Superstrut C-710 or equal, steel hanger in pipe sizes where suitable. Use saddle shield as specified for insulated pipes.
   3. For uninsulated copper tubing, use B-Line B3100F, or equal, felt lined hanger.

H. Pipe Saddles:
   1. Use B-Line B3153, or equal, protective insulation shield with “loc” tabs.

I. Concrete Inserts: Provide B-Line B2500, or equal, concrete inserts.

2.02 VALVE BOXES:

A. Provide at each valve or cock in ground a Christy, Brooks, or equal valve box with cover marked for service.

B. Valve boxes in traffic areas: Provide Christy No. G5 traffic valve box, 10-3/8” inside diameter with extensions to suit conditions, with cast iron locking cover.

C. Valve Boxes in non-traffic areas: Provide Christy No F22, 8” inside diameter by 30” long with cast iron locking cover. Cut bottom of plastic body for operation of valve as required.

D. Extension Handles
   1. Handle to be Alhambra Foundry Co., or equal, model A-3008 extension handle.
   2. Furnish 2 extension handles per project for underground valves.

2.03 ACCESS DOORS:

A. Where floors, walls, or ceilings must be penetrated for access to mechanical equipment, provide access doors, 14-inch by 14-inch minimum size in usable opening. Where entrance of a serviceman may be required, provide 18-inch by 24-inch minimum usable opening.
   1. All access doors less than 7’-0” above finished floors and exposed to public access shall have keyed locks.

B. Access doors shall match those supplied in Division 8 in all respects, except as noted herein.

C. Where panels are located on ducts or plenums, provide neoprene gaskets to prevent air leakage, and use frames to set door out to flush with insulation.

D. Provide insulated doors where located in internally insulated ducts or casings.

E. Where specific information or details relating to access panels different from the above is shown or given on the Drawings or other Divisions of work, then that information shall supersede this specification.

F. Do not locate access doors in highly visible public areas such as lobbies, waiting areas, and primary entrance areas. Coordinate with the architect when access is required within these areas.

G. Available Manufacturers:
1. Milcor
2. Karp
3. Nystrom
4. Cesco

H. Access doors to be equivalent to the following Milcor access doors:
1. Style M (plaster)
2. Style A (A/C tile, gypsum board)
3. Style M (Masonry)
4. Style "Fire Rated" where required.

2.04 DIELECTRIC UNIONS:

A. Furnish and install dielectric unions at all locations described herein, whether shown on Drawings or not, and except as noted herein. Construct couplings and flanges so that the two pipes being connected are completely insulated from each other with no metal-to-metal contact. Heavily line the couplings with a hard, insulating, phenolic plastic threaded in standard pipe sizes. Make up the flanges with insulating components consisting of a hard, phenolic gasket, bolt sleeves, and bolt washers. Supplement the insulating gasket with neoprene faces to form a seal.

B. Acceptable Manufacturers:
1. Watts Regulator Co.
2. Eclipse, Inc.
3. Perfection Corp.

2.05 PIPING AND EQUIPMENT IDENTIFICATION:

A. Pipe Identification:

1. Each piping system furnished and installed under this work shall be identified and the direction of flow indicated by a prefabricated coiled plastic colored label.

2. Labels shall comply with ASME A13.1 with regard to color, letter height, and marker size. The labels shall have black or white lettering and flow arrows on colored backgrounds and shall not require adhesive. The background colors shall conform to the color schedule shown in this Article.

3. For use indoors use 20 mil vinyl labels, MSI model MS-970, or equal. For piping with an outside diameter greater than 6 inches provide the label manufacturers nylon straps to secure label to piping.

4. For use outdoors use Polyester/Tedlar laminated material, MSI model MS-977, or equal. For piping with OD greater than 6” provide the label manufacturers stainless steel straps to secure label to piping.

5. The size of the lettering and label shall be such that the lettering can be easily read from the floor and the colors easily discernible.

6. Acceptable Manufacturers:
a. Marking Services Incorporated (MSI)
b. Idento Metal Products Co., Idento Bands
c. Setmark

B. Equipment Identification:

1. Provide white lamacoid plate for each and every piece of equipment installed in this work.
   a. Lettering on plate shall be black, with size of lettering to suit equipment.
   b. Lettering shall be minimum of 3/8-inch in height.
   c. Plates shall be riveted or bolted to equipment.

2. Equipment to include, but not limited to:
   a. Pumps
   b. Water Heaters
   c. Air Compressors
   d. Vacuum Pumps
   e. Etc.

C. Acceptable Manufacturers:
   1. Marking Services Incorporated, (MSI)
   2. LEM Products
   3. Seton
   4. Craftmark

2.06 FIREPROOFING

A. Fireproofing to be installed at all pipe and duct penetrations of rated assemblies.

B. Fireproofing to be UL Rated fire stop material.

C. Acceptable Manufacturers:
   1. Hilti
   2. 3M Pro-Set
   3. Or Equal

PART 3 - EXECUTION

3.01 INSTALLATION OF HANGERS AND SUPPORTS:

A. Fasten all piping securely to structure with hangers, supports, guides, anchors, or sway braces to maintain pipe alignment, to prevent any sagging, and to prevent noise or excessive strain on the piping due to uncontrolled movement under operating conditions. Relocate hangers as necessary to correct unsatisfactory conditions that may become evident when system is put into operation.

B. Follow drawing requirements and details where special pipe support requirements are detailed on the Drawings.

C. Do not support piping by perforated tape, wire, rope, wood, nails, or other makeshift devices.

D. Design hangers and supports to support the weight of the pipe, weight of fluid, and weight of the pipe insulation with a minimum factor of safety of five based on the ultimate tensile strength of the material used.

E. Burning or welding on any structural member under load shall not be attempted. Field welding not called for on the Drawings or reviewed shop Drawings may only be done with consent and advice of the Architect and after proper provisions have been made to relieve the stress on the member. The boring of holes in beam flanges or narrow members will not be allowed.

F. Install hanger on insulated piping in a manner which will not produce damage to insulation. Provide steel pipe saddles as required to protect pipe covering. Install pipe hangers on piping covered with insulation on the outside of the insulation and not in contact with the pipe.

G. Fasten hanger rods to concrete structural members with concrete inserts set flush with surface. Install a reinforcing rod through the opening provided in the concrete inserts. Fasten hanger rods to structural members with suitable beam clamps, and provide beam clips to lock clamp securely to beam.

H. Use of powder-actuated fasteners will not be permitted for the support of any overhead piping.

I. Turnbuckles, if used, shall have a load-carrying capacity at least equal to that of the pipe hanger with which they are being used.

J. All threaded parts of pipe hanger assemblies shall have full length of thread in service while in use.

K. Hanger material shall be reviewed by the Architect before installation.

L. Pipe Hanger or Support Spacing:
1. Provide pipe hangers or supports at 6-foot maximum spacing on steel pipe 3/4-inch diameter and smaller and for copper pipe 1-1/2 inches and smaller.
2. Support steel piping 1" and larger and copper larger than 1-1/2 inches at 10-foot maximum spacing.
3. Support steel piping used for gas at the following lengths:
   a. 1/2-inch diameter at 6-feet maximum
   b. 3/4-inch and 1-inch at 8-feet maximum
   c. 1-1/4-inch and larger at 10-feet maximum spacing

M. Provide continuous support channel for all polypropylene piping, and provide 6-foot maximum spacing for hangers, with a minimum of one hanger per length of pipe.

N. Provide hangers or supports for horizontal and vertical cast-iron drainage pipe at every other joint, except that when the developed length between hangers or supports exceeds 4 feet, provide hangers or supports at each joint. Provide adequate sway bracing to prevent shear.

3.02 ACCESS DOORS:

A. Access doors shall be furnished and installed wherever valves, balance valves, damper operating mechanisms, air terminal boxes, fans, and similar items normally requiring adjustment or servicing are installed in concealed or inaccessible spaces. Coordinate with access doors shown on architectural Drawings.

B. Comply with manufacturer's instructions for installation of access doors.

C. Where access panels are detailed on architectural or mechanical Drawings, sizes indicated thereon shall be used.

D. Keyed access doors shall be keyed alike.
1. Provide owner with 4 copies of keys for access doors.

3.03 VALVE BOXES:

A. Provide valve box for all buried valves. Install per manufacturer’s written instructions with top of box flush with finished grade.

B. Clean all valve boxes of debris.

3.04 DIELECTRIC UNIONS:

A. Install dielectric unions in the following locations:

1. In all metallic water and gas service connections into the building within 5 feet of the building wall. Install adjacent to the shut-off valve or cock and above ground where possible.
2. At points of connections where copper water lines connect to steel domestic water heater tanks and other equipment.
3. At points in piping where dissimilar metal pipes are connected together.
4. Any special applications shown on the Drawings.
5. Where steel or cast-iron pipe in the ground connects to copper or brass piping above the ground, the transition from steel or cast- iron pipe to the copper or brass pipe shall be made above ground in all cases and in an accessible location where practicable.
6. Where copper or brass piping is connected to steel or cast-iron piping and the connection is buried in the ground, the connection shall be covered with coal tar protective tape extending outward a minimum of 5 feet on all pipes, from the point of connection. The tape shall have a minimum thickness of 10 mils and a maximum thickness of 12 mils and shall be applied so as to provide at least two full thicknesses of the tape over the piping. A primer, specifically designed for use with the tape, shall be used. The piping shall be thoroughly cleaned before any tape or primer is applied.

3.05 PIPE AND EQUIPMENT IDENTIFICATION:

A. Identification shall be applied to all piping, except piping located in furred spaces without access to permit entrance of personnel, and piping buried in the ground or concrete.

B. Underground pipe identification shall consist of a buried, continuous, preprinted, bright colored, plastic ribbon cable marker provided for each underground pipe.

C. The legend and flow arrow shall be applied at the following locations:
1. All valve locations,
2. All points where piping enters or leaves a wall, partition, cluster of piping, or similar obstruction
3. All exposed locations
4. At approximately 20-foot intervals on pipe runs.

D. Practical variations or changes in locations and spacing may be made with the specific approval of the Architect to meet specific conditions.

E. Wherever two or more pipes run parallel, the printed legend and other markings shall be applied in the same relative location so that all piping is easily identified.

F. The marking shall be located so as to be readily conspicuous at all times from any reasonable point of vantage.

G. Where different equipment, such as fire sprinklers, are supplied from a common main, such as domestic water, the main should be identified as "Domestic Water" and each respective branch takeoff as "Fire Water," etc.

H. The non-potable water plumbing piping shall be marked with the legend "Danger - Unsafe Water". This legend shall be applied to both hot and cold water systems along the length of the pipe in fluorescent orange at a maximum of five foot intervals.

I. Lettering size and label colors are to be per ASME/ANSI A13.1 Pipe Marking Standards.

3.06 FIREPROOFING:

A. Pack the annular space between the pipe sleeves and the pipe and between duct openings and ducts through all floors and walls with UL listed fire stop.

B. Fireproofing system to be installed in strict accordance with manufacturer’s written instructions and details.

3.07 PAINTING:

A. Perform all priming and painting on the equipment and materials as specified herein.

B. Exposed piping and unfinished portions of equipment to be painted shall be cleaned of grease, oil, rust, or dirt in preparation for painting.

C. Where applicable, remove pipe clamps prior to painting so that entire pipe is painted. Provide temporary support as required. Re-install clamps after priming/painting is complete.

D. Priming:

1. Contractor to prime all exposed ferrous metals, including piping, which are not galvanized or factory-finished.
   a. Black steel pipe exposed to weather shall be cleaned and primed with one coat of Rust-Oleum, or equal, #1069 primer. Color to be Grey.

E. See Painting Section for detailed requirements.

3.08 CONCRETE

A. Where specifically indicated on the Drawings or specified as part of Mechanical Work, this Contractor shall furnish and install concrete work, such as thrust blocks or spring isolator bases.

B. Concrete and reinforcing steel shall be equal to that specified for General Construction.

C. Except as noted above, concrete work will be furnished and installed under General Work. This Contractor shall coordinate requirements accordingly.

3.09 EXCAVATING AND BACKFILL

A. Perform all excavating required for work of this Section. Do excavating required for installation of piping and service lines and other work that applies as indicated on Drawings. Verify location and elevation of all existing utilities prior to excavation for installation of new piping. Provide the services of a pipe/cable locating service prior to excavating activates to determine location of existing utilities

B. Excavations shall be of open vertical construction of sufficient width to provide free working space at both sides of trench and around pipe as required for caulking, joining, backfilling, and compacting. Unless shown otherwise, provide a minimum of 2’-6” cover above top of pipe to finished grade for all service piping unless otherwise noted. Trim trench bottom by hand or provide a minimum of 4” deep sand bed to provide a uniform grade and firm support throughout entire length of pipe. For PE gas pipe, bed the pipe in a 4” sand bed.

C. Dig trenches straight and true to line and grade with holes for bells for bell-and-spigot pipe. Evenly support piping for its entire length upon outside periphery of lower one-third of pipe. Where rock is encountered, undercut trenches 3 inches and fill with well-tamped, clean sand and pea gravel to correct pipe elevation.

D. After pipe lines in excavation have been installed and tested, backfill excavation to point 6 inches above pipe using sand, fine earth, or other materials free of rocks and large lumps. Proceed evenly on both sides of pipe and continuously tamp. Except as hereinafter noted, backfill above 6 inches above top of pipe shall be made by using earth from excavation placed in layers of 8-inch maximum depth. Compaction of each successive layer will be made with mechanical compactor.

E. Take special care in backfilling over wrapped piping to prevent damage to protective wrapping.

F. Bed sewers under pavements, wrapped piping, and PVC piping in sand prior to backfilling. Backfill to point 6 inches above pipe with sand.

G. This Contractor shall replace sod, concrete, asphalt paving, curbs, pavement, walks, and any other type of existing work or surface disturbed by excavation, using workmen skilled in trade involved.

H. When pipe or underground conduit with a protective wrapping is to be placed in the trench, sand only shall be used for bedding the pipe or conduit. The sand used shall be certified to have a minimum resistance of 5000 ohms per cubic centimeter when wetted to any moisture content with distilled water and shall consist of clean, natural, washed-sand, hard, and durable particles varying from fine particles to particles of such size that all will pass through a 3/8-inch screen, not less than 90 percent will pass through a 1/4-inch screen, and not more than 25 percent will pass through a No. 50 screen.

I. Any backfill placed under this contract which subsides or settles below the adjacent finished grade or paving level during the guarantee period shall be brought to grade by the Contractor by adding compacted backfill or additional paving in paved areas.

3.10 ELECTRICAL WORK:

A. Adequate working space shall be provided around electrical equipment in compliance with the National Electric Code and other applicable codes or ordinances. The mechanical work shall be coordinated with the Electrical Work in order to comply with these requirements. Any work which does not conform to these regulations shall be properly corrected without additional cost to the Owner.

B. Furnish and install all line voltage and low-voltage temperature control wiring in the Mechanical Work by the Temperature Control SubContractor, including all interlock wiring between motor starter coils, interlock relays, and temperature control equipment. Unless noted otherwise, this does not include primary control wiring between starters and push button or other manual starter switch or branch power circuits required for temperature control systems.

C. Temperature control equipment, including relays shown on control diagram, shall be furnished and installed by the Temperature Control Subcontractor.

D. Electrical devices with piping connections, such as solenoid valves, insertion thermostats, strap-on aquastats, and similar items which are to be wired under the Electrical Work or by the Temperature Control Subcontractor, shall be installed by the Mechanical Contractor.

E. Equipment furnished in this work that is factory wired but requires modification to internal wiring to meet specifications or drawing requirements shall have such internal modifications made at factory before shipment.

F. All electrical work and equipment, including internal wiring, must comply with applicable codes and applicable portions of electrical specifications. Run line and low-voltage control wiring in conduit. Conduit for temperature control wiring shall be responsibility of Mechanical Contractor and shall be of type specified in electrical specifications.

3.11 DEMOLITION

A. Refer to Division 1 sections for general demolition requirements and procedures.

B. Disconnect, dismantle, and remove plumbing systems, equipment, and components indicated to be removed. Coordinate with all other trades
   1. Piping to be removed: Remove portion of piping indicated to be removed. Cap or plug remaining piping with same or compatible piping material.

2. Piping to be abandoned in Place: Drain piping and cap or plug piping to remain with same or compatible piping material. Refrigerant system to be evacuated per EPA requirements.
3. Equipment to be removed: Drain down and cap remaining services and remove equipment.
4. Equipment to be removed and re-installed: Disconnect and cap services and remove, clean, and store equipment. When appropriate, re-install, reconnect, and make equipment operational.
   a. If existing equipment which is to be re-installed is damage, contact architect prior to removal. Contractor to take pictures of any damaged equipment prior to its removal and submit pictures to Architect.
   b. Equipment damaged during removal, storage, or re-installation shall be the Contractor's responsibility and is to be replaced with new at no additional cost to the owner.
5. Equipment to be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, removed damaged or unserviceable portions and replace with new products of equal capacity and quality.

D. Non-Destructive Testing Of Existing Concrete Slabs:
   1. When drilling or saw cutting existing reinforced concrete, use care and caution to avoid cutting or damaging the existing reinforcing bars, conduit, or tendons. Use a non-destructive method to locate metals poured into the slab prior to doing any work.

3.12 CARE AND CLEANING:

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures, and trim that are installed as part of this work. Leave systems and equipment in satisfactory operating condition.

B. Drain and flush piping to remove grease and foreign matter. Thoroughly clean out flush valves, traps, strainers, and pressure-reducing valves.

C. Keep the interior of all ductwork free of dirt, dust, loose insulation, and other foreign materials at all times.

D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.

3.13 OPERATION TEST:

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.14 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

SECTION 22.05.23

VALVES AND ACCESSORIES FOR PLUMBING

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes plumbing accessories including the following:

1. Valves

2. Miscellaneous piping products

3. Backflow Preventers

4. Cleanouts

1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of plumbing piping systems products, of types, materials, and sizes required whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with piping systems work similar to that required of project.

C. Requirements of Regulatory Agencies: Contractor to conform to the publications listed below. Requirements of these publications are to be considered as a minimum standard. If details and specifications which require more stringent work are indicated within project, Contractor to provide the more stringent.

1. California Plumbing Code (CPC) Compliance: Comply with applicable portions of the California Plumbing Code pertaining to selection and installation of plumbing materials and products. Fabricate and install natural gas systems in accordance with CPC.

2. ANSI Compliance: Fabricate and install natural gas piping in accordance with ANSI B21.2, *Fuel Gas Piping*.

3. NFPA Compliance: Fabricate and install natural gas systems in accordance with latest edition of NFPA 54, *National Fuel Gas Code*.

4. Utility Compliance: Fabricate and install natural gas systems in accordance with local gas utility company requirements.

5. ASME B31.9 for building services piping valves.

6. NSF Compliance: NSF 61 for valve materials for potable-water service

D. All plumbing components intended to dispense water for human consumption shall comply with requirements of California Assembly Bill AB1953. Components to include (but not limited to): piping, faucets, angle stops, valves, bubblers, drinking fountains, piping, etc.

1.03 SUBMITTALS

A. Product data: submit complete data of materials proposed including:

1. Manufacturer and model number

2. Clearly indicate all options, trim, and accessories.

3. Cross reference manufacturer's cut sheet to fixture callout ID on submittal sheet.

B. Operation and Maintenance Data: submit complete O&M data including:

1. Maintenance data and parts lists for each component.

2. Provide "trouble- shooting" maintenance guide

3. Include this data within maintenance manual

PART 2 - PRODUCTS

2.01 VALVES

A. General:

1. Similar valves to be by the same manufacturer.

2. Bronze valves shall be made with dezincification-resistant materials. Bronze valves made with copper alloy (brass) containing more than 15 percent zinc are not permitted.

3. Bronze Valves: 2"Ø and smaller with threaded ends, unless otherwise indicated.

4. Ferrous Valves: 2 ½"Ø and larger with flanged ends, unless otherwise indicated.

5. Valve Pressure and Temperature Ratings: Not less than indicated and as required for system pressures and temperatures.

6. Valve Sizes: Same as upstream piping unless otherwise indicated.

7. Valve Actuator Types:

a. Handwheel: For valves other than quarter-turn types.

b. Hand-lever: For quarter-turn valves 6"Ø and smaller, except for plug valves.

c. Wrench: For plug valves with square heads.

(1) Furnish Owner with 1 wrench for every 5 plug valves, for each size square plug-valve head.

d. Chainwheel: Device for attachment to valve handwheel, stem, or other actuator; of size and with chain for mounting height, as indicated in the "Valve Installation" Article.

8. Valve-End Connections:

a. Flanged: With flanges according to ASME B16.1 for iron valves, ASME B16.5 for steel valves.

b. Grooved: With grooves according to AWWA C606.

c. Valve solder-joint connections are common in smaller sizes of plumbing piping. Soldering and brazing methods used to achieve required pressure-temperature ratings may damage internal valve parts. Special installation requirements for soldered valves may make threaded valves more cost-effective.

d. Threaded: With threads according to ASME B1.20.1.

e. Valve Bypass and Drain Connections: MSS SP-45.

B. Acceptable Manufacturers:

1. Ball, gate, butterfly, and check valves:

a. Nibco
b. Apollo
c. Milwaukee

2. Plug Valves:

a. Rockwell
b. Homestead
c. Nordstrom Valves, Inc

3. Balance Valves:

a. Bell and Gosset Circuit Setter
b. Armstrong
c. Nibco

4. Gas Pressure Reducing Valves:

a. American Meter Company
b. Fisher
c. Or equal

5. Seismic Valve

a. Koso/California Seismic Valves
b. Or equal

C. Ball Valves - ≤ 2”Ø:

1. Two-Piece, Full-Port, Lead Free Bronze Ball Valves with Stainless-Steel Trim:

2. NIBCO Model S-585-66-LF or equal.

a. Pressure Rating: 600 PSI non-shock cold working pressure
b. Maximum pressure / Temperature: 100 PSI AT 300°F
c. Body Design: Two-piece steel with threaded body packnut design (no threaded stem designs allowed) with adjustable stem packing.
d. Body Material: Bronze ASTM B 584 Alloy C844.
e. Ends: Threaded or Solder.
f. Seats: PTFE or TFE.
g. Stem: Stainless.
h. Ball: Stainless steel, vented.
i. Port: Full.

D. Ball Valves – 2 ½”Ø:

1. Three Piece, Full-Port, Bronze Ball Valves with Stainless-Steel Trim:

2. NIBCO Model S-595-y-LF or equal.

a. Pressure Rating: 600 PSI non-shock cold working pressure
b. Maximum pressure / Temperature: 100 PSI AT 300°F
c. Body Design: 3-piece lead free bronze ball valve with threaded body packnut design (no threaded stem designs allowed) with adjustable stem packing.
d. Body Material: Silicon Bronze ASTM B 584 Alloy C844.
e. Ends: Threaded or Solder.
f. Seats: PTFE or TFE.
g. Stem: Stainless.
h. Ball: Stainless steel, vented.
i. Port: Full.

E. Gate Valves- ≤ 2 ½"Ø:

1. Union Bonnet, Rising Stem, Solid Wedge, Class 150 Bronze Gate Valve

2. NIBCO Model T-134 or equal.

a. SWP Rating: 150 psig
b. CWP Rating: 300 psig
c. Body Material: Bronze ASTM B62
d. Wedge Material: Bronze ASTM B62
e. Bonnet Material: Bronze ASTM B62
f. Bonnet Bronze ASTM B62
g. Packing Material: Synthetic Fibers with graphite
h. Packing nut: Bronze ASTM B62 or ASTM B584
i. Handwheel: Malleable Iron ASTM A 47
j. End Connections: Threaded

F. Gate Valves- 3"Ø and larger:

1. Bolted Bonnet, Non-Rising Stem, Solid Wedge, Class 125 Iron Body Gate Valve

2. NIBCO Model F-619 or equal for above ground use, Model F-619-SON for below grade use.

a. SWP Rating: 125 psig
b. CWP Rating: 200 psig
c. Stem Material: Brass ASTM B16 Alloy C36000
d. Bonnet Material: Cast Iron ASTM A 126 Class B
e. Body Material: Cast Iron ASTM A 126 Class B
f. Wedge Material: Cast Iron ASTM A 126 Class B
g. Packing Material: Synthetic Fibers with graphite
h. Hand-wheel: Cast Iron ASTM A 126 Class B
i. End Connections: Flanged
j. Provide with square operating nut for use below grade
k. Provide with 1 operating wrench per nut sizes.

G. Check Valves – - ≤ 3"Ø:

1. Horizontal Swing, Regrinding type, Y-patter, Renewable seat and disc bronze check valve

2. NIBCO Model T-413 or equal.

a. SWP Rating: 125 psig
b. CWP Rating: 200 psig
c. Body Material: Bronze ASTM B 62.
d. Ends: Threaded

e. Seats: Buna-N.
f. Hinge: Bronze ASTM B140 Alloy

H. Check Valves - ≤ 2"Ø:

1. Inline lift type bronze ring check valve

2. NIBCO Model T-480 or equal.

a. WWP Rating: 250 psig
b. Body Material: Bronze ASTM B 584.
c. Stem: Stainless Steel
d. Spring: Stainless Steel
e. Disc Holder: Stainless Steel
f. Disc: Buna-N

I. Butterfly Valves- 3"Ø and larger:

1. Extended neck, geometric drive, molded-in seat liner, lead free, lug style butterfly valve.

2. NIBCO Model LD-2000 or equal

3. Valves shall be lug body style manufactured in accordance with MSS-SP67;

a. CWP Rating: 200 psig
b. Body: Ductile Iron ASTM A536
c. Disc Aluminum Bronze ASTM B148 Alloy 954/955
d. Stem: Stainless Steel
e. Stem and Body Seal: EPDM Rubber

J. Plug Valves:

1. Screwed Gland-Type Iron Plug Valve.

2. Nordstrom Figure 114 or equal - for sizes up to 2 ½"

3. Nordstrom Figure 115 or equal – for sizes 3" to 4"

4. Valves to be as follows:

a. CWP Rating: 200 psig
b. Body: Steel Body
c. Lubricated Type Plug valve

K. Gas Cock:

1. Gas Ball valve, with lever handle

2. Valve to be rated for 250 psi compressed gas.

3. UL Listed for gas and oil

4. CSA listed

5. Nibco, Model T-FP-600A or equal

a. CWP Rating: 600 psig for 1/4" – 2", 400 PSI for 2-1/2" - 4"
b. Body: Forged Brass ASTM B283

c. Ball: Chrome Plated Brass
d. Ball Seat: PTFE
e. Stem: Brass

L. Balance Valves:

1. Bell and Gosset Circuit setter or equal

a. CWP Rating: 300 psig
b. Body: Bronze
c. Seat Rings: Caron Filled
d. Valve to have differential pressure read-out ports across valve area. Read out ports to be fitted with internal EPT insert and check valve. Valve bodies to have ¼" tapped drain/purge port.
e. Valve to have memory stop feature.

2. Provide owner with one Bell and Gossett Circuit Setter #RO-2 meter.

M. Gas pressure Reducing Valve:

1. American Meter Company, Series 1200 or equal

a. Size and capacity as scheduled.
b. Meter to have full internal relief.

N. Seismic Gas Valve:

1. Koso/California Seismic Valve or equal

a. Size to match adjacent piping.
b. Valve to be rated for gas service pressure.
c. Valve to be in compliance with California Standard for Earthquake Actuated Automatic Gas Shutoff Systems.

2.02 MISCELLANEOUS PIPING PRODUCTS

A. Backwater Valves

1. Provide flapper type backwater valve where indicated on drawings.

2. Valve to be a Zurn, model Z-1090 or equal

3. Provide with Christy Model B16 or equal utility box, 12" by 22".

B. Trap Primers

1. Provide trap primers as indicated, 1/2-inch size, with built-in air gap. Provide with 1/2-inch shut-off valve.

2. Where one trap primer will be used for more than one trap, provide a distribution unit (DU-2 through DU-4 as required) with feeder piping for a maximum of four traps.

3. Acceptable Manufacturers:

a. Precision Plumbing Products "Prime Rite"
b. Sioux Chief Manufacturing Company "Prime Perfect"
c. MiFab "M-500 Series"

C. Water Hammer Arrestors

1. Water Hammer Arrestors to be provided on both hot and cold water branch piping severing ALL plumbing fixtures (not just flush valves).

2. Provide water branch lines at single fixtures with a manufactured water hammer arrestor. Water hammer arrestors shall be sized per Plumbing Drainage Institute Standard PDI-WH201 “Water Hammer Arrestors.”

3. Water hammer arrestor to be with nesting type bellows contained within a casing having sufficient displacement volume to dissipate the calculated kinetic energy generated in piping system. Both casing and bellows constructed of Type 304 stainless steel. Arrestor to have a threaded connection.

4. Where multiple fixtures are located in a row or battery a single or multiple water hammer arrestors, as required, may be used. Multiple fixture installations shall have the arrestor sized and located per standard PDI-WH201 and the manufacturer’s installation instructions.

    a. Provide Access door for water hammer arrestors in restrooms containing more than 1 flush valve type fixture.

5. All water hammer arrestors shall have male pipe thread connections.

6. Water hammer arrestor to be a Zurn model Z1700 or equal.

7. Acceptable Manufacturers:

    a. Zurn
    b. J.R. Smith
    c. Wade
    d. Amtrol Inc.

D. Piping Escutcheons:

1. Provide chrome plated brass pipe escutcheons with inside diameter closely fitting pipe outside diameter or outside of pipe insulation where pipe is insulated.

2. Select outside diameter of escutcheon to completely cover pipe penetration hole in floors, walls, ceilings, or pipe sleeve extension, if any.

3. Furnish pipe escutcheons with nickel or chrome finish and screw or spring clamping device with concealed hinge

E. Pipe Sleeves:

1. Where pipes pass through concrete floors or walls, install galvanized metal or plastic sleeves having not less than 1/2-inch or more than 1-inch clearance around sides of the pipe or pipe covering for the full thickness of the concrete.

2. After piping has been installed, fill annular space with fireproof safeing.

3. Acceptable Manufacturers:

    a. Adjustocrete
    b. Sperzel "Crete-Sleeve"
    c. Or equal

F. Sleeve Seals:

1. Provide sleeve seals for sleeves located in foundation walls below grade or in exterior walls as follows:

a. Foundations: Lead and oakum, caulked between sleeve opening and pipe.

b. Walls Below Grade: Modular-mechanical type, consisting of interlocking synthetic rubber links shaped to continuously fill annular space between pipe and sleeve, connected with bolts and pressure plates which cause rubber sealing elements to expand when tightened, providing watertight seal and electrical insulation.

2. Acceptable Manufacturers:

a. Link-Seal Corporation
b. Or equal

2.03 BACKFLOW PREVENTORS

A. Provide reduced-pressure principle backflow preventers consisting of an internal pressure differential relief valve located in a zone between two positive seating check modules with captured springs and silicone seat discs. Seats and seat discs shall be replaceable in both check modules and the relief valve.

1. There shall be no threads or screws in the waterway exposed to line fluids. Service of all internal components shall be through a single access cover secured with stainless steel bolts

B. The assembly shall meet the requirements of: USC Manual 8th Edition; ASSE Std. 1013; AWWA Std. C511; CSA B64.4.

C. Provide substantial padlock and chain to lock valves in open position, and turn key over to Project Inspector. Provide capped connections at each test cock.

D. Backflow preventor to be a Watts Regulator Co. Series 009.

1. Provide with optional quarter turn ball valves: -QT

2. Provide with optional air gap drain fitting.

E. Acceptable Manufacturer’s

1. Watts Regulator Company

2. Febco Sales, Inc.

3. Or Equal

2.04 THERMOSTATIC MIXING VALVES

A. Acceptable Manufacturers:

1. Lawler

2. Powers

3. Leonard Valve Company

2.05 CLEANOUTS

A. Provide cleanouts of same diameter as pipe shall be installed in all horizontal soil and waste lines where indicated and at all points of change in direction. Cleanouts shall be located a minimum of 18” from building construction so as to provide sufficient space for rodding.

B. Cleanouts shall have cast iron ferrules and bronze plugs.

C. Cleanouts extending to floor level shall be provided with membrane flange and clamping collar, bronze raised head plug, and nonslip scoriated top.

D. Cleanouts to be as follows:

1. Cleanouts in cast-iron soil or waste lines: Zurn Z-1440A-BP.

2. Cleanouts in walls: Zurn Z-1446-A-BP with stainless steel access cover.

3. Cleanouts on exterior of building: Zurn Z-1440.

a. Provide stainless steel cover and vandal-proof screw where located in wall. Zurn Z-1446-A

b. Where located at grade, provide 18- by 18- by 6-inch concrete pad and Zurn Z-1474 heavy duty cover. Provide Z-1440-A cleanout.

4. Cleanouts in floor to be a Zurn ZN-1400 with the following options:

a. Where located in terrazzo floor, provide –T, square top option.

b. Where located in carpet, provide –T square top option and –CM carpet marker option.

c. Where located in vinyl tile, provide –TX square top recessed for tile option.

E. Acceptable Manufacturers:

1. Zurn

2. J.R. Smith

3. Josam

PART 3 - EXECUTION

3.01 INSTALLATION OF VALVES:

A. Valve Applications:

1. Domestic Water:

   a. Shut off valves above grade: Ball Vales
   b. Shut off valves below grade: Gate Valve

2. Natural Gas

   a. At entrance to building: Lubricated Plug Valve
   b. At connection to equipment: Gas Cock
   c. Branch Shut off Valves: Gas Cock
   d. At connection to appliances: Indoor lever handle gas Cock.

3. Check Valves:

   a. Piping in horizontal orientation: Swing Check Valve
   b. Piping in vertical orientation: Lift Check Valve

B. General:

1. Install valves with stems upright or horizontal. Valves stem position to be arranged to allow access for maintenance.

2. Do not install swing check valves in vertical position.

3. Provide gas cocks for gas service.

4. Provide lubricated plug valve at gas entrance to building.

5. Examine valve interior for cleanliness, freedom from foreign matter, and corrosion. Remove special packing materials, such as blocks, used to prevent disc movement during shipping and handling.

6. Operate valves in positions from fully open to fully closed prior to installing within system.

7. Install valves with unions or flanges at each piece of equipment arranged to allow service, maintenance, and equipment removal without system shutdown.

8. Locate valves for easy access and provide separate support where necessary.

9. Install valves in horizontal piping with stem at or above center of pipe.

10. Install valves in position to allow full stem movement.

11. Install chain-wheels on operators for butterfly and gate valves more than 10’-0” above finished floor. Extend chains to within 60” above finished floor.

12. Install check valves for proper direction of flow and as follows:

    a. Swing Check Valves: In horizontal position with hinge pin level.

    b. Lift Check Valves: With stem upright and plumb.

13. Install valves where required for proper operation of piping and equipment, including valves in branch lines where necessary to isolate sections of piping. Locate valves so as to be accessible and so that separate support can be provided when necessary.

14. Provide union at each connection to equipment and downstream of each valve. Provide unions at both ends of valves when valves can not be turned due to an obstruction.

15. Install seismic gas valve downstream of gas meter.

16. After piping systems have been tested and put into service, but before final testing, adjusting, and balancing, inspect each valve for possible leaks. Adjust or replace packing to stop leaks; replace valve if leak persists.

17. Tag each valve and provide a complete listing of valve locations and functions.

18. Provide additional tag at each valve noted below. Tag shall be black plastic with white lettering, 3-ply, 125 mil thick, Minimum 3" square.

VALVE FUNCTION	LOCATION	TAG TEXT
Main Domestic Water shut-off	Main water supply entrance to building.	"MAIN DOMESTIC WATER SHUT-OFF"
Main Natural Gas shut-off	Immediately downstream of gas meter	"MAIN NATURAL GAS SHUT-OFF"
Domestic cold water risers in multi-floor building	Riser shut-off valve	"RISER ## CW SHUT-OFF" with number of riser.
Domestic hot water risers in multi-floor building	Riser shut-off valve	"RISER ## HW SHUT-OFF" with number of riser.

19. Provide half scale floorplans highlighting location of all valves. Cross reference valve list with floorplans and valve tags.

3.02 PIPE ESCUTCHEONS:

A. Install pipe escutcheons on each pipe penetration through floors, walls, partitions, and ceilings where penetration is exposed to view and on exterior of building.

B. Tighten escutcheon to pipe or insulation so escutcheon covers penetration hole and is flush with adjoining surface.

3.03 SLEEVES:

A. Secure sleeves to metal or wood forms in such a manner that they will not become displaced during pouring of concrete. Fill sleeves on deck with sand.

B. After forms have been removed from concrete, the sleeves shall be removed from the openings.

C. Core drill properly sized holes in the concrete to replace metal sleeves that are crushed or knocked out of position during pouring of concrete.

D. Provide piping passing through concrete fire walls with sleeves of standard black steel pipe nominally one size larger than pipe enclosed, but in the case of insulated pipe, large enough for insulation to pass through. Caulk space between pipe and sleeve with fire-rated wicking, and provide metal retainer plates at both sides of the wall.

E. Sleeve Seals: Install in accordance with the following:

1. Lead and Oakum: Fill and pack annular space between sleeve opening and pipe with oakum; caulk with lead on both sides.

2. Mechanical Sleeve Seals: Loosely assemble rubber links around pipe with bolts and pressure plates located under each bolt head and nut. Push into sleeve opening and center. Tighten bolts until links have expanded to form watertight seal.

3.04 INSTALLATION OF Y-TYPE STRAINERS:

A. Install Y-type strainers full size of pipeline in accordance with manufacturer's installation instructions.

B. Install pipe nipple and shutoff valve in strainer blow down connection, full size of connection, except for strainers 2 inches and smaller installed ahead of control valves feeding individual terminals.

1. Where indicated, provide drain line from shutoff valve to plumbing drain, full size of blow-down connection.

C. Locate Y-type strainers in supply line ahead of the following equipment and elsewhere as indicated if integral strainer is not included in equipment:

1. Pumps

2. Temperature control valves

3. Pressure-reducing valves

4. Temperature- or pressure-regulating valves

D. Contractor to clean all pipeline strainers after their respective system has been flushed.

3.05 INSTALLATION OF UNIONS AND FLANGES:

A. Install unions and flanges so that piping can be easily disconnected for removal of tanks, equipment, and valves. Provide a minimum of two unions at each three-way valve.

3.06 CARE AND CLEANING:

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work.

B. At completion of work, carefully clean and adjust equipment and trim installed as part of this work.

C. Leave systems and equipment in satisfactory operating condition.

3.07 OPERATION TEST:

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

[END OF SECTION]

SECTION 22.07.00

PLUMBING INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes insulation types and thickness for plumbing piping and equipment.

1.02 REFERENCES

A. California Code of Regulations – Title 24, Part 4.

B. California Building Code, California Electric code, NFPA, and UL

C. ASTM

D. ASHRAE

E. MAIMA

F. NFPA

G. SMACNA – Sheet Metal and Air Conditioning Contractor's National Association, Inc.

H. Underwriter's Laboratories

I. GREENGUARD

1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firm specializing in manufacturing of mechanical insulation products applicable to project whose products has been in satisfactory use in similar services for a minimum of 3 years.

B. Installer's Qualifications: Company specializing in piping insulation application with a minimum of 3 years experience.

C. Flame/Smoke Ratings: Insulation materials, including but not limited to insulation, jackets, coverings, sealers, adhesives, etc., to have flame-spread rating of 25 or less and smoke-developed index of 50 or less when tested in accordance with ASTM E84.

D. Insulating products to be installed in accordance with manufacturer's written instructions and in accordance with recognized industry practices.

1.04 SUBMITTALS

A. Submit complete data of materials proposed.
   1. Indicate individual services for each system.
   2. Indicate proposed insulation thickness for each system
   3. Indicate proposed R-valves, densities, etc. for each product.

B. Provide Manufacturer's installation instructions for each product.

PART 2 - PRODUCTS

2.01 GENERAL

A. For purposes of this specification, fittings, joints, strainers, flexible piping, valves, etc. shall be considered as piping and shall be insulated with same material and thickness as adjoining piping unless noted otherwise.

B. Acceptable Manufactures
1. Knauf
2. Johns Manville
3. Certainteed
4. Owens-Corning

2.02 MATERIALS

A. Fiberglass Piping Insulation:
1. Insulation to be heavy density glass fiber insulation.
2. Insulation to have factory-applied self-sealing vapor barrier.
3. Maximum K-Value at 75ºF = 0.23 Btu-in/hr-FT^2-ºF.
4. Rigid segment of insulation to be provided at all pipe hangers
5. Fittings and valves to be insulated with John Manville Zeston 2000 Series 25/50 Smoke-Safe PVC pre-molded insulated covering secured with standard fasteners.
6. Insulation to be Johns Manville Micro-Lok or equal.

B. Flexible Closed Cell Insulation:
1. Flexible elastomeric thermal closed-cell structure insulation.
2. Maximum K-Value at 75ºF = 0.27 Btu-in/hr-FT^2-ºF.
3. Joints to be sealed with Armstrong 520 Adhesive
4. Insulation to be Armstrong Armaflex 22 or equal

2.03 PIPING INSULATION:
A. Domestic Hot Water Supply and Return:
1. Insulate exposed piping with fiberglass piping insulation with thicknesses as follows:
a. Pipes 2”∅ and smaller- 2” thick insulation.
b. Pipes 2 1/2”∅ and larger – 2 1/2” thick insulation.
c. Exposed pipes installed within 9’-0” of the finished floor to be provided with ASJ-SSL jacket.

2. Insulate concealed piping with fiberglass piping insulation with thicknesses as follows:
a. Pipes 1”∅ and smaller with 3/4” of fiberglass piping insulation.
b. Pipes 1 1/4”∅ and larger – insulate with 1 1/2:” of fiberglass piping insulation.

3. Do not insulate unions, valves, and exposed run-outs to fixture.

4. For protective pipe insulation at run-outs to fixtures, reference specification section 22.42.00.

B. Domestic Cold Water:
1. Insulate exposed piping with ¾” fiberglass piping insulation.
2. Insulate concealed piping with ½” fiberglass piping insulation.
3. Wrap valves and fittings with mastic and z-tape.
4. Exposed pipes on roof to be provided with ASJ-SSL jacket.

C. Condensate Drain Piping:
1. Insulated exposed condensate drain piping within building with ¾” closed-cell pipe insulation.
2. Seal with Armstrong 520 adhesive.
3. Pipes exposed to weather to be provided with ASJ-SSL jacket.

PART 3 - EXECUTION

3.01 GENERAL

A. Insulation to be stored on jobsite in clean / dry location. Any insulation exposed to water must be discarded immediately and removed from jobsite.

3.02 INSTALLATION OF PIPING INSULATION

A. Install piping insulation products in accordance with manufacturer's written instructions and in accordance with recognized industry practices.

B. Installation to be installed after installation of heat tracing, testing, acceptance of testing, and cleaning of pipe.

C. Insulate each continuous run of piping with full-length units of insulation. Cut pieces to size as required. Do not use multiple cut pieces and/or scraps abutting each other.

D. Clean and dry piping surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and type fit over surface to be covered.

E. Install piping insulation without interruption through walls and floors except where otherwise indicated.

F. Taper raw ends of insulation and seal with canvas and sealant as noted for fittings.

G. Install pipe hangers on the outside of the insulation.

3.03 INSULATION REPAIR:

A. Repair damaged sections of existing and/or new mechanical insulation where damaged occurred during this construction period. Use insulation of same thickness as existing insulation. Install new jacket lapping and seal over existing.

3.04 CARE AND CLEANING:

A. Repair and/or replace broken, damaged and or otherwise defective insulation. Work to be completed to the satisfaction of the Architect. At completion of work, clean materials installed as part of this work and leave systems and equipment in satisfactory operating condition.

B. Upon completion of work remove materials, equipment, tools from premises. Leave project area neat, clean and orderly.

END OF SECTION

SECTION 22.12.00

NATURAL GAS PIPING

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes piping as required for the natural gas piping.

1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of plumbing piping systems products, of types, materials, and sizes required whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with piping systems work similar to that required of project.

C. Requirements of Regulatory Agencies: Contractor to conform to the publications listed below. Requirements of these publications are to be considered as a minimum standard. If details and specifications which require more stringent work are indicated within project, Contractor to provide the more stringent.

1. California Plumbing Code (CPC) Compliance: Comply with applicable portions of the California Plumbing Code pertaining to selection and installation of plumbing materials and products. Fabricate and install natural gas systems in accordance with CPC.
2. ANSI Compliance: Fabricate and install natural gas piping in accordance with ANSI B21.2, *Fuel Gas Piping*.
3. NFPA Compliance: Fabricate and install natural gas systems in accordance with latest edition of NFPA 54, *National Fuel Gas Code*.
4. Utility Compliance: Fabricate and install natural gas systems in accordance with local gas utility company requirements.

D. Welding materials and labor shall comply with ASME Code and applicable state labor regulations.

E. Welders shall be fully qualified and certified by a state approved welding bureau for the types of welds required for the project.
1. Each welder shall identify their work with a marking stamped on each weld joint of pipe, valve, or fitting.

F. Supports to be in accordance with SMACNA's Seismic Restraint Manual Second Edition 2008.

1.03 SUBMITTALS

A. Submit manufacturer's catalog cut sheets, specifications, installation instructions, and dimensioned drawings for each type of pipe, support, anchor, and seal indicated within this section that is applicable to the project. Clearly indicate item being submitted.
1. Indicate pipe schedules, pressure classes, etc.
2. Indicate all options being submitted.

B. Provide Welding Certifications. Submit reports as required for piping work applicable to the project.
1. Welders that do not have current Certifications shall not be permitted to weld on the project.

PART 2 - GENERAL

2.01 GENERAL:

A. Provide piping materials and factory fabricated piping products of sizes, types, pressure and temperature ratings, and capacities as indicated. Materials and products to comply with the California Plumbing Code.

B. Where more than one type of material is indicated, selection is the Contractors option.
   1. Contractor to provide submittal information on material which is to be installed.
   2. Where more than one material is indicated, the Contractor shall only install one material per system and materials shall not be mixed within the same system.

C. Malleable Iron Threaded Fittings: ANSI B16.3; plain or galvanized to suit piping. For use above grade only, except where indicated otherwise.

D. Malleable-Iron Threaded Unions: ANSI B16.39; selected by Contractor for proper piping fabrication and service requirements, including style, end connections, and metal-to- metal seats (iron, bronze, or brass); plain or galvanized as indicated.

E. Forged-Steel Socket Welding and Threaded Fittings: ANSI B16.11, except MSS SP-79 for threaded reducer inserts; rated to match schedule of connected pipe.

F. Wrought-Steel Buttwelding Fittings: ANSI B16.9, except ANSI B16.28 for short-radius elbows and returns; rated to match connected pipe.

G. Pipe Nipples: Fabricated from same pipe as used for connected pipe; except do not use less than Schedule 80 pipe where length remaining unthreaded is less than 1-1/2 inches and where pipe size is less than 1-1/2 inches, and do not thread nipples full length (no close-nipples).

H. Welding Materials: Except as otherwise indicated, provide welding materials as determined by Contractor to comply with installation requirements. Comply with Section II, Part C, ASME Boiler and Pressure Vessel Code for welding materials.

I. Comply with SFA-5.8, Section II, ASME Boiler and Pressure Vessel Code for brazing filler metal materials.

J. Gaskets for Flanged Joints: ANSI B16.21; full-faced for cast- iron flanges; raised-face for steel flanges, unless otherwise indicated.

2.02 PIPING AND FITTINGS:

A. Natural Gas Piping:

   1. Site Piping:
      a. Polyethylene Pipe, PE2406; pipe and tubing shall meet requirements of ASTM D2513.
      b. Fittings and accessories shall be as manufactured and furnished by the pipe supplier. Fittings shall meet the requirements of ASTM D2513, as mandated by CFR 49 Part 192.59 and is so marked, according to Part 192.63.

   2. Piping within building:
      a. Black Steel Pipe: ASTM A53, A106, or A120; except comply with ASTM A53 or A106 where close coiling or bending is required.
      b. Pipe Size 2 inches and Smaller: Black steel pipe; Schedule 40; malleable-iron threaded fittings.
      c. Pipe Size 2-1/2 inches and Larger: Black steel pipe; Schedule 40; wrought-steel buttwelding fittings.

   3. Piping exposed to weather:
      a. Black Steel Pipe: ASTM A53, A106, or A120; except comply with ASTM A53 or A106 where close coiling or bending is required.

b. Pipe Size 2 inches and Smaller: Black steel pipe; Schedule 40; malleable-iron threaded fittings.
c. Pipe Size 2-1/2 inches and Larger: Black steel pipe; Schedule 40; wrought-steel buttwelding fittings.
d. Clean and paint all non-galvanized steel piping exposed to weather.
   (1) Provide a minimum of 2 coats of paint.
   (2) Paint to be continuous – contractor to loosen pipe supports/clamps for painting, then re-install supports/clamps.
e.

PART 3 - EXECUTION

3.01 GENERAL

A. Examine areas and conditions under which plumbing piping systems are to be installed. Do not proceed with Work until unsatisfactory conditions have been corrected in manner acceptable to Contractor.

B. Comply with ANSI B31 Code for Pressure Piping.

C. Install pipes and pipe fittings in accordance with recognized industry practices which will achieve permanently leak-proof piping systems, capable of performing each indicated service without piping failure. Install each run with minimum joints and couplings but with adequate and accessible unions for disassembly and maintenance/replacement of valves and equipment. Reduce sizes where indicated by use of reducing fittings. Align piping accurately at connections, within 1/16-inch misalignment tolerance.

D. Locate piping runs, unless detailed otherwise, vertically and horizontally (pitched to drain). Install piping parallel and perpendicular to adjacent building walls/structure and avoid diagonal runs wherever possible. Orient horizontal runs parallel with walls and column lines. Locate runs as shown or described by diagrams, details and notations. Hold piping close to walls, overhead construction, columns, and other structural and permanent-enclosure elements of building; limit clearance to 1/2-inch where furring is shown for enclosure or concealment of piping; locate insulated piping for 1” clearance outside insulation. Wherever possible in finished and occupied spaces, conceal piping from view by locating in column enclosures, in hollow wall construction, or above suspended ceilings; do not encase horizontal runs in solid partitions, except as indicated.

E. Electrical Equipment Spaces: Do not run piping through transformer vaults, elevator equipment rooms, Data closets or other electrical or electronic equipment spaces or enclosures.

F. Should structural difficulties or work of other contractors prevent the running of pipes or the setting of equipment at the points shown, Contractor to make the necessary deviations to the piping system, as determined by the Contractor, with the Architect's review, without additional cost to Owner.

G. Inspect each piece of pipe and each fitting to see that there is no defective workmanship on pipe or obstructions in pipes and fittings.

H. Installation Of Protective Pipe Wrap:

   1. Protect all steel pipe buried in ground from corrosion by the application of protective pipe wrap. Clean and prime pipe before application of the wrapping material.

I. Installation Of Detectable Underground Warning Tape:
   1. Provide all non-metallic pipes, including but not limited to plastic piping with detectable underground warning tape.
   2. Detectable underground warning tape shall consist of 4.5 mil foil tape printed with pipe service, (i.e. “CAUTION GAS LINE BELOW:).
   3. Tape shall be buried approximately one-half of the pipes buried depth.

4. Tape buried up to 24” deep shall be a minimum of 3” wide.
5. Tape buried greater than 24” deep shall be a minimum of 6” wide.

3.02 INSTALLATION OF NATURAL GAS PIPING:

A. Run piping generally level, free of unnecessary bends, arranged to conform to the building requirements, and to suit clearance for other mechanical work such as ducts, flues, conduits, and other work

B. Use sealants on metal gas piping threads which are chemically resistant to natural gas. Use sealants sparingly, and apply to only male threads of metal joints.

C. Connect gas piping to each gas-fired equipment item, with drip leg and shutoff gas cock. Comply with equipment manufacturer's instructions.
1. Appliance fuel connectors, as indicated in 1202 of the California Plumbing Code, are not acceptable for connection of equipment, except where specifically indicated on the Contract Documents.

D. Install Polyethylene Pipe, where defined, in accordance with ASTM D2774 "Standard Recommended Practice for Underground Installation of Thermoplastic Pressure Piping", and as required by Manufacturer's Installation Instructions.
1. Polyethylene Pipe fittings shall be joined in accordance with pipe manufacturer’s instructions.
2. Connection of plastic pipe with metal pipe shall be only outside underground with ASTM D2513 category I transition fittings.
3. Gas pipe risers to above grade, shall be metallic and shall be wrapped or coated to a point at least six inches above grade.
4. When riser connects underground to plastic pipe, the underground horizontal metallic portion of the riser shall extend at least 30 inches before connecting to the plastic pipe.
5. Heat-fusion joints shall be made in accordance with qualified procedures that have been established and proven by test to produce gas tight joints at least as strong as the pipe or tubing being joined. Joints shall be made with the joining method recommended by the pipe manufacturer.
6. Plastic pipe shall be buried with an electrically continuous corrosion resistant tracer wire (Min. AWG. 14) and tape to facilitate locating. One end shall be brought above ground at a riser.

E. Install exposed polished or enameled connections from fixtures or equipment with special care, showing no tool marks or threads at fittings.

F. Cap or plug openings in pipe and fittings immediately to exclude all dirt until fixtures are installed or final connections made.

G. Use reducing fittings where any change in pipe size occurs. Bushings shall not be used.

H. Couplings shall not be used except where required pipe runs between fittings are longer than a standard length of the type of pipe being used and except where their use is specifically reviewed by the Architect.

I. Conceal piping in finished portions of building, above the floor line, except where otherwise shown or noted. Cutting of walls and floors shall be held to the minimum possible to secure the proper installation.

J. Install piping subject to expansion or contraction in a manner permitting strains to be evenly distributed and alleviated by expansion loops installed as required.

K. Sleeves for branches through walls from adjacent mains shall be of sufficient size to allow for free side motion of covered pipe in sleeve.

L. Remove cutting and threading burrs before assembling piping.

M. Do not install defective piping or fittings. Do not use pipe with threads which are chipped, stripped, or damaged.

N. Plug each gas outlet, including valves, with threaded plug or cap immediately after installation and retain until continuing piping or equipment connections are completed.

O. Ground gas piping electrically and continuously within project, and bond tightly to grounding connection. Provide listed isolation fitting above grade prior to entry into building. Provide independent ground systems for above ground and below grade.

P. Install drip-legs in gas piping where indicated and where required by code or regulation.

Q. Install piping parallel to other piping and walls unless detailed otherwise.

R. Maintain minimum of 12-inch clearance between gas piping and steam piping above 200 ^{O}F.

S. Contractor to use extreme care when working with galvanized fittings as to not damage galvanized finish. If finish is damaged, contractor to paint damaged area with “Brite Zinc” paint by “Brite Products” or equal. Follow requirements as outlined in ASTM A780.

3.03 PIPING SYSTEM JOINTS:

A. General: Provide joints of type indicated in each piping system.

B. Cut all steel pipe by power hacksaw, a circular cutting machine using an abrasive wheel or in square end vise by means of hand hacksaw. Wheel cutters may be used for steel pipe provided that pipe shall have ends reamed to full inside diameter and beveled before being made up into fittings. Pipe shall have round edges or burrs removed so that a smooth and unobstructed flow will be obtained.

C. Thread pipe in accordance with ANSI B2.1; cut threads full and clean using sharp dies. Ream threaded ends to remove burrs and restore full inside diameter. Apply pipe joint compound, Rector- Seal #5, on male threads at each joint and tighten joint to leave not more than 3 threads exposed. Teflon tape may be used on piping smaller than 2 inches.

D. Use joint compound, same as specified for threaded pipe joints, on all cleanout plugs.

E. Weld pipe joints in accordance with recognized industry practice and as follows:
   1. Welding shall be done by qualified welders in a first-class, workmanlike manner, conforming to the American Standard Code for Pressure Piping USA B-31-1 and B-31-1A.
   2. Bevel pipe ends at a 37.5 degree angle where possible, smooth rough cuts, and clean to remove slag, metal particles, and dirt.
   3. Do not weld-out piping system imperfections by tack-welding procedures; re-fabricate to comply with requirements.

3.04 TEST OF PIPING:

A. Test piping at completion of roughing in, in accordance with the following schedule. Show no loss in pressure or visible leaks after a minimum duration of 4 hours at the test pressures indicated. Tests to be verified by Inspector of Record.

SYSTEM TESTED	TEST PRESSURE PSIG	TEST WITH
Steel Gas Piping	100 lbs.	Air
Polyethylene Gas Pipe	60 lbs.	Air

B. Testing equipment, materials, and labor shall be furnished by this Contractor.

C. Repair piping systems sections which fail required piping test, by disassembly and reinstallation, using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

D. Purge air from piping systems after testing and repair work has been completed.

3.05 CLEANING UP:

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

SECTION 23.00.00

MECHANICAL GENERAL CONDITIONS

PART 1 - GENERAL

1.01 GENERAL

A. This Section specifies the Division 23 Work coordination requirements with general work provisions.

B. For convenience and reference the Division 23 Specifications are separated into Divisions and Sections. Such separations shall not operate to make the Engineer an arbitrator to establish subcontract limits between the Prime Contractor and his Subcontractors. In any case, the Prime Contractor is responsible to the owner for a complete job.

C. This section consists of General Requirements and Standard Specifications covering certain parts of work under Division 23 and is supplemented by other Division 23 sections covering additional work, requirements, and materials specifically applicable to the work of each section.
   1. Requirements of subsequent sections of the specifications, if in conflict with these General Requirements, shall govern.

D. No material installed as part of this WORK shall contain asbestos in any form.

1.02 CONDITIONS OF THE CONTRACT

A. The Conditions of the Contract (General, Supplementary, and other Conditions) and the General Requirements (Sections of Division 1) are hereby made a part of this Section.

B. This section is a Division-23 Basic Materials and Methods section and is a part of each Division -23 section.

1.03 DESCRIPTION OF REQUIREMENTS

A. Provide finished work, tested and ready for operation including apparatus, appliances, materials, and work. Provide incidental accessories necessary to make the work complete and ready for operation without additional expense to the Owner.

B. Before beginning work or ordering materials, consult Architect for clarification of discrepancies between, or questionable intent, of the Contract Documents.

C. Contractor shall visit the site and field survey the existing site conditions prior to bid. Any site conditions which may cause significant deviation from the design drawings shall be brought to the attention of the Owner's representative for clarification prior to bid.

1.04 REQUIREMENTS OF REGULATORY AGENCIES:

A. Provide work and materials in full accordance with the latest rules and regulations of the following:
   1. California Code of Regulations - Title 24 - Parts 2, 3, 4,5, and 9
   2. California Code of Regulations - Title 22 - Chapter 7
   3. California Building Code, 2016
   4. California Mechanical Code, 2016
   5. California Plumbing Code, 2016
   6. California Electric Code, 2016
   7. California Fire Code, 2016
   8. California Building Energy Efficiency Standards 2016
   9. California Green Building Standards 2016
   10. California Energy Code 2016

11. National Fire Protection Association
12. CAL-OSHA
13. Occupational Safety and Health Administration
14. State Fire Marshal, Title 19 CCR
15. Other applicable state laws

B. Nothing in Drawings or specifications shall be construed to permit work not conforming to these codes.

C. Conform to State of California Energy Conservation Standards for all systems, equipment, and construction.

D. The above Codes and Standards define minimum requirements required for the project. Where Contract Documents differ from governing codes, furnish and install higher standard.

1.05 FEES, PERMITS, AND UTILITY SERVICES

A. Arrange for required inspections and permits required in installation of the work.

B. The Owner will pay charges for permits required.

C. Obtain the first permits to operate any compressed air tanks that are required to be furnished under this work, pay all costs, and perform all tests required to obtain permits. Post permits under glass in a conspicuous place on or near the tanks, as required by these authorities.

1.06 SITE EXAMINATION

A. Examine site, verify dimensions and locations against Drawings, and inform self of conditions under which work is to be done before submitting proposal. No allowance will be made for extra expense on account of error.

B. Information shown relative to existing services is based upon available records and data but is approximate only. Make minor deviations found necessary to conform with actual locations and conditions without extra cost. Verify location and elevation of utilities prior to commencement of excavation for new piping or its installation.

C. Exercise care in excavating near existing utilities to avoid any damage thereto. This Contractor is responsible for any damage caused by his operations.

1.07 MATERIAL LIST AND SUBSTITUTIONS

A. Prior to commencement of work, and within 35 days after award of Contract, submit to Architect for review electronic copies of a complete list of equipment and materials to be furnished, including all substitutions. All submittals to be in electronic format as follows:
1. Submittals to be in PDF Format.
2. Individual PDF cut sheets shall be inserted into a single file for review.
3. All sheets to be “unprotected” and writable.

B. Provide submittal information for all materials proposed for use as part of this project. Provide standard items on specified equipment at no extra cost to the contract regardless of disposition of submittal data. Other material or methods shall not be used unless approved in writing by the Architect. The Architect’s review will be required even though “or equal” or synonymous terms are used.

C. It is the responsibility of the Contractor to assume all costs incurred because of additional work and/or changes required to incorporate the proposed substitute into the project including possible extra compensation due to the Architect. Refer to Division 1 for complete instructions.

D. Contractor to provide complete Submittal packages for each system. At a maximum, submittals to be broken into the following packages:
   1. Mechanical – Dry Side package including: Ductwork, Source Equipment, Accessories, etc.
   2. Mechanical – Wet Side package including: Piping, valves, source equipment, pumps, accessories, etc.
      a. When required by schedule, a separate Mechanical Underground submittal package will be reviewed upon request.
   3. Mechanical – Source Equipment (e.g.: Packaged AC Units)
   4. Mechanical – Building Automation System
   5. Mechanical – Duct coordination shop drawing package.

E. Identify each item by manufacturer, brand, trade name, model number, size, rating, or whatever other data is necessary to properly identify and review materials and equipment.
   1. Where submittal sheets indicate more than one product, Contractor to clearly identify product being submitted. Contractor to cross-out information not being submitted for review.
   2. Submittals that do not clearly identify submitted item will be returned to the Contractor un-reviewed.

F. Identity each submitted item by reference to specification section number and paragraph in which item is specified. Cross reference submittals by equipment ID where applicable.

G. Quantities are the Contractor's responsibility and will not be reviewed.

H. If Contractor desires to make a substitution, he shall submit complete information or catalog data to show equality of equipment or material offered to that specified.
   1. Only one request for substitution will be considered on each item of material or equipment. No substitutions will be considered thereafter.
   2. Scheduled Products and first named manufacturer/product forms basis of design. All other manufacturers' products are substitutions.
   3. No substitutions will be allowed unless requested and reviewed in writing.
   4. The Architect shall review and take appropriate action on shop Drawings, product data, samples, and other submittals required by the Contract Documents. Such review shall be only for general conformance with the design concept and general compliance with the information given in the Contract Documents. It shall not include review of quantities, dimensions, weights or gauges, fabrication processes, construction methods, coordination with the work of other trades, or construction safety precautions, all of which are the sole responsibility of the Contractor.
   5. Review of a specific item shall not indicate acceptance of an assembly of which the item is a component. The Architect shall not be required to review and shall not be responsible for any deviations from the Contract Documents not clearly noted by the Contractor, nor shall the Architect be required to review partial submissions or those for which submissions for correlated items have not been received. Architect reserves right to require originally specified item.

I. Installation of reviewed substitution is Contractor's responsibility. Any changes required for installation of reviewed substituted equipment must be made without additional cost to the owner. Review by the Architect of the substituted equipment and/or dimensional Drawings do not waive these requirements.

1.08 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Instruct the Owners' authorized representatives in the operation, adjustment, and maintenance of all mechanical equipment and systems. Provide PDF copy of certificate signed by Owner's representatives attesting to their having been instructed.

B. Furnish Architect with PDF complete sets of operating and maintenance (O&M) instructions.
   1. O&M manuals to be scanned and provided in an organized PDF file.

2. O&M manuals to include: descriptive literature, catalog cuts, and diagrams covering all items of operation and maintenance for each and every mechanical system and piece of equipment furnished under these specifications.
3. Include in each set a copy of the air balance test report specified hereinafter.

C. Contractor must start compiling the above data (including obtaining operating and maintenance instruction data and catalog cuts and diagrams from the manufacturer of the reviewed equipment) immediately upon review of his list of materials, so as not to delay the final installation of the work.

D. Final observation will not be made until booklets are submitted and have been reviewed by the Architect.

E. O&M manuals to incorporate the following:
1. Complete operating instructions for each item of heating, ventilating and air conditioning equipment and associated piping and ductwork systems.
2. Test data and system balancing reports as specified.
3. Temperature control diagrams and literature.
4. Manufacturer's bulletins with parts numbers, instructions, etc. for each item of equipment. Remove information not applicable to project.
5. Typewritten maintenance instructions for each item of equipment listing in detail the lubricants to be used, frequency of lubrications, inspections required, adjustment, etc.
6. A complete list and/or schedule of all major valves giving the valve ID, location of valve, and the rooms or area controlled by the valve.
7. Provide copies of start-up reports for each piece of mechanical equipment provided as part of this work.
8. Name, address, and phone number of contractors involved in work under this Division.
9. Detailed step-by-step instructions for starting, summer operation, winter operation, and shutdown of each system.
10. Detailed maintenance instructions for starting, summer operation, winter operation, and shutdown of each system.
11. Spare parts list.
12. Full size Record as built shop drawings in hard copies and PDF files.

1.09 COORDINATION SHOP DRAWINGS

A. General:
1. Prepare and submit for review coordination drawings where work by separate entities requires fabrication of products and materials which must accurately interface or for which space provided is limited.
2. Coordination drawings shall indicate how the work will interface and installation will be sequenced. It is the intent of this provision to find, bring forth, and resolve potential constructability problems prior to actual construction, thereby allowing for the resolution of issues before construction cost and schedule are impacted.

B. The General Contractor shall oversee preparation of coordination drawings, assign priority space, and bring to the attention of the Architect any conflicts or interferences of an unresolved nature found during preparation of coordination drawings. Expedite conflict or interferences and submit solutions/ recommendations for approval review.

C. Drawings: Shop drawings shall include but are not necessarily limited to the following:
1. Submit 1/4" = 1'-0" minimum scale, a combined, comprehensive mechanical coordination drawing. Coordination drawing shall include all ductwork, mechanical piping, plumbing, sprinkler systems, and ceiling systems overlaid on structural frame and architectural plan. Shop drawings are to be coordinated with all electrical and Telecom systems.
2. Criteria: Ductwork, mechanical piping, plumbing, and sprinkler system components shall be sized as shown on Drawings. Seismic restraints shall be shown where required. Nonconforming Mechanical work installed within designated coordination areas is subject to removal and replacement by the installing contractor at no additional cost to Owner.

3. Provide sections for congested areas.
4. Identify typical areas, start preparation of coordination drawings for such areas first.

D. Where required for coordination purposes, Contractor to modify duct shape to an equivalent flattened size at no additional cost to the owner. Contractor to limit duct aspect ratio to 3:1 unless provided special written permission by the Architect.

E. Coordination drawings shall be signed and dated by individual trade contractors. By act of signature and submittal of singular combined coordination drawing, each trade contractor acknowledges their coordinated portion of the work with all other mechanical, electrical, telecom, architectural, and structural work contractors.

F. After completion of coordination shop drawings signed by individual trade contractors. Submit copies to the architect for review. Once approved, provide copy at the job site for reference. No work shall be performed without the complete coordination shop drawings.

G. No request for information regarding the routing of pipes, ductwork and placement of equipment will be reviewed and responded to without a completed shop drawings.

1.10 SITE CONDITIONS

A. Information of the drawings relative to existing conditions is approximate only. Deviations found necessary during progress of construction to conform to actual conditions as approved by the Architect shall be made without additional cost to the Owner. The Contractor shall be held responsible for any damage caused to existing services. Promptly notify the Architect if services are found which are not shown on the Drawings.

PART 2 - PRODUCTS

2.01 GENERAL

A. Mention herein or on Drawings requires that this Contractor provide each item listed of quality noted or equal. Refer to subsequence division 23000 specification sections for specific equipment and system materials and accessories.

B. All material shall be new, full weight, standard in all respects, and in first- class condition.

C. Provide materials of the same brand or manufacture throughout for each class of material or equipment wherever possible.

D. The grade or quality of materials desired is indicated by the trade names or catalog numbers stated herein.

E. Dimensions, sizes, and capacities shown are a minimum and shall not be changed without permission of the Architect.

F. Conform to the State Energy Conservation Standards for all material and equipment.

2.02 MATERIALS FURNISHED

A. Identify all materials and equipment by manufacturer's name and model number. Remove unidentified materials and equipment from site.

B. Equipment specified by manufacturer's number shall include all accessories, controls, etc. listed in catalog as standard with equipment. Furnish optional or additional accessories as specified.

C. Equipment or material damaged during transportation, installation, or operation is considered as totally damaged. Replace with new equipment. Variance from this permitted only with written consent of the Architect.

D. Deliver, Protection, and Care:
   1. Deliver materials or equipment to the Project in the manufacturer's original, unopened, labeled containers.
   2. Added costs associated with reordering, expediting orders, or project delays due to rejected materials shall be borne by the Contractor.
   3. Protect from damage which may be caused by theft, weather, and building operations. Failure to protect materials and apparatus adequately shall be sufficient cause for rejection of any damaged material or equipment.
   4. Close pipe and equipment openings to prevent intrusion of obstructions and damage.
   5. Owner or Architect will require removal and replacement of such material or work from the premises which is not in accordance with Contract Documents. Replace unsatisfactory work without delay, at no additional cost to the Owner.
   6. All material and equipment shall be protected against moisture, dirt and damage. Protective coverings shall be provided for bearings, open connections to pumps and tanks, coils, ducts, pipes and similar equipment that is vulnerable to grit and dirt.
   7. The interior of the pipes and ducts shall be kept clean at all times.

PART 3 - EXECUTION

3.01 GENERAL

A. General arrangement and location of piping, ductwork, equipment, etc. are shown on Drawings or herein specified. Carefully examine other work that may conflict with this work. Install this work in harmony with other crafts and at proper time to avoid delay of work. Provide all offsets as required to avoid other trades at no additional cost to the owner.

B. In advance of construction, work out minor changes and relocations to suit actual conditions and work of other trades to avoid conflict therewith. This shall not be cause for additional cost.

C. Execute any work or apparatus shown on the Drawings and not mentioned in the specifications, or vice versa, the same as if specifically mentioned by both. Omission from Drawings or specifications of any minor details of construction, installation, materials, or essential specialties does not relieve this Contractor from furnishing same in place complete.

D. Furnish and install any incidental work not shown or specified which can reasonably be inferred as part of the work and necessary to provide a complete and workable system.
   1. Minor piping associated with instrumentation and control is generally not shown. Interconnection of sensors, transducers, control devices, instrumentation panels, combustion control panel, burner control panels is the responsibility of the contractor. Small piping associated with water cooling, drips, drains and other minor piping may not be shown to avoid confusion in the plan presentation but shall be provided as part of contract work. Drains shall be piped to the nearest floor drains.

E. Furnish materials and work at proper time to avoid delay of the work.

F. Coordinate with testing and balancing contractor to review drawings for proposed additional balancing components required for proper system testing and balancing.

3.02 ACCESS

A. Continuously check Architectural Drawings for clearance and accessibility of equipment specified herein to be placed. No allowance of any kind will be made for negligence on part of Contractor to foresee means of installing his equipment into proper position.

3.03 CLOSING IN OF UNINSPECTED WORK

A. Do not allow or cause work installed to be covered up or enclosed before it has been inspected and tested. Should work be enclosed or covered up before it has been inspected and tested,

uncover work at own expense. After it has been inspected and tested, make repairs necessary to restore work of other contractors to condition in which it was found at time of cutting.

3.04 PROJECT MODIFICATIONS

A. During the progress of construction, if such conditions arise that require revisions, modifications, or relocations to any mechanical equipment or materials incorporated in this project, such alterations shall be immediately called to the attention of the Architect. Contractor shall then prepare necessary Drawings showing proposed changes. Submit proposed changes for review by the Architect prior to actual revision work in the field.

B. Two sets of Drawings showing all revisions shall be immediately presented to Architect for his records. Maintain additional copies on the project as necessary to comply with "RECORD DRAWINGS" requirement of the General Requirements.

C. Incorporate all revisions into record Drawings.

3.05 FORMING, CUTTING AND PATCHING

A. Coordinate with other contractors as necessary to provide any special forming, recesses, chases, etc., and provide wood blocking, backing, and grounds as necessary for proper installation of mechanical work.

B. If this Contractor fails to coordinate with other contractors at proper time or fails to locate items properly, resulting in extra work, then this Contractor is responsible.

C. This Contractor is responsible for proper placement of pipe sleeves, hangers, inserts, and supports for work.

D. Cutting, patching, and repairing of existing (old) construction to permit installation of piping, etc. is responsibility of this Contractor. Repair or replace damage to existing work with skilled mechanics for each trade involved in first-class manner.

E. Core openings through existing construction as required for the passage of new piping and conduits. Cut holes of the minimum diameter to suit size of pipe installed and associated insulation.

3.06 DEMOLITION AND SALVAGE

A. Provide demolition of mechanical work under this SECTION as indicated on Drawings.

B. Removed materials which will not be re-used and which are not claimed by the owner shall become the property of the Contractor and shall be removed from the premises. Consult Owner before removing any material from the premises. Carefully remove materials claimed by the owner to prevent damage. Coordinated delivery of such items to owner.

C. Removed materials which are to be reused are to be removed, cleaned, and stored in a safe location. If such items are lost or damaged by the Contractor, item shall be replaced with new item at no added cost to owner. If item is found to be damaged prior to removal, inform Architect prior to removal so that item may be examined by Architect and owner for further instructions.

3.07 WELDING FOR MECHANICAL WORK

A. All mechanical welding and inspection requirement shall be in accordance with the California Mechanical Code.

B. Qualify welding procedures, welders and operators shall be in accordance with ASME boiler and pressure vessel code, section IX, welding and brazing qualifications. Welding procedures and

testing shall comply with ANSI standard B31.9 - standard code for pressure piping, and the American Welding Society (AWS) welding handbook.

C. Soldering and brazing procedures shall conform to ANSI B9.1 standard safety code and NFPA 99.

D. All welders shall be certified by a state approved welding bureau. Fabricator shall have current and valid certificated registration by the building official for the types of welds required by the project. Prior to start of the project, the fabricator shall submit a copy of certificate of registration for approval. Prior to project close out, the fabricator shall submit a certificate of compliance that the work was performed in accordance with the approved plans and specifications to the building official and to the Engineer or Architect of record.

3.08 EXISTING SERVICES

A. Provide and install all required connections to existing systems as required by the Drawings and specifications.

B. Integrate existing systems with all new work to provide a complete working system.

C. Provide minimum 72 hour notice to Owner of service interruptions. All service interruptions shall be kept to the minimum possible time. When requested by Owner service interruptions shall occur outside of normal working hours at no additional cost to owner.

3.09 STRUCTURAL DESIGN OF EQUIPMENT AND SEISMIC RESTRAINTS

A. All mechanical equipment supports shall be designed by a licensed Structural Engineer and shall comply with the 2016 California Building Code, Section 1616A.1.18 through 1616A.1.26 and ASCE 7-10, Chapters 6 and 30.

3.10 WARRANTY

A. Be responsible for work done and material installed under these plans and specifications. Repair or replace, as may be necessary, any defective work, material, or part which may show damage to itself or other materials, furnishing, equipment, or premises caused by such defects during this period, if in the opinion of the Architect said defect is due to imperfection of material or workmanship. Provide all such work and materials at no cost to Owner.

B. Be responsible for damage to any part of premises during guarantee period caused by leaks or breaks in work furnished and/or installed under this section. Replace refrigerant, lubricants, or gasses lost as result of defects, breaks, or leaks in work.

C. Provide manufacturer's written warranties covering defects in material and workmanship of products and equipment utilized for the project.

D. Warranties shall be for a period of 1 year from the date of substantial completion unless more stringently specified within individual Sections of this Division.

3.11 TEMPORARY HEAT

A. The General Contractor will provide for all temporary heat at such times as may be required or directed by the Architect and pay all fuel and energy costs incurred. Temporary heating facilities proposed for use by the General Contractor will be subject to review of the Architect.

B. The permanent heating, ventilating, and air conditioning (HVAC) system shall not be operated or used to provide air to the space during construction. Start-up of this system shall not commence until the building is cleaned.

1. If the permanent HVAC system is required to operate during the course of construction and prior approval of owner and architect is obtained, the Contractor shall provide 2”

thick, MERV 8 filters at all return, exhaust, and transfer grilles. Filters shall also be provided at all return air ducts open to the plenum. Filter shall completely cover opening and be sealed tight as to not allow dirt/debris into the system. Filters to be provided at no additional cost to the owner and are to be removed upon completion of project. Filters to be inspected daily prior to the start of the HVAC system. Dirty filters are to be replaced.

a. Failure to comply with the above shall result in a complete cleaning of the duct system at no additional cost to the owner.

3.12 START-UP PROVISIONS FOR MECHANICAL WORK

A. General: Major equipment (such as air handling units, boilers, and chillers) start-up shall be performed by the equipment manufacturer or authorized representative.

B. Adjusting and Aligning Equipment: Adjust all equipment. Check all motors for proper rotation.

C. Lubrication:
1. Extend grease fittings on bearings to points of ready and easy accessibility.
2. Lubricate fan bearings, etc., before operation of any equipment.
3. Provide a final lubrication to equipment immediately before turning over to Owner.

D. Upon completion of the mechanical work, or at such time prior to completion as may be determined by the Architect, operate and test all mechanical equipment and systems to demonstrate the satisfactory overall operation of the building or project as a complete unit. Commence tests after preliminary balancing and adjustments to equipment have been checked. Immediately before starting tests, install new air filters and lubricate all running equipment. Notify the Architect at least seven calendar days in advance of starting the above tests. Test equipment and systems for a minimum as follows:
1. Packaged AC Units (under 20 tons), ductless split systems: 2 consecutive 8-hour days
2. Boilers, chillers, hydronic systems: 5 consecutive 8-hour days.

E. Provide training and orientation of Owners operating staff in proper care and operation of equipment, systems and controls.

F. Neatly tabulate and deliver to the Architect complete operational data, including air flows, room temperatures, fan speeds, motor currents, plenum and duct static pressures, and other data as required. The Architect reserves the right to spot check results, and if discrepancies or errors are noted, Contractor will be required to redo balancing tests and tabulations entirely.

G. During test period, make final adjustments and balancing of equipment, systems, controls, and circuits so that all are placed in first-class operating condition.

H. Mark final positions of balancing valves after balancing is complete.

I. All areas of building shall receive proper flow of hot and chilled water to assure adequate and uniform temperatures throughout.

J. Final observation will not be made until all of the above have been completed and a preliminary copy of the balance report has been submitted and reviewed.

3.13 POST-CONTRACT COMPLETION TESTS

A. If the required full-load operation conditions cannot be obtained at the time of the Project Completion Tests due to outdoor seasonal temperatures, return to the job site when requested by the Architect and complete proper loading of equipment and systems as required. Changing of any air filters will not be required under these tests. Contractor will be allowed seven calendar days after notification to begin tests.

3.14 PRE-SEASON START UP

A. When requested by the Owner within one year of the filing of Notice of Completion, and when full-load tests required under Project Completion Tests and Post Contract Completion Tests have not been performed, start up any equipment or systems required for heating or cooling season operation by the Owner when such equipment and systems have remained shut down immediately after the Project Completion Tests. Make proper assurance that all equipment and systems are operating properly before being turned over for the first operational use of the Owner within one year of filing of Notice of Completion. The changing of any air filters will not be required under these start-up requirements. The Contractor will be allowed seven calendar days after notification, to begin test.

3.15 MECHANICAL RECORD AS-BUILT DRAWINGS

A. During the course of Project Construction, Mechanical Contractor shall maintain recorded “AS-built” information by distinctively marking up approved shop drawings prints to depict all actual work installed on a daily basis form but not limited to field conditions, addendums, architectural supplemental instructions (ASIs) , instruction bulletins (IBs), change orders (COs), responses to Request For Information (RFIs), and approved product substitutions.

B. The marked-up shop drawings will be made available at the Construction Site to the Architect upon request, at any time.

C. The marked up shop drawings with the recorded information shall then be used to create Record As-built drawings at the completion of the project. Contractor shall submit the Record As-built drawings in full size hard copies and also in PDF format.
   1. Provide 2 complete sets of full size drawings on 20 pound white bond paper.
   2. Provide 1 CD (compact disc) or Thumb Drive with Record drawings in either AutoCAD, version 2013 or later version.
   3. Record as-built drawings are to be full size drawings (same size as Contract Documents) and all plans are to be to standard engineering scale. The minimum drawing scale to match those provided within the Contract Documents.

3.16 CLEANING UP

A. Remove tools, scaffolding, surplus materials, barricades, temporary walks, debris, and rubbish from the Project promptly upon completion of the work of each Section. Leave the area of operations completely clean and free of these items.

END OF SECTION

SECTION 23.05.00

COMMON WORK RESULTS FOR HVAC

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes general mechanical materials and methods required within the project. Items included within this specification section include:
1. Access Doors
2. Roof Flashing
3. Dielectric Unions
4. Thermometers
5. Gauges
6. Pipe and Equipment Identification
7. Fireproofing
8. Painting
9. Concrete
10. Excavating And Backfill
11. Electrical Work
12. Commissioning and preliminary operational tests

1.02 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firms regularly engaged in manufacturer of plumbing piping systems products, of types, materials, and sizes required whose products have been in satisfactory use in similar service for not less than 5 years.

B. Contractor's Qualifications: Firm with at least 5 years of successful installation experience on projects with piping systems work similar to that required of project.

1.03 SUBMITTALS

A. Product data: submit complete data of materials proposed including:
1. Manufacturer and model number
2. Clearly indicate all options, trim, and accessories.
3. Cross reference manufacturer's cut sheet to specification section on submittal sheet.

B. Operation and Maintenance Data: where applicable, submit complete O&M data including:
1. Maintenance data and parts lists for each component.
2. Provide "trouble- shooting" maintenance guide
3. Include this data within maintenance manual

PART 2 - PRODUCTS

2.01 ACCESS DOORS

A. Where floors, walls, or ceilings must be penetrated for access to mechanical equipment, provide access doors, 14-inch by 14-inch minimum size in usable opening. Where entrance of a serviceman may be required, provide 18-inch by 24-inch minimum usable opening.
1. All access doors less than 7'-0" above finished floors and exposed to public access shall have keyed locks.

B. Access doors shall match those supplied in Division 08 3113 in all respects, except as noted herein.

C. Where panels are installed against stainless steel panels, access doors to be stainless steel to match adjacent surfaces.

D. Where panels are located on ducts or plenums, provide neoprene gaskets to prevent air leakage, and use frames to set door out to flush with insulation.

E. Provide insulated doors where located in internally insulated ducts or casings.

F. Where specific information or details relating to access panels different from the above is shown or given on the Drawings or other Divisions of work, then that information shall supersede this specification.

G. Do not locate access doors in highly visible public areas such as lobbies, waiting areas, and primary entrance areas. Coordinate with the architect when access is required within these areas.

H. Available Manufacturers:
1. Milcor
2. Karp
3. Nystrom
4. Cesco

I. Access doors to be equivalent to the following Milcor access doors:
1. Style M (plaster)
2. Style A (A/C tile, gypsum board)
3. Style M (Masonry)
4. Style "Fire Rated" where required.

2.02 ROOF FLASHING

A. Flashings in metal deck or membrane type roofing:
1. Flashing for penetrations of the roof for mechanical items such as flues, ducts, and pipes will be furnished and installed under other sections of these specifications. The work of this section shall include layout, sizing, and coordination of penetrations required for the mechanical work.
2. Furnish and install counterflashings above each flashing required in the mechanical work. Flues and ducts shall have 24-gauge galvanized sheet metal storm collar securely clamped to the flue or duct above the flashing.
3. Sewer vents and other piping extending through roof structure shall have flashing provided and installed as part of the roofing work. This contractor shall coordinate his Work accordingly.

B. Flashing in built-up roofing assemblies:
1. Where flashing is not provided and installed as part of other Work, furnish and install a waterproof flashing and counterflashing for pipe, duct, and flue passing through roof. The flashing shall extend a minimum of 9 inches in all directions from the outside of the pipe, flue, or duct.
2. Sewer vents and other piping extending through roof structure shall have four-pound sheet lead flashings and Semco, Smith, or equal to Semco #1100-4, counterflashing sleeves installed as detailed.
   a. Provide Hydroseal at underside of counterflashings as recommended in Semco installation instructions.
3. Flues shall have 24-gauge galvanized steel flashings on all roofs. Securely clamp a storm collar (counterflashing) around the flue above the flashing. Storm collars shall be of same material as flashing.
4. Seal all pipes, flues, or ducts passing through exterior walls in an approved, watertight manner.

2.03 DIELECTRIC UNIONS

A. Furnish and install dielectric unions at all locations described herein, whether shown on Drawings or not, and except as noted herein. Construct couplings and flanges so that the two pipes being connected are completely insulated from each other with no metal-to-metal contact. Heavily line the couplings with a hard, insulating, phenolic plastic threaded in standard pipe sizes. Make up the flanges with insulating components consisting of a hard, phenolic gasket, bolt sleeves, and bolt washers. Supplement the insulating gasket with neoprene faces to form a seal.

B. Acceptable Manufacturers:
1. Watts Regulator Co.
2. Eclipse, Inc.
3. Perfection Corp.

2.04 THERMOMETERS

A. General:
1. Thermometers shall be furnished at all locations shown on the Drawings and in accordance with these specifications, whether shown on the Drawings or not
2. All thermometers, unless shown otherwise, shall be of the bimetal helix or liquid-filled type.
3. All thermometers shall be round, stainless steel case construction with glass front.
4. Accuracy to be within plus or minus one of the smallest scale divisions throughout the entire range.
5. The thermometer scales shall have a minimum of 2 degrees between graduations and a maximum of 20 degrees between figures.
6. The thermometers shall be located so as to be easily read and shall be furnished with adjustable angle pattern so as to be rotated to any position.
7. Liquid thermometers for tanks and similar equipment shall have a minimum 5-inch diameter face.
8. Thermometers for piping shall have a minimum face diameter of 3 inches.
9. Thermometers installed on insulated tanks or piping shall be provided with an extension neck well to compensate for the thickness of the insulation.
10. Thermometers shall be provided with stainless steel stems and steel wells.
11. Thermometers used for air temperature in ductwork, plenum boxes, etc., unless specified or shown otherwise, shall have a minimum scale face of 5 inches and shall have an adjustable mounting flange so that scale may be set at any angle up to 45 degrees to facilitate reading.
    a. The thermometers shall have a perforated guard over stem suitable for sensing air temperature.
    b. Length of stem shall be a minimum of 8 inches.
12. Thermometer wells with chain and cap shall be provided where wells are indicated on the Drawings.

B. Provide Pete's Plug II, Sisco P/T, or equal test plug with Nordel core where indicated on drawings.

C. Acceptable Manufacturers:
1. Weston
2. Marsh
3. Taylor
4. Or Equal

2.05 GAUGES

A. General:
1. Gauges and gauge connections shall be furnished at all locations shown on the Drawings and in accordance with these specifications, whether shown on the Drawings or not.
2. Accuracy to be within 1 percent in the middle third of the dial range and equipped with front calibration.
3. Dials to be white with black numerals.

4. Normal reading to be mid-scale.
5. Provide a needle valve on each gauge connection.
6. Gauge to have bronze bushed movement and front recalibration.
7. Gauges shall have a minimum dial size of 3-1/2 inches.

B. Provide Pete's Plug II, Sisco P/T, or equal test plug with Nordel core where indicated on drawings.

C. Acceptable Manufacturers:
1. Marsh, Series J
2. U.S. Gage
3. Danton 800

2.06 PIPING AND EQUIPMENT IDENTIFICATION

A. Pipe Identification:

1. Each piping system furnished and installed under this work shall be identified and the direction of flow indicated by a prefabricated coiled plastic colored label.

2. Labels shall comply with ASME A13.1 with regard to color, letter height, and marker size. The labels shall have black or white lettering and flow arrows on colored backgrounds and shall not require adhesive. The background colors shall conform to the color schedule shown in this Article.

3. For use indoors use 20 mil vinyl labels, MSI model MS-970, or equal. For piping with an outside diameter greater than 6 inches provide the label manufacturers nylon straps to secure label to piping.

4. For use outdoors use Polyester/Tedlar laminated material, MSI model MS-977, or equal. For piping with OD greater than 6" provide the label manufacturers stainless steel straps to secure label to piping.

5. The size of the lettering and label shall be such that the lettering can be easily read from the floor and the colors easily discernible.

6. Acceptable Manufacturers:
a. Marking Services Incorporated (MSI)
b. Idento Metal Products Co., Idento Bands
c. Setmark

B. Equipment Identification:

1. Provide white lamacoid plate for each and every piece of equipment installed in this work.
a. Lettering on plate shall be black, with size of lettering to suit equipment.
b. Lettering shall be minimum of 3/8-inch in height.
c. Plates shall be riveted or bolted to equipment.

2. Equipment to include, but not limited to:
a. Air Handling Units
b. Exhaust Fans
c. VAV / CAV Boxes
d. Split Systems AC Units
e. Boilers
f. Chillers
g. Pumps
h. Air Compressors
i. Etc.

C. Acceptable Manufacturers:
1. Marking Services Incorporated, (MSI)
2. LEM Products
3. Seton
4. Craftmark

2.07 FIREPROOFING

A. Fireproofing to be installed at all pipe and duct penetrations of rated assemblies.

B. Fireproofing to be UL Rated fire stop material.

C. Acceptable Manufacturers:
1. Hilti
2. 3M Pro-Set
3. Or Equal

PART 3 - EXECUTION

3.01 ACCESS DOORS

A. Access doors shall be furnished and installed wherever valves, balance valves, damper operating mechanisms, air terminal boxes, fans, and similar items normally requiring adjustment or servicing are installed in concealed or inaccessible spaces. Coordinate with access doors shown on architectural Drawings.

B. Comply with manufacturer's instructions for installation of access doors.

C. Where access panels are detailed on architectural or mechanical Drawings, sizes indicated thereon shall be used.

D. Keyed access doors shall be keyed alike.
1. Provide owner with 4 copies of keys for access doors.

3.02 ROOF FLASHING

A. Provide pipe flashings as noted on the Drawings.

B. Flue and duct flashings and storm collars shall be securely clamped around flue or duct storm collar or counterflashing, above flashing.

3.03 DIELECTRIC UNIONS

A. Install dielectric unions in the following locations:
1. In all metallic water and gas service connections into the building within 5 feet of the building wall. Install adjacent to the shut-off valve or cock and above ground where possible.
2. At points of connections where copper water lines connect to steel domestic water heater tanks and other equipment.
3. At points in piping where dissimilar metal pipes are connected together.
4. Any special applications shown on the Drawings.
5. Where steel or cast-iron pipe in the ground connects to copper or brass piping above the ground, the transition from steel or cast- iron pipe to the copper or brass pipe shall be made above ground in all cases and in an accessible location where practicable.
6. Where copper or brass piping is connected to steel or cast-iron piping and the connection is buried in the ground, the connection shall be covered with coal tar protective tape extending outward a minimum of 5 feet on all pipes, from the point of connection. The tape shall have a minimum thickness of 10 mils and a maximum thickness of 12 mils and shall be applied so as to provide at least two full thicknesses of the tape over the piping.

A primer, specifically designed for use with the tape, shall be used. The piping shall be thoroughly cleaned before any tape or primer is applied.

3.04 THERMOMETERS

A. Liquid thermometers for piping systems shall be installed so that the liquid flows completely around the bulb.

B. Enlarge pipes smaller than 2 ½" for installation of thermometer wells.

C. Apply thermal grease in thermowells prior to installation of thermometers.

D. Where shown on the temperature control diagram, the temperature control subcontractor shall furnish and install remote, bulb, panel-mounted, pneumatic-type thermometers. Duct-mounted thermometers may be omitted at these locations.

E. Locations: Thermometers shall be placed at all locations shown on the Drawings and at locations specified below. Ranges shall be as specified below.

Location	Range (°F)
Air inlet and outlet of each bank of heating and cooling coils.	30 to 120 °F
Adjacent to each insertion type thermostat installed (Hot Water) under "Temperature Control."	+50 to 250 °F
Thermometer bulb to be installed adjacent to bulb (Chilled Water) of insertion thermostat.	+25 to 125 °F
In both the water inlet and water outlet of each bank of Hot water and chilled water coils and heat exchangers	+50 to 250 °F
In both the water inlet and water outlet of cooling tower	+50 to 250 °F

F. In such cases where the above described thermometers cannot be located so as to be easily read, a remote reading type of thermometer shall be installed, as approved by the Architect.

G. Thermometers provided as part of the temperature control work and located on a control panel, etc. need not be duplicated by above requirements.

3.05 GAUGES

A. Gauges shall have indication of 0 to 160 psi where indicated pressure will be greater than 40 PSI and 0 to 60 psi for lesser pressures.

B. Provide gauge connections at the following locations:
1. Inlet and outlet of butterfly-type balancing valves.
2. Inlet and outlet of water chiller.
3. Suction and discharge of circulating pump.
4. Elsewhere as may be shown on the Drawings.

C. Gauges shall be provided in a convenient location within approximately 5 feet of the flanges or connections and elsewhere as may be shown on the Drawings.

D. A needle-point globe valve, similar to Crane No. 88, shall be supplied at each gauge and gauge connection.

E. A gauge siphon located adjacent to the gauge shall be applied with each hot water gauge.

3.06 PIPE AND EQUIPMENT IDENTIFICATION

A. Identification shall be applied to all piping, except piping located in furred spaces without access to permit entrance of personnel, and piping buried in the ground or concrete.

B. Underground pipe identification shall consist of a buried, continuous, preprinted, bright colored, plastic ribbon cable marker provided for each underground pipe.

C. The legend and flow arrow shall be applied at the following locations:
1. All valve locations,
2. All points where piping enters or leaves a wall, partition, cluster of piping, or similar obstruction
3. All exposed locations
4. At approximately 20-foot intervals on pipe runs.

D. Practical variations or changes in locations and spacing may be made with the specific approval of the Architect to meet specific conditions.

E. Wherever two or more pipes run parallel, the printed legend and other markings shall be applied in the same relative location so that all piping is easily identified.

F. The marking shall be located so as to be readily conspicuous at all times from any reasonable point of vantage.

G. Where different equipment, such as fire sprinklers, are supplied from a common main, such as domestic water, the main should be identified as "Domestic Water" and each respective branch takeoff as "Fire Water," etc.

H. The non-potable water plumbing piping shall be marked with the legend "Danger - Unsafe Water". This legend shall be applied to both hot and cold water systems along the length of the pipe in fluorescent orange at a maximum of five foot intervals.

I. Lettering size and label colors are to be per ASME/ANSI A13.1 Pipe Marking Standards.

3.07 FIREPROOFING

A. Pack the annular space between the pipe sleeves and the pipe and between duct openings and ducts through all floors and walls with UL listed fire stop.

B. Fireproofing system to be installed in strict accordance with manufacturer’s written instructions and details.

3.08 PAINTING

A. Perform all priming and painting on the equipment and materials as specified herein.

B. Exposed piping and unfinished portions of equipment to be painted shall be cleaned of grease, oil, rust, or dirt in preparation for painting.

C. Where applicable, remove pipe clamps prior to painting so that entire pipe is painted. Provide temporary support as required. Re-install clamps after priming/painting is complete.

D. Priming:

1. Contractor to prime all exposed ferrous metals, including piping, which are not galvanized or factory-finished.
   a. Black steel pipe exposed to weather shall be cleaned and primed with one coat of Rust-Oleum, or equal, #1069 primer. Color to be Grey.

E. See Painting Section for detailed requirements.

3.09 CONCRETE

A. Where specifically indicated on the Drawings or specified as part of Mechanical Work, this Contractor shall furnish and install concrete work, such as thrust blocks or spring isolator bases.

B. Concrete and reinforcing steel shall be equal to that specified for General Construction.

C. Except as noted above, concrete work will be furnished and installed under General Work. This Contractor shall coordinate requirements accordingly.

3.10 EXCAVATING AND BACKFILL

A. Perform all excavating required for work of this Section. Do excavating required for installation of piping and service lines and other work that applies as indicated on Drawings. Verify location and elevation of all existing utilities prior to excavation for installation of new piping. Provide the services of a pipe/cable locating service prior to excavating activates to determine location of existing utilities

B. Excavations shall be of open vertical construction of sufficient width to provide free working space at both sides of trench and around pipe as required for caulking, joining, backfilling, and compacting. Unless shown otherwise, provide a minimum of 2’-6” cover above top of pipe to finished grade for all service piping unless otherwise noted. Trim trench bottom by hand or provide a minimum of 4” deep sand bed to provide a uniform grade and firm support throughout entire length of pipe. For PE gas pipe, bed the pipe in a 4” sand bed.

C. Dig trenches straight and true to line and grade with holes for bells for bell-and-spigot pipe. Evenly support piping for its entire length upon outside periphery of lower one-third of pipe. Where rock is encountered, undercut trenches 3 inches and fill with well-tamped, clean sand and pea gravel to correct pipe elevation.

D. After pipe lines in excavation have been installed and tested, backfill excavation to point 6 inches above pipe using sand, fine earth, or other materials free of rocks and large lumps. Proceed evenly on both sides of pipe and continuously tamp. Except as hereinafter noted, backfill above 6 inches above top of pipe shall be made by using earth from excavation placed in layers of 8-inch maximum depth. Compaction of each successive layer will be made with mechanical compactor.

E. Take special care in backfilling over wrapped piping to prevent damage to protective wrapping.

F. Bed sewers under pavements, wrapped piping, and PVC piping in sand prior to backfilling. Backfill to point 6 inches above pipe with sand.

G. This Contractor shall replace sod, concrete, asphalt paving, curbs, pavement, walks, and any other type of existing work or surface disturbed by excavation, using workmen skilled in trade involved.

H. When pipe or underground conduit with a protective wrapping is to be placed in the trench, sand only shall be used for bedding the pipe or conduit. The sand used shall be certified to have a minimum resistance of 5000 ohms per cubic centimeter when wetted to any moisture content with distilled water and shall consist of clean, natural, washed-sand, hard, and durable particles varying from fine particles to particles of such size that all will pass through a 3/8-inch screen, not less than 90 percent will pass through a 1/4-inch screen, and not more than 25 percent will pass through a No. 50 screen.

I. Any backfill placed under this contract which subsides or settles below the adjacent finished grade or paving level during the guarantee period shall be brought to grade by the Contractor by adding compacted backfill or additional paving in paved areas.

3.11 ELECTRICAL WORK

A. Adequate working space shall be provided around electrical equipment in compliance with the National Electric Code and other applicable codes or ordinances. The mechanical work shall be coordinated with the Electrical Work in order to comply with these requirements. Any work which does not conform to these regulations shall be properly corrected without additional cost to the Owner.

B. Furnish and install all line voltage and low-voltage temperature control wiring in the Mechanical Work by the Temperature Control Sub-Contractor, including all interlock wiring between motor starter coils, interlock relays, and temperature control equipment. Unless noted otherwise, this does not include primary control wiring between starters and push button or other manual starter switch or branch power circuits required for temperature control systems.

C. Temperature control equipment, including relays shown on control diagram, shall be furnished and installed by the Temperature Control Subcontractor.

D. Equipment furnished in this work that is factory wired but requires modification to internal wiring to meet specifications or drawing requirements shall have such internal modifications made at factory before shipment.

E. All electrical work and equipment, including internal wiring, must comply with applicable codes and applicable portions of electrical specifications. Run line and low-voltage control wiring in conduit. Conduit for temperature control wiring shall be responsibility of Mechanical Contractor and shall be of type specified in electrical specifications.

3.12 DEMOLITION

A. Refer to Division 1 sections for general demolition requirements and procedures.

B. Disconnect, dismantle, and remove mechanical systems, equipment, and components indicated to be removed. Coordinate with all other trades
   1. Piping to be removed: Remove portion of piping indicated to be removed. Cap or plug remaining piping with same or compatible piping material.
   2. Piping to be abandoned in Place: Drain piping and cap or plug piping to remain with same or compatible piping material. Refrigerant system to be evacuated per EPA requirements.
   3. Ducts to be removed: Remove portion of duct indicated to be removed. Cap remaining ducts with same or compatible ductwork material and seal cap air-tight.
   4. Ducts to be abandoned in Place: Cap ducts with same or compatible ductwork material.
   5. Equipment to be removed: Drain down and cap remaining services and remove equipment.
   6. Equipment to be removed and re-installed: Disconnect and cap services and remove, clean, and store equipment. When appropriate, re-install, reconnect, and make equipment operational.
      a. If existing equipment which is to be re-installed is damage, contact architect prior to removal. Contractor to take pictures of any damaged equipment prior to its removal and submit pictures to Architect.
      b. Equipment damaged during removal, storage, or re-installation shall be the Contractor’s responsibility and is to be replaced with new at no additional cost to the owner.
   7. Equipment to be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.

C. If pipe, insulation, or equipment to remain is damaged in appearance or is unserviceable, removed damaged or unserviceable portions and replace with new products of equal capacity and quality.

D. Non-Destructive Testing Of Existing Concrete Slabs:
   1. When drilling or saw cutting existing reinforced concrete, use care and caution to avoid cutting or damaging the existing reinforcing bars, conduit, or tendons. Use a non-destructive method to locate metals poured into the slab prior to doing any work.

3.13 CARE AND CLEANING

A. Repair or replace broken, damaged, or otherwise defective parts, materials, and work. Leave entire work in condition satisfactory to Architect. At completion, carefully clean and adjust equipment, fixtures, and trim that are installed as part of this work. Leave systems and equipment in satisfactory operating condition.

B. Drain and flush piping to remove grease and foreign matter. Thoroughly clean out flush valves, traps, strainers, and pressure-reducing valves.

C. Keep the interior of all ductwork free of dirt, dust, loose insulation, and other foreign materials at all times.

D. Clean out and remove surplus materials and debris resulting from the work, including surplus excavated material.

3.14 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.15 CLEANING UP

A. Upon completion of Work remove materials, equipment, apparatus, tools, and the like, and leave premises clean, neat, and orderly.

END OF SECTION

SECTION 23.05.93

TESTING, ADJUSTING, AND BALANCING FOR AIR AND WATER

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes total system balance, as defined by AABC, which constitutes the process of testing, adjusting, and balancing each system component so that the entire system produces the results for which it was designed. Testing results of total system balance shall be accepted by the Mechanical Engineer of Record and Owner

1.02 QUALITY ASSURANCE

A. Balance agency shall be a member of Associated Air Balance Council (AABC), or National Environmental Balancing Bureau (NEBB).
   1. Company shall be a member of AABC or NEBB for a minimum of 5 years.

B. Work shall be done by qualified engineering technicians and trained personnel, using instruments certified accurate to limits used in standard practice for testing and balancing of hydronic and air distribution for heating-cooling systems. Agency shall field test air and hydronic flows in accordance with methods set up by Associated Air Balance Council, National Standard Volume 1, latest edition.

C. Approved Balancing Firms: Obtain service from one of the following firms (No others will be considered):
   1. RS Analysis
   2. Raglen System Balance
   3. MESA 3

D. AABC Compliance: Comply with AABC's "National Standards," Volume 1, as applicable to mechanical air and hydronic distribution systems and associated equipment and apparatus.

E. Industry Standards: Comply with ASHRAE recommendations pertaining to measurements, instruments and testing, adjusting and balancing, except as otherwise indicated.

F. Reference Standards: Comply with the following Standards:
   1. AABC - Associated Air Balance Council - A National Standard Volume 1.
   2. ASHRAE - American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.
   3. AMCA Publication 203, "A Guide to the Measurement of Fan System Performance in the Field."
   4. ASHRAE HVAC Applications Handbook, Chapters 34 and 42 as applicable.
   5. ADC Test Code No. 1062, "Equipment Test Code."
   6. ANSI A1.4, Specification for Sound Level Meters.
   7. ANSI S1.11, Specification for Octave, Half-Octave, and Third-Octave Band Filter Sets.

1.03 WORK INCLUDED

A. Test and balance of existing and new air distribution system, and associated equipment.

B. Setting and adjusting speed and volume of systems, recording data, conducting tests, preparing and submitting reports, and recommending modifications to work as required by contract documents.

C. Component types of testing, adjusting, and balancing specified in this section includes the following as applied to mechanical equipment:
   1. Fans

2. Air handling units
3. Ductwork systems
4. Pumps
5. Coils and heat exchangers
6. Piping systems
7. Relief vent and/or power exhaust section of economizers.

D. TAB agency shall perform the following during installation phase of systems:
1. Study design specifications and engineering Drawings and prepare schedule to physically inspect mechanical equipment for hydronic and air distribution systems to be tested and balanced.
   a. Contractor shall provide TAB agency with one copy of Contract Drawings and specifications, mechanical equipment submittals, and change orders necessary for proper balancing of air distribution systems.
2. TAB agency shall make periodic field inspections prior to closing in portions of systems to be balanced. Agency shall verify to its satisfaction that all work, fittings, dampers, balancing devices, etc. are properly fabricated and installed as shown or specified and that Agency will be able to properly balance system.
3. Prepare test and balancing schedule, test record forms, and necessary technical information about hydronic and air distribution systems for installed heating-cooling equipment.
4. Recommend adjustments and/or corrections to mechanical equipment and hydronic and air distribution systems that are necessary for proper balancing of systems.
   a. Corrections required based on TAB Contractor field inspections shall be made at no additional cost to the owner.

1.04 SUBMITTALS

A. Contractor data:
1. Provide TAB Contractor company information.

B. Duct Leakage Reports:
1. TAB Contractor to provide TAB report for duct leakage tests.

C. Field Inspection Report:
1. TAB Contractor to provide written verification of field inspections.
   a. Include date of inspection and list of all items to be corrected prior to balance.

D. TAB Contractor to provide Test Reports as follows:
1. Submit data on printed report forms published by AABC or NEBB.
2. Include identification and types of instruments used and their most recent calibration date with submission of final test report.
3. Reports to have computer generated drawings. Drawings to include: general building layout, ductwork and piping layout, HVAC equipment, and air inlet/outlet locations.
   a. Hand drawn/numbered drawings shall not be accepted.
4. Reports to be stamped and signed licensed TAB Contractor.
5. Submit three copies of complete test report prior to final acceptance of project.

E. Balance agency shall submit the results of tests in this SECTION for review by the Architect.

PART 2 - PRODUCTS

2.01 PATCHING MATERIALS

A. Except as otherwise indicated, use same products as used by original installer for patching holes in insulation, ductwork and housings which have been cut or drilled for test purposes, including access for test instruments, attaching jigs, and similar purposes.

1. At tester's option, plastic plugs with retainers may be used to patch drilled holes in ductwork and housings.

2.02 TEST INSTRUMENTS

A. Utilize test instruments and equipment for test and balance work required, of type, precision, and capacity as recommended in the following test and balance standards:
   1. Comply with AABC's Manual "AABC National Standards," Volume 1.

PART 3 - EXECUTION

3.01 BALANCING OF EXISTING AIR HANDLING SYSTEMS

A. Prior to any other Work being started on this project, test all existing air handling systems indicated on the drawings. Provide report indicating fan RPM and CFM, air velocity and air volume for all air inlets and outlets, and any recommended repairs or alterations to the existing system.

B. Prior to completion of the Work, rebalance all existing air inlets and outlets to conditions at start of Work.

3.02 BALANCING

A. Upon completion of hydronic and air handling systems, balance agency shall complete tests, analysis, and balance of hydronic and air handling systems for heating-cooling equipment.

B. This report shall include as minimum, but not be limited to, following design and actual information:

   1. Air-Moving Equipment Data:
      a. Fan or unit number.
      b. Location.
      c. Area served.
      d. Manufacturer.
      e. Model number and serial number.
      f. Design and actual air-flow measurements:
         (1) Total CFM.
         (2) Return air CFM
         (3) Outdoor air CFM
         (4) Relief air CFM
         (5) Total/external static pressure in w.g.
         (6) Approximate suction static pressure in w.g.
         (7) Approximate discharge static pressure in w.g.
         (8) Fan rpm

   2. Rated and Actual Motor Data:
      a. Horsepower / Break-horsepower
      b. Phase
      c. Voltage.
      d. Amperage.

   3. Duct Velocity Traverse Data:
      a. Fan or unit number
      b. Design and actual CFM
      c. Duct division signs and area.
      d. Design and actual average velocity
      e. Duct static pressure average velocity
      f. Traverse location

g. Traverse measurements in fpm (show grid pattern)

4. Individual Outlet and Inlet Data:
   a. Identify each outlet for location, area, and fan or unit system
   b. Outlet or inlet manufacturer and type
   c. Outlet or inlet size, effective area or A_k factor
   d. Design and actual velocity in feet per minute (FPM)
   e. Design and actual CFM

5. Other information required to establish completely balanced systems.

3.03 BALANCE REQUIREMENTS

A. Make allowance for air filter resistance at time of tests. Balance main air supplies at design air quantities and at an air resistance across filter bank midway between design specifications for clean and dirty filters.

B. Balance work within the following tolerances:
   1. Supply, Return, Exhaust inlets/outlets: balance within -5% / +10% of design CFM.
   2. Outside Air Inlets: balance within -0% / +10% of design CFM.

C. Rooms with positive or negative pressure requirements to maintain a minimum of 15% differential pressure regardless of the above tolerances.

D. Provide a room or building pressure test for each system. Maximum building pressure shall not exceed 0.03” inches of pressure.

E. Test and balance fume hoods to per AABC National Standards for Total System Balance, Chapter 16.

F. HVAC systems shall be balanced at normal "minimum outside air" condition. Where such systems are required to deliver 100-percent return air or a variable amount of outside air, as indicated in specifications for automatic temperature control sequences, total CFM test shall be repeated for 100-percent return air and maximum outside air shall agree with conditions found under maximum outside air operation before system is considered to be in balance. Adjustments of proper dampers shall be made to achieve balance and marked so that control systems contractor may set damper motors accordingly.

G. After final air balance of systems, make adjustments to obtain uniform temperatures as required by actual occupancy.

H. Take static pressure readings with inclined manometer. Take air velocity readings with instruments of recent calibration. Take final velocity readings with Alnor Velometer, Anemotherm or Vane Type Anemometer, calibrated prior to test and recalibrated at end of test. Include certified correction curves for each calibration as part of record. Certify instruments accurate to standards currently used in common practice for system balance work. Use test cones for diffusers.

I. Run tests with supply, return, and exhaust systems operating and doors, windows, etc. closed or under regular traffic. If possible, make final readings with cooling coils under load to ensure that static pressures are at maximum.

J. Adjust deflection of supply outlets to ensure proper and uniform air distribution throughout area served by such outlets.

K. Work with temperature Control Subcontractor in adjustment of automatic dampers, valves, thermostats, etc. required to maintain proper temperatures in all portions of building.

L. Contractor responsible for installing heating, cooling, and ventilating equipment shall make any changes, additions, or modifications to dampers, fan drives and motor sheaves, pump impellers, motors, and other equipment necessary for proper air and hydronic balance.

M. Balance of systems shall be reviewed by Architect and during this review Mechanical Contractor shall furnish men, materials, ladders, etc. to enable Architect to take all readings as he may direct. If errors are found, Balancing Agency shall readjust system to satisfaction of Architect.

END OF SECTION

SECTION 23.07.00

HVAC INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. This Section includes insulation types and thickness for mechanical piping, ductwork, and equipment.

1.02 REFERENCES

A. California Code of Regulations – Title 24, Part 4.

B. California Building Code, California Electric code, NFPA, and UL

C. ASTM

D. ASHRAE

E. MAIMA

F. NFPA

G. SMACNA – Sheet Metal and Air Conditioning Contractor's National Association, Inc.

H. Underwriter's Laboratories

I. GREENGUARD

1.03 QUALITY ASSURANCE

A. Manufacturer's Qualifications: Firm specializing in manufacturing of mechanical insulation products applicable to project whose products has been in satisfactory use in similar services for a minimum of 3 years.

B. Installer's Qualifications: Company specializing in piping insulation application with a minimum of 3 years experience.

C. Flame/Smoke Ratings: Insulation materials, including but not limited to insulation, jackets, coverings, sealers, adhesives, etc., to have flame-spread rating of 25 or less and smoke-developed index of 50 or less when tested in accordance with ASTM E84.

D. Insulating products to be installed in accordance with manufacturer's written instructions and in accordance with recognized industry practices.

1.04 SUBMITTALS

A. Submit complete data of materials proposed.

1. Indicate individual services for each system.

2. Indicate proposed insulation thickness for each system

3. Indicate proposed R-valves, densities, etc. for each product.

B. Provide Manufacturer's installation instructions for each product.

PART 2 - PRODUCTS

2.01 GENERAL

A. For purposes of this specification, fittings, joints, strainers, flexible piping, valves, etc. shall be considered as piping and shall be insulated with same material and thickness as adjoining piping unless noted otherwise.

B. Acceptable Manufactures
1. Knauf
2. Johns Manville
3. Certainteed
4. Owens-Corning

2.02 MATERIALS

A. Fiberglass Piping Insulation:
1. Insulation to be heavy density glass fiber insulation.
2. Insulation to have factory-applied self-sealing vapor barrier.
3. Maximum K-Value at 75°F = 0.23 Btu-in/hr-FT^{2}-^{o}F.
4. Rigid segment of insulation to be provided at all pipe hangers
5. Fittings and valves to be insulated with John Manville Zeston 2000 Series 25/50 Smoke-Safe PVC pre-molded insulated covering secured with standard fasteners.
6. Insulation to be Johns Manville Micro-Lok or equal.

B. Flexible Closed Cell Insulation:
1. Flexible elastomeric thermal closed-cell structure insulation.
2. Maximum K-Value at 75°F = 0.27 Btu-in/hr-FT^{2}-^{o}F.
3. Joints to be sealed with Armstrong 520 Adhesive
4. Insulation to be Armstrong Armaflex 22 or equal

C. Fiberglass Ductwork Insulation:
1. Duct wrap to be blanket-type thermal and acoustical insulation made from glass fibers, bonded with white formaldehyde-free resin.
2. Labeled K-Value to equal 0.29 Btu-in/hr-FT^{2}-^{o}F.
3. Compressed K-Value to equal 0.27 Btu-in/hr-FT^{2}-^{o}F.
4. Insulation to be Johns Manville Microlite XG or equal.

2.03 PIPING INSULATION

A. Refrigerant Piping:
1. Insulate both liquid and suction lines with closed-cell pipe insulation.
2. Insulation to be a minimum of ¾” thick.
3. Seal all joints with Armstrong 520 adhesive.
4. Insulation exposed to weather to be provided with metal protective jacket. Metal protective jacket to be as follows:
   a. Sheet Aluminum: ASTM B209, 3003 allow, H-14 temper, 0.16” thick.
   b. Longitudinal lab to be at least 2” wide.
   c. Fitting covers: Factory fabricated type 3003 sheet aluminum, 0.024” minimum thickness.
   d. Provide stainless steel metal screws spaced at 6” on center for fastening aluminum jacket and fittings. Aluminum ban not acceptable.

B. Condensate Drain Piping:
1. Insulated exposed condensate drain piping within building with ¾” closed-cell pipe insulation.
2. Seal with Armstrong 520 adhesive.

2.04 DUCTWORK INSULATION

A. Wrap all concealed unlined supply and return ductwork, with duct wrap insulation as follows:
1. Where installed over unconditioned spaces, wrap ductwork with type 75, 3" thick duct wrap. Minimum installed R-value to equal 8.3 (hr-ft$^{2-0}$F)/BTU.
2. Where installed over or within conditioned concealed ceilings, wrap ductwork with type 75, 2" thick duct wrap. Minimum installed R-value to equal 5.6 (hr-ft$^{2-0}$F)/BTU.
3. Duct wrap to have FSK vapor barrier facing.
4. Duct wrap to be Johns Manville Microlite XG or equal.

2.05 DUCTWORK EXPOSED TO WEATHER

A. Wrap all unlined supply and return ductwork exposed to weather with flexible, closed-cell elastomeric insulation in tubular or sheet form. Armstrong AP Armaflex, or equal.
1. Provide 2-layers of ¾" thick material.

B. Cover insulation with 0.024" thick aluminum jacket of ducting with ½" wide stainless steel bands at 12" on center.

PART 3 - EXECUTION

3.01 GENERAL

A. Insulation to be stored on jobsite in clean / dry location. Any insulation exposed to water must be discarded immediately and removed from jobsite.

3.02 INSTALLATION OF PIPING INSULATION

A. Install piping insulation products in accordance with manufacturer's written instructions and in accordance with recognized industry practices.

B. Installation to be installed after installation of heat tracing, testing, acceptance of testing, and cleaning of pipe.

C. Insulate each continuous run of piping with full-length units of insulation. Cut pieces to size as required. Do not use multiple cut pieces and/or scraps abutting each other.

D. Clean and dry piping surfaces prior to insulating. Butt insulation joints firmly together to ensure complete and type fit over surface to be covered.

E. Install piping insulation without interruption through walls and floors except where otherwise indicated.

F. Taper raw ends of insulation and seal with canvas and sealant as noted for fittings.

G. Install pipe hangers on the outside of the insulation.

3.03 INSTALLATION OF CONCEALED DUCTWORK INSULATION

A. Install ductwork insulation products in accordance with manufacturer's written instructions and in accordance with recognized industry practices.

B. Prior to applying duct wrap, sheet metal duct shall be clean, dry and tightly sealed at all joints and seams.

C. Wrap insulation around duct with facing to the outside so the 2" flap completely overlaps facing and insulation at the other end of stretch out. Insulation shall be snugly butted.

D. Secure seams with outward clinching staples on 6" centers.

E. Neatly cut insulation at all volume control dampers.

F. Tape all seams and loose edges with scrim backed foil tape.

G. For ducts which are greater than 24” wide, provide mechanical fasteners at bottom of duct spaced at a maximum of 18” on center.

a. Fasteners to be weld pins or clinch pins. Adhesive type pins shall not be used.

3.04 INSTALLATION OF DUCTWORK INSULATION WHERE EXPOSED TO WEATHER

A. Install ductwork insulation products in accordance with manufacturer’s written instructions and in accordance with recognized industry practices.

B. Adhere duct insulation to ductwork with Armstrong 520 Adhesive per manufacturer’s recommendations.

C. Armaflex Sheet Insulation shall be adhered directly to clean, oil free surfaces with full coverage of 520 adhesive.

D. The duct insulation shall be constructed for the bottom up, with the top insulation sized to extend over the side insulation. This will for a water shed.

E. Butt-edge seams shall be adhered using 520 Adhesive by the compression fit method to allow for expansion/contraction. Leave a ½” wide uncoated border at the but-edge seams on the duct surface. Overlap the insulation ¼” at the but-edges and compress the edges into place. Apply 520 Adhesive to the butt-edges of the insulation.

F. Standing metal duct seams shall be insulated with the same insulation thickness as installed on the duct surface. Seams may be covered using strips of Armaflex Sheet Insulation or half sections of tubular pipe insulation with miter-cut ends. Standing seams shall be adhered using 520 adhesive.

G. Seams shall be staggered when applying multiple layers of insulation.

H. Duct Insulation Finish:

1. Proved 0.024” thick aluminum jacket over ducting with ½” wide stainless steel bands at 12” on center.

2. Longitudinal seams shall be on the bottom sides of duct only.

3. Seal all seams with duct sealant approved for outdoor use and approved for aluminum.

4. System shall be water-tight.

3.05 INSTALLATION OF EQUIPMENT INSULATION

A. Clean and dry all surfaces prior to insulating.

B. Install insulation materials with smooth and even surfaces. Do not use mastic or joint sealer as filler for gapping joints and excessive voids resulting in poor workmanship.

3.06 INSULATION REPAIR

A. Repair damaged sections of existing and/or new mechanical insulation where damaged occurred during this construction period. Use insulation of same thickness as existing insulation. Install new jacket lapping and seal over existing.

3.07 CARE AND CLEANING

A. Repair and/or replace broken, damaged and or otherwise defective insulation. Work to be completed to the satisfaction of the Architect. At completion of work, clean materials installed as part of this work and leave systems and equipment in satisfactory operating condition.

B. Upon completion of work remove materials, equipment, tools from premises. Leave project area neat, clean and orderly.

END OF SECTION

SECTION 23.31.00

HVAC DUCTWORK

PART 1 - GENERAL

1.01 SUMMARY

A. This section includes sheet metal materials, fasteners, supports, and duct construction classifications for:
   1. Supply, return, and exhaust systems.

1.02 REFERENCES

A. AABC – Associated Air Balance Council Manual: National Standards for Total System Balance

B. ANSI – American National Standard Institute

C. ASHRAE Standards: Comply with American Society of Air Conditioning, Refrigeration, and Air Conditioning Engineers Handbook.

D. NFPA – Compliance. Comply with ANSI/NFPA 90A, *Standard for the Installation of Air Conditioning and Ventilating Systems,* and ANSI/NFPA 90B *Standard for the Installation of Warm Air Heating and Air Conditioning Systems,* latest accepted edition.

E. CBC – California Building Code

F. CFC – California Fire Code

G. CMC – California Mechanical Code

H. Local Codes

I. SMACNA – Sheet Metal and Air Conditioning Contractor's National Association, Inc.

   1. Duct Construction Standards

   2. Fire damper and heat stop guide.

   3. HVAC Systems testing adjusting and balancing.

   4. Guidelines for Seismic Restraints of Mechanical Systems and Plumbing Pipe systems.

J. UL – Underwriters' Laboratory Standards for Safety: referred to as UL 181, UL 555, etc.

1.03 QUALITY ASSURANCE

A. Contractor to comply with all the above referenced standards.

B. The above referenced standards may be superseded by notes and details on Drawings and in specification.

C. Where two or more references are in conflict, the most stringent, as determined by the Architect, shall take precedence.

D. Flame-Smoke Ratings: All products used in ductwork system to comply with flame-spread index of 25 or less, fuel-contributed index of 50 or less, and smoke-developed index of 50 or less.

E. Installer: A firm with at least three years of successful installation experience on projects similar to that required for this work.

F. Fabricate all ductwork with sheet metal. Fiberglass ductwork will not be accepted.

G. Duct liner to be certified by Greenguard: Greenguard Environmental Institute, independent testing of products for emissions of respirable particles and Volatile Organic Compounds (VOCs), including formaldehyde and other specific product-related pollutants. Provides independent, third-party certification of IAQ performance. Certification is based upon criteria used by EPA, OSHA and WHO

1.04 SUBMITTALS

A. Submit typical shop standards and/or SMACNA details for each class of duct specified. Indicate the following for each standard:

1. Gauge sizes and joint details

2. Pressure Class

3. Seam Construction

4. System type (e.g. supply air, return, air, etc.)

B. Submit shop drawings for ductwork including elevations and showing all terminal units and air devices connections. Drawings shall be a minimum scale of ¼”=1’-0” and be coordinated with all other trades.

C. Record Drawings: At project closet-out, submit Record Drawings of installed ductwork, duct accessories, and inlets / outlets in accordance with the requirements of Division 1.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Manufactured Round and Oval Ductwork:
1. United McGill Sheet Metal
2. Omni Duct
3. Or equal

B. Duct Connection Systems:
1. Ductmate Industries, Inc.
2. Travers Duct Connection (TDC)
3. or equal

C. Flexible Ductwork:
1. Flexmaster
2. Thermaflex
3. or equal

D. Fabric Ductwork:
1. DuctSox
2. or equal

E. Duct Sealants:
1. United McGill Corp.
2. Ductmate Proseal
3. Or Equal

F. Duct Liner:
1. Johns Manville - Linacoustic
2. Owens Corning Fiberglas Corporation – Aeroflex Plus
3. Certainteed Corporation - Toughgard

G. Duct adhesives:
1. Fosters Adhesive – 85-462
2. Swifts Adhesive – 7336
3. Or Equal

2.02 DUCT CONSTRUCTION CLASSIFICATIONS

A. General: Construct and seal ductwork in accordance with SMACNA pressure classifications and seal classes listed for ductwork systems involved.
1. Minimum duct gauge for concealed ductwork to be 26 gauge.
2. Provide 20 gauge minimum for ductwork exposed within occupied areas.

B. Rectangular Ductwork:
1. +2” W.G. Class ductwork:
a. Supply air Ductwork downstream of terminal boxes.
b. Constant volume supply air ductwork in systems without terminal boxes

2. -2” W.G. Class ductwork:
a. General exhaust ductwork.
b. Return Air Ductwork

C. Round or oval ductwork: Same as rectangular ductwork

2.03 GENERAL

A. All duct sizes listed on drawings are external sizes.

B. Galvanized Sheet Steel to be lock-forming quality, ASTM A924 and ASTM. Coating to be Designation G90. Provide mill phosphatized finish for exposed surfaces of ducts exposed to view.

1. Provide mill certification for galvanized material at request of IOR, Owner, Architect, or engineer.

C. Tapers to be as follows:

1. Limit diverging tapers to a maximum of 30 degrees.

2. Limit expanding tapers to a maximum of 20 degrees.

D. Run ductwork parallel to adjacent walls unless shown otherwise on plans.

E. Ductwork exposed to weather to be cross-broken to shed water.

1. At contractor’s option, ductwork can be manufactured with a sloped top, with a minimum angle of 5 degrees.

F. Joint Sealing:

1. Seal all concealed ductwork within the building, all ductwork within mechanical rooms, and all ductwork exposed to weather air tight. Seal all standing seams, transverse joints, manufactured joints and seams with duct sealant. Duct Sealant to be rated for indoor and outdoor use.

2. Seal punched holes, corner cracks, and all sheet metal screws.

3. After testing, reseal joints found to be leaking.

4. At ductmate joints, in addition to ductmate gaskets, seal all bolted corners to eliminate air leakage at corners.

5. Pressure sensitive tapes shall not be considered.

G. Provide sheet metal angle frame at all duct penetrations to wall, floor, roof, or ceiling.

1. Ducts to penetrate perpendicular to walls, ceilings and floors.

H. Internal Duct Liner:

1. Provide internal duct liner as follows:

a. As indicated on the drawings.

2. Internal duct liner within building installed over conditioned spaces to be as follows:

a. 1” thick, 1.5-pound density (minimum) with matt facing.

b. Thermal Performance - C Value – 0.24 BTU / (h * FT^2 * ^oF) – minimum

c. Thermal Performance - R Value – 4.2 (h * FT^2 * ^oF) / BTU – minimum

d. Minimum Acoustical Performance shall be as follows:

Absorption Coefficients @ Octave Band Frequencies (Hz)						
125	250	500	1000	2000	4000	NRC
0.10	0.32	0.66	0.84	0.91	0.91	0.70

e. Liner to be CertainTeed, ToughGard R Duct Liner, Type 150, or equal.

3. Internal duct liner exposed to weather or installed over un-conditioned space to be as follows:

a. 2” thick, 1.5-pound density (minimum) with matt facing.

b. Thermal Performance - C Value – 0.14 BTU / (h * FT^2 * ^oF) – minimum

c. Thermal Performance - R Value – 8.3 (h * FT^2 * ^oF) / BTU – minimum

d. Minimum Acoustical Performance shall be as follows:

Absorption Coefficients @ Octave Band Frequencies (Hz)						
125	250	500	1000	2000	4000	NRC
0.24	0.79	1.09	1.05	1.02	1.01	1.00

e. Liner to be CertainTeed, ToughGard R Duct Liner, Type 150, or equal.

4. Cement duct liner in place with nonflammable, non-hardening duct adhesive. Seal up all raw edges of insulation inside ductwork with adhesive.

5. Provide sheet metal weld pin fasteners and washers on all duct work on 12-inch intervals with the first row within 3 inches of the leading edge of each piece of insulation and 4 inches from corners. No substitutions on fastening method will be allowed.

6. Duct liner and adhesive shall not exceed flame-spread rating of 25 and smoke-developed rating of 50, all in conformance with NFPA 90A.

7. Provide metal nosing at all locations where liner is preceded by unlined metal.

I. Ductwork Support: Provide hot-dipped galvanized steel fasteners, anchors, rods, straps, trim, and angles for support of ductwork, unless noted otherwise.

J. Miscellaneous Ductwork Materials:

1. Duct Joints: Install duct sealers, pop rivets, or sheet metal screws at each fittings and joint. Use a minimum of #10 galvanized sheet metal screws.

2.04 2” W.G. RECTANGULAR DUCT CONSTRUCTION/FABRICATION

A. Shop fabricate ductwork of gauges and reinforcement complying with the more stringent of the following standards, except as noted herein.

B. California Mechanical Code (CMC).

C. SMACNA HVAC Duct Construction Standards, latest Edition.

D. Fabricate Ducts with minimum gauges and joint reinforcement as follows:

Duct Dimension	Minimum Gauge	Joint Reinforcement per CMC
Up through 12”	26	Not Required
13” through 18”	24	Not Required
19” through 30”	24	C/4
31” through 42”	22	E/4
43” through 54”	22	F/2
55” through 60”	20	G/4
61” through 84”	20	I/2
85” through 96”	20	J/2
Over 96”	18	K/2

E. Fabricate duct fittings to match adjoining ducts and to comply with duct requirements as applicable to fittings. Fabricate elbows with center-line radius equal to 1.5 times associated duct width. Fabricate to include single thickness turning vane in elbows where space does not permit the above radius or where square elbows are shown.

F. Fabricate round supply connections at rectangular, plenum type fittings using spin-in type fittings, complete with extractor and volume control damper.

G. Provide drive slip or equivalent flat seams for ducts exposed in the condition space or where necessary due to space limitations. On ducts with flat seams, provide standard reinforcing on inside of duct. Duct connection to outlet on exposed duct shall be full size of outer perimeter of outlet flange.

2.05 ROUND/OVAL DUCT CONSTRUCTION

A. Spiral lock seam prefabricated factory-built round and oval duct and fittings shall be used wherever possible. Shop fabricated ducts shall be used only where rectangular shaped ducts are shown on plans or where transitions and special fittings cannot be prefabricated by factory. Provide couplings to join each length of duct.

B. Fabricate duct fittings to match adjoining ducts and comply with duct requirements as applicable to fittings. Except as noted otherwise, fabricate elbows as follows:

1. Center-line radius to be equal to 1.5 times associated duct width.

2. Provide 2-piece, die stamped, 45 degree to 90 degree elbows for sizes up to 12 inches.

3. Provide 5-piece 90 degree elbows for sizes 12” and above, conical tees, and conical laterals.

4. All reducers to be located after tap. Reducers shall be long-taper style. Reducing tees shall not be allowed.

C. Round Ductwork: Construct of galvanized sheet metal complying with ANSI/ASTM A527 by the following methods and in minimum gauges listed.

Duct Diameter	Minimum Gauge	Method of Manufactured
4”Ø – 14” Ø	26	Spiral Lockseam
15”Ø - 23”Ø	24	Spiral Lockseam
24”Ø - 36”Ø	22	Spiral Lockseam
37”Ø - 50”Ø	20	Spiral Lockseam
51”Ø - 60”Ø	18	Spiral Lockseam
Over 60”Ø	14	Longitudinal Seam

D. Fittings and Couplings:

1. Construct of same minimum gauges listed for ductwork.

2. Provide continuous welds along seams.

3. At Contractors option, provide spot welded fittings sealed inside and out.

2.06 FLEXIBLE DUCTWORK

A. Flexible ducts may be used in concealed areas where detailed and as specified.

B. Flexible ducts from rigid run-outs to registers shall be Flexmaster USA, Inc., Type 1M Acoustical Insulated flex duct, or equal.

C. Flexible ducts shall be as follows:

1. Minimum Operating Pressure:
   a. Positive = 10” w.g. for all sizes
   b. Negative = 5” w.g. for sizes thru 16” and 1” w.g. for sizes 18 & 20”

2. Rated Velocity = 5,500 FPM

3. Minimum Burst Pressure = 2 1/2 times working pressure

4. Minimum R Value = 6.0 (h * FT^2 * ^oF) / BTU

5. Duct to be ETL Class 1 Air duct.

6. Flame spread to be less than 25 and smoke developed less than 50.

7. Flex duct to consist of an exterior reinforced metalized vapor barrier, fiberglass insulation, mechanical lock wire helix, and polyethylene inner film. Inner liner to be mechanically locked without adhesives.

8. Minimum Acoustical Performance shall be as follows:

a. 8”∅ Straight Duct – 3 Feet Length

Insertion Losses (DB) / Octave Band Center Frequency (Hz)					
125	250	500	1,000	2,000	4,000
2.8	5.4	5.8	6.0	5.6	4.6

b. 8”∅ Straight Duct – 6 Feet Length

Insertion Losses (DB) / Octave Band Center Frequency (Hz)					
125	250	500	1,000	2,000	4,000
5	16	17	18	16	11

c. 12”∅ Straight Duct – 3 Feet Length

Insertion Losses (DB) / Octave Band Center Frequency (Hz)					
125	250	500	1,000	2,000	4,000
3.5	5.6	5.0	5.8	5.2	4.3

d. 12”∅ Straight Duct – 6 Feet Length

Insertion Losses (DB) / Octave Band Center Frequency (Hz)					
125	250	500	1,000	2,000	4,000
8	17	14	18	14	11

9. Provide acoustical submittal data for 8”∅ and 12”∅ ducts within submittal package.

D. Minimum length of three feet and a maximum length of five feet to be installed at each air terminal. Flexible duct shall have no bends greater than 45 degrees. Specifications and any applicable drawings or details will be strictly enforced.

E. Make connections to rigid ductwork with Panduit style draw band. Provide one draw-band at inner liner and a second draw band over the outer vapor barrier material.

F. SYSTEM FABRICATION REQUIREMENTS:

1. System to be constructed in modular lengths (zippered) with proper radial securing clips (inlets, endcaps and mid-sections) and top access zippers for vertical cable safety attachment.

2. Integrated air dispersion shall be specified and approved by manufacturer.

a. Linear Vents
(1) Air dispersion accomplished by linear vent and permeable fabric. Linear vents must be sized in 1 CFM per linear foot increments (based on .5” SP), starting a 1 CFM through 90 CFM per linear foot. Linear vent is to consist of an array of open orifices rather than a mesh style vent to reduce maintenance requirements of mesh style vents. Linear vents should also be designed to minimize dusting on fabric surface.
(2) Size of vent openings and location of linear vents to be specified and approved by manufacturer.
(3) Manufacturer to provide analysis for full area coverage of MP Room.

3. Inlet connection to metal duct via fabric draw band with anchor patches as supplied by manufacturer. Anchor patches to be secured to metal duct via. zip screw fastener – supplied by contractor.

4. Inlet connection includes zipper for easy removal / maintenance.

5. Lengths to include required intermediate zippers as specified by manufacturer.

6. System to include Adjustable Flow Devices to balance turbulence, airflow and distribution as needed. Flow restriction device shall include ability to adjust the airflow resistance from 0.06 – 0.60 in w.g. static pressure.

7. End cap includes zipper for easy maintenance.

8. Each section of the duct shall include identification labels documenting order number, section diameter, section length, piece number, code certifications and other pertinent information.

PART 3 - EXECUTION

3.01 INSTALLATION OF DUCTWORK

A. Assemble and install ductwork in accordance with recognized industry practices which will achieve air tight (leakage class 12 for 2-inch pressure class and leakage class 3 for 4-inch pressure class) and noiseless (no objectionable noise) systems capable of performing each indicated service. Install each run with minimum of joints. Align ductwork accurately at connections within 1/8- inch misalignment tolerance and with internal surfaces smooth. Support ducts rigidly with suitable ties, braces, hangers, and anchors of type which will hold ducts true to shape and to prevent buckling.

B. Seal ductwork after installation to seal class required and method prescribed in SMACNA "HVAC Leakage Test Manual," latest edition.

C. Paint inside of duct visible through grille dull black.

D. Duct Supports:

1. Support ductwork in manner complying with SMACNA "HVAC Duct Construction Standards," latest edition, hangers and supports sections. Where special hanging of ductwork is detailed or shown on Drawings, Drawings shall be followed.
   a. Except where modified in individual paragraphs in this section or detailed on drawings, provide hanger support with minimum 18 gauge straps, 1 inch wide. Fold duct strap under bottom of duct.
   b. Install duct supports to rectangular ducts with sheet metal screws. Provide one screw through strap at top of duct and one screw through strap at bottom of duct.

2. Upper Connection of support to wood structure shall be with wood screws or lag screws in shear fastened in the upper one half of the wood structural member. Fasteners shall conform to the following schedule:

Duct Size	Fastener Size/Type
P/2 ≤ 30”	#10 x 1 ½”wood screw
31” ≤ P/2 ≤ 72”	1/4” x 1 ½” lag screw
P/2 > 73”	3/8” x 1 ½” lag screw

   a. Upper connection in tension shall not be used unless absolutely necessary. Where deemed necessary, the Contractor shall submit calculations to show the size fastener and penetration required to support loads in tension from wood in accordance with the following schedule:

Duct Size	Load per hanger
P/2 ≤ 30”	260 pounds per hanger
31” ≤ P/2 ≤ 72”	320 pounds per hanger
73” ≤ P/2 ≤96”	460 pounds per hanger
P/2 > 96”	Not Allowed

E. Where ducts pass through interior partitions and exterior walls, conceal space between construction opening and duct or duct-plus- insulation with sheet metal flanges of same gauge as duct. Overlap opening on four sides by at least 1-1/2 inches.

F. Where ductwork is exposed, Contractor to paint ductwork, supports, and air inlets and outlets to match adjacent architectural surfaces, or as directed by Architect.

3.02 INSTALLATION OF FLEXIBLE DUCTWORK

A. Provide flexible ducts with supports at or near mid-length with 2-inch wide, 26-gauge steel hanger collar attached to the structure with an approved duct hanger. Installation shall minimize sharp radius turns or offsets.

B. Make connections to rigid ductwork with Panduit style draw band. Provide one draw-band at inner liner and a second draw band over the outer vapor barrier material.

C. Bends in flexible ductwork shall be kept to a minimum. When required, the minimum bend radius shall be 1.5 times the duct diameter. Duct offsets to be limited to 45 degree turns.

3.03 CLEANING AND PROTECTION

A. Ductwork being stored on site to be covered and protected from elements. Internally lined ductwork to be stored on jobsite in clean / dry location. Any insulation exposed to water must be discarded immediately and removed from jobsite.

B. Clean ductwork internally, unit by unit as it is installed, of dust, dirt, and debris.

C. Clean external surfaces of dirt and foreign substances which might cause corrosive deterioration of metal or where ductwork is to be painted.

D. Strip protective paper from stainless ductwork surfaces, and repair finish wherever it has been damaged.

E. Temporary Closure: At ends of ducts which are not connected to equipment or air distribution devices at time of ductwork installation, provide temporary closure of polyethylene film or other covering which will prevent entrance of dust and debris until time connections are to be completed.

F. If HVAC System is operated prior to the completion of construction, Contractor to provide temporary filters at all return air and exhaust air grilles. Filters to be 2” thick, MERV 8 filters. Contractor to secure filters in place with tape or wiring. Filters to completely cover grille opening.

3.04 OPERATION TEST

A. Test each piece of equipment to show that it will operate in accordance with indicated requirements.

3.05 CLEANING UP

A. Upon completion of Work remove materials, equipment, apparatus, and tools, and leave premises clean, neat, and orderly.

[END OF SECTION]

SECTION 23.74.00

PACKAGED AIR CONDITIONING UNITS

PART 1 - GENERAL

1.01 SUMMARY

A. This section provides requirements for split system ducted air conditioning units.

1.02 QUALITY ASSURANCE

A. Flame-Smoke Ratings: Except as otherwise indicated, provide air conditioning unit thermal insulation with flame-spread index of 25 or less, fuel-contributed index of 50 or less, and smoke-developed index of 50 or less.

B. AMCA Standards: Comply with Air Movement and Control Association (AMCA) Standards as applicable to testing and rating fans.

C. SMACNA Compliance: Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) ductwork construction standards as applicable to air conditioning units.

D. AGA Certification: Gas fired equipment shall be AGA certified.

E. ARI Certification: Coils shall comply with ARI Standard 410.

F. UL Compliance: Provide electric components for air conditioning units which have been listed and labeled by Underwriters Laboratories or by a testing organization of equal standing.

G. Only Manufacturer’s Authorized Commercial and Industrial Equipment Suppliers shall be allowed to supply equipment for this project. Equipment suppliers who’s primary business is residential and are not a Manufacturer’s Authorized Commercial and Industrial Equipment Supplier shall not be accepted on this project due to lack of a service company capable of proper support on a commercial quality project.

1.03 SUBMITTALS

A. Submit the following information for each packaged unit:

1. Manufacturer’s product data and cut sheet for each unit.

2. Submit manufacturer's specifications for air conditioning units showing dimensions, weights, capacities, ratings, certified fan performance with operating point clearly indicated on a fan curve, motor electrical characteristics, gauges, finishes of materials, and installation instructions.

B. Maintenance Data:

1. Submit maintenance instructions, including lubrication instructions, filter replacement, motor and drive replacement, and spare parts lists.

2. Include this data in maintenance manuals only.

1.04 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Deliver air conditioning units with factory-installed shipping skids and lifting lugs; pack components in factory-fabricated protective containers.

B. Handle air conditioning units carefully to avoid damage to components, enclosures, and finish. Do not install damaged components; replace and return damaged components to air conditioning unit manufacturer.

PART 2 - PRODUCTS

2.01 GENERAL

A. Extent of air conditioning unit work is indicated by Drawings and schedules and by requirements of this section. Each unit shall include fan system, gas heat exchanger, cooling and dehumidifying coil, evaporator coil drain pan, foil-faced thermal insulation, economizer, and any other equipment specified or scheduled, all manufactured by one manufacturer.

B. The single-packaged units shall be a standard product of a firm regularly engaged in the manufacture of heating/cooling equipment.

C. The equipment shall be shipped completely factory assembled, pre-charged, piped, and wired internally ready for field connections.

D. Provide thermal overload protected motors.

E. Manufacturer shall test operate system at the factory before shipment.

F. Unit shall be U.L. listed.

G. All wiring shall be in compliance with Current NEC Codes.

H. Acceptable manufacturers:
1. Carrier
2. Trane
3. or Equal

2.02 PACKAGED AIR CONDITIONING UNITS 3 THRU 5 TONS

A. Cooling System:

1. The total certified cooling capacity shall not be less than scheduled.

2. Units to have two stage scroll compressors with crankcase heaters, and multi speed ECM condenser fan motors.

3. The compressor power input shall not exceed that of the unit specified.

4. The coils shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes.

a. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1,775 psig.

b. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

5. The compressor shall be resiliently mounted and have built- in, three-mode crankshaft lubrication; crankcase heater; discharge temperature limiter; and current- and temperature- sensing motor overloads.

6. The cooling system shall be protected by high and low pressure switches, filter dryer, oil failure switch, and a five-minute, compressor, timed off cycle controller (anti- recycle timer), and evaporator coil frostat that shall disable cooling when temperatures on the

evaporator coil reach 10 degrees or below. Mechanical cooling will start again when temperatures on the evaporator coil rise to 50 degrees or above.

B. Cabinet:
1. Galvanized steel with a baked-on outdoor enamel paint finish.
2. Cabinet panels where conditioned air is handled shall be fully insulated.
3. Lifting lugs shall be provided for rigging.
4. Unit shall have a raised 1 1/8 inch lip around the supply and return openings.

C. Single-side Service Access:
1. All components, wiring, and inspection areas shall be completely accessible via one side of the unit through hinged access panels.
2. Hinged access panels shall provide access to filter section, fan section, compressor section, heat section, and controls.
   a. No tools shall be required for the panels.

D. Supply Air Blowers:
1. Centrifugal blowers shall have belt drive motors unless noted otherwise on the Drawings.
2. The entire assembly shall be resilient rubber mounted.
3. Blower wheel assembly shall be statically and dynamically balanced.
4. Supply blower motors shall be thermally protected and meet the US EPACT 1992 Code.

E. Condenser Fans:
1. Propeller-type condenser fans shall discharge vertically.
2. Fan motor shall be totally enclosed with sleeve bearings, permanently lubricated, thermally protected and equipped with rain shield.
3. Fan shall be protected by a steel guard.

F. Condenser Coil Guard:
1. Factory installed tool-less panel guard shall be manufactured from minimum 20 gauge steel with G90-U corrosion protection.
2. The panel shall be powder coated to match the unit color.
3. Guard open area shall be between fifty percent and sixty percent.

G. Evaporator Coil Drainpan:
1. Drainpan shall be constructed of stainless steel and shall be double-sloped.
2. Unit shall allow for drain on either side and shall have reversible drainpan provided.

H. Air Filters:
1. Provide two-inch thick, pleated MERV 8, 30%, filters with cardboard holding frames.
2. Provide sufficient filters for four complete changes for each unit.
3. Air filters shall be of an approved type tested in accordance with test method SFM-31.6 as shown in Article 80, Title 19, California Code of Regulations. Pre-formed filters having combustible framing shall be tested as a complete assembly.
4. Air filters in all occupancies shall be Class 2 or better, as defined in the test method above.
5. Air filters shall be accessible for cleaning or replacement.

I. Gas Heat Exchanger:
1. Unless noted otherwise, units shall be complete with gas heating section made up of aluminized steel heat exchanger capable of mixed air temperatures as low as 40 ^{O}F.
2. Where noted on drawings, units shall be complete with gas heating section made up of 304 stainless steel heat exchanger capable of mixed air temperatures as low as 20 ^{O}F.
3. Heat shall be single-stage with intermittent spark electric ignition system and flame sensor.

J. Economizer:
1. Provide factory dry-bulb 0-100% economizer with barometric relief.
   a. Shall be listed on the CEC web site.

b. Maximum damper leakage rate to be equal to or less than 10.0 cfm/sq. ft. at 1.0 in. w.g., meeting or exceeding Title 24 2013 requirements. Economizer controller shall be Honeywell W7220 that provides:
(1) 2-line LCD interface screen for setup, configuration and troubleshooting.
(2) On-board fault detection and diagnostics
(3) Sensor failure loss of communication identification
(4) Automatic sensor detection
(5) Capabilities for use with multiple-speed indoor fan systems
(6) Utilize digital sensors: Dry bulb and Enthalpy
(7) 5 year manufacture parts warranty

K. Field installed power exhaust capable of approximately 35% of unit nominal airflow.

L. TXV: Provide factory installed thermal expansion valve (TXV) for each refrigerant circuit.

2.03 PACKAGED AIR CONDITIONING UNITS 6 THRU 25 TONS

A. Cooling System:

1. The total certified cooling capacity shall not be less than scheduled.

2. Units to have three stage cooling capacity control with staged scroll compressor design and multi speed ECM condenser fan motors.

3. The compressor power input shall not exceed that of the unit specified.

4. The coils shall be non-ferrous construction with aluminum fins mechanically bonded to durable copper tubes.

a. Evaporator coils shall be leak tested to 150 psig, pressure tested to 450 psig, and qualified to UL 1995 burst test at 1,775 psig.

b. Condenser coils shall be leak tested to 150 psig, pressure tested to 650 psig, and qualified to UL 1995 burst test at 1980 psig.

5. The compressor shall be resiliently mounted and have built- in, three-mode crankshaft lubrication; crankcase heater; discharge temperature limiter; and current- and temperature- sensing motor overloads.

6. The cooling system shall be protected by high and low pressure switches, filter dryer, oil failure switch, and a five-minute, compressor, timed off cycle controller (anti- recycle timer), and evaporator coil frostat that shall disable cooling when temperatures on the evaporator coil reach 10 degrees or below. Mechanical cooling will start again when temperatures on the evaporator coil rise to 50 degrees or above.

B. Cabinet:
1. Galvanized steel with a baked-on outdoor enamel paint finish.
2. Cabinet panels where conditioned air is handled shall be fully insulated.
3. Lifting lugs shall be provided for rigging.
4. Unit shall have a raised 1 1/8 inch lip around the supply and return openings.

C. Single-side Service Access:
1. All components, wiring, and inspection areas shall be completely accessible via one side of the unit through hinged access panels on downflow models.
2. Hinged access panels on downflow models shall provide access to filter section, fan section, compressor section, heat section, and controls.
3. Standard removable access panels shall be provided for horizontal supply/return units.

D. Supply Air Blowers:
1. Centrifugal blowers shall have belt drive motors.
2. The entire assembly shall be resilient rubber mounted.
3. Blower wheel assembly shall be statically and dynamically balanced.
4. Supply blower motors shall be thermally protected and meet the US EPACT 1992 Code.

E. Condenser Fans:
1. Propeller-type condenser fans shall discharge vertically.
2. Fan motor shall be totally enclosed with sleeve bearings, permanently lubricated, thermally protected and equipped with rain shield.
3. Fan shall be protected by a steel guard.

F. Condenser Coil Guard:
1. Factory installed tool-less panel guard shall be manufactured from minimum 18 gauge steel with G90-U corrosion protection.
2. The panel shall be powder coated to match the unit color.
3. Guard open area shall be between fifty percent and sixty percent.

G. Evaporator Coil Drainpan:
1. Drainpan shall be constructed of stainless steel and shall be double-sloped.

H. Air Filters:
1. Provide two-inch thick, pleated MERV 8, 30%, filters with cardboard holding frames.
2. Provide sufficient filters for four complete changes for each unit.
3. Air filters shall be of an approved type tested in accordance with test method SFM-31.6 as shown in Article 80, Title 19, California Code of Regulations. Pre-formed filters having combustible framing shall be tested as a complete assembly.
4. Air filters in all occupancies shall be Class 2 or better, as defined in the test method above.
5. Air filters shall be accessible for cleaning or replacement.

I. Gas Heating Section:

1. Unless noted otherwise, units shall be complete with gas heating section made up of aluminized steel heat exchanger capable of mixed air temperatures as low as 40 ^{O}F.

2. Where noted on drawings, units shall be complete with gas heating section made up of 304 stainless steel heat exchanger capable of mixed air temperatures as low as 20 ^{O}F.

3. Heat shall be single-stage with intermittent spark electric ignition system and flame sensor.

4. Heat exchanger shall have limited 10 year parts warranty.

J. Modulating Outdoor Air Control Package:

1. Provide factory dry-bulb 0-100% economizer with barometric relief.
   a. Shall be listed on the CEC web site.
   b. Maximum damper leakage rate to be equal to or less than 10.0 cfm/sq. ft. at 1.0 in. w.g., meeting or exceeding Title 24 2013 requirements. Economizer controller shall be Pelican Pearl that provides:
      (1) 2-line LCD interface screen for setup, configuration and troubleshooting.
      (2) On-board fault detection and diagnostics
      (3) Sensor failure loss of communication identification
      (4) Automatic sensor detection
      (5) Capabilities for use with multiple-speed indoor fan systems
      (6) Utilize digital sensors: Dry bulb and Enthalpy
      (7) 5 year manufacture parts warranty

K. Field installed power exhaust capable of approximately 35% of unit nominal airflow.

L. TXV: Provide factory installed thermal expansion valve (TXV) for each refrigerant circuit.

M. Phase/Voltage Monitor and Protection Device:

1. Provide unit with standard factory installed phase/voltage monitor.

2. Monitor shall have two LED indicator lights. One shall indicate a balanced, three-phase power supply circuit and the other shall indicate that unit operation has been prevented and that the power supply circuit is either not balanced, properly connected or that the line-to-line voltage is not between 180 volts and 633 volts.

3. The monitor shall protect unit from damage if any of the following occur:

a. If power is lost on one of the 3 conductors of the 3-phase power supply circuit.

b. If voltage is not sufficiently balanced between the three conductors of the three-phase power supply circuit.

c. If the 3-phase power supply circuit does not have the proper phase sequence.

N. Supply Air Smoke Detector:

1. Unit shall be provided with a supply air smoke detector mounted in supply plenum of cabinet that is powered and prewired for unit shutdown upon detection of smoke per AC unit schedule.

2. Manual reset shall be required upon detection.

3. The smoke detector shall have relays for connection to the fire/smoke system.

a. Wiring to the fire/smoke system shall be by Division 16.

2.04 EQUIPMENT MOUNTING

A. Roof-Mounting Frame:

1. Furnish and install a steel roof-mounting frame for bottom discharge and return air duct connection, where noted on Drawings. It shall mate to the bottom perimeter of the equipment. When flashed into the roof, it shall make a unit- mounting curb and provide weatherproof duct connection and entry into the conditioned area. Flashing shall be the responsibility of Roofing Contractor. Fourteen inch high frame unless noted otherwise.

2. Sloping Roof Decks: For deck slopes of one inch per foot and more, fabricate support units to form level top edge. Where slope is less than one inch per foot, provide tapered wood nailers (treated wood) at top of support units to form level top edge. Where gauge or height is not indicated, fabricated units of 14-ga. metal and height of 14 inches.

2.05 CONDENSATE DRAINS

A. Provide type-L, hard-drawn copper tubing with wrought copper solder joint fittings; no iron-to-copper connections; copper fittings with IPS outlets and threaded brass nipples at connections to equipment; di-electric couplings or unions at connections to dissimilar materials.

PART 3 - EXECUTION

3.01 GENERAL

A. Examine areas and conditions under which air conditioning units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Warranty:

1. Unit manufacturer shall provide 2 year parts and labor warranty on entire unit including any accessories provided for field installation on the unit.

2. This warranty period shall begin at upon signoff of substantial completion of the project.

3. Unit manufacturer shall provide 5 year compressor parts warranty.

C. Maintenance:

1. Equipment supplier shall perform the scheduled maintenance as detailed in the published maintenance manuals for the packaged air conditioning units for a period of 1 year upon startup of the units.

2. All Preventative maintenance procedures shall be adhered to, including required periodic inspections as prescribed in the manufacturer’s published operations and maintenance literature.

3.02 INSTALLATION OF AIR CONDITIONING UNITS

A. Install air conditioning units where indicated in accordance with equipment manufacturer's written instructions and with recognized industry practices to ensure that units comply with requirements and serve intended purposes.

3.03 TESTING AND STARTUP

A. Equipment manufacturer’s commercial and industrial local service company shall conduct check, test, and start-up of units and shall complete one startup form for each unit listing the refrigerant suction line pressure and temperature, liquid line pressure and temperature, charge in pounds of refrigerant, charge in pounds of refrigerant as required by the unit nameplate, supply blower rpm and supply blower amps drawn. Startup forms shall be submitted to the Architect and Mechanical Engineer for approval upon completion. If necessary, units shall be field charged with refrigerant for proper operation. Startup by installing contractor or others shall not be acceptable.

[END OF SECTION]

SECTION 23.81.26

DUCTED SPLIT SYSTEM AC UNITS

PART 1 - GENERAL

1.01 SUMMARY

A. This section provides requirements for packed ducted air conditioning units.

1.02 QUALITY ASSURANCE

A. Flame-Smoke Ratings: Except as otherwise indicated, provide air conditioning unit thermal insulation with flame-spread index of 25 or less, fuel-contributed index of 50 or less, and smoke-developed index of 50 or less.

B. AMCA Standards: Comply with Air Movement and Control Association (AMCA) Standards as applicable to testing and rating fans.

C. SMACNA Compliance: Comply with Sheet Metal and Air Conditioning Contractors National Association (SMACNA) ductwork construction standards as applicable to air conditioning units.

D. AGA Certification: Gas fired equipment shall be AGA certified.

E. ARI Certification: Coils shall comply with ARI Standard 410.

F. UL Compliance: Provide electric components for air conditioning units which have been listed and labeled by Underwriters Laboratories or by a testing organization of equal standing.

G. Only Manufacturer’s Authorized Commercial and Industrial Equipment Suppliers shall be allowed to supply equipment for this project. Equipment suppliers who’s primary business is residential and are not a Manufacturer’s Authorized Commercial and Industrial Equipment Supplier shall not be accepted on this project due to lack of a service company capable of proper support on a commercial quality project.

1.03 SUBMITTALS

A. Submit the following information for each packaged unit:
1. Manufacturer’s product data and cut sheet for each unit.
2. Submit manufacturer's specifications for air conditioning units showing dimensions, weights, capacities, ratings, certified fan performance with operating point clearly indicated on a fan curve, motor electrical characteristics, gauges, finishes of materials, and installation instructions.

B. Maintenance Data:
1. Submit maintenance instructions, including lubrication instructions, filter replacement, motor and drive replacement, and spare parts lists.
2. Include this data in maintenance manuals only.

PART 2 - PRODUCTS

2.01 OUTDOOR UNIT

A. General
1. The unit shall be fully charged from the factory for matched indoor section and up to 15 feet of piping. This unit must be designed to operate at outdoor ambient temperatures as high as 115°F. Cooling capacities shall be matched with a wide selection of air handlers

and furnace coils that are ARI certified. The unit shall be UL listed. Exterior must be designed for outdoor application.

B. Casing
1. Unit casing is constructed of heavy gauge, galvanized steel and painted with a weather-resistant powder paint. Corrosion and weatherproof base.

C. Refrigerant Controls:
1. Refrigeration system controls include condenser fan and compressor contactor. High and low pressure controls are inherent to the compressor. Another standard feature is the liquid line dryer.

D. Compressor
1. The compressor features internal over temperature and pressure protector, total dipped hermetic motor and thermostatically controlled sump heater. Other features include: roto lock suction and discharge refrigeration connections, centrifugal oil pump, and low vibration and noise. The compressor is standard with a 5 year limited warranty.

E. Condenser Coil
1. The coil shall be continuously wrapped, corrosion resistant all aluminum with minimum brazed joints.
2. This coil is 3/8 inch O.D. seamless aluminum glued to a continuous aluminum fin.
3. Coils are lab tested to withstand 2,000 pounds of pressure per square inch.
4. The outdoor coil provides low airflow resistance and efficient heat transfer.
5. The coil is protected on all four sides by louvered panels and has a 5 year limited warranty.

F. Low Ambient Cooling
1. Provide unit with evaporator defrost control and TXV valve to permit low ambient cooling to 30°F.

G. Thermostats — Heating/Cooling
1. Sub-base to match thermostat and locking thermostat cover.

2.02 INDOOR UNIT

A. General:
1. Blower coil units shall be completely factory assembled including coil, condensate drain pan, fan, motor, filters and controls in an insulated casing that can be applied in horizontal or vertical configuration with 4.2 “R” value insulation and additional sealing systems.
2. Units shall be UL listed.

B. Casing
1. Units shall have a rugged sheet metal and steel frame construction and shall be painted with an enamel finish.
2. Casing shall be insulated and knockouts for electrical power and control wiring.

C. Refrigerant Circuits
1. The units have a single refrigerant circuit.
2. Refrigerant circuit shall be controlled by a factory-installed non-bleed thermal expansion valve.

D. Coil
1. Aluminum fin surface shall be mechanically bonded to 3/8-inch OD copper tubing. Coils are factory pressure and leak tested.

E. Fan

1. Forward curved, dynamically balanced and statically balanced with 4-speed direct drive shall be standard, fan motor bearing shall be permanently lubricated.

F. Controls
1. Pelican thermostats shall be owner furnished, contractor installed, and integrated into existing Pelican controls system. Contractor shall update graphics to match campus standard for all new thermostats.

G. Filters:
1. Filters shall be included as standard, one-inch low velocity semi-permanent type.
2. Provide with 2 sets of spare filters.

2.03 REFRIGERATION PIPING

A. Copper Tubing: ASTM B 280, Type ACR, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

B. Copper Tubing: ASTM B 88, Type L, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing.

C. Fittings: Wrought copper, ANSI B16.24, 150 psi.

D. Joints: Use silver solder and non-corrosive flux.

E. Valves and Sight Glasses: Alco or Henry.

F. Oil Loops and Double Risers: Provide to assure successful operation.

PART 3 - EXECUTION

3.01 GENERAL

A. Examine areas and conditions under which air conditioning units are to be installed. Do not proceed with work until unsatisfactory conditions have been corrected.

B. Warranty:
1. Unit manufacturer shall provide 2 year parts and labor warranty on entire unit including any accessories provided for field installation on the unit.
2. This warranty period shall begin at upon signoff of substantial completion of the project.

3.02 INSTALLATION OF AIR CONDITIONING UNITS

A. Install air conditioning units where indicated in accordance with equipment manufacturer's written instructions and with recognized industry practices to ensure that units comply with requirements and serve intended purposes.

3.03 TEST OF PIPING

A. Test piping at completion of roughing in, in accordance with the following:
1. Pressurize with dry nitrogen to 300 psig and test all joints with an electronic detector or halide torch.
2. Release the pressure and attach a high vacuum pump. Evacuate to 4,000 microns and hold for 30 minutes.
3. Break vacuum with dry nitrogen and pressurize to 5 psig. Hold pressure in system for 10 minutes.
4. Evacuate to 2,000 microns and hold for 30 minutes.

5. Use a mercury manometer or electronic vacuum gauge to measure pressures. Do not start timing until recommended vacuum range is reached.
6. Show no loss in pressure or visible leaks after each test at the test pressures indicated. Tests to be verified by Inspector of Record.

B. Testing equipment, materials, and labor shall be furnished by this Contractor.

C. Repair piping systems sections which fail required piping test, by disassembly and reinstallation, using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

3.04 TESTING AND STARTUP

A. Equipment manufacturer's commercial and industrial local service company shall conduct check, test, and start-up of units and shall complete one startup form for each unit listing the refrigerant suction line pressure and temperature, liquid line pressure and temperature, charge in pounds of refrigerant, charge in pounds of refrigerant as required by the unit nameplate, supply blower rpm and supply blower amps drawn. Startup forms shall be submitted to the Architect and Mechanical Engineer for approval upon completion. If necessary, units shall be field charged with refrigerant for proper operation. Startup by installing contractor or others shall not be acceptable.

END OF SECTION

SECTION 23.81.28

DUCTLESS SPLIT SYSTEM AC UNITS

PART 1 - GENERAL

1.01 SUMMARY

A. This section provides requirements for single zone Ductless Split System Air Conditioning Units.

1.02 QUALITY ASSURANCE

A. The units shall be tested by a Nationally Recognized Testing Laboratory (NRTL) and shall bear the ETL label.

B. All wiring shall be in accordance with the California Electrical Code (C.E.C.).

C. The units shall be rated in accordance with Air-conditioning Refrigeration Institute's (ARI) Standard 210 and bear the ARI Certification label

D. The units shall be manufactured in a facility registered to ISO 9001 and ISO 14001, which is a set of standards applying to environmental protection set by the International Standard Organization (ISO).

E. Flame-Smoke Ratings: Except as otherwise indicated, provide thermal insulation with flame-spread index of 25 or less, fuel- contributed index of 50 or less, and smoke-developed index of 50 or less.

F. AMCA Standards: Comply with Air Movement and Control Association (AMCA) Standards as applicable to testing and rating fans.

G. SMACNA Compliance: Comply with Sheet metal and Air-Conditioning Contractors National Association (SMACNA) ductwork construction standards as applicable to split systems.

H. UL Compliance: Provide electric components for split systems which have been listed and labeled by Underwriters Laboratories or by a testing organization of equal standing.

1.03 SUBMITTALS

A. Submit the following information for each packaged unit:

1. Manufacturer's product data and cut sheet for each unit.

2. Submit manufacturer's specifications for air conditioning units showing dimensions, weights, capacities, efficiency ratings, motor electrical characteristics, gauges, finishes of materials, and installation instructions.

B. Maintenance Data:

1. Submit maintenance instructions, including lubrication instructions, filter replacement, motor and drive replacement, and spare parts lists.

2. Include this data in maintenance manuals only.

PART 2 - PRODUCTS

2.01 GENERAL

A. Acceptable manufacturers:

1. Mitsubishi Electric
2. Or Equal

B. Delivery, Storage, and Handling:

1. Unit shall be stored and handled according to the manufacturer's recommendations.

2. Wireless controllers shall be shipped inside the carton with the indoor unit and able to withstand 105°F storage temperatures and 95% relative humidity without adverse effect.

C. Warranty:

1. The units shall have a manufacturer's parts and defects warranty for a period one (1) year from date of installation. The compressor shall have a warranty of 6 years from date of installation. If, during this period, any part should fail to function properly due to defects in workmanship or material, it shall be replaced or repaired at the discretion of the manufacturer.

2.02 REFRIGERATION PIPING

A. Copper Tubing: ASTM B 280, Type ACR, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing. Tubing shall be factory cleaned, ready for installation, and have ends capped to protect cleanliness of pipe interiors prior to shipping.

B. Copper Tubing: ASTM B 88, Type L, hard-drawn straight lengths, and soft-annealed coils, seamless copper tubing.

C. Fittings: Wrought copper, ANSI B16.24, 150 psi.

D. Joints: Use silver solder and non-corrosive flux.

E. Valves and Sight Glasses: Alco or Henry.

F. Oil Loops and Double Risers: Provide to assure successful operation.

2.03 RAS SERIES DUCTLESS SPLIT SYSTEM AIR CONDITIONER

A. General:

1. The Air Conditioner system shall be a Carrier split system with Variable Speed Inverter Compressor technology. The system shall consist of a wall mounted indoor section with wired, wall mounted controller and a horizontal discharge, single phase outdoor unit.
2. Provide model and capacity to be as scheduled on drawings.

a. Cooling performance shall be based on 80°F DB, 67°F WB for the indoor unit and 95°F DB, 75°F WB for the outdoor unit

3. A dry air holding charge shall be provided in the indoor section.

4. The outdoor unit shall be pre-charged with R-410a refrigerant for 70 feet of refrigerant tubing.

a. Where required, provide charge system with extra refrigerant.

5. System efficiency shall meet or exceed scheduled SEER.

B. Indoor Unit Cabinet:

1. The indoor unit cabinet shall be wall mounted by means of a factory supplied mounting plate, the cabinet shall be formed from high strength molded plastic with front panel access for filter.

2. The indoor unit shall be factory assembled, wired and tested. Contained within the unit shall be all factory wiring and internal piping, control circuit board and fan motor.

3. The unit in conjunction with the wired, wall mounted controller shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, and a test run switch.

4. Indoor unit and refrigerant pipes shall be purged with dry nitrogen before shipment from the factory.

C. Indoor Unit Fan:

1. The evaporator fan shall be high performance, double inlet, forward curve, direct drive sirocco fan with a single motor

2. The fans shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings.

3. The indoor fan shall have fan speeds as listed on drawings.

a. Unless noted otherwise, set fan speed on low.

D. Indoor Unit Vane

1. There shall be a motorized horizontal vane to automatically direct air flow in a horizontal and downward direction for uniform air distribution. The horizontal vane shall significantly decrease downward air resistance for lower noise levels and shall close the outlet port when operation is stopped.

2. There shall also be a set of vertical vanes to provide horizontal swing airflow movement selected by remote control.

E. Indoor Unit Filter:

1. Return air shall be filtered by means of an easily removable washable filter.

F. Indoor Unit Coil:

1. The evaporator coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing. The multi-angled heat exchanger shall have a modified fin shape that reduces air resistance for a smoother, quieter airflow. All tube joints shall be brazed with PhosCopper or silver alloy. The coils shall be pressure tested at the factory. A condensate pan and drain shall be provided under the coil.

G. Indoor Unit Electrical:

1. The electrical power of the unit shall be 208 volts or 230 volts, 1 phase, 60 hertz.

a. The system shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts.

2. The power to the indoor unit shall have an option of being supplied from the outdoor unit, using Carrier control system or separate power source for indoor and outdoor units.

H. Unit Control:

1. Unit shall be connected to owner furnished, contractor installed Pelican thermostat and integrate into existing campus Pelican controls system. Contractor shall updated graphics to match campus standard for all new thermostats.

2. The control system shall consist of two (2) microprocessors, one on each indoor and outdoor unit, interconnected by a single non-polar two-wire cable.

3. Field wiring shall run directly from the indoor unit to the wall mounted controller with no splices.

    a. A three (3) conductor 14 ga. AWG wire with ground shall provide power feed and bi-directional control transmission between the outdoor and indoor units.

    b. Where separate power is supplied to the indoor and outdoor units, a two (2) 20 ga. AWG wire shall be run between the units to provide forbid-directional control communication.

4. The system shall be capable of automatic restart when power is restored after power interruption. The system shall have self-diagnostics ability, including total hours of compressor run time. Diagnostics codes for indoor and outdoor units shall be displayed on the wired controller panel.

5. The microprocessor located in the indoor unit shall have the capability of monitoring return air temperature and indoor coil temperature, receiving and processing commands from the wired controller, providing emergency operation and controlling the outdoor unit.

6. The indoor unit shall be connected to a wall mounted wired controller to perform input functions necessary to operate the system.

    a. The wired controller shall have a large multi-language DOT liquid crystal display (LCD) presenting contents in eight (8) different languages, including English, French, Chinese, German, Japanese, Spanish, Russian, and Italian.
    b. There shall be a built-in weekly timer with up to eight pattern settings per day.
    c. The controller shall consist of an On/Off button, Increase/Decrease Set Temperature buttons, a Cool/Dry/Fan mode selector, a Timer Menu button, a Timer On/Off button, Set Time buttons, a Fan Speed selector, a Vane Position selector, a Louver Swing button, a Ventilation button, a Test Run button, and a Check Mode button.
    d. The controller shall have a built-in temperature sensor. Temperature shall be displayed in either Fahrenheit (°F). Temperature changes shall be by increments of 1°F with a range of 67°F to 87°F.

7. The wired controller shall display operating conditions such as set temperature, room temperature, pipe temperatures (i.e. liquid, discharge, indoor and outdoor), compressor operating conditions (including running current, frequency, input voltage, On/Off status and operating time), LEV opening pulses, sub cooling and discharge super heat.

8. Normal operation of the wired controller shall provide individual system control in which one wired controller and one indoor unit are installed in the same room. The controller shall have the capability of controlling up to a maximum of sixteen systems at a maximum developed control cable distance of 1,500 feet (500 meters).

9. The control voltage from the wired controller to the indoor unit shall be 12 volts, DC. The control signal between the indoor and outdoor unit shall be pulse signal 24 volts DC. Up to two wired controllers shall be able to be used to control one unit.

10. Control system shall control the continued operation of the air sweep louvers, as well as provide On/Off and mode switching. The controller shall have the capability to provide sequential starting with up to fifty seconds delay.

I. Outdoor Unit:
   1. General:
      a. The outdoor unit shall be compatible with the three different types of indoor units.
      b. The connected indoor unit must be of the same capacity as the outdoor unit.
      c. The outdoor unit shall be capable of operating at 0°F ambient temperature without additional low ambient controls.
      d. The outdoor unit shall be able to operate with a maximum height difference of 100 feet indoor unit to outdoor unit.
      e. System shall have a maximum refrigerant tubing length of 100 feet for 12,000 and 18,000 units and 165 feet for the 24,000, 30,000 and 36,000 between indoor and outdoor units without the need for line size changes, traps or additional oil.
      f. Models PUY-A12NHA, PUY-A18NHA, PUY-A24NHA, PUY-A30NHA and PUY-A36NHA shall be pre-charged for a maximum of 70 feet of refrigerant tubing. The outdoor unit shall be completely factory assembled, piped, and wired. Each unit must be test run at the factory.

J. Outdoor Unit Cabinet:

   1. The casing shall be constructed from galvanized steel plate, coated with a finished with an electrostatically applied, thermally fused acrylic or polyester powder coating for corrosion protection and have a munsell 3Y 7.8/1.1 finish.

   2. The fan grille shall be of ABS plastic.

K. Outdoor Unit Fan:

   1. Unit to be furnished with an AC fan motor. The fan motor shall be of aerodynamic design for quiet operation, and the fan motor bearings shall be permanently lubricated. The outdoor unit shall have horizontal discharge airflow. The fan shall be mounted in front of the coil, pulling air across it from the rear and dispelling it through the front. The fan shall be provided with a raised guard to prevent contact with moving parts.

L. Outdoor Unit Coil:

   1. The L shaped condenser coil shall be of copper tubing with flat aluminum fins to reduce debris build up.

   2. The coil shall be protected with an integral metal guard.

   3. Refrigerant flow from the condenser shall be controlled by means of linear expansion valve (LEV) metering orifice. The LEV shall be control by a microprocessor controlled step motor.

M. Outdoor Unit Compressor:

   1. The compressor shall be a DC rotary compressor with Variable Compressor Speed Inverter Technology.

   2. The compressor shall be driven by inverter circuit to control compressor speed.

   3. The compressor speed shall dynamically vary to match the room load for significantly increasing the efficiency of the system which results in vast energy savings.

   4. To prevent liquid from accumulating in the compressor during the off cycle, a minimal amount of current shall be intermittently applied to the compressor motor to maintain enough heat.

5. The outdoor unit shall have an accumulator and high pressure safety switch.

6. The compressor shall be mounted to avoid the transmission of vibration.

N. Outdoor Unit Electrical:

1. The electrical power of the unit shall be 208volts or 230 volts, 1 phase, 60 hertz.

   a. The unit shall be capable of satisfactory operation within voltage limits of 198 volts to 253 volts.

2. The outdoor unit shall be controlled by the microprocessor located in the indoor unit.

3. The control signal between the indoor unit and the outdoor unit shall be pulse signal 24 volts DC. The unit shall have Pulse Amplitude Modulation circuit to utilize 98% of input power supply.

2.04 MS SERIES DUCTLESS SPLIT SYSTEM AIR CONDITIONER

A. General:

1. The system shall consist of a slim silhouette, compact, wall mounted indoor fan coil section with wireless remote controller and a slim silhouette horizontal discharge outdoor unit with constant speed compressor, charged with R410A refrigerant.

2. Provide model and capacity to be as scheduled on drawings.

   a. Cooling performance shall be based on 80°F DB, 67°F WB for the indoor unit and 95°F DB, 75°F WB for the outdoor unit.

3. A dry air holding charge shall be provided in the indoor section.

4. The outdoor unit shall have an accumulator.

5. The outdoor unit must have the ability to operate with a maximum height difference of 35 feet between indoor and outdoor units.

6. The unit shall have a maximum refrigerant tubing length of 65 feet between indoor and outdoor units without the need for line size changes, traps or additional oil.

7. The unit shall be pre-charged with R-410a for a maximum of 25 feet of refrigerant tubing.

   a. Where required, provide charge system with extra refrigerant.

8. System efficiency shall meet or exceed scheduled SEER.

B. Indoor Unit Cabinet:

1. The indoor unit shall be factory assembled, wired and run tested. Contained within the unit shall be all factory wiring, internal piping, control circuit board and fan motor.

2. The unit shall have a self-diagnostic function, 3-minute time delay mechanism, an auto restart function, an emergency operation function and a test run switch.

3. Indoor unit and refrigerant pipes shall be charged with dry air before shipment from the factory.

4. Multi directional drain and refrigerant piping offering four (4) directions for refrigerant piping and two (2) directions for draining shall be standard.

5. Unit to come with installation mounting plate which secures the unit firmly to the wall.

C. Indoor Unit Fan:

1. The indoor unit fan shall be an assembly with a line-flow fan direct driven by a single motor.

2. The fan shall be statically and dynamically balanced and run on a motor with permanently lubricated bearings.

3. A manual adjustable vertical guide vane shall be provided with the ability to change the airflow from side to side (left to right).

4. An integral, motorized air sweep flow louver shall provide an automatic change in airflow by directing the air up and down to provide for uniform air distribution.

5. The indoor unit fan motor shall operate in three (3) selectable speeds, High, Medium and Low.

a. Unless noted otherwise, set fan speed on low.

D. Indoor Unit Filter:

1. Return air shall be filtered by means of easily removed Catechin air filter and an anti-allergy enzyme filter – blue bellows type.

E. Indoor Unit Coil:

1. The indoor unit (evaporator) coil shall be of nonferrous construction with smooth, pre-coated aluminum fins on copper tubing

2. Tubing shall have inner groves for high efficiency heat exchange

3. All tube joints shall be brazed with PhosCopper or silver alloy.

4. The coil shall be pressure tested at the factory.

5. A sloped condensate pan and drain with extension hose shall be provided under the coil.

F. Indoor Unit Electrical:

1. The electrical power of the unit, supplied from the outdoor unit shall be 115 volts, 1 phase, 60 hertz.

a. The system shall be capable of satisfactory operation within voltage limits of 103 volts to 127 volts.

2. The unit shall be equipped with Mitsubishi Electric's micro-processor control system directing indoor and outdoor unit coordinated operation by two polarity sensitive control wires.

3. The indoor unit shall not have any supplemental electrical heat elements.

G. Unit Control:

1. System shall have a wireless remote controller to perform input functions necessary to operate the system. The controller shall consist of a Power On/Off switch, Mode Selector, Temperature Setting, Timer Control, Fan Speed Select and Auto Vane Selector.

2. Temperature changes shall be by 1°F increments with a range of 65°F to 87°F.

3. There shall be a 24 hour On/Off timer.

4. The unit shall have an emergency operation mode to allow operation without the remote controller.

5. The microprocessor located in the indoor unit shall have the capability of sensing return air temperature and indoor coil temperature, receiving and processing commands from the wireless remote controller, providing emergency operation and controlling the outdoor unit.

6. The control voltage between the indoor unit and the outdoor unit shall be115 volts, AC.

7. The system shall be capable of automatic restart when power is restored after power interruption.

8. The control system shall control the operation of the air sweep louvers, as well as provide on/off and system/mode function switching.

H. Outdoor Unit General:

1. The outdoor unit is designed specifically for use with indoor units. Units to be equipped with a circuit board that interfaces to the indoor unit circuit board. The outdoor unit shall be completely factory assembled, internally piped and wired. Each unit shall be run tested at the factory.

I. Outdoor Unit Cabinet:

1. The casing shall be fabricated from zinc coated steel, bonderized with an electrostatically applied, thermally bonded, acrylic or polyester powder coating for corrosion protection.

2. Case and mounting feet shall be as follows:

a. The MS-A09WA base shall be of Aluminum-Zinc-Magnesium alloy coated steel, with welded mounting feet.

b. The base for the MS-A12WA shall have a galvanized steel base with welded mounting feet.

J. Outdoor Unit Fan:

1. The unit shall be furnished with a direct drive propeller type fan, statically and dynamically balanced for smooth and quiet operation.

2. The fan motor shall have inherent protection, be equipped with permanently lubricated bearings. The fan motor shall be mounted and isolated for quiet operation.

3. The fan shall be provided with a raised guard to prevent contact with moving parts.

4. The outdoor unit shall have horizontal discharge airflow.

K. Outdoor Unit Coil:

1. The condenser coil shall be of nonferrous construction with pre-coated aluminum strake fins on copper tubing.

2. The coil shall be protected with an integral metal guard.

3. Refrigerant flow from the condenser shall be controlled by means of a metering orifice.

L. Outdoor Unit Compressor:

1. The compressor shall be a high performance, hermetic, rolling piston, rotary type.

2. Compressor shall be mounted using rubber isolating bushings to avoid the transmission of vibration.

3. Compressor shall be protected by an automatic over current relay and a thermal overload switch.

M. Outdoor Unit Electrical:

1. The electrical power of the system shall be 115 volts, 1 phase, 60 hertz.

a. The unit shall be capable of satisfactory operation within voltage limits of 103 volts to 127 volts.

2. The outdoor unit shall be controlled by the microprocessor located in the indoor unit. The control voltage between the indoor unit and the outdoor unit shall be 115 volts, AC.

2.05 CONDENSATE DRAIN

A. Provide type L hard drawn copper tubing with wrought copper solder joint fittings; no iron to copper connections; copper fittings with IPS outlets and threaded brass nipples at connections to fixtures and equipment; di-electric couplings or unions at connections to dissimilar materials. Supply piping with temporary caps on all piping.

PART 3 - EXECUTION

3.01 TEST OF PIPING

A. Test piping at completion of roughing in, in accordance with the following:

1. Pressurize with dry nitrogen to 300 psig and test all joints with an electronic detector or halide torch.

2. Release the pressure and attach a high vacuum pump. Evacuate to 4,000 microns and hold for 30 minutes.

3. Break vacuum with dry nitrogen and pressurize to 5 psig. Hold pressure in system for 10 minutes.

4. Evacuate to 2,000 microns and hold for 30 minutes.

5. Use a mercury manometer or electronic vacuum gauge to measure pressures. Do not start timing until recommended vacuum range is reached.

6. Show no loss in pressure or visible leaks after each test at the test pressures indicated. Tests to be verified by Inspector of Record.

B. Testing equipment, materials, and labor shall be furnished by this Contractor.

C. Repair piping systems sections which fail required piping test, by disassembly and reinstallation, using new materials to extent required to overcome leakage. Do not use chemicals, stop-leak compounds, mastics, or other temporary repair methods.

3.02 INSTALLATION OF UNITS

A. Install ductless split system air conditioners where indicated on drawings.

B. Install in accordance with equipment manufacturer's written instructions and with recognized industry practices, to ensure that units comply with requirements and serve intended purposes.

C. At the end of the piping pressure tests, if the system has been proved leak-free, charge with refrigerant and fill the crankcase to the oil level specified by the manufacturer. All refrigerant oil shall be delivered to the location in sealed containers.

D. Program unit thermostats as required by owner.

3.03 UNIT OPERATION TEST

A. Upon completion of installation of AC / units, start up and operate equipment to demonstrate capability and compliance with requirements. Field correct malfunctioning units, then retest to demonstrate compliance.

B. Install units where indicated, in accordance with equipment manufacturer's written instructions and with recognized industry practices, to ensure that units comply with requirements and serve intended purposes.

END OF SECTION

SECTION 26 00 10

BASIC ELECTRICAL REQUIREMENTS

PART 1 - GENERAL

1.01 SUMMARY

A. Table of Contents, Division 26 - Electrical:

SECTION NO.	SECTION TITLE
260010	BASIC ELECTRICAL REQUIREMENTS
260090	DEMOLITION
260529	ELECTRICAL HANGERS AND SUPPORTS
260531	CONDUIT
260553	ELECTRICAL IDENTIFICATION
262213	DRY TYPE TRANSFORMERS
286100	FIRE ALARM
286516	SECURITY ALARM AND CCTV MONITORING SYSTEM

B. Work included: This Section includes general administrative and procedural requirements for Division 26. The following administrative and procedural requirements are included in this Section to supplement the requirements specified in Division 01.

1. Quality assurance.
2. Definition of terms.
3. Submittals.
4. Coordination.
5. Record documents.
6. Operation and maintenance manuals.
7. Rough-in.
8. Electrical installation.
9. Cutting, patching, painting and sealing.
10. Field quality control.
11. Cleaning.
12. Project closeout.

C. Related Work: Consult all other Sections, determine the extent and character of related Work and properly coordinate Work specified herein with that specified elsewhere to produce a complete and operable installation.

1. General and supplementary conditions: Drawings and general provisions of Contract and Division 01 of the Specifications, apply to all Division 26 Sections.
2. Earthwork: Include trenching, backfilling, boring and soil compaction as required for the installation of underground conduit, in-grade pull boxes, vaults, lighting pole foundations, etc. Refer to Division 31, Earthwork.
3. Miscellaneous metal Work: Include fittings, brackets, backing, supports, rods, welding and pipe as required for support and bracing of raceways, lighting fixtures, panelboards, distribution boards, switchboards, motor control centers, etc. Refer to Division 05, Miscellaneous Metals.
4. Miscellaneous lumber and framing Work: Include wood grounds, nailers, blocking, fasteners and anchorage for support of electrical materials and equipment. Refer to Division 06, Rough Carpentry.
5. Moisture protection and smoke barrier penetrations: Include membrane clamps, sheet metal flashing, counter flashing, caulking and sealant as required for waterproofing of conduit

penetrations and sealing penetrations in or through fire walls, floors, ceiling slabs and foundation walls. All penetrations through vapor barriers at slabs on grade shall be taped and made vaportight. Refer to Division 07, Thermal and Moisture Protection.

6. Access panels and doors: Required in walls, ceilings and floors to provide access to electrical devices and equipment. Refer to Division 08, Access Doors also, Division 05, Metals.

7. Painting: Include surface preparation, priming and finish coating as required for electrical cabinets, exposed conduit, pull and junction boxes, etc. where indicated as field painted in this Division.

8. Lighting fixture supports: Provide slack fixture support wire for lighting fixtures installed in acoustical tile or lay-in suspended ceilings.

1.02 QUALITY ASSURANCE

A. Reference to Codes, Standards, Specifications and recommendations of technical societies, trade organizations and governmental agencies shall mean that latest edition of such publications adopted and published prior to submittal of the bid. Such codes or standards shall be considered a part of this Specification as though fully repeated herein.

B. When codes, standards, regulations, etc. allow Work of lesser quality or extent than is specified under this Division, nothing in said codes shall be construed or inferred authority for reducing the quality, requirements or extent of the Contract Documents. The Contract Documents address the minimum requirements for construction.

C. Work shall be performed in accordance with all applicable requirements of the latest edition of all governing codes, rules and regulations including but not limited to the following minimum standards, whether statutory or not:

1. 2016 Edition California Electric Code (CEC).

2. 2016 Edition California Building Code (CBC).

3. 2016 Edition California Fire Code (CFC).

4. 2016 Edition California Mechanical Code (CMC).

D. Standards: Equipment and materials specified under this Division shall conform to the following standards where applicable:

ACI	American Concrete Institute
ANSI	American National Standards Institute
ASTM	American Society for Testing Materials
CBM	Certified Ballast Manufacturers
ETL	Electrical Testing Laboratories
FS	Federal Specification
IEEE	Institute of Electrical and Electronics Engineers, Inc.
IPCEA	Insulated Power Cable Engineer Association
NEMA	National Electrical Manufacturer's Association
UL	Underwriters' Laboratories

E. Independent Testing Agency qualifications:

1. Testing Agency shall be an independent testing organization that will function as an unbiased authority, professionally independent of Manufacturer, Supplier and Contractor, furnishing and installing equipment or system evaluated by Testing Agency.

2. Testing Agency shall be regularly engaged in the testing of electrical equipment, devices, installations and systems.

3. Testing Agency shall meet Federal Occupational Safety and Health Administration (OSHA) requirements for accreditation of independent testing laboratories, Title 9, Part 1907.

4. On-site technical personnel shall be currently certified by the International Electrical Testing Association in electrical power distribution system testing.

5. Testing Agency shall use technicians who are regularly employed by the firm for testing services.

6. Contractor shall submit proof of above Testing Agency qualifications with bid documentation upon request.

F. All base material shall be ASTM and/or ANSI standards.

G. All electrical apparatus furnished under this Section shall conform to NEMA standards and the NEC and bear the UL label where such label is applicable.

H. Certify that each welder performing Work has satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, has undergone re-certification.

1.03 DEFINITION OF TERMS

A. The following list of terms as used in the Division 26 documents shall be defined as follows:

1. "Provide": Shall mean furnish, install and connect unless otherwise indicated.
2. "Furnish": Shall mean purchase and deliver to Project site.
3. "Install": Shall mean to physically install the items in-place.
4. "Connect": Shall mean make final electrical connections for a complete operating piece of equipment.
5. "As directed": Shall be as directed by the Owner or their authorized Representative.
6. "Utility Companies": Shall mean the company providing electrical, telephone or cable television services to the Project.

1.04 SUBMITTALS

A. Format: Furnish submittal data neatly bound in an 8-1/2" x 11" folder or binder for each Specification Section with a table of contents listing materials by Section and paragraph number.

B. Submittals shall consist of detailed Shop Drawings, Specifications, block wiring diagrams, "catalog cuts" and data sheets containing physical and dimensional information, performance data, electrical characteristics, materials used in fabrication and material finish. Clearly indicate by arrows or brackets precisely what is being submitted on and those optional accessories which are included and those which are excluded. Furnish quantities of each submittal as noted in Division 01.

C. Each submittal shall be labeled with the Specification Section Number and shall be accompanied by a cover letter or shall bear a stamp stating that the submittal has been thoroughly reviewed by the Contractor and is in full compliance with the requirements of the Contract Documents. Cover letters shall list in full the items and data submitted. Failure to comply with this requirement shall constitute grounds for rejection of data.

D. The Contractor shall submit detailed Drawings of all electrical equipment rooms and closets if the proposed installation layout differs from the construction documents. Physical size of electrical equipment indicated on the Drawings shall match those of the electrical equipment that is being submitted for review, i.e.: switchboards, panelboards, transformers, control panels, etc. Minimum scale: 1/4" = 1'- 0". Revised electrical equipment layouts must be approved prior to release of order for equipment and prior to installation.

E. As part of the equipment submittals, the Manufacturer shall provide anchorage calculations for floor and wall mounted electrical equipment so that it shall remain attached to the mounting surface after experiencing forces in conformance with CCR, Title 24, Table 23P, Part II and with Section 2312 "Earthquake Regulations" of the "Uniform Building Code" for Seismic Zone 4 Area, Importance Factor of 1.251.5. Structural Calculations shall be prepared and signed by a California Registered Structural Engineer. Specify proof loads for drilled-in anchors, if used.

F. The Manufacturer shall recommend the method of anchoring the equipment to the mounting surface and shall provide the Contractor with the assembly dimensions, weights and approximate centers of gravity.

G. All resubmittals shall include a cover letter that lists the action taken and revisions made to each Drawing and equipment data sheet in response to Submittal Review Comments. Resubmittal packages will not be reviewed unless accompanied by this cover letter. Failure to include this cover letter will constitute rejection of the resubmittal package.

H. Shop Drawings for the following systems must be prepared via a computer aided drafting (CAD or Revit) system for submission by the Contractor. The versions shall be Autocad 2018 file format or Revit 2018can provide files of the electrical Contract Documents to the Contractor.

1. Fire Alarm
2. Power
3. Security

I. Testing report:

1. Testing contractor shall provide 3 copies of the complete testing report.
2. Test report shall include the following:
   a. Summary of Project.
   b. Description of equipment.
   c. Equipment used to conduct the test.
      1) Type.
      2) Manufacturer.
      3) Model number.
      4) Serial number.
      5) Date of last calibration.
      6) Documentation of calibration leading to NIST standards.
   d. Description of test.
   e. Test results, as compared to Manufacturers or industry accepted standards and tolerances.
   f. Conclusion and recommendation.
   g. Signature of responsible test organization authority.
3. Furnish completed test report to Engineer no later than 30 days after completion of testing, unless otherwise directed.

J. Substitutions:

1. All requests for substitutions shall conform to the general requirements and procedure outlined in Division 01.
2. Where items are noted as "or equal," a product of equal design, construction and performance will be considered. Contractor must submit to the Engineer all pertinent test data, catalog cuts and product information required substantiating that the product is in fact equal to that specified. Only one substitution will be considered for each product specified.
3. Manufacturers' names and model numbers used in conjunction with materials, processes or equipment included in the Contract Documents are used to establish standards of quality, utility and appearance. Materials, processes or equipment, which in the opinion of the Engineer is equal in quality, utility and appearance, will be approved as substitutions to that specified.
4. Whenever any material, process or equipment is specified in accordance with a Federal specification, an ASTM standard, an ANSI specification, UL rating or other association standard, the Contractor shall present an affidavit from the Manufacturer certifying that the product complies with the particular standard specification. When requested by the Engineer, support test data to substantiate compliance shall be submitted by the Contractor at no additional cost.
5. Substitutions shall be equal, in the opinion of the Architect/Engineer, to the specified product. The burden of proof of such shall rest with the Contractor. When the Architect/Engineer in writing accepts a substitution, it is with the understanding that the Contractor guaranteed the substituted article or material to be equal to the one specified and dimensioned to fit within the construction.

Approved substitutions shall not relieve the Contractor of responsibilities for the proper execution of the Work or from any provisions of the Specifications.

6. The Contractor shall be responsible for all expenses in connection with the substitution materials, processes and equipment, including the effect of the substitution on the Contractor, Subcontractor's or other Contractor's Work. No substitution of material, processes or equipment shall be permitted without written authorization of the Architect/Engineer. Any assumptions on the acceptability of a proposed substitution prior to acceptance by the Engineer are at the sole risk of the Contractor.

1.05 COORDINATION

A. Discrepancies:

1. In the event of discrepancies within the Contract Documents, the Engineer shall be so notified, within sufficient time, as delineated in Division 01, prior to the Bid Opening to allow the issuance of an Addendum.

2. If, in the event that time does not permit notification or clarification of discrepancies prior to the Bid Opening, the following shall apply: The Drawings govern in matters of quantity and the Specifications govern in matters of quality. In the event of conflict within the Drawings involving quantities or within the Specifications involving quantities or within the Specifications involving quality, the greater quantity and higher quality shall apply. Such discrepancies shall be noted and clarified in the Contractor's Bid. No additional allowances will be made because of errors, ambiguities or omissions that reasonably should have been discovered during the preparation of the Bid.

B. Project conditions:

1. Examination of Project site: The Contractor shall visit the Project site and thoroughly review the locale, working conditions, conflicting utilities and the conditions in which the Electrical Work will take place. Verify all existing conditions in the field. No allowances will be made subsequently for any costs that may be incurred because of any error or omission due to failure to examine the Project site and to notify the Engineer of any discrepancies between Contract Documents and actual Project site conditions.

2. Protection: Keep conduits, junction boxes, outlet boxes and other openings closed to prevent entry of foreign matter. Cover fixtures, equipment, devices and apparatus and protect them against dirt, paint, water, chemical or mechanical damage, before and during construction period. Prior to final acceptance, restore to original condition any fixture, apparatus or equipment damaged including restoration of damaged factory applied painted finishes. Protect bright finished surfaces and similar items until in service. No rust or damage will be permitted.

3. Supervision: Contractor shall personally or through an authorized and competent representative constantly supervise the Work from beginning to completion and, within reason, keep the same foreman and workmen on the Project throughout the Project duration.

C. Preparation:

1. Drawings:

a. Layout: General layout indicated on the Drawings shall be followed except where other Work may conflict with the Drawings.

b. Accuracy: Drawings for the Work under this Section are essentially diagrammatic within the constraints of the symbology applied.

1.06 RECORD DOCUMENTS

A. Provide Project Record Drawings as described herein:

1. Drawings shall fully represent installed conditions including actual locations of outlets, true panelboard connections following phase balancing routines, correct conduit and wire sizing as well as routing, revised fixture schedule listing Manufacturers and products actually installed and revised panel schedules. Contractor shall record all changes in the Work during the course of construction on blue or black line prints. These prints shall be made subject of monthly review by

the Owner's Representative to ascertain that they are current. If not current monthly payments may be withheld.

2. Record Drawings shall be the transfer of information into electronic format of the original Drawings by a professional drafts person. The construction documents will be provided for the Contractor's use in reproducing at their cost. the construction documents via computer aided drafting (CAD) or Revit. A set of Revit files of the electrical documents will be provided to the Contractor in Revit 2018.
3. Record drawing submissions shall be provided to the Engineer to review upon the completion of the following phases of Work:
   a. All underground installation.
   b. Building rough-in.
   c. Final systems installation.
4. Include in the record drawing submission the following shop drawing submission with all updated installation information:
   a. Fire alarm system.
   b. Security alarm system.
5. A single set of half size prints of the Record Drawings shall be submitted for review. Upon receipt of the Engineer's review comments, corrections shall be made and the Contractor shall provide the following:
   a. Two sets of full size prints.
   b. Four sets of half size prints.
   c. PDF files of Drawings.
   d. DXF or Revit files of Drawings.
6. A single set of full size fire alarm as-built drawings laminated in a storage tube to be located at the FACP.
7. A single set of full size security as-built drawings laminated in a storage tube to be located at the security panel.

1.07 OPERATION AND MAINTENANCE MANUALS

A. Prior to Project closeout furnish to the Owner, six (6) hard back 3-ring binders containing all bulletins, operation and maintenance instructions, part lists, service telephone numbers and other pertinent information as noted in each Section all equipment furnished under Division 26. Binders shall be indexed into Division Sections and labeled for easy reference. Bulletins containing more information than the equipment concerned shall be properly stripped and assembled.

1.08 SYSTEM SOFTWARE

A. At project closeout provide all programmers software and dongles to the owner for the fire alarm and security systems.

PART 2 - PRODUCTS (NOT APPLICABLE)

PART 3 - EXECUTION

3.01 ROUGH-IN

A. Contractor shall verify lines, levels and dimensions indicated on the Drawings and shall be responsible for the accuracy of the setting out of Work and for its strict conformance with existing conditions at the Project site.

B. Verify final locations for rough-ins with field measurements and with the requirements for the actual equipment to be connected.

C. Refer to equipment specification in Divisions 22 through 33 for rough-in requirements.

3.02 ELECTRICAL INSTALLATION

A. Preparation, sequencing, handling and installation shall be in accordance with Manufacturer's written instructions and technical data particular to the product specified and/or accepted equal except as otherwise specified. Comply with the following requirements:

1. Shop Drawings prepared by Manufacturer.
2. Verify all dimensions by field measurements.
3. Arrange for chases, slots and openings in other building components during progress of construction, to allow for electrical installations.
4. Coordinate the installation of required supporting devices and sleeves to be set in poured-in-place concrete and other structural components, as they are constructed.
5. Sequence, coordinate and integrate installations of electrical materials and equipment for efficient flow of the Work. Give particular attention to large equipment requiring positioning prior to closing in the building.
6. Where mounting height is not detailed or dimensioned, contact the Architect for direction prior to proceeding with rough-in.
7. Install systems, materials and equipment to conform with approved submittal data, including coordination Drawings, to greatest extent possible. Conform to arrangements indicated by the Contract Documents, recognizing that portions of the Work are indicated only in diagrammatic form. Where coordination requirements conflict with individual system requirements, refer conflict to the Architect.
8. Install systems, materials and equipment level and plumb, parallel and perpendicular to other building systems and components, where installed exposed in finished spaces.
9. Install electrical equipment to facilitate servicing, maintenance and repair or replacement of equipment components. As much as practical, connect equipment for ease of disconnecting, with minimum of interference with other installations.
10. Coordinate electrical systems, equipment and materials installations with other building components.
11. Provide access panel or doors where devices or equipment are concealed behind finished surfaces. Furnish and install access doors per the requirements of Division 08.
12. Install systems, materials and equipment giving right-of-way priority to other systems that are required to maintain a specified slope.
13. Conform to the National Electrical Contractor's Association "Standard of Installation" for general installation practice.

3.03 CUTTING, PATCHING, PAINTING AND SEALING

A. Structural members shall in no case be drilled, bored or notched in such a manner that will impair their structural value. Cutting of holes, if required, shall be done with core drill and only with the approval of the Architect and Structural Engineer.

B. Protection of Installed Work: During cutting and patching operations, protect adjacent installations.

C. Cut, remove and legally dispose of selected electrical equipment, components and materials as indicated, including but not limited to removal of electrical items indicated to be removed and items made obsolete by the new Work.

D. Protect the structure, furnishings, finishes and adjacent materials not indicated or scheduled to be removed.

E. Provide and maintain temporary partitions or dust barriers adequate to prevent the spread of dust and dirt to adjacent areas.

F. Patch existing surfaces and building components using experienced installers and new materials matching existing materials and the original installation. For installers' qualifications refer to the materials and methods required for the surface and building components being patched.

G. Application of joint sealers:

1. General: Comply with joint sealer Manufacturers' printed application instructions applicable to products and applications indicated, except where more stringent requirements apply.

2. Installation of fire-stopping sealant: Install sealant, including forming, packing and other accessory materials, to fill openings around electrical services penetrating floors and walls, to provide fire-stops and fire-resistance ratings indicated for floor or wall assembly in which penetration occurs. Comply with installation requirements established by testing and inspecting agency.

3.04 FIELD QUALITY CONTROL

A. General testing requirements:

1. The purpose of testing is to ensure that all tested electrical equipment, both Contractor and Owner supplied, is operational and within industry and Manufacturer’s tolerances and is installed in accordance with design Specifications.

2. Tests and inspections shall determine suitability for energization.

3. Perform tests in presence of the Owner's Representative and furnish test equipment, facilities and technical personnel required to perform tests.

4. Tests shall be conducted during the construction period and at completion to determine conformity with applicable codes and with these Specifications.

B. Tests: In addition to specific system test described elsewhere, tests shall include:

1. Equipment operations: Test motors for correct operation and rotation.

2. Lighting control circuits: Test lighting circuits for correct operation through their control devices.

3. Alarm and interlock systems: Produce malfunction symptoms in operating systems to test alarm and interlock systems. In addition, all specific tests described in the fire alarm system shall be performed.

4. Circuit numbering verification: Select on a random basis various circuit breakers in the panelboards and cycle them on and off to verify compliance of the typed panel directories with actual field wiring.

C. Contractor shall provide test power required when testing equipment before service energization and coordinate availability of test power with General Contractor after service energization. The Contractor shall provide any specialized test power as needed or specified herein.

D. Testing safety and precautions:

1. Safety practices shall include the following requirements:

a. Applicable State and Local safety operating procedures.

b. OSHA.

c. NSC.

d. NFPA 70E.

2. All tests shall be performed with apparatus de-energized and grounded except where otherwise specifically required ungrounded by test procedure.

E. Calibration of test equipment:

1. Testing Agency shall have calibration program that assures test instruments are maintained within rated accuracy.

2. Instruments shall be calibrated in accordance with the following frequency schedule:

a. Field instruments: Analog, 6 month maximum; Digital, 12 months maximum.

b. Laboratory instruments: 12 months.

c. Leased specialty equipment: 12 months where accuracy is guaranteed by lessor.

3. Dated calibration labels shall be visible on test equipment.
4. Records, which show date and results of instruments calibrated or tested, must be kept up-to-date.
5. Up-to-date instrument calibration instructions and procedures shall be maintained for test instrument.
6. Calibration standards shall be of higher accuracy than instrument tested.
7. Equipment used for field testing shall be more accurate than instrument being tested.

F. Coordinate with General Contractor regarding testing schedule and availability of equipment ready for testing.

G. Notify Owner and Engineer one week in advance of any testing.

H. Any products which fail during the tests or are ruled unsatisfactory by the Owner's Representative shall be replaced, repaired or corrected as prescribed by the Owner's Representative at the expense of the Contractor. Tests shall be performed after repairs, replacements or corrections until satisfactory performance is demonstrated.

I. Testing Agency shall maintain written record of tests and shall assemble and certify final test report.

J. Include all test results in the maintenance manuals.

3.05 CLEANING

A. Prior to energizing of electrical equipment, the Contractor shall thoroughly clean the interior of enclosures from construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.

B. Upon completion of Project, prior to final acceptance, the Contractor shall thoroughly clean both the interior and exterior of all electrical equipment per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt and debris.

C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

3.06 PROJECT CLOSEOUT

A. Training: At the time of completion, a period of not less than 4 hours shall be allotted by the Contractor for instruction of building operating and maintenance personnel in the use of all systems. This 4 hours training is in addition to any instruction time called out in the Specifications for specific systems, i.e., Fire Alarm, etc. All personnel shall be instructed at one time, the Contractor making all necessary arrangements with Manufacturer’s Representative. The equipment Manufacturer shall be requested to provide product literature and application guides for the users' reference. Costs, if any, for the above services shall be paid by the Contractor.

B. Special tools: Provide one of each tool required for proper operation and maintenance of the equipment provided under this Section. All tools shall be delivered to the Owner at the Project completion.

C. Keying: Provide two keys for each lock furnished under this Section and turn over to Owner.

D. Provide all programming software and dongles for owners use.

END OF SECTION

SECTION 26 00 90

DEMOLITION

PART 1 - GENERAL

1.01 SUMMARY

A. Work included: Labor and equipment necessary to complete the demolition required for the item specified under this Division, including but not limited to:

1. Selective Electrical demolition

1.02 SYSTEM DESCRIPTION

A. Disconnection, removal and relocation of all Fire Alarm, and Security Alarm wiring, outlets, surface raceway, panels and all other types of Fire Alarm and Security equipment as described on Drawings.

B. Purpose is to remove, relocate and extend existing installations to accommodate new construction.

PART 2 - PRODUCTS

2.01 MATERIALS AND EQUIPMENT

A. Materials and equipment necessary for patching and extending Work, as specified in other Sections.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Contractor shall thoroughly review conditions in the area of demolition prior to commencing Work to ensure complete understanding of existing installation in relationship to demolition Work.

3.02 GENERAL REQUIREMENTS

A. Remove all wiring, devices, panels, surface raceway and all other types of alarm equipment indicated to be removed. Devices that are to be removed may require reworking conduit and wiring in order to maintain service to other devices. If removed devices are on walls or ceilings that are to remain, blank cover plates are to be installed on outlet boxes.

B. Where remodeling interferes with circuits in areas that are otherwise undisturbed, circuits shall be reworked as required.

C. Existing devices and circuiting that are indicated are indicated only for informational purposes. Contractor shall visit the Project site and shall verify conditions as they exist and shall remove, relocate and/or rework any electrical equipment or circuits affected (whether indicated or not) due to removal of existing walls, ceilings, etc. Coordinate all Work with that of other trades.

D. All equipment, fixtures, devices, etc., which are removed shall be delivered to the Owner for disposition. All items which are removed and not wanted by the Owner and which are not reused shall become the property of the Contractor and shall be legally removed from the Project site.

E. Cutting and patching necessary for the removal of Fire Alarm and Security Alarm Work shall be included.

F. Remove and replace, rework, relocate or replace conduit and wiring required by the installation of new piping, etc., above the ceiling.

3.03 LIGHT FIXTURES

A. Disconnect and remove abandoned light fixtures. Remove conduits, wiring, boxes, brackets, stems, hangers and other accessories.

3.04 OUTLETS

A. Disconnect abandoned outlets and remove devices. Remove abandoned outlets if conduit servicing them is abandoned and removed. Provide blank cover for abandoned outlets that are not removed.

3.05 CONDUIT

A. Remove abandoned conduit, including abandoned conduit above accessible ceiling finishes. Cut conduit flush with walls and floors and patch surfaces.

3.06 WIRING

A. Removed abandoned wiring to source of supply.

3.07 EXISTING SYSTEMS

A. Fire alarm system: Maintain the existing system in service. Disable system only to make temporary connections to maintain service in areas adjacent to Work area(s). Notify Owner and Fire Supervisory Service at least 24 hours before partially or completely disabling the system.

B. Security alarm system: Maintain the existing system in service. Disable system only to make temporary connections to maintain service in areas adjacent to Work area(s). Notify Owner and Fire Supervisory Service at least 24 hours before partially or completely disabling the system.

3.08 CLEANING AND REPAIR

A. Clean and repair existing materials and equipment that shall remain.

END OF SECTION

SECTION 26 05 29

ELECTRICAL HANGERS AND SUPPORTS

PART 1 - GENERAL

1.01 SUMMARY

A. Work included: Labor, materials and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:

1. Conduit supports.
2. Equipment supports.
3. Fastening hardware.

B. Related Work: Consult all other Sections, determine the extent and character of related Work and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.

1. Division 03: Cast-in-place concrete. Concrete equipment pads.
2. Division 05: Miscellaneous metals. Hangers for electrical equipment.
3. Division 09: Ceiling suspension systems. Slack fixture support wires.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated or specified:

1. Underwriters Laboratories, Inc. (UL):

   UL 2239; Hardware for the Supports of Conduit, Tubing and Cable.

1.03 SYSTEM DESCRIPTION

A. Provide devices specified in this Section and related Sections for support of electrical equipment furnished and installed under Division 26.

B. Provide support systems that are adequate for the weight of equipment, conduit and wiring to be supported.

1.04 SUBMITTALS

A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:

1. Data/catalog cuts for each product and component specified herein.
2. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
3. Submit Manufacturer's installation instructions.

1.05 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the units specified herein shall be new, unused and currently under production.

B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.

1. Concrete fasteners:

a. Phillips "Red-Head".

b. Remington.

c. Ramset.

2. Concrete inserts and construction channel:

a. Unistrut Corp.

b. GS Metals "Globe Strut."

c. Thomas & Betts "Kindorf" Corp.

3. Conduit straps:

a. O-Z/Gedney.

b. Erico "Caddy" Fastening Products.

c. Thomas & Betts "Kindorf" Corp.

B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

2.02 CONCRETE FASTENERS

A. Provide expansion-shield type concrete anchors.

B. Provide powder driven concrete fasteners with washers. Obtain approval by Architect and Structural Engineer prior to use.

2.03 CONCRETE INSERTS

A. Provide pressed galvanized steel, concrete spot insert, with oval slot capable of accepting square or rectangular support nuts of ¼ inch to ½ inch diameter thread for rod support.

2.04 THREADED ROD

A. Provide steel threaded rod, sized for the load unless otherwise noted on the Drawings or in the Specifications.

2.05 CONSTRUCTION CHANNEL

A. Provide 1-1/2 inch by 1-1/2 inch, 12 gauge galvanized steel channel with 17/32-inch diameter bolt holes and 1-1/2 inch on center in the base of the channel.

2.06 CONDUIT STRAPS

A. One hole strap, steel or malleable iron, with malleable iron clamp-back spacer for surface mounted wall and ceiling applications.

1. Use malleable strap with spacers for exterior and wet locations.

2. Use steel strap without spacers for interior locations.

B. Steel channel conduit strap for support from construction channel.

C. Steel conduit hanger for pendant support with threaded rod

D. Steel wire conduit support strap for support from independent #12 gauge hanger wires.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Contractor shall thoroughly examine Project site conditions for acceptance of supporting device installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.02 PREPARATION

A. Coordinate size, shape and location of concrete pads with Division 03, Cast-in-place concrete.

B. Layout support devices to maintain headroom, neat mechanical appearance and to support the equipment loads.

C. Where indicated on the Contract Documents, install freestanding electrical equipment on concrete pads.

3.03 INSTALLATION

A. Furnish and install supporting devices as noted throughout Division 26.

B. Electrical device and conduit supports shall be independent of all other system supports that are not structural elements of the building, unless otherwise noted.

C. Fasten hanger rods, conduit clamps, outlet and junction boxes to building structure using precast inserts, expansion anchors, preset inserts or beam clamps.

D. Use toggle bolts or hollow wall fasteners in hollow masonry, plaster or gypsum board partitions and walls.

E. Use expansion anchors or preset inserts in solid masonry walls.

F. Use self-drilling anchors, expansion anchor or preset inserts on concrete surfaces.

G. Use sheet metal screws in sheet metal studs and wood screws in wood construction.

H. Do not fasten supports to piping, ductwork, mechanical equipment, conduit or acoustical ceiling suspension wires.

I. Do not drill structural steel members unless first approved in writing by the Architect or Structural Engineer.

J. Fabricate supports from structural steel or steel channel, rigidly welded or bolted to present a neat appearance. Use hexagon head bolts with spring lock washers under all nuts.

K. Install surface-mounted cabinets and panelboards with minimum of four anchors. Provide additional support backing in stud walls prior to sheet rocking as required to adequately support cabinets and panels.

L. Bridge studs top and bottom with channels to support flush mounted cabinets and panelboards in stud walls.

3.04 ERECTION OF METAL SUPPORTS

A. Cut, fit and place miscellaneous metal fabrications accurately in location, alignment and elevation to support and anchor electrical materials and equipment.

B. Field Welding: Comply with AWS "Structural Welding Code."

3.05 WOOD SUPPORTS

A. Cut, fit and place wood grounds, nailers, blocking and anchorage accurately in location, alignment and elevation to support and anchor electrical materials and equipment.

END OF SECTION

SECTION 26 05 31

CONDUIT

PART 1 - GENERAL

1.01 SUMMARY

A. Work included: Labor, materials and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:

1. Rigid steel conduit and fittings.
2. PVC insulated rigid steel conduit and fittings.
3. Intermediate metal conduit and fittings.
4. Electrical metallic tubing and fittings.
5. Flexible metallic conduit and fittings.
6. Liquidtight flexible metallic conduit and fittings.
7. Miscellaneous conduit fittings and products.

B. Related Work: Consult all other Sections, determine the extent and character of related Work and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.

1. Division 01: Cutting and patching.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated or specified:

1. Federal Specifications (FS):

FS WW-C-563;	Electrical Metallic Tubing.
FS WW-C-566;	Specification for Flexible Metal Conduit.
FS WW-C-581;	Specification for Galvanized Rigid Conduit.
FS W-C-1094A;	Conduit and Conduit Fittings Plastic, Rigid.

2. American National Standards Institute, Inc. (ANSI):

ANSI C80.1;	Rigid Steel Conduit, Zinc-Coated.
ANSI C80.3;	Electrical Metallic Tubing, Zinc Coated.
ANSI C80.5;	Rigid Aluminum Conduit.

3. Underwriters Laboratories, Inc. (UL):

UL 1;	Flexible Metal Conduit.
UL 6;	Rigid Metal Conduit.
UL 360;	Liquid-Tight Flexible Steel Conduit.
UL 514B;	Conduit, Tubing and Cable Fittings.
UL 635;	Insulating Bushings.
UL 651;	Schedule 40 and 80 Rigid PVC Conduit.
UL 651A;	Type EB and A Rigid PVC Conduit and HDPE Conduit.
UL 797;	Electrical Metallic Tubing - Steel.
UL 1242;	Intermediate Metal Conduit - Steel.

4. National Electrical Manufacturer Association (NEMA):

NEMA RN1;	PVC Externally coated Galvanized Rigid Steel Conduit.
NEMA TC 2;	Electrical Plastic Tubing and Conduit.
NEMA TC 3;	PVC Fittings for use with Rigid PVC Conduit.
NEMA TC 6;	PVC Plastic Utilities Duct (EB and DB Type)
NEMA TC 9;	Fittings for PVC Plastic Utilities Duct (EB and DB Type)

1.03 SUBMITTALS

A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements the following items:

1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
2. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
3. Submit Manufacturer's installation instruction. Provide written instructions for raceway products requiring glues, special tools or specific installation techniques.

1.04 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the units specified herein shall be new, unused and currently under production.

B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted and approved.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.

1. Metal conduit:
   a. Allied Tube and Conduit Co.
   b. Triangle PWC, Inc.
   c. Western Tube and Conduit Corp.
   d. Spring City Electrical Manufacturing Co.
   e. Occidental Coating Co. (OCAL).
   f. Alflex Corp.
   g. American Flexible Metal Conduit Co.
   h. Anaconda.
2. Nonmetallic conduit:
   a. Carlon.
   b. PW Pipe.
3. Fittings:
   a. Appleton Electric Co.
   b. OZ/Gedney.
   c. Thomas & Betts Corp.
   d. Spring City Electrical Manufacturing Co.

e. Occidental Coating Co. (OCAL).

f. Carlon.

B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

2.02 GALVANIZED RIGID STEEL CONDUIT (GRS)

A. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and UL 6.

B. Standard threaded couplings, locknuts, bushings and elbows: Only materials of steel or malleable iron are acceptable. Locknuts shall be bonding type with sharp edges for digging into the metal wall of an enclosure.

C. Three piece couplings: Electroplated, cast malleable iron.

D. Insulating bushings: Threaded polypropylene or thermosetting phenolic rated 150 degree C minimum.

E. Insulated grounding bushings: Threaded cast malleable iron body with insulated throat and steel "lay-in" ground lug with compression screw.

F. Insulated metallic bushings: Threaded cast malleable iron body with plastic insulated throat rated 150 degrees C.

G. All fittings and connectors shall be threaded.

2.03 PVC INSULATED GALVANIZED RIGID STEEL CONDUIT (PVC GRS)

A. Conduit: Full weight, threaded, hot-dip galvanized steel, conforming to ANSI C80.1 and NEMA RN-1 with nominal 20 or 40 mil thermoplastic vinyl coating, heat fused and bonded to the exterior of the conduit.

B. Fittings: Conduit couplings and connectors shall be as specified for galvanized rigid steel conduit and shall be factory PVC coated with an insulating jacket equivalent to that of the coated material.

2.04 INTERMEDIATE METAL CONDUIT (IMC)

A. Conduit: Hot dip galvanized steel meeting the requirements of NEC Article 345 and conforming to ANSI C80.6 and UL 1242.

B. Fittings: Conduit couplings, connector and bushing shall be as specified for galvanized rigid steel conduit. Integral retractable type IMC couplings are also acceptable.

2.05 ELECTRICAL METALLIC TUBING (EMT)

A. Conduit: Shall be formed of cold rolled strip steel, electrical resistance welded continuously along the longitudinal seam and hot dip galvanized after fabrication. Conduit shall conform to ANSI C80.3 Specifications and shall meet UL requirements.

B. Set screw type couplings: Not allowed on project. Steel Compression type are required.

C. Set screw type connectors: Not allowed on project. Steel Compression type are required.

D. Raintight couplings: Electroplate steel or cast malleable iron; UL listed raintight and concrete tight, using gland and ring compression type construction.

E. Raintight connectors: Electroplated steel or cast malleable iron, UL listed raintight and concrete tight, with insulated throat, using gland and ring compression type construction.

2.06 FLEXIBLE METALLIC CONDUIT (FMC)

A. Conduit: Shall be fabricated in continuous lengths from galvanized steel strip, spirally wound and formed to provide an interlocking design and conforming to UL 1.

B. Fittings: Connectors shall be of the single screw clamp variety with steel or cast malleable iron bodies and threaded male hubs with insulated throats. Exception: Pressure cast screw-in connectors shall be acceptable for fixture connection in suspended ceilings and cut-in outlet boxes within existing furred walls.

2.07 LIQUIDTIGHT FLEXIBLE METALLIC CONDUIT (LFMC)

A. Conduit: Shall be fabricated in continuous lengths from galvanized steel strips, interlocking spirally wound, covered with extruded liquidtight jacket of polyvinyl chloride (PVC) and conforming to UL 360. Provide conduit with a continuous copper-bonding conductor wound spirally between the convolutions.

B. Fittings: Connector body and gland nut shall be of cadmium plated steel or cast malleable iron, with tapered, male, threaded hub; insulated throat and neoprene "O" ring gasket recessed into the face of the stop nut. The clamping gland shall be of molded nylon with an integral brass push-in ferrule.

2.08 MISCELLANEOUS CONDUIT FITTINGS AND PRODUCTS

A. Watertight conduit entrance seals: Steel or cast malleable iron bodies and pressure clamps with PVC sleeve, neoprene sealing grommets and PVC coated steel pressure rings. Fittings shall be supplied with neoprene sealing rings between the body and PVC sleeve.

B. Watertight cable sealing bushings: One piece, compression molded sealing ring with PVC coated steel pressure disks, stainless steel sealing screws and zinc plated cast malleable iron locking collar.

C. Expansion fittings: Multi-piece unit comprised of a hot dip galvanized malleable iron or steel body and outside pressure bussing designed to allow a maximum of 4" conduit movement (2" in either direction). Furnish with external braid tinned copper bonding jumper. Unit shall be UL listed for wet or dry locations.

D. Expansion/deflection couplings: Multi-piece unit comprised of a neoprene sleeve with internal flexible tinned copper braid attached to bronze end couplings with stainless steel bands. Coupling shall accommodate .75-inch deflection, expansion or contraction in any direction and allow 30-degree angular deflections. Flexible, corrosion-resistant, watertight, moisture and heat resistant molded rubber jacket and stainless steel jacket clamps. Unit shall comply with UL467 and UL514. Manufacturer shall be OZ/Gedney Type DX, Steel City Type EDF or equal.

E. Fire rated penetration seals:

1. UL building materials directory classified.

2. Conduit penetrations in fire rated separation shall be sealed with a UL classified fill, void or cavity material.

3. The fire rated sealant material shall be the product best suited for each type of penetration and may be a caulk, putty, composite sheet or wrap/strip.

F. Standard products not herein specified:

1. Provide listing of standard electrical conduit hardware and fittings not herein specified for approval prior to use or installation, i.e. locknuts, bushings, etc.

2. Listing shall include Manufacturers name, part numbers and a written description of the item indicating type of material and construction.

3. Miscellaneous components shall be equal in quality, material and construction to similar items herein specified.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Contractor shall thoroughly examine Project site conditions for acceptance of conduit system installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.02 APPLICATION

A. Galvanized rigid steel conduit (GRS) shall be used in the following applications:

1. For feeders and branch circuits located indoors, concealed or exposed above suspended ceilings, in damp/wet locations, in crawl spaces, in attics, chases, furred spaces, equipment rooms, loading docks or in hazardous locations in accordance with NEC and local Codes.

2. For feeders and branch circuits concealed in concrete floors and walls when not in contact with earth.

B. PVC insulated galvanized rigid steel conduit shall be used in the following applications:

1. Use 40-mil coating for feeders and branch circuits in damp or wet locations.
2. Use 20 or 40 mil for feeders and branch circuits concealed in concrete walls or slabs in contact with earth.
3. Use 20 or 40-mil for runs beneath floor slabs on grade.
4. Use 40-mil for all below grade penetrations through floor slabs on grade or exterior walls.

C. Electrical metallic tubing (EMT): Shall be used exposed or concealed for interior electrical feeders 4" and smaller, interior power and lighting branch circuits and low tension distribution system where run above suspended ceilings, in concrete slabs and walls not in contact with earth; in stud walls, furred spaces and crawl spaces. EMT shall not be installed exposed below 6 feet above the finish floor except within electrical, communication or signal rooms or closets.

D. Flexible metallic conduit (FMC): Shall be used only in dry locations for connections from an adjacent outlet box or conduit to all motors, transformers, vibrating equipment or machinery, controllers, solenoid valves, float and flow switches or similar devices and to lighting fixtures installed in suspended ceilings, minimum sizes shall be 3/8" for lighting fixtures and control wiring and 1/2" for motor and transformer connections. U.O.N.

E. Liquidtight flexible metallic conduit (LFMC): Shall be used in wet or damp locations for connections from adjacent outlet box or conduit to all motors, transformers, vibrating equipment or machinery, controllers, solenoid valves, float and flow switches or similar devices. These areas are typically food preparation and dishwashing areas, sump wells, loading docks, pump rooms, exterior areas, etc. Minimum sizes shall be 1/2".

3.03 PREPARATION

A. Locations of conduit runs shall be planned in advance of the installation and coordinated with ductwork, plumbing, ceiling and wall construction in the same areas and shall not unnecessarily cross other conduits or pipe, nor prevent removal of ceiling tiles or panels, nor block access to mechanical or electrical equipment.

B. Where practical, install conduits in groups in parallel vertical or horizontal runs and at elevations that avoid unnecessary offsets.

C. All conduits shall be run parallel or at right angles to the centerlines of columns and beams, whether routed exposed, concealed above suspended ceiling or in concrete slabs.

D. Conduits shall not be placed closer than 12 inches to a flue, parallel hot water, steam line or other heat producing source or three inches from such lines when crossing perpendicular to the runs.

E. Exposed conduit installation shall not encroach into the ceiling height headroom of walkways or doorways. Where possible, install horizontal raceway runs above water and below steam piping.

F. The largest trade size conduits in concrete floor and wall slabs shall not exceed 1/3 the floor or wall thickness and conduits shall be spaced a minimum of three conduit diameters apart unless otherwise noted on the Drawings. All conduits shall be installed in the center of concrete slabs or wall and shall not be placed between reinforcing steel and the bottom of floor slabs.

G. In long runs of conduit, provide sufficient pull boxes inside buildings to facilitate pulling wires and cables, with spacing not to exceed 150 feet. Support pull boxes from structure independent of conduit supports. These pull boxes are not indicated on the Drawings.

H. Provide all reasonably inferred standard conduits fitting and products required to complete conduit installation to meet the intended application whether noted, indicated or specified in the Contract Documents or not.

3.04 INSTALLATION

A. Install conduit in accordance with Manufacturer's written instructions, as indicated on Drawings and as specified herein.

B. Minimum Conduit Size: Unless otherwise noted herein or on Drawings, minimum conduit size shall be 1/2" for interior applications and 3/4" for exterior and underground applications.

C. All conduit sizes indicated on the Drawings are sized for copper conductors with THHN/THWN insulation. If conductor type or size is changed the Contractor shall be responsible for resizing conduits upward to meet Code.

D. In general, all conduit work shall be concealed where possible. Exceptions shall be electrical, communication and mechanical rooms, exposed ceiling areas, and parking garages.

E. Conduit connections to motors and surface cabinets shall be concealed, with the exception of electrical, communication and mechanical rooms, or unless exposed Work is clearly called for on the Drawings.

F. Install conduits in complete runs before pulling in cables or wires.

G. Install conduit free from dented, bruises or deformations. Remove and replace any damaged conduits with new undamaged material.

H. Conduits shall be well protected and tightly covered during construction using metallic bushings and bushing "pennies" to seal open ends.

I. In making joints in rigid steel conduit, ream conduit smooth after cutting and threading. Coat all field-threaded joints with UL approved conductive type compound to ensure low resistance ground continuity through conduit and to prevent seizing and corrosion.

J. Clean any conduit in which moisture or any foreign matter has collected before pulling in conductors. Paint all field-threaded joints to prevent corrosion.

K. In all empty conduits or ducts, install a “True Tape” conduit measuring tape line to provide overall conduit length for determining length of cables/conductors for future use.

L. Conduit systems shall be mechanically and electrically continuous throughout. Install code size, insulated, copper, green-grounding conductors in all conduit runs for branch circuits and feeders. This conductor is not indicated on the Drawings. Refer to Section 260526: Grounding and Bonding.

M. Metallic conduit shall not be in contact with other dissimilar metal pipes (i.e. plumbing).

N. Make bends with standard conduit bending hand tool or machines. The use of any item not specifically designed for the bending of electrical conduit is strictly prohibited.

O. A run of conduit between terminations at wire pulling points shall not contain more than the equivalent of four quarter bends (360 degrees, total).

P. Emergency power raceway system: Install entirely independent of other raceway systems, except where specifically allowed by NEC Article 517.

3.05 PENETRATIONS

A. Locate penetrations and holes in advance where they are proposed in the structural sections such as footings, beams, wall, etc. Penetrations are acceptable only when the following occurs:

1. Where indicated on the Structural Drawings.

2. As approved by the Structural Engineer prior to construction and after submittal of Drawing showing location, size and position of each penetration.

B. Cutting or holes:

1. Cut holes through concrete, masonry block or brick floors and floors of structure with a diamond core drill or concrete saw. Pneumatic hammer, impact electric, hand or manual hammer type drills are not allowed, except where permitted by the Structural Engineer as required by limited working space. Obtain the approval of the Structural Engineer prior to drilling through structural sections.

2. Provide sleeves or “can outs” for cast-in-place concrete floors and walls. Following conduit installation, seal all penetrations using non-iron bearing, chloride free, non-shrinking, dry-pack grouting compounds; or fire rated penetration-sealing materials.

3. Cut holes for conduit penetrations through non-concrete and non-masonry walls, partitions or floors with a hole saw. The hole shall be only as large as required to accommodate the size of the conduit.

4. Provide single piece escutcheon plates around all exposed conduit penetrations in public places.

C. Sealing:

1. Non-rated penetrations: Pack opening around conduits with non-flammable insulating material and seal with gypsum wallboard taping compound.

2. Fire stop: Where conduits, wireways and other electrical raceways pass through fire rated partitions, walls, smoke partitions or floor; install a UL classified fire stop material to provide an effective barrier against the spread of fire, smoke and gases. Completely fill and seal clearances between raceways and openings with the fire stop material.

D. Waterproofing: At floor, exterior wall and roof conduit penetrations, completely seal clearances around the conduit and make watertight as specified in Division 07: Sealants and Caulking.

1. Install specified watertight conduit entrance seals at all below grade wall and floor penetrations. Conduits penetrating exterior building walls and building floor slab shall be PVC coated rigid galvanized steel.

2. For roof penetrations furnish and install roof flashing, counter flashing and pitch-pockets as specified under Roofing and Sheet Metal Sections of the Specifications.

3. Provide membrane clamps and cable sealing fittings for any conduit that horizontally penetrates the waterproof membrane.

4. Conduits that horizontally penetrate a waterproof membrane shall fall away from and below the penetration on the exterior side a minimum of two times the conduit diameters.

3.06 CONCEALED IN CONCRETE

A. Install conduits approximately in the center of the slab so that there will be a minimum of 3/4-inch of concrete around the conduits.

B. Installation of conduit in structural concrete that is less than three inches thick is prohibited. Topping slabs, maintenance pads and curbs are exempted.

C. Tie conduits to reinforcing rods or otherwise secure them to prevent sagging or shifting during concrete placement. Run conduit larger than 1-inch trade size, parallel with or at right angles to the main reinforcement; where at right angles to the reinforcement, the conduit shall be close to one of the supports of the slab.

D. Where nonmetallic conduit or tubing is used, raceways must be converted to PVC coated rigid steel conduit before rising above floor.

E. Make couplings and connections watertight.

F. Protect stub-ups from damage where conduits rise from floor slabs. Arrange so curved portion of bends is not visible above the finished slab.

3.07 TERMINATIONS AND JOINTS

A. Use raceway fittings that are of types compatible with the associated raceway and suitable for the use and location. For intermediate steel conduit, use threaded rigid steel conduit fittings except as otherwise indicated.

B. Raceways shall be joined using specified couplings or transition couplings where dissimilar raceway systems are joined.

C. Conduits shall be securely fastened to cabinets, boxes and gutters using two locknuts and an insulating bushing or specified insulated connectors. Where joints cannot be made tight, use bonding jumpers to provide electrical continuity of the raceway system. Where terminations are subject to vibration, use bonding bushings or wedges to assure electrical continuity. Where subject to vibration or dampness, use insulating bushings to protect conductors. Install grounding bushings or bonding jumpers on all conduits terminating at concentric or eccentric knockouts.

D. Conduit terminations exposed at weatherproof enclosures and cast outlet boxes shall be made watertight using specified connectors and hubs.

E. Stub-up connections: Extend conduits through concrete floor for connection to freestanding equipment with an adjustable top or coupling threaded inside for plugs and set flush with the finished floor. Extend conductors to equipment with rigid steel conduit; flexible metal conduit may be used 6 inches above the floor. Where equipment connections are not made under this contract, install screwdriver operated threaded flush plugs with floor.

F. Install specified cable sealing bushings on all conduits originating outside the building walls and terminating in switchgear, cabinets or gutters inside the building. Install cable sealing bushings or raceway seal for conduit terminations in all grade level or below grade exterior pull, junction or outlet boxes.

G. Install expansion couplings where any conduit crosses a building separation or expansion joint as follows:

1. Conduits three inches and larger, shall be rigidly secured to the building structure on opposite sides of a building expansion joint and provided with expansion or deflection couplings. Install the couplings in accordance with the Manufacturer's recommendations.

2. Conduits smaller than three inches shall be rigidly secured to the building structure on opposite sides of a building expansion joint with junction boxes on both sides of the joint. Connect conduits to junction boxes with 15 inches of slack flexible conduit. Flexible conduit shall have a copper green ground-bonding jumper installed. For concrete embedded conduit, use expansion and deflection couplings as specified above for three inches and larger conduits.

H. Use short length (maximum of 6ft) of the appropriate FMC or LFMC conduit for connections to motors and other electrical equipment subject to movement, vibration, misalignment, cramped quarters or noise transmission. Provide liquidtight flexible metal conduit for installation in exterior locations, moisture or humidity-laden atmosphere, corrosive atmosphere, water hose or spray wash-down operations and locations subject to seepage or dripping of oil, grease or water. Provide a green ground wire with FMC or LFMC conduit.

3.08 SUPPORTS

A. Provide supports for raceways as specified in Section 260529: Electrical Hangers and Supports.

B. All raceways systems shall be secured to building structures using specified fasteners, clamps and hangers spaced according to the NEC.

C. Support single runs of conduit using one-hole pipe straps. Where run horizontally on walls in damp or wet locations, install "clamp backs" to space conduit off the surface.

D. Multiple conduit runs shall be supported using "trapeze" hangers fabricated from specified construction channel, mounted to 3/8-inch diameter, threaded steel rods secured to building structures. Fasten conduit to construction channel with standard one-hole pipe clamps or the equivalent. Provide lateral seismic bracing for hangers.

E. Individual 1/2" and 3/4" conduits installed above suspended ceilings may be attached to the ceiling's hanger wire using spring steel support clips provided that not more than two conduits are attached to any single support wire.

F. Support exposed vertical conduit runs at each floor level, independent of cabinets or switches to which they run, by means of acceptable supports.

G. Fasteners and supports in solid masonry and concrete:

1. Use steel or malleable iron concrete inserts set in place prior to placing the concrete.

2. After concrete installation:

a. Steel expansion anchors not less than ¼ inch bolt size and not less than 1-1/8 inch embedment.

b. Power set fasteners not less than ¼ inch diameter with depth of penetration not less than three inches.

c. Use vibration and shock resistant anchors and fasteners for attaching to concrete ceilings.

H. Hollow masonry: Toggle bolts are permitted. Bolts supported only by masonry block are not acceptable.

I. Metal structures: Use machine screw fasteners or other devices specifically designed and approved for the application.

END OF SECTION

SECTION 26 05 53

ELECTRICAL IDENTIFICATION

PART 1 - GENERAL

1.01 SUMMARY

A. Work included: Labor, materials and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:

1. Electrical equipment nameplates.
2. Panelboard directories.
3. Wire and cable identification.
4. Buried electrical line warnings.
5. Junction box identification.
6. Inscribed device coverplates.

B. Related Work: Consult all other Sections, determine the extent and character of related Work and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.

1. Division 09: Painting.

1.02 SUBMITTALS

A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:

1. Data/catalog cuts for each product and component specified herein.
2. Schedules for nameplates to be furnished.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.

1. Conduit and wire markers:
   a. Thomas & Betts Corp.
   b. Brady.
   c. Griffolyn.
2. Inscription Tape:
   a. Kroy.
   b. Merlin.

B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

2.02 NAMEPLATES

A. Type NP: Engraved, plastic laminated labels, Signs and Instruction Plates. Engrave stock melamine plastic laminate 1/16-inch minimum thickness for signs up to 20 square inches or 8 inches in length; 1/8 inch thick for larger sizes. Engraved nameplates shall have white letters and be punched for mechanical fasteners.

B. Color and letter height as specified in Part 3: Execution.

2.03 LEGEND PLATES

A. Type LP: Die-stamped metal legend plate with mounting hole and positioning key for panel mounted operator devices, i.e. motor control pilot devices, hand-off-auto switches, reset buttons, etc.

B. Stamped characters to be paint filled.

2.04 BRASS TAGS

A. Type BT: Metal tags with die-stamped legend, punched for fastener.

B. Dimensions: 2" diameter 19 gauge.

2.05 PANELBOARD DIRECTORIES (400 AMP OR LESS)

A. Directories: A 6" x 8" minimum size circuit directory frame and card with clear plastic covering shall be provided inside the inner panel door.

B. Circuit numbering: Starting at the top, odd numbered circuits in sequence down the left hand side and even numbered circuits down the right hand side. Multi-section panelboards shall have continuous consecutive circuit numbers, i.e. Section 1 (circuit numbers 1-42), Section 2 (circuit numbers 43-84), Section 3 (circuit numbers 85-126).

2.06 WIRE AND TERMINAL MARKERS

A. Provide self-adhering, pre-printed, machine printable or write-on, self-laminating vinyl wrap around strips. Blank markers shall be inscribed using the printer or pen recommended by Manufacturer for this purpose.

2.07 CONDUCTOR PHASE MARKERS

A. Colored vinyl plastic electrical tape, 3/4" wide, for identification of phase conductors. Scotch 35 Brand Tape or equal.

2.08 UNDERGROUND CONDUIT MARKER

A. 6-inch wide, yellow polyethylene tape, with continuous black imprinting reading "Caution - Buried Electric Line Below".

2.09 INSCRIBED DEVICE COVERPLATES

A. Coverplate material shall be as specified in Section 262726: Wiring Devices.

B. Methods of inscription: (Unless otherwise noted)

1. Type-on-tape:

a. Imprinted or thermal transfer characters onto tape lettering system.

b. Tape trimmer.

c. Matte finish spray-on clear coating.

2. Engraving:

a. 1/8" high letters.

b. Paint filled letters finished in black.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Contractor shall thoroughly examine Project site conditions for acceptance of identification device installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.02 NAMEPLATES

A. Installation:

1. Degrease and clean surfaces to receive nameplates.

2. Install nameplates parallel to equipment lines.

3. Secure nameplates to equipment fronts using machine screws.

B. Provide type 'NP' color coded nameplates that present, as applicable, the following information:

1. Equipment or device designation:

a. Equipment designations shall conform to the following:

1) Building number designation – 00.

2) Power source:

a) Normal - __

b) Emergency – E

c) UPS – U

3) Equipment description:

a) Primary substation – PS

b) Secondary substation – SS

c) Main switchboard – MS

d) 277/480 volt distribution board – HD

e) 277/480 volt panelboard – H

f) 120/208 volt distribution board – LD

g) 120/208 volt panelboard – L

h) Transformer – TX

i) Motor control center – MCC

4) Floor number where equipment is located – 3

5) Equipment designation – B

b. Example: 06EHD2A

1) Building number 06.

2) Emergency source.

3) 277/480 volt distribution board.

4) 2nd floor.

5) Board designation A

2. Amperage, KVA or horsepower rating, where applicable.

3. Voltage or signal system name.

4. Source of power or control.

5. Examples:

a. Boards: 06EHD2A; 1200A; 277/480V, 3PH, 4W; Served from: 06ATS1A

b. Transformers: 06ETX2A; 150KVA; 480V pri. - 120/208V, 3PH, 4W sec.; Served from: 06EHD2A; Load Served: 06EL2A

c. Motor Control Centers:

1) Main nameplate: 06MCC1A; 600A Main Bus; 480V,3PH,3W; Served from 06HD1A

2) Each compartment: EF-1; 20 HP; 100A Switch; Size 1 Starter

d. Disconnects or Individual Motor Starters: EF-1; 20HP; 480V,3PH,3W; Served from 06MCC1A

e. Signal: 06STB3C; Public Address System; Served from 06STB2C

C. Nameplates for power system distribution equipment and devices are to be black.

D. Nameplates for signal systems equipment and devices are to be black except as follows:

1. Fire alarm and life safety - Red.

E. Minimum letter height shall be as follows:

1. For panelboards, switchboards, battery panels motor control center, etc.: ½ inch letters to identify equipment designation. Use ¼ inch letters to identify voltage, phase, wires, etc.

2. For individual circuit breakers, switches and motor starters in panelboards, switchboards and motor control centers use 3/8-inch letters to identify equipment designation. Use 1/8-inch letters to identify all other.

3. For individual mounted circuit breakers, disconnect switches, enclosed switches and motor starters use 3/8-inch letters to identify equipment designation. Use 1/8" letters to identify all other.

4. For transformers use 1/2 inch letters to identify equipment designation. Use ¼ inch letters to identify primary and secondary voltages, etc.

5. For equipment cabinets, terminal cabinets, control panels and other cabinet enclosed apparatus use 3/8-inch letters to identify equipment designation.

3.03 LEGEND PLATES

A. Provide panel-mounted operators devices such as pilot lights, reset buttons, “HAND-OFF-AUTO” switches, etc.

3.04 BRASS TAGS

A. Provide type BT tags for individual ground conductors to exposed ground bus indicating connection i.e. "UFER", "Cold water bond", etc.

B. Provide tags for all feeder cables in underground vaults and pull boxes.

C. Provide tags for empty conduits in underground vault, pull boxes and stubs.

3.05 PANELBOARD DIRECTORIES (400 AMP OR LESS)

A. Provide typewritten directories arranged in numerical order denoting loads served by room number or area for each circuit.

B. Verify room numbers or area designation with Project Manager.

C. Mount panelboard directories in a minimum 6" x 8" metal frame under clear plastic cover inside every panelboard.

3.06 WIRE AND CABLE IDENTIFICATION

A. Provide wire markers on each conductor in panelboards, pull boxes, outlet and junction boxes and at load connection. Identify with branch circuit or feeder number for power and lighting circuits and with control wire number as indicated on equipment Manufacturer's Shop Drawings for control wiring.

B. Provide colored phase markers for conductors as noted in Section 260519: Building Wire and Cable. Apply colored, pressure sensitive plastic tape in half-lapped turns for a distance of 3 inches from terminal points and in boxes where splices or taps are made. Apply the last two laps of tape with no tension to prevent possible unwinding. Do not cover cable identification markings by taping.

3.07 UNDERGROUND CONDUIT MARKERS

A. During trench backfilling, for exterior underground power, signal and communications lines, install continuous underground plastic line marker, located directly above line at 6 to 8 inches below finished grade. Where multiple lines installed in a common trench or concrete envelope, do not exceed an overall width of 16 inches; install a single line marker.

3.08 JUNCTION BOX IDENTIFICATION

A. The cover of junction, pull and connection boxes for both power and signal systems, located above suspended ceilings and below ceilings in non-public areas, shall be clearly marked with a permanent ink felt pen. Identify the circuit(s) (panel designation and circuit numbers) contained in each box, unless otherwise noted or specified.

3.09 INSCRIBED DEVICE COVERPLATE

A. General:

1. Lettering type: Helvetica, 12 point or 1/8" high.
2. Color of characters shall be black.
3. Locate the top of the inscription ½" below the top edge of the coverplate.
4. Inscription shall be centered and square with coverplate.

B. Application:

1. Provide inscribed coverplates for devices as outlined below:
   a. Receptacles.
   b. Outlets in surface raceways.
   c. Multi-ganged (four or more) switch arrangement.
   d. Special purpose switches, i.e. projection screens, shades, exhaust fans, etc.
   e. Telecommunication outlets.
2. Type-on-tape inscriptions shall be provided for the following devices:
   a. Receptacles.
   b. Outlets in surface raceways.
   c. Telecommunication outlets.
3. Engraved inscriptions shall be provided for the following devices:
   a. Multi-ganged switches.
   b. Special purpose switches.
4. Type-on-tape installation:
   a. Tape shall be trimmed to the height of the letters.
   b. Trim tape length to 1/4 inch back from each edge of coverplate.
   c. Contractor hands shall be clean or covered with surgical type glove prior to application of tape. Tape installations with visible fingerprints or smudges will not be acceptable.

END OF SECTION

SECTION 26 22 13

DRY TYPE TRANSFORMERS

PART 1 - GENERAL

1.01 SUMMARY

A. Work included: Labor, materials and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:
   1. Dry type ventilated transformers.

B. Related Work: Consult all other Sections, determine the extent and character of related Work and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.
   1. Division 03: Cast-in-place concrete. Equipment housekeeping pad.
   2. Division 09: Painting. Touch-up painted surfaces.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated or specified.
   1. American National Standards Institute (ANSI):
      ANSI C57; Pertaining to Power/Distribution Transformer.
   2. Underwriter's Laboratories, Inc. (UL):
      UL 486E; Equipment Wiring Terminals for Use with Aluminum and/or Copper Conductors.
      UL 1561; Dry-Type General Purpose and Power Transformers.
   3. National Electrical Manufacturers Association (NEMA):
      NEMA ST 20; Dry Type Transformers.
   4. U.S. Department of Energy
      2016 Energy Efficiency Standards Low Voltage Distribution Transformers.

1.03 SUBMITTALS

A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:
   1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
   2. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
   3. Shop Drawings: Include type and style, dimensions, insulation class, rated temperature rise, taps provided, voltage, kVA and impedance ratings and characteristics, loss data, efficiency at 25, 50, 75 and 100 percent rated load and sound level.
   4. Furnish structural calculations for equipment anchorage as described in Section 260010: Basic Electrical Requirements.
   5. Submit Manufacturer's installation instructions.
   6. Final test results.
   7. Warranty.

1.04 OPERATION AND MAINTENANCE MANUAL

A. Supply operation and maintenance manuals in accordance with the requirements of Section 260010: Basic Electrical Requirements, to include the following:
   1. Detailed explanation of operation of the system.
   2. Instructions for routine maintenance.
   3. Telephone numbers for the authorized parts and service distributors.
   4. Include all service bulletins and torque Specifications for all terminations.
   5. Final testing reports.

1.05 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the units specified herein shall be new, unused and currently under production.

B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

C. Independent Testing Agency qualifications: Refer to Section 260010: Basic Electrical Requirements.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery: Transformers shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner. Components shall be properly packaged in factory-fabricated containers and mounted on shipping skids.

B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.

C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

1.07 WARRANTY

A. Units and components offered under this Section shall be covered by a 1 year parts and labor warranty for malfunctions resulting from defects in materials and workmanship. Warranty shall begin upon acceptance by the Owner.

1.08 EXTRA MATERIAL

A. Provide one spray can of matching finish paint for touching up damaged surfaces after installation.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.
   1. Square D.
   2. Eaton Electrical/Cutler-Hammer.
   3. General Electric.
   4. Siemens/I-T-E.

B. Substitutions: Under provisions of Section 260010: Basic Electrical Requirements.

2.02 DRY TYPE TRANSFORMER - GENERAL

A. Rating: Provide kVA rating, primary and secondary voltage, frequency and phase as indicated on the Drawings. The designated rating is for continuous duty without the use of cooling fans unless specifically noted otherwise on the Drawings.

B. Windings: three phase dry type transformers shall be of the two-winding type.

C. Taps: All dry type transformers rated 15 kVA and larger shall have two 2 1/2 percent full capacity taps above normal (FCAN) and four 2 1/2 percent full capacity taps below normal (FCBN) rated primary voltage.

D. Noise attenuation:
1. Isolate core and coil unit from the enclosure by means of vibration absorbing mounts that preclude metal-to-metal contact between the core-coil and the enclosure.
2. Provide sound levels that do not exceed the following maximum levels in accordance with NEMA and ANSI standards:
a. Up to 9 kVA; 0 db
b. 10 to 50 kVA; 45 db
c. 51 to 150 kVA; 50 db

E. Impedance:
1. Transformer impedance shall conform to NEMA standards. Do not use low impedance type transformers unless the circuits and equipment affected by the larger short circuit currents through such transformers are increased in short circuit current ratings, as required, at no additional cost to the Owner.
2. The following impedance are used as our basis of design:
a. Three phase transformers:
1) 15 kVA: 6.4Z
2) 25 kVA: 5.8Z
3) 30 kVA: 5.2Z
4) 37.5 kVA: 5.5Z
5) 45 kVA: 5.0Z
6) 75 kVA: 4.7Z
7) 112.5 kVA: 5.1Z
8) 150 kVA: 5.3Z

F. Basic impulse level (BIL): 10 kV for transformers less than 300 kVA, 30 kV for transformers 300 kVA and larger.

G. Energy efficiency: Transformers rated 15 kVA and larger shall be energy efficient designs and DOE2016 compliant. The energy efficient transformers shall be specifically designed to meet the energy efficiency standards set forth by the U.S. Department of Energy 2013-04-18 Energy Conservation Standards for Distribution Transformers; Final Rule.
1. Three phase transformer efficiency:
a. 15 kVA: 97.89%
b. 30 kVA: 98.23%
c. 45 kVA: 98.40%
d. 75 kVA: 98.60%
e. 112.5 kVA: 98.74%
f. 150 kVA: 98.83%
g. 225 kVA: 98.94%
h. 300 kVA: 99.02%
i. 500 kVA: 99.14%
j. 750 kVA: 99.23%
k. 1000 kVA: 99.28%

H. Grounding: Ground core and coil assembly to enclosure by means of a visible flexible copper strap.

I. Enclosures:
1. Material: Code gauge steel.
2. Manufacturers nameplate: Include transformer connection data and overload capacity based on rated allowable temperature rise.
3. Type: Provide NEMA type as indicated on Drawings or specified herein, drip-proof, self-bracing enclosure designed to prevent accidental contact with electrically energized parts unless otherwise noted.
4. Mounting: Transformers 75 kVA and less shall be suitable for wall, floor, frame or trapeze mounting. Transformers larger than 75 kVA shall be suitable for floor mounting.
5. Finish: Clean, degrease, zinc-phosphate, prime and finish paint steel parts with a baked-on synthetic enamel, ANSI 61 (light gray).
6. Accessories: Provide accessories as indicated on the Drawings.
7. Size: Dimensions and configurations shall conform to the spaces allocated on the Drawings.

2.03 DRY TYPE VENTILATED TRANSFORMERS

A. General:
1. Indoor or outdoor, convection air-cooled, dry type transformers with NEMA Type 1 enclosure unless otherwise noted. Provide NEMA Type 3R Enclosure for all exterior mounted transformers or where indicated on Drawings.
2. Transformers shall have been tested to UL standards and constructed to NEMA standards.
3. Transformers shall be specifically designed to supply circuits with a harmonic profile equal to or less than a K-factor of 13 without exceeding the rated temperature rise.

B. Insulation:
1. Insulation system and average winding temperature rise for kVA as follows unless otherwise indicated:

KVA RATING	CLASS H	RISE IN DEGREES
1 - 15	150c	80c
16 - 500	150c	80c

2. Case temperature shall not exceed 40 degrees centigrade rise above ambient at its warmest point.
3. Provide insulating materials that are in accordance with the latest addition of NEMA ST20 Standards for a 220-degree centigrade, UL component recognized insulation system for extended life.

C. Core construction: High grade, non-aging, silicon steel, clamped with structural angles and bolted to the transformer enclosure on vibration isolating pads.

D. Coil construction:
1. Continuous wound with copper wire, without splices except for taps.
2. Pressure type, primary, secondary and tap connections.
3. End fillers or tie downs for maximum strength.
4. Vacuum impregnated with non-hygroscopic, thermosetting varnish.
5. All connections shall be accessible from the front of the transformer to allow rear of transformer to be positioned within six inches of the adjacent wall.
6. Isolate core and coil from enclosure using vibration-absorbing mounts.
7. Isolate core and coil from enclosure using vibration-absorbing mounts.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Contractor shall thoroughly examine Project site conditions for acceptance of transformer installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.02 PREPARATION

A. Ensure all conduit stub-ups for bottom entry into transformer are in place and located as required per Shop Drawings.

B. Where noted on the Drawings provide a 4 inch high concrete housekeeping pad beneath equipment. Coordinate actual sizes of equipment base with approved Shop Drawings and extend pad 4 inches in all directions beyond overall dimension of base. Provide reinforcing bars as required structurally within pad to ensure proper support of equipment.

3.03 INSTALLATION

A. Install transformer in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.

B. Transformers shall be installed to provide adequate air circulation for the removal of the heat they produce, in accordance with Manufacturer recommendations.

C. Transformers not specifically designed for wall mounting, shall be spaced a minimum of 6" from adjacent walls, ceiling and equipment.

D. Transformers shall be anchored and braced to withstand seismic forces as calculated per Section 260010: Basic Electrical Requirements.

E. Loosen and/or remove all shipping bolts in accordance with Manufacturer's instructions.

F. Install the transformers on the noise and vibration isolation pads designed to suppress the transformer noise from the building structure. Select and arrange the pads in accordance with the weight and mounting of the transformers. These pads are in addition to any internal vibration pads. Provide a neoprene sleeve over the portion of the bolt that passes through the transformer base or mounting bracket. Provide a rubber washer between the bolt head and the mounting channel. Use Kinetics Model KIP or equal.

3.04 TERMINATIONS

A. Provide all transformers with lugs for both primary and secondary conductor sizes for conductors indicated on Drawing. Connect lug to termination point with appropriate size bolt, nut flat and Belleville washers.

B. Provide high-pressure compression lugs, for primary and secondary phase and neutral terminations for transformers 45 kVA and larger. Utilize only the tool and dies designed for uses in installing the lugs provided.

C. Use flexible conduit indoors in dry locations or liquidtight flexible conduit in damp/wet locations, two-foot minimum in length, for primary and secondary connections to transformer case. Make connections to side panels of enclosure, except for floor mounted transformers fed from directly below enclosure.

3.05 GROUNDING

A. Provide transformer with a dual rated four-barrel solderless grounding lug with a 5/8"-11 threaded hole. Drill transformer enclosure with 11/16" bit and attach lug to enclosure utilizing a torque bolt and Dragon Tooth transition washer. Connect the following:
   1. Primary feeder ground.
   2. Secondary feeder ground.
   3. Grounding electrode.
   4. Main bond jumper to neutral (when present).

3.06 IDENTIFICATION

A. Provide transformer nameplate as described in Section 260533: Electrical Identification.

3.07 FIELD QUALITY CONTROL

A. Independent testing: Contractor shall arrange and pay for the services of an independent Testing Agency to perform all quality control electrical testing, calibration and inspection required herein. Independent Testing Agency shall meet the requirements as outlined in Section 260010: Basic Electrical Requirements. Testing Agencies objectives shall be to:
   1. Assure transformer installation conforms to specified requirements and operates within specified tolerances.
   2. Field test and inspect to ensure operation in accordance with Manufacturer's recommendations and Specifications.
   3. Prepare final test report including results, observations, failures, adjustments and remedies.
   4. Apply label on transformer upon satisfactory completion of tests and results.
   5. Verify ratings and settings and make final adjustments.

B. At least three weeks prior to any testing, notify the Engineer so that arrangement can be made for witnessing test, if deemed necessary. All pretesting shall have been tested satisfactorily prior to the Engineer's witnessed test.

C. The Contractor shall supply a suitable and stable source of electrical power to each test site. The Testing Agency shall specify the specific power requirements.

D. Prefunctional testing:
   1. Provide Testing Agency with Contract Documents and Manufacturer instructions for installation and testing.
   2. Visual and mechanical inspection:
      a. Compare nameplate information and connections to Contract Documents.
      b. Inspect for physical damage, defects alignment and fit.
      c. Check tightness of all control and power connections.
      d. Check that all covers, barriers and doors are secure.
      e. Perform specific inspections and mechanical tests as recommended by Manufacturer.
      f. Verify seismic bracing is correct.
      g. Verify winding core, frame and enclosure grounding are correct.
      h. Verify tap connections are as specified.
   3. Electrical tests:
      a. Perform insulation-resistance tests winding-to-winding and winding-to-ground with test voltage in accordance with Manufacturer’s recommendation.
      b. Calculate polarization index.
      c. Perform power-factor or dissipation-factor tests in accordance with test equipment Manufacturer’s instructions.
      d. Perform turn-ratio test on tap connections. Verify winding polarities are in accordance with nameplate.
      e. Perform an excitation-current test on each phase.
      f. Measure resistance of each winding at each tap.
      g. Verify core is solidly grounded. If core is insulated and removable core ground strap is available, perform core insulation-resistance test at 500V DC.
      h. Verify correct secondary voltage phase-to-phase and phase-to-neutral after energization and prior to loading.
      i. Perform over-potential test on all high and low voltage windings-to-ground.
   4. Test values:
      a. Bolt-torque levels shall be in accordance with the Manufacturer’s written instructions.
      b. Insulation-resistance test values at one minute should not be less than 500 megohms at 1000 VDC.
      c. Polarization index should be compared to Manufacturer’s factory test results. If Manufacturer’s data is not available, acceptance test results will serve as baseline data.
      d. Turn-ratio test results should not deviate more than 0.5% from either adjacent coils or calculated ratio.

e. Dissipation-factor/power-factor values should be 5% or less.
f. If winding-resistance test results vary more than 1% from adjacent windings, consult Manufacturer.
g. Typical excitation current test data pattern for three-legged core transformer is two similar current readings and one lower current reading.
h. If core insulation resistance is less than one megohm at 500 VDC, consult Manufacturer.
i. AC over-potential test shall not exceed 75% of factory test voltage for one minute duration. DC over-potential test shall not exceed 100% of factory RMS test voltage for one minute duration. Insulation shall withstand over-potential test voltage applied.

E. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

F. Contractor shall submit the Testing Agency's final report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.08 ADJUSTING

A. Adjust primary taps so that secondary voltage is above and within 2 percent of rated voltage.

3.09 CLEANING

A. Prior to energizing of transformer the Contractor shall thoroughly clean the interior of enclosure of all construction debris, scrap wire, etc. using Manufacturer's approved methods and materials.

B. Upon completion of Project prior to final acceptance the Contractor shall thoroughly clean both the interior and exterior of transformer per Manufacturers approved methods and materials. Remove paint splatters and other spots, dirt and debris.

C. Touch-up paint any marks, blemishes or other finish damage suffered during installation.

[END OF SECTION 26 22 13]

SECTION 28 61 13

FIRE ALARM SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Work included: Labor, materials and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:

1. Fire alarm control panel (FACP).
2. Initiating devices.
3. Notification devices.
4. Fireman's remote annunciator panel (FRAP).
5. Record Drawings.
6. Pretesting and final testing.

B. Work furnish and installed under another Section, but connected under this Section:

1. Fire sprinkler alarm system flow switches, valve monitors and post indicating valves.
2. Elevator controller for recall.
3. Door hold-open/closure devices with/without integral smoke detectors.
4. Fire barrier roll-down doors and shutters.
5. Fire/smoke dampers.

C. Work furnished and connected to alarm system under this Section, but installed and connected to HVAC system under another Section:

1. Duct mounted smoke detectors at supply air equipment 2000 cfm and larger.

D. Work furnished and installed under another Section: HVAC shutdown wiring via dry contacts in remote mounted programmable relays.

E. Related Work: Consult all other Sections, determine the extent and character of related Work and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.

1. Division 08: Roll-Down Doors, Door Hardware.
2. Division 14: Elevators.
3. Division 21: Fire Sprinkler System.
4. Division 23: HVAC System.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated or specified:

1. American National Standards Institute, Inc. (ANSI):

   ANSI C62.41; Guide for Surge Voltage in Low-Voltage AC Power Circuits.

   ANSI / ASME A17.1 Safety Code for Elevators and Escalators (1996 edition).

2. National Fire Protection Association (NFPA):

   NFPA 72; National Fire Alarm Code.

3. Underwriters Laboratories, Inc. (UL):

   UL 38; Manual Signaling Boxes for Fire Alarm Systems.

UL 268;	Smoke Detectors for Fire Alarm Signaling Systems.
UL 268A;	Smoke Detectors for Duct Application.
UL 464;	Audible Signal Appliances.
UL 497B;	Protectors for Data Communications and Fire Alarm Circuits.
UL 521;	Heat Detectors for Fire Protective Signaling Systems.
UL 864;	Control Units and Accessories for Fire Alarm Systems.
UL 1424;	Cables for Power-Limited Fire-Alarm Circuits.
UL 1481;	Power Supplies for Fire-Protective Signaling Systems.
UL 1638	Visual Signaling Appliances Standard.
UL 1971	Signal Devices for Hearing Impaired.

4. Americans with Disabilities Act (ADA).
   a. All visual Notification appliances and manual pull stations shall comply with the requirements of the Americans with Disabilities Act.
5. Factory Mutual System (FM):

FM P7825	Approval Guide.

1.03 DEFINITIONS

A. Addressable device: A fire alarm system component with discrete identification that can have its status individually identified or that is used to individually control other functions.

B. Alarm signal: A signal indicating an emergency that requires immediate action, such as a signal indicative of fire.

C. Annunciator: A unit containing one or more indicator lamps, alphanumeric displays or other equivalent means in which each indication provides status information about a circuit, condition or location.

D. Class B wiring: Circuit that is monitored for integrity such that a single break, a single wire-to-wire short or a single loss of carrier condition will be indicated by a trouble signal on the FACP no matter where the break, short or loss of carrier condition occurs, but which would prohibit devices beyond the fault, short or carrier loss from remaining operational. This would be Style 4 wiring for signaling line circuits, Class B for initiating device circuits and Style Y for notification device circuits.

E. Initiating device: A system component that originates transmission of a change-of-state condition, such as in a smoke detector, manual fire alarm box or supervisory switch.

F. Initiating device circuit: A circuit to which automatic or manual initiating devices are connected where the signal received does not identify the individual device operated.

G. Multiplexing: A signaling method characterized by simultaneous or sequential transmission or both and reception of multiple signals on a signaling line circuit, a transmission channel or a communication channel, including means for positively identifying each signal.

H. Notification appliances: A fire alarm system component such as a bell, horn, speaker, light or text display that provides audible, tactile or visible outputs or any combination thereof.

I. Notification appliance circuit: A circuit or path directly connected to a notification appliance(s).

J. Signaling line circuit: A circuit or path between any combination of circuit interfaces, control units or transmitters over which multiple system input signals or output signals or both, are carried.

K. Supervisory signal: A signal indicating the need for action in connection with the supervision of guard tours, the fire suppression systems or equipment or the maintenance features of related systems.

L. Trouble signal: A signal initiated by the fire alarm system or device indicative of a fault in a monitoring circuit or component.

1.04 SYSTEM DESCRIPTION

A. The fire alarm system shall be zone non-coded addressable. It shall be 24 VDC closed circuit, electronically supervised, common signaling, device indicating, automatic alarm type; operating from manual pull stations, smoke detectors, heat detectors and sprinkler system switches. The system shall include all wiring, raceways, pull boxes, terminal cabinets, outlet and mounting boxes, control equipment, alarm and supervisory signal initiating devices, alarm notification devices and all other accessories required for a complete operating system.

B. Provide system with the following circuit functions:

1. Class B, Style B for initiating device circuits.
2. Class B, Style 4 for signaling line circuits.
3. Class B, Style Y for notification appliance circuits.

C. For system description of output controls and monitoring, based on input signals, refer to Sequence of Operation Matrix on the Drawings.

D. In addition to the above sequence of operation, the FACP shall perform the following functions:

1. Identify every addressable device by location, priority and device type.
2. Read and display at FACP the sensitivity of addressable smoke and heat detection devices.
3. Remain 100% operational and capable of responding to an alarm condition while in the routine maintenance mode.
4. Be capable of supporting non-addressable as well as addressable devices.
5. Allow individual programmable control of each connected remote or panel-mounted relay.
6. Provide the user with the field programmability to add or change addressable device types and custom messages on-site.
7. Display up to 127 alarms and/or up to 127 trouble indications, one at a time, as a list on the system printer/terminal.
8. Change the status of configured circuits (arming or disarming) and change status of relays.
9. Generate an addressable detector sensitivity report providing a chamber voltage listing (device testing) for each detector.

1.05 SUBMITTALS

A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:

1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
2. Describe system operation, equipment and dimensions and indicate features of each component.
3. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
4. Shop Drawings shall include:
   a. Basic:
      1) Name of Owner and occupant.
      2) Address of the building.
      3) Contractor’s name, address, telephone number and license number.
   b. Symbols legend.
   c. Equipment list showing quantity, make, model and CSFM listing number for each device.
   d. Wire and cable schedule.

e. Scope of Work with overall system description.

f. Sequence of operation matrix with system inputs signals and output functions.

g. Code summary and Building type.

h. Assignment of Class and/or Style designation for device circuits.

i. Plot plan and floor plans of building with partitions, walls and room identification, showing locations of each device and control/monitoring equipment, conduit routing and size and cable/conductor type and quantity. Field devices shall all have a discrete identification designation located adjacent to each device on the Drawings.

j. Point-to-point wiring diagram in block or riser format showing all fire alarm components, device designations, conduit, wire types and sizes.

k. Provide 1/4" scale plan of equipment layout in main fire control room.

l. Include elevations of control panel and remote annunciator panel(s).

m. Elevation indicating mounting heights for manual pull stations, audible and visual devices and combination audible/visual devices.

n. Rated penetration details.

o. Typical wiring diagram details of field devices.

p. Detector mounting details at HVAC ducts.

q. Battery standby calculations showing total standby power needed to meet the specified system requirements.

r. Voltage drop calculations for system wiring circuits.

5. Furnish structural calculations for equipment anchorage as described in Section 260010: Basic Electrical Requirements.

6. Submit Manufacturer's installation instructions.

7. Complete bill of materials listing all components.

8. Provide California State Fire Marshal ‘CSFM’ listing sheet for each device.

9. Warranty.

B. Contractor shall submit approved Shop Drawings for review by Engineer prior to the purchase and installation of equipment. Drawings shall be wet stamped and signed by a registered professional Engineer.

C. Record Drawings:

1. Furnish Record Drawings as described in Section 260010: Basic Electrical Requirements, utilizing Shop-Drawing submissions with updated field conditions. These Drawings shall include but not be limited to the following:

a. Plot plans and building floor plans, showing point-to-point wiring location of and conduit routing to all devices.

b. Block Diagram/Riser Diagram showing the FACP, system components and all conduit and wire type/sizes between each.

2. Drawings shall be incorporated into the Record Drawing submission.

3. Final acceptance will not be made until the Engineer has approved the Record Drawings.

1.06 OPERATION AND MAINTENANCE MANUAL

A. Supply operation and maintenance manuals in accordance with the requirements of Section 260010: Basic Electrical Requirements, to include the following:

1. A detailed explanation of the operation of the system.

2. Instructions for routine maintenance.
3. Pictorial parts list and part numbers.
4. Schematic Drawings of wiring system, including all initiation and annunciation devices, control panel, annunciators, etc.
5. Telephone numbers for the authorized parts and service distributors.
6. Final testing reports.

1.07 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the units specified herein shall be new, unused and currently under production.

B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.08 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery: Fire alarm system components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.

C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

1.09 WARRANTY

A. Units and components offered under this Section shall be covered by a 2 year parts and labor warranty for malfunctions resulting from defects in materials and workmanship. Warranty shall begin upon acceptance by the Owner.

B. The warranty package shall include, but not be limited to the following:

1. Emergency maintenance service.
2. Service by factory trained service representative of system Manufacturer.
3. Replacement of any defective components.

1.10 SYSTEM START-UP

A. Upon completion of installation, a factory trained dealer service representative shall perform initial start-up of the fire alarm system. Sufficient time shall be allowed to properly check the system out and perform required minor adjustments before the Engineer's witnessed test shall begin.

1.11 MAINTENANCE

A. Extra Material:

1. Provide the following fire alarm system components as extra materials, matching the products installed and packaged for storing.

a. Manual pull station: Furnish a quantity equal to 10 percent of the number installed.
b. Detectors: Furnish a quantity equal to 10 percent, for each type of the number installed.
c. Strobes, Horn/strobes: Furnish a quantity equal to 10 percent of the number installed.
d. Horns: Furnish a quantity equal to 10 percent of the number installed.

B. Maintenance Service:

1. For a period of one year following acceptance the equipment Supplier shall have a person(s) familiar with this Project attend four quarterly meetings with the Owner's Representative to review system performance, operation and any system problems. That person shall provide a written summary of the items discussed in each meeting and a schedule of when the system problems will be corrected. The report is due within 7 working days after each meeting.
2. During the eleventh month following system acceptance, on a weekend day, the equipment Supplier shall perform a complete test of the system, in a manner similar to the acceptance test. A written report shall be submitted to the Owner certifying that each initiating device has been tested. A copy of these test forms shall be submitted to the Engineer for review and acceptance.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.

1. Silent Knight IFP-2000ECS

B. Substitutions: no substitutions.

2.02 CONTROL PANEL WITH EMERGENCY COMMUNICATION SYSTEM

A. The fire alarm control panel (FACP) shall be the Silent Knight IFP-2000ECS analog addressable control panel. The audio amplifiers shall be the Silent Knight ECS-50W, ECS-125W, or ECS-DUAL50W voice evacuation units. The FACP must have a 9 amp power supply and be capable of expansion to a minimum of 54 total amps via bus connected expander modules that supervise low battery, loss off AC and loss of communication.

B. The system must contain at least one (1) Silent Knight ECS-50W, ECS-125W, or ECS-DUAL-50W watt amplifier and shall be expandable from 50 to 2000 watts utilizing up to 15 additional amplifiers. The ECS-50W and ECS-125W amplifiers shall be capable of adding a 4 zone splitter (Silent Knight ECS-CE4) to distribute the audio information to different locations in the installation. The system shall have the capability of controlling up to 40 notification zones. The amplifiers must contain the capability of being remotely located through a four-wire SBUS communications circuit and a two-wire VBUS voice circuit. The system shall have the capability of adding up to 7 ECS-RCU2000 remote command units.

C. The voice evacuation system must have the capability of downloading fifteen (15) 60 second messages and utilize DSP technology for higher audio intelligibility.

D. The voice evacuation system shall be capable of operating at 25vrms or 70.7vrms (ECS-50W and ECS-DUAL50W only) and must be field selectable at the amplifier level. Systems that require additional modules for voltage conversion shall not be accepted.

E. The FACP must have Day/Night sensitivity capabilities on detectors and be capable of supporting up to 636 analog addressable points. This shall be accomplished via signaling line circuits (SLC) capable of supporting a minimum of 159 detectors and 159 module devices each. The main panel will contain one SLC circuit with the option of utilizing 5815XL expander modules. The communication protocol on the SLC loop must be digital.

F. The FACP must support a minimum of eight programmable Flexput™ circuits. The panel must have a built in 160 character LCD annunciator with the capability of having an additional supervised remote annunciators connected in the field.

G. The FACP must have a built in UL approved digital communicator. The communicator must allow local and remote up/downloading of system operating options, event history, and detector sensitivity data.

H. The FACP must automatically test the smoke detectors in compliance with NFPA standards to ensure that they are within listed sensitivity parameters and be listed with Underwriters Laboratories for this purpose.

I. The FACP must compensate for the accumulation of contaminants that affect detector sensitivity.

J. The FACP must have day/night sensitivity adjustments, maintenance alert feature (differentiated from trouble condition), detector sensitivity selection, auto-programming mode (Jumpstart) and the ability to upgrade the core programming software on site or over the telephone.

K. The FACP shall have a Jumpstart feature that can automatically enroll all properly connected accessories into a functional system within 60 seconds of powering up the panel. Panels that do not have these capabilities will not be accepted.

L. The main communication bus (SBUS RS485) shall be capable of class A or class B configuration with a total SBUS length of 6,000 feet.

2.03 SYSTEM WIRING

A. The Signaling Line Circuit (SLC) and Data Communication Bus (SBUS) shall be wired with standard NEC 760 compliant wiring. No twisted, shielded or mid capacitance wiring is required for standard installations. All FACP screw terminals shall be capable of accepting 14-18 AWG wire. All system wiring shall be in accordance with the requirements of NFPA 70, the National Electrical Code (NEC) and also comply with article 760 of the NEC.

2.04 SIGNALING LINE CIRCUITS

A. Each SLC shall be capable of a wiring distance of 10,000 feet from the panel or SLC driver module (5815XL) and be capable of supporting 318 devices. The communication protocol to SLC devices must be digital. Any SLC loop device, which goes into alarm, must interrupt the polling cycle for priority response from the FACP. The FACP must respond consistently to a device that goes into alarm on an SLC in within 10 seconds. The auxiliary 5815XL SLC loop module must be capable of being located up to 6,000 feet from the FACP on a SBUS, which is separate from the SLC. The SLC shall be capable of functioning in a class A or class B configuration.

2.05 SLC LOOP DEVICES

A. Devices supported must include analog photoelectric, ionization smoke detectors, analog heat detectors, addressable input modules, relay output modules or addressable notification modules. Each SLC loop shall support up to 159 detectors and 159 modules.

2.06 ANALOG DETECTOR FUNCTIONS

A. The products of combustion detectors must communicate analog values using a digital protocol to the control panel for the following functions:

1. Automatic compliance with NFPA 72 standards for detector sensitivity testing
2. Drift compensation to assure detector is operating correctly
3. Maintenance alert when a detector nears the trouble condition
4. Trouble alert when a detector is out of tolerance

2.07 SENSITIVITY FUNCTION

A. The FACP shall have the ability to set three different sensitivity levels. A zone can be programmed to a day and a night sensitivity value. The day/night schedule shall allow for 16 holiday dates that are user programmable to allow the FACP to respond at the night level on those days.

2.08 PROGRAMMABLE FLEXPUTS

A. The FACP shall support eight programmable Flexput circuits that are capable of being programmed as supervised reverse polarity notification circuits or supervised auxiliary power circuits that can be programmed as continuous, resettable or door holder power. The circuits shall also be programmable as input circuits in class A or B configurations to support dry contact or compatible two wire smoke detectors.

2.09 ADDRESSABLE NOTIFICATION MODULE

A. The contractor shall furnish and install where indicated on the plans, addressable notification modules, Silent Knight Model IDP-Control. The modules shall be U.L. listed compatible with Silent Knight's IFP-2000ECS fire alarm control panel. The notification module must provide one class A (Style Z) or class B (Style Y) notification output with one auxiliary power input. The notification module

must be suitable for mounting in a standard 4 square electrical box and must include a plastic cover plate. The notification module must provide an LED that is visible from the outside of the cover plate. The notification module must be fully programmable for such applications as required by the installation. The IDP-Control shall reside on the SLC loop and can be placed up to 10,000 feet from the control or 5815XL SLC loop module.

2.10 ANNUNCIATOR

A. The main control must have a built in annunciator with a 160-character LCD display and feature LED's for Alarm, Supervisory, Trouble, Silenced and Power. When in the normal condition the LCD shall display time and date based on a 200 year clock which is capable of automatic daylight savings time adjustments. All controls and programming keys are silicone mechanical type with tactile and audible feedback. Keys have a travel of .040 in. No membrane style buttons will be permissible. The annunciator must be able to silence and reset alarms through the use of a keypad entered code. The annunciators must have twenty levels of user codes that will allow the limitation of operating system programming to authorized individuals.

2.11 REMOTE ANNUNCIATORS

A. The fire system shall be capable of supporting remote annunciators. LCD Remote annunciator, Model RA-2000, shall have the same control and display layout so that they match identically the built in annunciator. Remote annunciators shall be available in two colors, red and light gray. Remote annunciators shall have the same functionality and operation as the built-in annunciator. All annunciators must have 160-character LCD displays and must feature five LED's for Alarm, Supervisory, Trouble, Silenced, and Power. All controls and programming keys are silicone mechanical type with tactical and audible feedback. Keys shall have a travel of .040 inches. No membrane style buttons will be permitted.

B. The annunciator must be able to silence and reset alarms through the use of a code entered on the annunciator keypad. The annunciator must have twenty levels of user codes that will limit the operating system programming to authorized individuals. The control panel must allow all annunciators to accommodate multiple users input simultaneously. Remote annunciators shall be capable of operating at a distance of 6,000 feet from the main control panel on unshielded, non-twisted cable.

2.12 I/O MODULE

A. The fire system shall be able to support I/O modules (SK5880) that shall be used to drive remote LED graphic style displays and accommodate up to eight dry contact type switch inputs, including ECS inputs. The I/O modules shall each drive up to 40 LEDs without requiring external power connections. The I/O module inputs shall be supervised and be suitable for alarm and trouble circuits as well as reset and silence switches. The system shall also support up to 40 LED drivers that reside on the two-wire SLC loop. These driver boards shall contain 80 LED outputs that are powered by an external power source.

2.13 SERIAL/PARALLEL INTERFACE

A. The fire system shall be capable of supporting up to two serial/parallel interfaces (SK5824) that are capable of driving standard computer style printers. The interface shall be programmable for the serial and parallel ports and allow printing of events as they occur.

2.14 DISTRIBUTED POWER MODULES

A. The contractor shall supply power modules, Models RPS-1000 and 5496, compatible with the IFP-2000ECS fire alarm control panel. The RPS-1000 power module must have 6 amps of output power, six Flexput™ circuits rated at 3amps each, and two form C relay circuits rated at 2.5 amps at 24 volts DC. The six Flexput™ circuits shall have the same functionality as the Flexput™ circuits on the main panel. The RPS-1000 shall be capable of being connected via an RS-485 system bus (SBUS) at a maximum distance of 6,000 feet from the main control panel. The RPS-1000 shall contain an additional RS-485 bus that is completely compatible with all IFP-2000ECS add on modules; including 5815XL SLC expanders, RA-2000-SK5865-SK5880 annunciators, 5824 serial/parallel module and addressable devices. The RPS-1000 will also act as a bus repeater so that additional RS-485 (modules) devices can be connected at a maximum distance of 6,000 feet from the power module.

B. The 5496 power module must have 6 amps of output power and four circuits rated at 3 amps each. The four circuits can be programmed as notification outputs or auxiliary power outputs of door holder, constant and resettable types.

2.15 DIGITAL COMMUNICATOR

A. The digital communicator must be an integral part of the control panel and be capable of reporting all zones or points of alarm, supervisory, and trouble as well as all system status information such as loss of AC, low battery, ground fault, loss of supervision to any remote devices with individual and distinct messages to a central station or remote station. The communicator must also be capable of up/downloading of all system programming options, event history and detector sensitivity compliance information to a PC on site or at a remote location.

B. The communicator shall have an answering machine bypass feature that will allow the panel to respond to communication even on phone lines that have other communication equipment present. The communicator must be capable of reporting via SIA and Contact ID formats. The communicator shall have a delayed AC loss report function which will provide a programmable report delay plus a 10-25 min random component to help ease traffic to the central station during a power outage. No controls that use external modems for remote programming and diagnostics shall be accepted. Coded, Zone 8 Coded, Custom Output Pattern 1, Custom Output Pattern 2, Custom Output Pattern 3, Custom Output Pattern 4, Constant, System Sensor Synchronization, Wheelock Synchronization, Gentex Synchronization, Amseco Synchronization, and Faraday Synchronization. This mapping/cadence pattern shall be supported by all system power supplies. 15 recordable one minute messages are available that can be mapped to eight ECS buttons. ECS messages can have priority.

2.16 ON-BOARD PROGRAMMER

A. The FACP shall have an on board programmer which will allow for all system functions and options, except for mapping, to be programmed via the on board annunciator keypad. Any panel that does not have this capability will not be accepted.

2.17 DOWNLOADING SOFTWARE

A. The fire alarm control panel must support up/downloading of system programming from a PC. The FACP must also be able to download the detector sensitivity test results and a 1,000 event system event buffer to the PC. Communication shall take place over a direct connection to the PC and/or via the same telephone lines as the built in digital communicator and shall not require an external modem to be connected to the panel. The downloading software shall contain a code that will block unauthorized persons from accessing the panel via direct connection or over the phone lines.

2.18 ENGLISH LANGUAGE DESCRIPTIONS

A. The FACP shall provide the ability to have a text description of each system device, input zone and output group on the system. The use of individual lights to provide descriptions will not be acceptable.

2.19 SYSTEM OPERATION

A. Alarm

1. When a device indicates any alarm condition the control panel must respond within 10 seconds. All programmed audio and visual devices will activate at this time. The Alarm or Supervisory LED on the annunciator(s) should light and the LCD should prompt the user as to the number of current events. The alarm information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators.

2. When the alarmed device is restored to normal, the control panel shall be required to be manually reset to clear the alarm condition, except that the alarms may be silenced as programmed.

3. An alarm shall be silenced at the main or remote annunciators. When silenced, this shall not prevent the resounding of subsequent events if another event should occur (subsequent alarm feature). When alarms are silenced the silenced LED on the control panel, and on any remote annunciators shall remain lit, until the alarmed device is returned to normal.

B. Troubles

1. When a device indicates a trouble condition, the control panel System Trouble LED should light and the LCD should prompt the user as to the number of current events. The trouble information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators.

2. When the device in trouble is restored to normal, the control panel shall be automatically reset. The trouble restore information must be stored in event memory for later review. Event memory must be available at the main and all remote annunciators. A trouble shall be silenced at the main or remote annunciators. When silenced, this shall not prevent the resounding of subsequent events if another event should occur.

C. Supervision Methods

1. Each SLC loop shall be electrically supervised for opens and ground faults in the circuit wiring, and shall be so arranged that a fault condition on any loop will not cause an alarm to sound. Additionally, every addressable device connected to the SLC will be supervised and individually identified if in a fault condition. The occurrence of any fault will light a Trouble LED and sound the system trouble sounder, but will not interfere with the proper operation of any circuit which does not have a fault condition.

2. Each indicating appliance circuit shall be electrically supervised for opens, grounds and short circuit faults, on the circuit wiring, and shall be so arranged that a fault condition on any indicating appliance circuit or group of circuits will not cause an alarm to sound. The occurrence of any fault will light the trouble LED and sound the system trouble sounder, but will not interfere with the proper operation of any circuit which does not have a fault condition.

2.20 CONTROL UNIT

A. System Cabinet

1. The system cabinets shall be red and can be either surface or flush mounted.

B. Audible System Trouble Sounder

1. An audible system trouble sounder shall be an integral part of the control unit. Provisions shall also be provided for an optional supervised remote trouble signal.

C. Power Supply and Charger

1. The entire system shall operate on 24 VDC, filtered switch mode power supply with the rated current available of 9 Amps. The FACP must have a battery charging circuit capable of complying with the following requirements:

2. Sixty (60) hours of battery standby with five (5) minutes of alarm signaling at the end of this sixty (60) hour period (as required per NFPA 72 remote station signaling requirements) using rechargeable batteries with automatic charger to maintain standby gel-cell batteries in a fully charged condition. OR Twenty-four (24) hours of battery standby with five (5) minutes of alarm signaling at the end of this twenty-four (24) hour period (as required per NFPA 72 central station signaling requirements) using rechargeable batteries with automatic charger to maintain gel-cell batteries in a fully charged condition.

3. The power supply shall comply with U.L. Standard 864 for power limiting.

4. The FACP will indicate a trouble condition if there is a loss of AC power or if the batteries are missing or of insufficient capacity to support proper system operation in the event of AC failure. A “Battery Test” will be performed automatically every minute to check the integrity of the batteries. The test must disconnect the batteries from the charging circuit and place a load on the battery to verify the battery condition.

5. In the event that it is necessary to provide additional power one or more of the Model RPS-1000 or 5496 distributed power modules shall be used to accomplish this purpose.

D. Connections and Circuits

1. Connections to the light and power service shall be on a dedicated branch circuit in accordance with the National Fire Alarm Code NFPA 72, National Electrical Code (NEC) NFPA 70, and the local authority having jurisdiction (AHJ). The circuit and connections shall be mechanically protected.
2. A circuit disconnecting means shall be accessible only to authorized personnel and shall be clearly marked “FIRE ALARM CIRCUIT CONTROL”.

2.21 ACCESSORY COMPONENTS

A. The FACP shall support the following devices on the RS-485 data bus:

1. ECS-VCM Voice Control Module
2. ECS-SW24 Additional 24 Zone Switch Module
3. ECS-50W 50 Watt Amplifier
4. ECS-125W 125 Watt Amplifier
5. ECS-DUAL50W 50/100 Watt Dual Channel Amplifier with 50 Watt Backup
6. ECS-CE4 4 Zone Splitter
7. ECS-RCU Remote Microphone (7 max.)
8. 5815XL Signaling Line Circuit Expander (SLC) Module
9. 5824 Printer Interface Module
10. RA-2000 LCD Remote Annunciator
11. 5865-3 LED Remote Annunciator
12. 5865-4 LED Remote Annunciator with reset and silence switches
13. 5880 LED I/O module
14. RPS-1000 Intelligent Distributed Power Module
15. 5496 Intelligent Distributed Power Module

B. The FACP shall support the operation of 159 detectors and 159 addressable modules per SLC loop without regard to device type. The following devices shall be supported:

1. IDP-Photo Addressable Photoelectric Smoke detector
2. IDP-Photo-T Addressable Photoelectric Smoke detector with Thermal
3. IDP-PhotoR Addressable Photoelectric Smoke detector with Relay
4. IDP-Ion Addressable Ionization Sensor
5. IDP-Heat Addressable Heat Sensor
6. IDP-Heat-ROR Addressable Heat with Rate of Rise
7. IDP-Heat-HT Addressable Heat High temp 190°
8. IDP-Acclimate Addressable Multi Criteria Smoke detector with thermal
9. IDP-6AB 6” detector base
10. DNR Addressable Duct Detector Housing
11. IDP-Relay Addressable Relay Module
12. IDP-Relay-6 Addressable Multi Relay Module
13. IDP-RelayMon-2 Addressable Relay/Input Module
14. IDP-Monitor Addressable Input Module (Class A or B)

15. IDP-Minimon Mini Input Module
16. IDP-Monitor-2 Addressable Dual Input Module
17. IDP-Monitor-10 Addressable Multi Input Module (10)
18. IDP-Control Addressable Notification Module
19. IDP-Control-6 Addressable Notification Multi Module (6)
20. IDP-Zone Two Wire Smoke Detector Module
21. IDP-Zone-6 6 Multi Smoke Detector Module
22. IDP-Iso Isolation Module
23. IDP-Beam Addressable Beam Detector
24. IDP-Beam-T Addressable Beam Detector with Test feature
25. B224BI Addressable Isolator base
26. B224RB Detector Relay Base
27. B200SR Detector Sounder Base
28. B200S Intelligent Detector Sounder Base
29. RTS151KEY Remote Test Switch for Photoelectric Duct Detector
30. RTS151 Remote Test Switch for Photoelectric Duct Detector
31. IDP-Pull-SA Addressable Single Action Pull Station
32. IDP-Pull-DA Addressable Dual Action Pull Station

C. The FACP shall support these other Silent Knight devices via addressable input, addressable notification, or addressable output modules.

1. PS-DALOB Dual Action Manual Pull Outdoor Listed
2. PS-DAH Dual Action Manual Pull Hex Key reset
3. PS-SATK Single Action Manual Pull Station – Key Reset
4. PS-DATK Dual action Manual Pull Station – Key Reset
5. PS-DASP Dual action Manual Pull Station “Spanish”- Key reset
6. SB-I/O Surface mount back box for outdoor use.

2.22 FURNISH AND INSTALL, WHERE SHOWN ON THE DRAWINGS, THE FOLLOWING DEVICES

A. Manual Fire Alarm Stations

1. Manual fire alarm stations shall be non-coded, break glass, single or double action type, with a key operated test-reset lock in order that they may be tested, and so designed that after actual emergency operation, they cannot be restored to normal except by use of a key. The reset key shall be so designed that it will reset manual station and open FACP without use of another key. An operated station shall automatically condition itself so as to be visually detected, as operated, at a minimum distance of fifty feet, front or side. Manual stations shall be constructed of die cast metal or polycarbonate with clearly visible operating instructions on the front of the stations in raised letters. Stations shall be suitable for surface mounting on matching backbox, or semi-flush mounting on a standard single-gang box, and shall be installed within the limits defined by the Americans with Disabilities Act (ADA) dependent on manual station accessibility or per local requirements. Manual stations shall be installed in conjunction with an addressable input module, IDP-Monitor or IDP-Minimon. Manual stations shall be Silent Knight Underwriters Laboratories listed.

B. Remote Power Supplies

1. The remote power supplies for notification appliances shall be the Silent Knight Model RPS-1000 or 5496. The Model RPS-1000 intelligent power supply shall wire on the main SBUS and be programmed through the IFP-2000ECS. It will support 6 amps of 24 volt DC power with 6 Flexput™ circuits, rated at 3 amps each. Two additional 5815XL SLC loop expanders shall be capable of be install in the cabinet. The power supply will also regenerate the SBUS for an additional 6000 feet of SBUS capability.

2. The Silent Knight 5496 intelligent power supply shall wire on the main SBUS and be programmed through the IFP-2000ECS. It will support 6 amps of 24 volt DC power with 4 notification circuits, rated at 3 amps each.

3. The remote power supply model 5499 or 5495 may also be used on the system. These power supplies are activated by a notification circuit or an IDP-Control module and support 6amps of 24VDC power, with 4 notification circuits, rated at 3amps each.

C. Notification Devices

1. The visible and audible/visible signal shall be System Sensor series signal devices and be listed by Underwriters Laboritories Inc. per UL 1971 and/or 1638 and UL 464. The notification appliance (combination audible/visible units only) shall produce a peak sound output of 90dba or greater as measured in an anechoic chamber. The signaling appliance shall also have the capability to silence the audible signal while leaving the visible signal energized with the use of a single par of wires. Additionally, the user shall be able to select either continuous or temporal tone output with the temporal signal having the ability to be synchronized. The visible signaling appliance shall maintain a minimum flash rate of 1Hz or greater regardless or power input voltage. The appliance shall also be capable of meeting the candela requirements of the blueprints presented by the engineer and ADA. The appliance shall be polarized to allow for electrical supervision of the system wiring. The unit shall be provided with terminals with barriers for input/output wiring and be able to mount to a single gang or double gang box or double workbox with the use of an adapter plate. The unit shall have an input voltage range of 20-30 volts with either direct current or full wave rectified power.

D. Smoke Detectors

1. Smoke detectors shall be Silent Knight Model IDP-Photo ceiling mounted, analog/addressable photoelectric smoke detectors. The combination detector head and twist lock base shall be U.L. listed compatible with the Silent Knight IFP-2000ECS fire alarm control panel. The base shall permit direct interchange with Silent Knight's IDP-Ion, IDP-Acclimiate, or the IDP-Heat detectors. The base shall be the appropriate twist lock base B210LP. The smoke detector shall have a flashing status LED for visual supervision. When the detector is actuated, the flashing LED will latch on steady at full brilliance. The detector may be reset by actuating the control panel's reset switch. The sensitivity of the detector shall be capable of being selected and measured by the control panel without the need for external test equipment. The vandal security-locking feature shall be used in those areas as indicated on the drawing. The locking feature shall be field selectable when required. It shall be possible to perform a sensitivity test of the detector without the need of generating smoke. The test method shall simulate the effects of products of combustion in the chamber to ensure testing of the detector circuits. Detectors shall have completely closed back to restrict entry of dust and air turbulence and have a 30 mesh insect screen. Electronics of the unit shall be shielded to protect against false alarms from E.M.I. and R.F.I.

E. Heat Detectors

1. Furnish and install analog/addressable heat detectors, Silent Knight model IDP-Heat. The combination heat detector and twist lock base shall be U.L. listed compatible with the Silent Knight IFP-2000ECS fire alarm control panel. The base shall permit direct interchange with the Silent Knight IDP-Ion, IDP-Photo, or IDP-Acclimate detectors. The base shall be appropriate twist lock base B210LP. The heat detector shall have a flashing status LED for visual supervision. When the detector is actuated, the flashing LED will latch on steady at full brilliance. The detector may be reset by actuating the control panel's reset switch. The vandal security-locking feature

shall be used in those areas as indicated on the drawings. Electronics of the unit shall be shielded to protect against false alarms from E.M.I. and R.F.I.

F. Duct Detectors

1. Duct Detector shall be Silent Knight Model DNR Duct Detector Housing. A separate IDP-Photo or IDP-PhotoR is required. The duct detector housing shall be capable of housing the IDP-Relay module for optional output devices.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Contractor shall thoroughly examine Project site conditions for acceptance of fire alarm system installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.02 INSTALLATION

A. General:

1. Install fire alarm system in accordance with Manufacturer's written instructions, as indicated on the Drawings and as specified herein.

2. The 120/208-volt, 3 wire, 60 cycles AC two-20A circuit supply required to power the system shall be connected as indicated on the Drawings. Connect to red colored circuit breaker(s) in panel board. Identify circuit as "Fire Alarm Circuit Control."

B. Wiring:

1. Installer’s Responsibilities

a. The installer shall coordinate the installation of the fire alarm equipment.

b. All conductors and wiring shall be installed according to the manufacturer’s recommendations.

c. It shall be the installer’s responsibility to coordinate with the supplier, regarding the correct wiring procedures before installing any conduits or conductors.

2. Installation of System Components

a. System components shall be installed in accordance with the latest revisions of the appropriate NFPA pamphlets, the requirements contained herein, National Electrical Code, local and state regulations, the requirements of the fire department and other applicable authorities having jurisdiction (AHJ).

b. All wire used on the fire alarm system shall be U.L. Listed as fire alarm protection signaling circuit cable per National Electrical Code, Articles 760.

3. Individual input and output device addressability as well as remote sensitivity measurement, supervision and power shall all be performed on the same pair of wires. Wiring shall be Class B.

4. Each Class B initiating circuit shall consist of a two wire circuit, allowing multiple T-taps and not requiring any end-of-line device for supervision. Each initiating circuit shall accommodate up to thirty (30) addressable programmable initiating devices. On the initial installation, only 21 devices are to be allowed per circuit to allow for future expansion.

5. Wiring for shielding certain conductors from others or routing in separate raceways, shall be as recommended by the Manufacturer's current requirements.

6. All wiring shall be installed in a continuous steel conduit system and shall be of the size recommended by the equipment Supplier. Refer to Section 260546: Signal Systems Raceway.

7. Wire color-coding shall remain the same throughout the system.

8. No wiring other than that directly associated with fire alarm detection, alarms or auxiliary fire protection functions (no 120 VAC), shall be permitted in fire alarm conduits.

9. Make conduit and wiring connections to sprinkler flow switches, sprinkler valve monitors, P.I.V., door hold-open/closure devices, fire/smoke dampers, elevator controller.
10. All wiring shall be checked and tested to insure that there are no grounds, opens or shorts.
11. All fire alarm junction boxes shall be color-coded and marked per Section 260553: Electrical Identification.
12. Wire nut splices are not allowed.
13. Wires shall be numbered at each connection, termination and junction point. Wire numbering tags shall be Brady Perma-Code, Westline or equal wire makers. Each group of wires shall be tagged with its destination at each panel, terminal box or junction box.

3.03 FIELD QUALITY CONTROL

A. Manufacturer's field service: Contractor shall arrange and pay for the services of a factory-authorized service representative to supervise the initial start-up, pretesting and adjustment of the fire alarm system.

B. Independent testing: Contractor shall arrange and pay for the services of an independent Testing Agency to perform all quality control electrical testing, calibration and inspection required herein. Testing Agencies objectives shall be to:

1. Assure fire alarm system installation conforms to specified requirements and operates within specified tolerances.
2. Field test and inspect to insure operation in accordance with Manufacturer's recommendations and Specifications.
3. Prepare final test report including results, observations, failures, adjustments and remedies.
4. Apply label on fire alarm system control panel upon satisfactory completion of tests and results.
5. Verify settings and make final adjustments.

C. At least three weeks prior to any testing, notify the Engineer so that arrangement can be made for witnessing test, if deemed necessary. All pretesting shall have been tested satisfactorily prior to the Engineer's witnessed test.

D. Pre-functional testing:

1. Provide Testing Agency with Contract Documents and Manufacturer instructions for installation and testing.
2. Visual and mechanical inspection:
   a. Inspect for physical damage, defects alignment and fit.
   b. Perform mechanical operational tests in accordance with Manufacturer's instructions.
   c. Compare nameplate information and connections to Contract Documents.
   d. Check tightness of all control and power connections.
   e. Check that all covers, barriers and doors are secure.
3. Electrical tests:
   a. The system shall be completely tested prior to final acceptance testing. All points shall be tested from point of initiation to the final point or points of annunciation. All circuits shall be tested for continuity and ability to transmit the required signal correctly to the FACP. Any problem due to wrong wire type, wire twist, impedance, mismatches, noise filtering or shielding shall be completely corrected during pretesting and prior to any final acceptance tests.
   b. Testing shall include each and every device in the system. Coordinate with other trades as necessary for testing.
      1) Sprinkler flow switches: Record time delay from water flow to alarm and adjust as necessary for a 30-50 second delay.

2) Tamper switches: Verify "trouble "signal is received and alarmed on closing of each valve.

3) Smoke detectors , in-duct smoke detectors and duct mounted smoke detectors: Test with actual or approved artificial smoke. Verify that reset does not occur when devices are cleared of smoke. Verify supervisory circuit function.

4) Door release: Verify that proper alarm activates every held-open door, roll-down doors and shutters, that doors close completely to the closed position.

5) Elevator recall: Verify that elevators recall to designated floor by testing elevator lobby detectors with smoke. This is necessary on the ground floor and one other only.

6) Audible/visual notification: Activate by means of an alarm-initiating device that audible and visual devices are clearly audible and/or visual throughout.

7) Central station notification: Verify that one set of conductors in the terminal cabinet becomes a short circuit on any "trouble" condition and that the other set becomes a short circuit on any "alarm" condition. Verify that the conductor groups are labeled properly.

c. Test report:

1) Provide a complete report listing every device, the date it was tested, the results and the date retested (if failure occurred during the previous test). The test report shall indicate that every device tested successfully.

2) Submit two typed copies of the test report in a neatly bound folder for review and approval. Failure to comply with this will result in a delay of final testing and acceptance.

E. Functional performance testing:

1. After the approval of the test report, provide a schedule of final testing to be done in the presence of the Inspector of Record and Owner's Representative. The schedule must be received by the Engineer a minimum of 2 weeks prior to the Final Test Date and must list the dates and time slots in which the various systems can be tested.

2. Coordination of the Final Test dates with all parties (General Contractor, Mechanical Contractor, Elevator Contractor, Inspector of Record, Owner and others) shall be the sole responsibility of the Contractor. If a party is required to be present during any phase of testing to activate a device, ensure that the party or a qualified representative of the party is present throughout that phase of the testing.

F. In the event that the system fails to function properly during the testing, as a result of inadequate pretesting or preparation, the Contractor shall bear all costs incurred by the necessity for retesting including test equipment, transportation, subsistence and the Engineer's hourly rate.

G. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

H. Contractor shall submit the Testing Agency's final report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.04 AS BUILT DRAWINGS

A. A complete set of reproducible “as-built” drawings showing installed wiring, color coding, and wire tag notations for exact locations of all installed equipment, specific interconnections between all equipment, and internal wiring of the equipment shall be delivered to the owner upon completion of system. Refer ti section 260010 for deliverable requirements.

3.05 OPERATING AND INSTRUCTION MANUALS

A. Operating and instruction manuals shall be submitted prior to testing of the system. Refer to section 260010 for quantities. Complete sets of operating and instruction manuals shall be delivered to the owner upon completion. User operating instructions shall be provided prominently displayed on a separate sheet located next to the control unit in accordance with U.L. Standard 864.

3.06 TEST RESULTS

A. Provide 2 sets of final electronic test results on CD.

3.07 SOFTWARE.

A. Provide a full version of the system software with all programming included to the owner at the completion and acceptance of the Fire Alarm system.

3.08 TRAINING

A. Refer to Specification Section 260800: Electrical Commissioning.

B. Factory authorized service representative shall conduct a 8 hour training seminar for Owner's Representatives upon completion and acceptance of system. Instructions shall include safe operation, maintenance and testing of equipment with both classroom training and hands-on instruction.

C. Contractor shall schedule training with a minimum of 7 days advance notice.

END OF SECTION

SECTION 28 65 16

SECURITY ALARM AND CCTV MONITORING SYSTEM

PART 1 - GENERAL

1.01 SUMMARY

A. Work included: Labor, materials and equipment necessary to complete the installation required for the item specified under this Division, including but not limited to:

1. Main controller/communicator panel/s.
2. Addressable Passive infrared detector “PIR.”
3. Addressable Door position contact switches.
4. Digital keypad arming/disarming stations.
5. Remote terminal cabinets.
6. System printer.
7. CCTV IP Cameras
8. Structured Cable.

B. Related Work: Consult all other Sections, determine the extent and character of related Work and properly coordinate Work specified herein with that specified elsewhere to produce a complete installation.

1.02 REFERENCES

A. Comply with the latest edition of the following applicable Specifications and standards except as otherwise indicated or specified:

1. Underwriters Laboratories, Inc. (UL):

UL 13;	Power-Limited Circuit Cables.
UL 294;	Access Control System Units.
UL 603;	Power Supplies for Use with Burglar-Alarm Systems.
UL 639;	Intrusion-Detection Units.
UL 1076:	Proprietary Burglar Alarm Units and Systems.

2. Electronics Industries Alliance (EIA):

EIA:	Testing standards.

1.03 SYSTEM DESCRIPTION

A. General requirements:

1. Provide a complete security alarm monitoring/keypad access control system as described herein.
2. Provide an IP camera system with On Board Storage and Browser Based Control.
3. The system shall comprise all necessary supervision, processing, display and printout circuitry and/or devices.
4. The system shall comprise redundant circuitry to ensure that no single independent failure of any component or component group shall cause consequential failure of the system.

B. Intrusion System Overview:

1. Passive infrared detectors shall be installed in all interior spaces indicated on the Drawings.
2. Flush mounted magnetic contact switches will be provided on all exterior doors to monitor and annunciate “open,” “closed,” ‘forced,” and “held” positions.

3. Both passive infrared detectors and door position switches shall transmit an alarm condition when the buildings are "armed" and system is violated.
4. Keypads shall be installed at each common building to provide individual zone control of a building. Keypads shall allow access to programmed zones via a 1 to 5 digit access code. They shall be capable of "disarming" or "arming" functions. A delay feature shall be built into the system to provide personnel sufficient time to disarm system upon entering a building prior to activation of an alarm sequence.
5. The monitoring and control panel shall include a programmable microprocessor and related circuitry capable of interpreting signals from the detection circuits and initiating appropriate alarms.
6. Activation of an intrusion alarm sensor shall cause a signal to be transmitted to a Central Station via telephone lines. A built-in dialer unit shall initiate signal transmission. In addition to alarm reporting, system shall report trouble, low battery and shunted zone indications.

C. CCTV System Overview

1. The CCTV IP cameras shall be located on the exterior of the buildings as shown on drawings.
2. The cameras shall have on board video storage.
3. Cameras shall be powered by PoE switches.
4. The cameras shall be monitored by a web based browser for access of video storage.

1.04 SUBMITTALS

A. Submit in accordance with the requirements of Section 260010: Basic Electrical Requirements, the following items:

1. Data/catalog cuts for each product and component specified herein, listing all physical and electrical characteristics and ratings indicating compliance with all listed standards.
2. Describe system operation, equipment and dimensions and indicate features of each component.
3. Clearly mark on each data sheet the specific item(s) being submitted and the proposed application.
4. Shop Drawings:
   a. Plot plans and building floor plans, showing location of and conduit routing to all devices.
   b. Point-to-point wiring diagram in block or riser formats showing all components, conduit and wire types and sizes with cable legend.
   c. Include elevations of control panel and remote terminal cabinet(s).
5. Furnish structural calculations for equipment anchorage as described in Section 260010: Basic Electrical Requirements.
6. Submit Manufacturer's installation instructions.
7. Complete bill of materials listing all components.
8. Warranty.

1.05 OPERATION AND MAINTENANCE MANUAL

A. Supply operation and maintenance manuals in accordance with the requirements of Section 260010: Basic Electrical Requirements, to include the following:

1. A detailed explanation of the operation of the system.
2. Instructions for routine maintenance.
3. Pictorial parts list and part numbers.
4. Schematic Drawings of wiring system, including all devices, control panel, terminal cabinets, etc.
5. Telephone numbers for the authorized parts and service distributors.

6. Final testing reports.

1.06 QUALITY ASSURANCE

A. All materials, equipment and parts comprising the units specified herein shall be new, unused and currently under production.

B. Only products and applications listed in this Section may be used on the Project unless otherwise submitted.

1.07 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Delivery: Security monitoring and control system components shall not be delivered to the Project site until protected storage space is available. Storage outdoors covered by rainproof material is not acceptable. Equipment damaged during shipment shall be replaced and returned to Manufacturer at no cost to Owner.

B. Storage: Store in a clean, dry, ventilated space free from temperature extremes. Maintain factory wrapping or provide a heavy canvas/plastic cover to protect units from dirt, water, construction debris and traffic. Provide heat where required to prevent condensation.

C. Handling: Handle in accordance with Manufacturer's written instructions. Be careful to prevent internal component damage, breakage, denting and scoring. Damaged units shall not be installed. Replace damaged units and return equipment to Manufacturer.

1.08 WARRANTY

A. Units and components offered under this Section shall be covered by a ***1*** year parts and labor warranty for malfunctions resulting from defects in materials and workmanship. Warranty shall begin upon acceptance by the Owner.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Products furnished by the following Manufacturers shall be acceptable if in compliance with all features specified herein and indicated on the Drawings.

1. Intrusion Alarm System

a. Honeywell Ademco - Vista 128FBP

2. CCTV Camera System

a. Verkada Inc.

B. Substitutions: Are not acceptable.

C. Intrusion Basis-of-design shall be the Honeywell VISTA 128FBP System, a burglary/access control/CCTV switching system that includes the following capabilities:

1. Listed for UL Commercial Burglary.
2. Compatible Detection Devices: Addressable.
3. Addressable Inputs: 241.
4. Access Readers: 15.
5. Onboard Communication: Digital Dialer.
6. Onboard Inputs: 9.
7. Communication Choices: Digital Dialer, TCP/IP, GSM.
8. Event Log: 1024.
9. Supports up to 250 zones.
10. Supports up to 8 separate partitions.
11. Supports up to 250 users.

12. Supports commercial wireless devices.
13. Wireless Inputs: 249.
14. Provides integrated security, access control, and CCTV switching capability.
15. Provides supervision of peripheral devices.
16. Supports up to 96 relay outputs.
17. Supports long-range radio (LRR) communication.
18. Provides scheduling capability to allow for automated operations.
19. Supports alarm reporting via Internet.
20. Interfaces with automation software.
21. Monitors smoke detector maintenance signals.
22. Capable of being installed using existing wiring.

D. Environmental Conditions: System shall be designed to function in the following environmental conditions:

1. Storage Temperature: Designed for a storage temperature of -10 degree C to 70 degree C.
2. Operating Temperature: System shall be designed for an operating temperature of 0 degree C to 50 degree C (32 degree F to 120 degree F).
3. Humidity: System shall be designed for normal operation in an 85% relative humidity environment.
4. Electromagnetic Interference: System shall meet or exceed the requirements of FCC Part 15, Class B devices, FCC Part 68, IEC EMC directive.

E. Power Requirements: Components shall have the following electrical specifications. The system shall operate using standard 120 VAC, 50 Hz/60 Hz power.

1. Control Primary Power: Transformer power shall be 16.5 VAC, 40 VA.
2. Backup Battery: Rechargeable 12 VDC, gel type, lead acid backup battery shall be provided. The battery shall be rated between 12 and 34-ampere hours (AH).
3. Alarm Power: 12 VDC, 1.7 amps for each bell output
4. Auxiliary Standby Power: 12 VDC, 0.75 amp maximum.
5. Total Power: Combined auxiliary standby and alarm currents shall be 2.3 amps.
6. Fusing: The battery input, auxiliary, and bell outputs shall be protected using PTC circuit breakers. All outputs shall be power limited.

F. Control Panel Enclosure: A metal cabinet, suitable for wall mounting. Dimensions shall not exceed 14.5 inches (36.8 cm) in height, 12.5 inches (31.8 cm) in width or 3 inches (7.6 cm) in depth.

G. Control Panel: The control panel shall be an 8-partition, UL commercial and burglary control panel that supports zones using basic hardwired, polling loop, and wireless zones, RF receivers, and relay modules. The control shall provide the ability to schedule time-driven events, and allow certain operations to be automated by pressing a single button. The system shall be capable of interfacing with an ECP long range radio (LRR) unit that can send Contact ID messages. The control shall provide integrated access control and CCTV-switching capability with the use of a single downloader and database.

1. Basic Hardwired Zones: Control shall provide 8 style-B hardwire zones with the following characteristics:
   a. EOLR supervision (if required for zones 2-8) shall support N.O. or N.C. sensors (EOLR supervision required for UL installations).
   b. Zones/Points shall be individually assignable to any partition.
   c. Supports up to 16 two-wire smoke detectors on zone 1.

d. Supports four-wire smoke or heat detectors on any zone (power to four-wire smoke detectors must be supervised with an EOL device).

2. Expansion Zones:

a. Polling Loop Expansion: Control shall support up to 120 additional hardwire zones using a built-in two-wire polling (multiplex) loop interface. The polling loop shall provide power and data to remote point modules, and constantly monitor the status of all zones on the loop. Maximum current draw shall not exceed 128 mA. The polling loop zones shall have the following characteristics:

1) Interface with RPM (Remote Point Module) devices that provide Class B, Style Y (e.g., 4208U/4208SN) or a combination of Class B, Style Y, and Class A, Style Z (e.g., 4208SNF) zones.

2) Individually assignable to one of 8 partitions.

3) Supervised by the control panel.

4) A 12,000 feet (3658 m) wire runs capability without using shielded cable.

5) Each RPM (Remote Point Module) enclosure shall be tamper protected.

3. Partitions: Control shall provide the ability to operate 8 separate areas, each functioning as if it had its own control. Partitioning features shall include:

a. A Common Lobby partition (1-8), which can be programmed to perform the following functions:

1) Arm automatically when the last partition that shares the common lobby is armed.

2) Disarm when the first partition that shares the common lobby is disarmed.

b. A Master partition (9), used strictly to assign keypads for the purpose of viewing the status of all 8 partitions at the same time (master keypads).

c. Assignable by zone.

d. Assignable by keypad/annunciator.

e. Assignable by relay to one or all 8 partitions.

f. Ability to display burglary and panic and/or trouble conditions at all other partitions' keypads (as a selectable choice).

g. Certain system features selectable by partition, such as entry/exit delay and subscriber account number.

4. User Codes: Control shall accommodate user codes, all of which can operate any or all partitions. Certain characteristics must be assigned to each user code, as follows:

a. Authority level (Master, Manager, or several other Operator levels). Each User Code (other than the installer code) shall be capable of being assigned the same or a different level of authority for each partition that it will operate.

b. Opening/Closing central station reporting.

c. Specific partitions that the code can operate.

d. Global arming capability (ability to arm all partitions the code has access to in one command).

e. Use of an RF (button) to arm and disarm the system (RF key must first be enrolled into the system).

5. Peripheral Devices: Control shall support up to 30 addressable ECP devices, which can be any combination of keypads, RF receivers, relay modules, and interactive phone module. Peripheral devices have the following characteristics:

a. Each device set to an individual address according to the device's instructions.

b. Each device enabled in system programming.

c. Each device's address shall be supervisable (via programming).

6. Keypad/Annunciator: Control shall accommodate up to 16 keypads or six (6) touch-screen (i.e.; advanced user interface) keypads. The keypads shall be capable of the following
    a. Performing all system arming functions.
    b. Being assigned to any partition.
    c. Providing four programmable single-button function keys, which can be used for:
        1) Panic Functions: activated by wired and wireless keypads; reported separately by partition.
        2) Keypad Macros: 32 keypad macro commands per system (each macro is a series of keypad commands). Assignable to the A, B, C, and D keys by partition.
7. Output Relays: A total of 96 relay outputs shall be accommodated using relay modules. Each relay module shall provide four (4) Form C (normally open and normally closed) relays for general-purpose use. The relays shall be capable of being:
    a. Programmed to activate in response to system events.
    b. Programmed to activate using time intervals.
    c. Activated manually.
    d. Assigned an alpha descriptor.
    e. A combination of 4204 (ECP) and 4101SN (polling loop) relays.
8. Integrated Access Control: Control shall be capable of the following:
    a. Providing a command that activates relays to allow access doors to open (e.g., lobby door), lights to be turned on or off, etc.
    b. Becoming a fully integrated access control system by using numerous VistaKey Single-Door Access Control Modules.
    c. Supporting up to 15 VistaKey Access Control Modules. The VistaKey Access Control Modules shall use the same Compass Downloader as the Vista-250BPT and shall be programmable from the Compass Downloader or the Keypad/Annunciators.
    d. Assigning any number of access control relays to each partition (up to 96 for the system).
    e. Supporting up to 500 access card holders using VistaKey.
9. Keyswitch: Control shall support the ADEMCO 4146 Keyswitch on any one of the system's 8 partitions. If used, zone 7 is no longer available as a protection zone.
10. Voltage Triggers: System shall provide voltage triggers, which change state for different conditions. Used with devices such as a remote keypad sounder or keyswitch ARMED and READY LEDs.
11. Event Log: System shall maintain a log of different event types (enabled in programming). The event log shall provide the following characteristics:
    a. Stories events.
    b. Viewable at the keypad or through the use of Compass software.
    c. Printable on a serial printer, including zone alpha descriptors.
12. Scheduling: Provides the following scheduling capabilities:
    a. Open/close schedules (for control of arming/disarming and reporting).
    b. Holiday schedules (allows different time windows for open/close schedules).
    c. Timed events (for activation of relays, auto-bypassing and un-bypassing, auto-arming and disarming, etc.).
    d. Access schedules (for limiting system access to users by time).
    e. End User Output Programming Mode (provides 20 timers for relay control).
    f. The system shall automatically adjust for daylight savings time.

13. Communication Features: Supports the following formats and features for the primary and secondary central station receivers:
    a. Formats: ADEMCO Express; ADEMCO Contact ID 4 and 10 Digit Acct number.
    b. Backup reporting: The system shall support backup reporting via the following: Secondary phone number; ECP long-range radio (LRR) interface; with ability to select long range radio (LRR) or dialup as the primary reporting method (dynamic signaling feature).
    c. Internet reporting: The system shall be capable of communicating with the central station via the internet using Alarmnet-i. It shall provide the user with the ability to control the system via a browser interface (i.e., AOL, Netscape, Internet Explorer). All packet data transmitted to the monitoring station shall be encrypted with a minimum of 1024 bits of encryption.
14. Audio Alarm Verification: Provides a programmable Audio Alarm Verification (AAV) that can be used in conjunction with an output relay to permit voice dialog between an operator at the central station and a person at the premises.
15. Cross-Zoning Capability: Helps prevent false alarms by preventing a zone from going into alarm unless its cross-zone is also faulted within 5 minutes.
    a. Alarm notification appliances, including but not limited to sirens horns, bells and strobes.
    b. Auxiliary devices capable of operating using full-wave rectified unfiltered voltage.
16. Exit Error False Alarm Prevention Feature: System shall be capable of differentiating between an actual alarm and an alarm caused by leaving an entry/exit door open. If not subsequently disarmed, the control panel shall:
    a. Bypass the faulted E/E zone(s) and/or interior zones and arm the system.
    b. Generate an Exit Error report by user and by zone so the central station knows it was an exit alarm and who caused it.
17. Built-in User's Manual and Descriptor Review: For end-user convenience, the control panel shall contain a built-in User's Manual. It shall include the following capabilities:
    a. By depressing any of the function keys on the keypad for five (5) seconds, a brief explanation of that function shall scroll across the alphanumeric display.
    b. By depressing the READY key for five (5) seconds, all programmed zone descriptors shall be displayed (one at a time). This feature shall provide a check for installers and ensure all descriptors have been entered properly.
18. Programming: Control shall be capable of being programmed locally or remotely using the ADEMCO Compass Downloader and shall be capable of:
    a. Uploading and downloading all programming information at 300 baud.
    b. Uploading and displaying firmware revision levels from the control.
19. Automation Software: The Control shall be capable of interfacing with automation software via an RS232 input on a single partition.
20. Include panel linking modules to network all panels with RS-485.

H. V-Plex-PASSIVE INFRARED DETECTOR “PIR”
    1. Wall mounted addressable wide-angle infrared detector with dual element pyro-electric sensor and directional pulse count.
    2. Swivel wall mount for adjusting PIR angle.
    3. Tamper switch shall protect against removal of front cover or unit from wall and shall alarm upon loss of power.
    4. Honeywell V-Plex PIR Detector: IS30350A-SN

I. DIGITAL KEYPAD

1. Wall mounted keypad to interface with controller to remotely "arm" and "disarm" designated alarm zones of the security monitoring system.
2. Honeywell Keypad: 6160-CR

J. DOOR POSITION CONTACT SWITCH

1. Concealed, flush mounting, addressable V-Plex magnetic contact switch, with self-locking housing, six-inch wire leads and single-pole/double-throw contacts.
2. Honeywell V-Plex Door Monitoring Module: 4191SN-WH
   a. 4191WA (3/4” adapter for steel doors)

K. Panel Link Module

1. Panel Link Module to Network the system panels to form a single operating intrusion system.
2. RS-485 cabling
3. Honeywell Panel Link Module: VA8200

L. Key Switch

1. Key switch device mounted on building exterior wall for arming/disarming the building.
2. Ademco Key Switch: 4146

M. Polling Loop Extender

1. Polling Loop Extender for extending the loop to an additional 120 V Plex devices
2. Honeywell Polling Loop Extender: 4297

N. Exterior motorized Bell

1. Notification Bell for audible exterior alarm.
2. Honeywell Motorized Bell and Box: AB12M

O. System Printer

1. System printer shall provide printed event information of the system.
2. Honeywell System Printer: 6220

P. Software

1. Software compatible with the Vista 128FBP intrusion alarm system

2.02 CCTV SYSTEM

A. The system shall be a standalone CCTV system utilizing onboard video storage and web based software. The system shall be capable of sharing real time camera feeds via SMS. The cameras shall be IP and powered via PoE network switches. Each camera will have built in IR.

B. Category 6 cable will be routed from each switch port to the exterior camera.

C. CCTV Cameras

1. CCTV IP Cameras
   a. Maximum Resolution:2048x1536 (3MP)
   b. Lens Type: Verifocal Lens
   c. Focus: Autofocus
   d. Focal Length: 3-9mm
   e. Aperture: F1.2 – F2.3
   f. Auto Iris: P-iris

g. Field Of View: 41-86 Horizontal, 31-64 Vertical, 51-113 Diagonal

h. Illuminators: 30 meters in low light

i. Power Input: IEEE 802.3af PoE, IEEE 802.3at PoE

j. Connector: RJ45

2. Required Options

a. Wall Mount Support

3. Verkada Camera: D50 with on camera 60 day storage option.

4. Mounting Brackets:

a. Pendant Cap Mounting Adapter Kit: ACC-MNT-1

1) Requires a 3/4" NPT threaded pipe (Length as required)

2) Use with ACC-MNT-2

b. Mounting Arm Kit: ACC-MNT-2

c. Wall Mounted L-Shaped Bracket Kit: ACC-MNT-3

PART 3 - EXECUTION

3.01 EXAMINATION

A. Contractor shall thoroughly examine Project site conditions for acceptance of the security system installation to verify conformance with Manufacturer and Specification tolerances. Do not commence with installation until all conditions are made satisfactory.

3.02 COORDINATION

A. Coordinate all installation requirements for door contacts, PIR detectors and Cameras with the owners representative prior to construction.

B. Re-use boxes and conduits and connections to doors and frames for complete operating installation. All connections shall be concealed.

C. Provide new conduits for all cameras and new device locations as indicated on drawings.

3.03 INSTALLATION REQUIREMENTS

A. Alarm circuits shall be terminated on screw terminals. Terminal blocks shall be Honeywell Intrusion #312 or Ideal #89612, with 600 volt screw terminals for #22 to #10 conductors. Submittal shall show internal elevation of terminal cabinets with equipment laid out.

B. All cables entering terminal cabinet shall be identified with Brady or E-Z code wire markers. Upon completion of installation, six (6) copies of one-line "as-built" wiring diagram shall be furnished to the Owner.

C. Each cable run on wiring diagram shall be identified with exact wire marker code (numerical or alphabetical) as appears in terminal cabinets.

D. Station locations shall be identified by architectural room numbers and in all ways one-line wiring diagram shall relate as closely as possible to architectural Drawings.

E. No splices shall occur in underground pull boxes. System wiring shall be continuous, without splices, from terminal cabinet to terminal cabinet and control panel to devices. All interior junction boxes shall be accessible and locations shall be recorded or "As-Built" Drawings.

F. Remove existing door contacts and cabling and replace with new, located in the existing door contact location.

G. Remove existing PIR detectors and cabling and replace with new, located in the same location.

H. Terminate camera category 6 cables on category 6 patch panels at the nearest IDF.

I. After all equipment is installed and operational, Contractor shall set angle settings, sensitivity settings, etc., of each detector to ensure optimum performance and minimal false alarms. Mask out areas, of each detector, to remove sources of false alarms (windows, heaters, air diffusers, etc.), from detection zones.

J. Coordinate exact location of cameras with the owners representative prior to construction.

K. Cameras shall be supported with mounting hardware suitable for the optimum viewing of the camera.

L. Secure mounts to the building plumb and level with manufacturers recommended hardware.

M. After all cameras have been installed and connected to the network, the final adjustment for optimal view shall be completed with input from the owners representative.

3.04 WIRING

A. Wiring from devices in building to terminal block at the same building shall be per the single line drawings or approved equal.

B. Wiring from each building terminal block to the control panel shall be per the single line drawings or approved equal.or approved equal.

C. Underground Wiring from each keypad, PIR, Door Contacts, Key switch and Linking Modules to the control panel shall be rated for Underground use and shall be per the single line drawings or approved equal.

D. Category 6e camera cable shall be installed in new conduit when exposed or above non-accessible ceiling. J-hooks are acceptable when above accessible ceiling. J-hooks shall be provided every 60” or less.

3.05 FIELD QUALITY CONTROL

A. Manufacturer's field service: Contractor shall arrange and pay for the services of a factory-authorized service representative to supervise the initial start-up, pretesting and adjustment of the security system.

B. Pretesting objectives shall be to:

1. Assure security system installation conforms to specified requirements and operates within specified tolerances.

2. Field test and inspect to ensure operation in accordance with Manufacturer's recommendations and Specifications.

3. Prepare final test report including results, observations, failures, adjustments and remedies.

4. Apply label on security system control panel upon satisfactory completion of tests and results.

5. Verify settings and make final adjustments.

C. At least three weeks prior to any testing, notify the Engineer so that arrangement can be made for witnessing test, if deemed necessary. All pretesting shall have been tested satisfactorily prior to the Engineer's witnessed test.

D. Prefunctional testing:

1. Visual and mechanical inspection:

a. Inspect for physical damage, defects alignment and fit.

b. Perform mechanical operational tests in accordance with Manufacturer's instructions.

c. Compare nameplate information and connections to Contract Documents.

d. Check tightness of all control and power connections.

e. Check that all covers, barriers and doors are secure.

2. Electrical tests:

   a. The system shall be completely tested prior to final acceptance testing. All points shall be tested from point of initiation to the final point or points of annunciation. All circuits shall be tested for continuity and ability to transmit the required signal correctly to the controller. Any problem due to wrong wire type, wire twist, impedance, mismatches, noise filtering or shielding shall be completely corrected during pretesting and prior to any final acceptance tests.

   b. Testing shall include each and every device in the system. Coordinate with other trades as necessary for testing.

      1) Door contact switches: Verify alarm signal received and annunciated at control panel.

      2) PIR detection devices: Adjust device sensitivity as required for coverage and location. Verify alarm signal received and annunciated at control panel.

      3) Keypads: Ensure that keypads function properly to “arm” and “disarm” the system.

      4) Key Switch: Ensure that key switches function properly to “arm” and “disarm” the building it is associated with.

      5) Linking Module: Ensure that all alarm panels on the campus are linked and communicating. Ensure that the main keypad can alarm/disarm individual buildings or all buildings as required.

      6) Remote station monitoring: Verify that the alarm condition is transmitted via telephone lines to remote monitoring station from auto-dialer/modem device within the control panel.

   c. Test report:

      1) Provide a complete report listing every device, the date it was tested, the results and the date retested (if failure occurred during the previous test). The test report shall indicate that every device tested successfully.

      2) Submit two typed copies of the test report in a neatly bound folder for review and approval. Failure to comply with this will result in a delay of final testing and acceptance.

E. In the event that the system fails to function properly during the testing, as a result of inadequate pretesting or preparation, the Contractor shall bear all costs incurred by the necessity for retesting including test equipment, transportation, subsistence and the Engineer's hourly rate.

F. Contractor shall replace at no costs to the Owner all devices which are found defective or do not operate within factory specified tolerances.

G. Contractor shall submit the Testing Agency's final report for review prior to Project closeout and final acceptance by the Owner. Test report shall indicate test dates, devices tested, results, observation, deficiencies and remedies. Test report shall be included in the operation and maintenance manuals.

3.06 TRAINING

A. Factory authorized service representative shall conduct a 2 hour training seminar for Owner's Representatives upon completion and acceptance of system. Instructions shall include safe operation, maintenance and testing of equipment with both classroom training and hands-on instruction.

B. Contractor shall schedule training with a minimum of 7 days advance notice.

END OF SECTION

SECTION 31 10 00

SITE CLEARING AND DEMOLITION

PART 1 – GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all site clearing and demolition work plus all related activities as shown on the Drawings and/or specified herein.

B. Scope of work:
The general extent of the site clearing and demolition work is shown on the Drawings and can include, but is not necessarily limited to the following:

1. Demolition, removal and disposal of designated items.
2. Careful removal, protection and re-installation of designated items.
3. Careful removal and salvage of designated items.
4. Disconnection and capping of existing utility and/or irrigation lines.
5. Underground utility locating.
6. Incidental demolition of abandoned utility and irrigation lines.
7. Spraying until dead, clearing, grubbing vegetated areas and/or roto-tilling in existing turf areas.
8. Protection of existing plant material.
9. Removal of designated trees and planting areas.
10. Related sections can include, but may not be limited to:

1.02 RELATED SECTIONS

A. Section 31 22 00: Excavating, grading and site preparation.

1.03 REFERENCES AND REGULATORY REQUIREMENTS

A. State of California Department of Transportation Standard Specifications, current edition.

1.04 SUBMITTALS

A. Conform to requirements of Section 01-33-00 Submittals and/or applicable Division One and Division Two specifications, General Conditions and Special Provisions.

B. Indicate the proposed time line for site clearing and demolition work including all required shut off times and capping of utility services on the project schedule.

C. Submit a written description of all proposed salvage, demolition and removal procedures to the District's representative for review before work is started. Procedures shall include:

1. List of items to be removed and disposition of materials specified to be salvaged.

2. Plan of coordination with other work in progress.

3. Disconnection schedule of utility services.

4. Detailed description of methods and equipment to be used for each operation.

5. Sequence of operations.

1.05 QUALITY ASSURANCE

A. The District shall obtain and pay for all permits required in connection with this work. Fees for the dumping of debris shall be paid for by the Contractor.

1.06 PROJECT CONDITIONS

A. Dust Control:

1. The contractor shall, at all times, prevent the formation of airborne dust on and around the project site with the use of sprinkled water or other means acceptable to the District's representative. Non-compliance with proper dust control measures shall be grounds for issuance of "stop work" orders by the District's representative until such time as satisfactory measures are implemented.

B. Utility Services:

1. Issue written notices of planned demolition operations to utility companies and coordinate site clearing and demolition improvements as requested by said utility companies.

2. Existing power poles and lines serving existing occupied buildings shall remain. Arrange all necessary work in order to maintain utilities not designated for removal.

3. Coordinate work in order to maintain utilities to any applicable temporary on-site facilities.

PART 2 - PRODUCTS - NOT USED

PART 3 - EXECUTION

3.01 EXAMINATION

A. Conform to Section 01 45 00 - Quality Control (as applicable).

B. Carefully identify limits of demolition.

C. Mark project areas as directed by the District's representative and as necessary to clearly identify the interface of items to be removed and items to be left in place intact.

3.02 PREPARATION

A. Protection:

1. Make provisions and take necessary precautions to protect all existing items not designated for removal. Any existing item or area damaged during construction operations shall be replaced or repaired to an "as-was" or better condition at no additional cost to the project and subject to the acceptance of the District's representative.

2. Erect barriers, fences, guard rails, enclosures, chutes, and shoring as necessary to protect personnel, structures, and utilities remaining intact.

3. Provide warning signs and lighting as necessary for vehicular and personnel protection. Maintain warning signs during construction as required by applicable safety ordinances and as reasonably prudent.

4. Coordinate arrangements for items to be salvaged and turned over to the District.

5. Notify Underground Service Alert (USA), (800) 227-2600, and local utility companies to verify locations of existing utilities a minimum of 48 hours prior to beginning work.

6. Underground utility locating - Please refer to section 3.06.

B. Traffic Access:

1. Ensure minimum interference with roads, streets, driveways, sidewalk and adjacent facilities.

2. Do not close or obstruct streets, sidewalk, alleys or passageways without acceptance from the District's representative.

3. Provide approved alternate routes around closed or obstructed traffic ways as required by the District's representative.

4. Maintain access to adjacent existing buildings to ensure uninterrupted operations during demolition work.

3.03 DEMOLITION

A. General:

1. Refer to drawings for extent of demolition work.

B. Paving:

1. Demolish paving in accordance with local noise ordinance regulations and as acceptable to the District's representative.

C. Filling:

1. Completely fill below-grade areas and voids resulting from demolition work. Install appropriate, acceptable fill material consisting of soil, gravel or sand, free of trash and debris, stones over 6" diameter, roots or other organic matter. Meet compaction requirements as specified.

D. Other:

1. If unanticipated mechanical, electrical or structural elements which conflict with intended function or design are encountered, investigate and measure both the nature and extent of the conflict. Submit report to District's representative in written, accurate detail. Pending receipt of directive from District's representative, rearrange selective demolition schedule as necessary to continue overall job progress without delay.

E. Clearing and Grubbing:

1. Remove trees as shown on Drawings. Removal shall include trunks and roots over one inch (r') in diameter to a depth of eighteen inches (18") below subgrade elevations.

2. Clear and strip surface vegetation and organic laden topsoil to a minimum four inch (4") stripping depth. All organic material shall be removed from subgrades of proposed paving

and synthetic turf surfacing areas. Exact depth of the stripping shall be verified by the geotechnical engineer prior to commencement of work. All stripped material not reused in new turf planting areas shall be removed from project site by Contractor and disposed of in a legal manner at no additional expense to the District.

3. Clear/strip vegetative material from soil surface and remove unless noted otherwise. Existing natural turf areas to be renovated and resodded need not be stripped, but may be cross-ripped in two opposite directions and roto-tilled into the ground to a minimum six inch (51!) depth. Remaining clods of turf shall be no larger than two inches (2") in diameter.

4. Contractor is responsible for stockpiling and protecting all topsoil needed for landscaping improvements. All new landscaped and renovated turf areas shall have a minimum of nine inches (9") of clean, organic topsoil.

F. Utilities and Related Equipment:

1. The locations of existing utilities, as may be shown on the Drawings, are approximate. Should existing utilities not shown on the Drawings be encountered during construction operations, notify the District's representative immediately, and re-direct work to avoid delay. The District's representative shall then determine what action, if any, is required.

2. Remove all abandoned utilities as indicated and as uncovered by the work, and terminate in a manner conforming to code.

3. Remove and salvage designated items and related equipment and deliver to a location acceptable to the District's representative.

G. Underground Piping:

1. Existing storm drain and irrigation systems, as may be shown on the Drawings, may be modified to allow for construction of new items as a part of this project. Caution shall be exercised so as not to damage underground piping not scheduled for removal.

2. Remove underground piping as indicated, or as necessary and backfill to designated compaction density.

3. Manholes and lines scheduled for removal which connect to active systems shall have their active remaining portions capped, plugged, or blind-flanged as appropriate.

4. Materials used for pipe terminations and temporary connections shall be the same as the existing lines. Fittings and flanges shall be of weight and class suitable for the service in which used.

5. All existing utilities, including irrigation systems shall be completed so that work to remove or modify minimum impact to the school and its students is ensured by the contractor.

3.04 SALVAGE

A. Demolition:

1. Materials or equipment to be demolished shall become the property of the Contractor except for items specified to be salvaged for the District.

2. Carefully remove items to be salvaged to avoid damage and deliver to location acceptable to the District's representative.

B. Replacement:

1. In the event items not scheduled to be demolished are damaged, promptly replace or repair such items to an “as-was" or better condition per the discretion of the District's representative at no additional cost.

C. Materials scheduled for removal shall not be placed on view to prospective purchasers or sold on site.

3.05 CLEANING

A. Debris and Rubbish:

1. Remove and transport debris and rubbish as it accumulates and dispose in a legal manner via recognized haul routes per Section 01-50-00, in a manner that will prevent spillage on streets or adjacent areas.

2. Remove all tools, equipment and appliances used for demolition from the site upon completion of the work.

3. Clean entire project area, adjacent streets, and pavements to a “broom-clean", “stain-free" condition per the discretion of the District's representative.

3.06 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

A. Ground-breaking requirements:

1. All demolition/site clearing work performed by a Contractor must be authorized by the District’s Construction Manager or the Low Voltage Consultant prior to start of construction.

2. The Contractor is to obtain and keep the original School’s construction utility site plans on site during all excavation operations. Contractor can contact the District’s Construction Manager or the Low Voltage Consultant to procure the drawings.

B. Underground Utility Locating:

1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas affected by the scope of work.

2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact B&B Locating (916/838-8903) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for “hot” electric, and metal detector.

4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72”.

5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:

a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.

b. All conduit pathways containing an active cable TV system.

c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.

d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.

e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.

f. All plastic and other nonconductive water lines in which a TransOnde (Radiodetection) or other “transmitter” can be applied to create a low frequency pressure waive (signal) without damaging or triggering the existing systems.

6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.

7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.

8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the District Representative at no additional charge. At the conclusion of the project, one (1) electronic copy prepared in Autocad V2010 will be included in the close-out documentation turned over to the District.

9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.

10. Contractor shall inform the District’s Construction Manager or Low Voltage Consultant no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

C. Damage to existing utilities procedures:

1. Contractor shall locate all utility shut-off valves prior to excavation operations.

2. Contractor will be responsible for any damage to existing, located, utilities.

3. Contractor will be responsible for any damage to existing utilities plus or minus five (5’) feet in either direction of the located utilities and utilities as shown on the original School’s construction utility site plans.

4. Contractor will not be responsible for damage to any existing utility that was not located by the utility locator service or utilities not shown on the original School’s construction utility site plans.

5. Contractor is to notify the District’s Construction Manager or Low Voltage Consultant immediately when a utility is broken.

6. All damaged electrical power or low voltage utilities shall be replaced. Splicing of damaged electrical power or low voltage utilities is not allowed.

7. Contractor shall provide test-results for all replaced electrical power or low voltage utilities indicating that the system has been restored to proper working order.

8. All repairs of broken utilities, except Fire Intrusion Detection Systems (FIDS), are the responsibility of the contractor. Fire Intrusion Detection Systems lines will be repaired by a licensed and certified FIDS engineer and/or District personnel. All repair costs will be back-charged to the contractor.

9. The contractor shall contact the District's Construction Manager or Low Voltage Consultant who will contact the appropriate District department prior to contractor back-filling the trench. Each District department will verify system repair before trench is to be back filled.

10. Contractor is responsible for maintaining all utility markings made by the utility locator service, District, or others from time of first marking to the end of the project. The contractor is required to provide marked as-built drawings to the District's Construction Manager or Low Voltage Consultant from the utility locator service of all utilities encountered within plus or minus five (5') feet in either direction of the area of the excavation.

[END OF SECTION 31 10 00]

SECTION 31 22 00

EXCAVATING, GRADING AND SITE PREPARATION

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Excavation and Grading for Concrete Work.

B. Excavation and Grading for Asphalt Concrete Paving.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 31 10 00: Site Clearing and Demolition

C. Section 32 12 00: Asphalt Concrete Paving.

D. Section 32 13 00: Portland Cement Concrete Paving.

1.03 REFERENCE STANDARDS

A. American Society for Testing and Materials (ASTM):

1. ASTM D1557-09 Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort.

1.04 QUALITY ASSURANCE

A. Perform all necessary compaction and soils preparation to obtain suitable subgrade as required by Testing Lab.

1.05 JOB CONDITIONS

A. Existing conditions: Contractor to record existing conditions of adjacent areas prior to commencing work and report any discrepancies or conflicts with contract work.

B. Prior to commencement of any excavations, contract Underground Service Alert (USA).

C. Contractor to locate all existing utilities and provide protection as required, see Section 31 10 00.

D. Maintain benchmarks, monuments and survey control references.

E. Protection of Persons and Property:

1. Provide dust control during all grading operations.

2. Protect all existing facilities to remain.

3. Protect Occupants from area of work by providing barricades.

4. Protect graded areas from erosion and water damage.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Fill required to establish grades for walkways shall be Class two aggregate, conforming to Section 26 of State Specifications.

B. Imported Engineered Fill Material: Imported fill may be required to complete work. Proposed import fill material shall meet the above requirements; shall be similar to the native soils. Import fill shall meet the above requirements; shall have plasticity index of ___ or less; an Expansion Index of ___ or less; be free of particles greater than ___-inch (__") in largest dimension; be free of contaminants and have corrosion characteristics within the acceptable limits. All import fill material shall be tested and approved by Soils Engineer prior to transportation to the site. Proposed fill material shall comply with DTSC guidelines to include Phase 1 environmental site assessment and related tests. Refer to the October 2001 DTSC Information Advisory for clean imported fill material.

1. DTSC TESTING: Site work contractor is to coordinate testing with an analytical lab, hired by the owner, licensed by the State of California for the DTSC testing. The costs associated with the testing will be paid by the contractor.

2. DTSC testing shall include documentation as to the previous land use, location, and history. Soils shall be analyzed for all compounds of concern to ensure the imported soil is uncontaminated and acceptable. Testing shall be performed per the recommendations included in DTSC Imported Fill Advisory http://www.dtsc.ca.gov/Schools/upload/SMP FS Cleanfill-Schools.pdf). Soils shall be tested prior to import to the project site.

3. Lab shall determine geographically which tests and analysis comparison will be appropriate for the testing. (CAM 17 / Title 22); (RWQCB) Regional Water Quality Control Board; or (OEHHA) Office of Environmental Health Hazard Assessment.

4. Frequency of testing shall be conducted in accordance with DTSC's Imported Fill Advisory as follows;

Fill Material Sampling Schedule

Area of Individual Borrow Area	**Sampling Requirements**
2 Acres or less	Minimum of 4 samples
2 to 4 Acres	Minimum of 1 sample every ½ Acre
4 to 10 Acres	Minimum of 8 Samples
Greater than 10 Acres	Minimum of 8 locations with 4 subsamples per location
Volume of Borrow Area Stockpile	
Up to 1,000 Cubic Yards	1 sample per 250 cubic yards
1,000 to 5,000 Cubic Yards	4 samples for the first 1000 cubic Yards + 1 sample per each additional 500 cubic yards
Greater than 5,000 Cubic Yards	12 samples for the first 5,000 cubic yards + 1 sample per each additional 1,000 cubic yards

5. Reports/ Documentation

a. Results of the testing analysis shall be sent to the Owner; Architect; Project Inspector, Project Civil Engineer, DTSC, and DSA. Letter shall reference DSA file and application numbers.

C. Native soil approved by Testing Lab may be used for fills below aggregate base indicated on drawings.

PART 3 – EXECUTION

3.01 LAYOUT

A. All Staking and Layout Work required for work included under this section shall be the responsibility of the Contractor. He shall establish any and all reference points, lay out his work, and be responsible for all lines, elevations, measurements and other grading operations.

1. Layout and Preparation: Prior to the beginning of any grading, excavation or trenching operations, layout all work, establish grades, locate existing underground utilities, set necessary markers and stakes, set up necessary barricades and protection facilities as outlined under Division 1, and be responsible for their correctness and adequacy.

3.02 SITE PREPARATION

A. General: Clear and prepare the site for new walkways, ramps to the limits indicated on the drawings.

1. All debris and materials from the cleaning operations shall become the Contractor's property and shall be removed from the site.

B. Site Clearing: All existing, rubbish, loose and/or saturated materials, shall be removed and disposed of so as to leave areas that have been disturbed with a neat and finished appearance, free from unsightly debris.

3.03 EXCAVATIONS

A. Excavate for all work below grade to dimensions and elevations indicated or deeper if required to obtain firm bearing.

B. Excess excavations shall be restored to the proper elevations by the placement of additional earth and recompacted to 95%.

C. Dewatering Site:

1. Any water which accumulates in excavations shall be drained promptly, by appropriate means.

2. Grading is to be controlled in the vicinity of buildings and other structures so that the surface of the ground will be properly sloped to prevent water from running into excavated areas or creating adverse drainage conditions.

3.04 GRADING

A. General: Uniformly grade areas within specified limits including adjacent transitions. Smooth finished surfaces within specified tolerances, compact with uniform levels or slopes between points indicated.

B. Grade areas adjacent to buildings to provide positive drainage away from buildings.

3.05 COMPACTION

A. General: Control soil compaction to provide minimum percentages of density specified for each classification as determined by Testing Lab.

B. Percentages of Maximum Density Requirements: Compact to the percentages of maximum density, determined in accordance with ASTM D1557.

1. Structures, Building Slabs, Steps and Pavements: Compact top 12 inches of subgrade and each layer of fill material at 95 percent maximum density.

2. Landscape Areas: Compact top 6 inches of subgrade and each layer of fill material at 85 percent maximum density.

3. Walkways: Compact top 6 inches of subgrade and each layer of fill material at 90 percent maximum density.

C. Moisture Control, General Testing Lab: to be present during compaction operations. Contractors to coordinate scheduling of inspection in a minimum of 72 hours in advance.

1. Where soil material must be moisture conditioned before compaction, uniformly apply water to surface of subgrade or layer of soil material. Prevent free water from appearing on surface during or subsequent to compaction.

2. Where soil condition are too moist to provide adequate compaction, the Contractor is responsible for drying soils through aeration, mixing or import.

[END OF SECTION 31 22 00]

SECTION 31 23 00

EXCAVATING, BACKFILLING AND COMPACTING FOR UTILITIES

PART 1 - GENERAL

1.01 SECTION INCLUDES

A. Description of requirements for materials, equipment and services necessary to complete trenching, excavation, backfilling and compaction as shown and specified for all underground utilities, related structures, and thrust blocks.

1. Utilities companies' requirements where applicable will take precedence over these specifications for conduit placement only, all bedding, backfill and compaction must be per these contract specifications.

1.02 RELATED SECTIONS

A. General Requirements

B. Division 22 – Plumbing

C. Division 23 – Heating Ventilating & Air Conditioning

D. Division 26 – Electrical

E. Division 28 – Electronic Safety & Security

1.03 QUALITY ASSURANCE

A. Requirements of Regulatory Agencies:

1. Safety Regulations: Work shall comply with all Federal, state and municipal regulations regarding safety, including the requirements of the following:

a. William-Steiger Occupational Safety & Health Act of 1970.

b. All trenching work shall conform to Trench Construction Safety Orders of California State Industrial Accident Commission.

B. References and Standards:

1. American Society for Testing and Materials (ASTM):

a. D1557-09- Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Modified Effort.

C. Observations and Inspections: The District’s Geotechnical Engineering Consultant will observe and respective utilities agencies' representative will inspect utilities trenching, excavation, backfilling and compaction as appropriate. Contractor shall appropriately schedule all inspections prior to commencing trenching and backfilling operations with the Districts Construction Manger or Low Voltage Consultant. All installations are subject to satisfactory installation and inspection by the appropriate agency.

D. Testing: Refer to Section 01 45 00:

1. Backfill material compaction and other tests will be performed as shown in the plans and specifications, District’s Geotechnical Engineering Consultant, and utilities agencies' requirements.

E. Submittals: Refer to General Conditions Section 00 72 00.

1. Submit on all non native backfill materials required for the execution of the work in this Section.

1.04 JOB CONDITIONS

A. Existing conditions: Contractor to record existing conditions of adjacent areas prior to commencing work and report any discrepancies or conflicts in the contract work.

B. Prior to commencement of any excavations, contact Underground Service Alert (USA).

C. Contractor to locate all existing utilities and provide protection as required.

D. Maintain benchmarks, monuments and survey control references.

E. Protection of Persons and Property:

1. Provide dust control during all excavation and backfill operations.

2. Protect all existing facilities to remain.

3. Protect occupants from area of work by providing barricades.

4. Protect excavations from erosion and water damages.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Pipe bedding backfill material (initial backfill) shall be washed sand material graded such that 100% passes the No. 4 sieve and not more than 5% passes the No. 200 sieve, and judged suitable by the District's Geotechnical Engineering Consultant.

1. Pipe bedding and backfill material used in trenches containing utilities owned by utility companies shall meet all requirements of that utility company.

B. Trench backfill material for use above the bedding and initial backfill materials in a trench shall be native or imported material which is free of highly plastic clays, organic materials, debris or other deleterious materials. The material shall be predominately granular with no rocks or lumps larger than 3 inches in maximum dimension, and have a Plasticity Index (ASTM D4318-05) of 15 or less. All backfill materials shall be pre-approved by the District's Geotechnical Engineering Consultant.

PART 3 – EXECUTION

3.01 TRENCHING

A. Make all trenches open vertical or sloped construction, as recommended by the manufacturer of the pipe, and with sufficient width to provide free working space at both sides of trench and around installed item as required for caulking, joining, backfilling, and compacting. For underground pipe and conduit, trench width is to be calculated based on a minimum of 2'' between all sides of the pipe and conduit and a minimum of 6" between the pipe and conduit and the trench walls.

1. Where recommended trench widths are exceeded, redesign shall be performed at no extra cost to the owner, using stronger pipe or special installation procedures.

B. Excavate trench straight and true to line and grade and to a depth below the bottom of the pipe

sufficient to provide for pipe bedding material as required. Trenches over-excavated in depth shall be re-filled with suitable materials and compacted to 90 percent (90%) relative compaction.

C. Excavations for utilities related structures and appurtenances, pull-boxes, vaults, manholes, drop inlets or similar structures shall be sufficient to leave at least 12 inches clear between the outer structure surface and face of the excavations. Provide 12" of compacted pea gravel for bedding and/or to facilitate drainage. When concrete is to be placed in an excavated area, special care shall be taken not to disturb the bottom and/or sides of the excavation.

D. Unsatisfactory material, as determined by the District's Geotechnical Engineering Consultant, shall be removed and replaced with suitable material and then compacted as required.

E. Where depths are not shown, trench to sufficient depth to give minimum fill above top installed item measured from adjacent finished grade as follows or as required to meet Utility Company standards:

1. Electrical conduit: 24 inches

2. Sewer pipe: As indicated on drawings.

3. Water pipe: 30 inches, 18" at valves.

4. Gas pipe: 30 inches

F. Areas damaged by trenching shall be restored to original condition.

3.02 DEWATERING EXCAVATIONS

A. Dewatering for excavating, backfilling and compacting for utilities is the responsibility of the Contractor.

B. Any water that accumulates in excavations shall be drained promptly, by appropriate means.

C. Trenching shall be controlled in the vicinity of buildings and other structures so that the surface of the ground will be properly sloped to prevent water from running into excavated areas or creating adverse drainage conditions.

3.03 BRACING AND SHORING

A. The Contractor shall furnish, place, and maintain such bracing and shoring as necessary for the safety of workers, protection of adjacent facilities and utilities, and proper installation of pipe, in conformance with legal requirements.

3.04 BACKFILLING

A. Initial Pipe Bedding Backfill Placement: Initial pipe bedding backfill material around pipes shall be placed and compacted to 90 percent (90%) relative compaction (per ASTM D1557) on all sides of the pipe and simultaneously on each side of the pipe to avoid displacement of the pipe. Allow for a minimum of 2" sand bedding below the pipe, 2" between pipe, 6" above the pipe, and 6" to the trench walls. Initial pipe bedding backfill shall be placed such that it completely surrounds all pipes leaving no void areas. The District's Geotechnical Engineering Consultant shall judge and approve the suitability of the initial backfill material and placement method prior to commencement of work. Acceptable methods for consolidation include moisture conditioning and compacting with light vibratory equipment and jetting. Other methods of placement and consolidation of initial backfill may be acceptable, upon review and approval by the District's Geotechnical Engineering Consultant.

B. Trench Backfill Placement: Subsequent trench backfill material shall be placed in loose layers not exceeding eight (8) inches in thickness, and be compacted to at least 90 percent (90%) relative

compaction (per ASTM D1557). In pavement areas (asphalt and concrete), the top twelve (12) inches of backfill beneath the aggregate base section shall be compacted to at least 95 percent (95%) relative compaction. Aggregate base materials placed in pavement areas shall also be compacted to at least 95 percent (95%) relative compaction. The District's Geotechnical Engineering Consultant shall judge and approve the suitability of the trench backfill material and placement method prior to commencement of work.

3.05 DISPOSAL OF EXCESS AND UNSUITABLE MATERIALS

A. Remove excess excavated material, trash, debris and waste materials. Dispose of off-site in a legal manner. Do not stockpile on site.

3.06 ON SITE UTILITY VERIFICATION AND REPAIR PROCEDURES

A. Ground-breaking requirements:

1. All underground work performed by a Contractor must be authorized by the District's Construction Manager or the Low Voltage Consultant prior to start of construction.

2. The Contractor is to obtain and keep the original School's construction utility site plans on site during all excavation operations. Contractor can contact the District's Construction Manager or the Low Voltage Consultant to procure the drawings.

B. Underground Utility Locating:

1. The contractor shall hire an Underground Utility Locating Service to locate existing underground utility pathways in areas effected by the scope of work.

2. Contractor must use an underground utility locator service with a minimum of 3 years experience. The equipment operator must have demonstrated experience. Contact B&B Locating (916/838-8903) or Precision Locating (800/577-7324)

3. The Underground Utility Locator Service must have the use of equipment with the ability to locate by means of inductive clamping, induction, inductive metal detection, conductive coupling, or TransOnde (Radiodetection) to generate signals, passive locating (free scoping) for "hot" electric, and metal detector.

4. The Underground Utility Locator Service must be able to locate existing utilities at a depth of at least 72".

5. The Underground Utility Locator Service must be able to locate but are not limited to locating the following types of utility pathways:

a. All conduit pathways containing 110 volt or greater 50-60Hz electrical wire.

b. All conduit pathways containing an active cable TV system.

c. All conduit pathways containing wire or conductor in which a signal can be attached and generated without damaging or triggering the existing systems.

d. All empty conduit pathways or pipe in which a signal probe or sonde (miniature transmitter) can be inserted.

e. All conduit pathways containing non-conductive cables or wires in which a signal probe or sonde (miniature transmitter) can be inserted.

f. All plastic and other nonconductive water lines in which a TransOnde (Radiodetection) or other "transmitter" can be applied to create a low frequency pressure waive (signal) without damaging or triggering the existing systems.

6. All markings made by the Underground Utility Locator Service or other shall be clear and visible.

7. The contractor shall maintain all markings made by Underground Utility Locator Service or other throughout the entire length of the project.

8. The Underground Utility Locator Service shall provide the contractor with two sets of maps showing the location of utilities and average depth. They will be referenced to permanent buildings. Contractor will deliver one copy to the District Representative at no additional charge. At the conclusion of the project, one (1) electronic copy prepared in Autocad V2010 will be included in the close-out documentation turned over to the District.

9. Contractor is responsible to contact Underground Service Alert (U.S.A. 800/227-2600) and receive clearance prior to any excavation operations.

10. Contractor shall inform the District's Construction Manger or Low Voltage Consultant no later than five (5) days prior to the date scheduled for the utility locator service to be on site.

C. Damage to existing utilities procedures:

1. Contractor shall locate all utility shut-off valves prior to excavation operations.

2. Contractor will be responsible for any damage to existing, located, utilities.

3. Contractor will be responsible for any damage to existing utilities plus or minus five (5') feet in either direction of the located utilities and utilities as shown on the original School's construction utility site plans.

4. Contractor will not be responsible for damage to any existing utility that was not located by the utility locator service or utilities not shown on the original School's construction utility site plans.

5. Contractor is to notify the District's Construction Manager or Low Voltage Consultant immediately when a utility is broken.

6. All damaged electrical power or low voltage utilities shall be replaced. Splicing of damaged electrical power or low voltage utilities is not allowed.

7. Contractor shall provide test-results for all replaced electrical power or low voltage utilities indicating that the system has been restored to proper working order.

8. All repairs of broken utilities, except Fire Intrusion Detection Systems (FIDS), are the responsibility of the contractor. Fire Intrusion Detection Systems lines will be repaired by a licensed and certified FIDS engineer and/or District personnel. All repair costs will be back-charged to the contractor.

9. The contractor shall contact the District's Construction Manager or Low Voltage Consultant who will contact the appropriate District department prior to contractor back-filling the trench. Each District department will verify system repair before trench is to be back filled.

10. Contractor is responsible for maintaining all utility markings made by the utility locator service, District, or others from time of first marking to the end of the project. The contractor is required to provide marked as-built drawings to the District's Construction Manager or Low Voltage Consultant from the utility locator service of all utilities encountered within plus or minus five (5') feet in either direction of the area of the

excavation.

[END OF SECTION 31 23 00]

SECTION 32 12 00

ASPHALT CONCRETE PAVING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Description of requirements for materials and installation of new and repair of asphalt concrete paving and related work as shown on Drawings and necessary to complete the work.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 02 41 00: Site Demolition.

C. Section 31 22 00: Excavating, Grading, and Site Preparation.

D. Section 32 13 00: Portland Cement Concrete Paving.

1.03 QUALITY ASSURANCE

A. Qualifications of Asphalt Concrete Producer: Use only materials which are furnished by bulk asphalt concrete producers regularly engaged in production of hot-mix, hot-laid asphalt concrete.

B. Applicator Qualification: Company specializing in the application of asphalt concrete paving with two (2) years documented experience.

C. Reference and Standards:

1. American Society for Testing and Materials (ASTM)

2. State of California, Business and Transportation Agency, Department of Transportation (CSS) - "Standard Specifications", (latest Ed.).

3. Redwood Inspection Service (RIS) - "Standard Specifications for Grades of California Redwood Lumber", with Supplements No. 1 and No. 2.

D. Design Criteria: Asphalt concrete paving shall show no evidence of cracking, uneven settlement or improper drainage. Correct work displaying such conditions under the Contractor's warranty of all work.

E. Allowable Tolerances: Unless noted otherwise, finish surface shall be true to established elevations within 1/8-inch in ten feet as measured from a 10 foot straight edge in any direction.

1. No tolerances shall be allowed for slopes and elevations noted for accessible parking stalls, loading aisles, and access aisles. Contractor shall be responsible for the removal and replacement of paving which exceeds the maximum slope noted on the Construction Documents.

1.04 SUBMITTALS

A. Submit under provisions of Section 00 72 00.

B. Product data: Submit product data for all materials intended for use and certification of compliance with standards specified.

C. Soil Sterilizer: Upon completion of application of soil sterilizer applicator shall furnish the following

information to Architect: Project name, applicator's name and license number, chemicals and mixture used, area treated (sq. feet) and date of application.

1.05 ENVIRONMENTAL CONDITIONS

A. Do not lay base corse on muddy subgrade during wet weather or when atmosphere temperature is below 40 degrees F.

B. Do not apply asphalt concrete surfacing on wet base during wet weather or when atmospheric temperature is below 40 degrees F.

1.06 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Cover loads of asphalt concrete with tarpauline during transport to site.

B. Deliver, store, and handle packaged products in original containers with seals unbroken and labels intact until time of installation.

C. Store delivered products in clean, safe, dry area.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Soil sterilizer shall Barrier 50W. California-compliant version of CIBA GEIGY's Pramitol 25-E or Thompson-Hayward Casoron, or equal.

1. Soil sterilizer shall be applied in strict accordance with manufacturer's instructions.

B. Aggregate Base: Class 2 aggregate base conforming to CSS Section 26.

C. Asphalt Binders: Steam-refined paving asphalt conforming to CSS Section 92, viscosity grade AR 4000.

D. Paint Binders: Conform to requirements of CSS Section 94.

E. Asphalt concrete: conform to requirements of CSS Section 39 for Type B asphalt with 1/2 inch maximum medium aggregate size using AR 4000 asphalt for binder.

F. Seal Coat: shall be a pre-mixed asphalt emulsion blended with select fillers and fibers such as:

1. "Park-Top No. 302", Western Colloid Products.

2. "Overcote", Reed and Graham.

G. Headerboards: 2x6 Foundation Grade Redwood.

1. Use 1/2 inch thick boards where required for bending.

2.02 MIXING

A. Mix surface course aggregate and asphalt binder in central mixing plant in accordance with CSS Section 39 by either batch mixing or continuous mixing to produce uniform distribution of binder.

B. Plant shall be equipped with accurately calibrated devices 320 degrees Fahrenheit for control of temperature and weight of both ingredients.

C. Ensure temperature of asphalt concrete does not exceed 320 degrees Fahrenheit at anytime and is not less than 250 degrees Fahrenheit at time of delivery.

2.03 PAVEMENT MARKING PAINT

A. Approved Manufacturers: Glidden Professional Latex Traffic Paint", Dunn-Edwards Corp. "Traffic Paint W-801" or approved equal.

B. Colors:

1. Stripping and Lettering: White, Blue where required at access aisle borders.

2. Limited Parking: Green.

3. Disabled Access: Blue. Blue paint shall match Color No. 15090 of Federal Standard 595B and white.

4. Caution and Bus Loading: Yellow.

5. Fire Lane: Red.

6. Black Out Stripping: Black.

7. Paint surface shall have a static coefficient of friction of.6 or greater.

PART 3 – EXECUTION

3.01 INSPECTION

A. Examine areas to receive asphalt concrete and verify following:

1. That related work such as concrete work, headers, etc. have been set at proper elevations or that conditions will permit adjustment to proper elevations.

2. Absence of wet receiving surfaces or other conditions to adversely affect execution of this work.

B. Do not start work until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Subgrade:

1. Verify areas have proper compaction and Testing Lab has accepted prior to placement of base material and again prior to placement of asphalt.

2. Ensure areas are true to line and grade, dry, properly prepared and free from loose or foreign material.

B. Do not proceed until subgrade has been inspected and approved by Architect.

C. Notify Architect 48 hours in advance of performing paving work.

D. Sawcut existing paving in straight lines to provide uniform joints at transitions.

3.03 APPLICATION

A. Grade Control: Establish and maintain required lines and grades including the crown and cross slope for each course during all application operations.

B. Aggregate Base: Spread and compact in accordance with CSS Section 26, to thickness, lines and

grades noted.

C. Soil sterilizer shall be applied only to areas indicated to receive paving. Apply over aggregate base after base has been compacted and just prior to application of prime coat. Do not spread sterilizer beyond areas to receive paving. Soil sterilizer shall be applied by a professional applicator holding a valid State Agricultural Pest Control license.

D. Paint Binder: Apply at rate of 0.05 to 0.10 gallon per square yard to all vertical surfaces of curbs, aprons, and construction joints in surfacing against which additional material is to be placed in accordance with CSS Section 39-4.02.

E. Asphalt concrete:

1. Spread and compact in accordance with CSS Section 39-5, to thickness noted using minimum eight-ton self-propelled rollers.

2. Provide smooth side and water-resistant surfaces, true within tolerances specified, and free of bird baths.

3. Bring asphalt concrete to edges of concrete paving or walks, adjacent paving, and header boards; do not overlay these items.

4. Roll Surfaces longitudinally; cross-rolling will be required where space permits.

5. Header Boards: Install redwood header boards as edging for asphalt concrete paving to asphalt paving, except where adjoining existing pavement, concrete curbs, walks or building. Install header boards true to line and grade, securely anchored in place. Use three (3) 1/2" thick boards where required at curves. Anchors shall be 2" x 3" x 24" long redwood stakes spaced a maximum of 4'-0" o.c. and shall not be visible upon completion of paving. Remove existing headers where new paving will join existing. Saw cut existing asphalt to provide clean edge. .Install true to line and grade. Cut off tops of stakes 2-inches below top of header so they will not be visible on completion of job.

3.04 PAVEMENT SEALER (Seal Coat)

A. Seal coat emulsion shall not be applied to newly constructed asphalt concrete surfaces until 30 days after spreading and compacting of the new asphalt concrete.

B. Surface Preparation: surface shall be clean of all dirt, sand, oil or grease. Broom, blow or hose down entire area with a strong jet of water to remove all debris.

1. Remove soft, loose, or otherwise damaged areas of asphalt concrete to full depth of damage and replace with compacted asphalt concrete as specified herein.

a. Minor holes and imperfections may be patched using hot mix asphalt or mastic using sand/SS-1-H.

2. Use wire brush for removal of oil and grease; prime with shellac or synthetic resin as recommended by manufacturer of pavement sealer material.

3. Surfaces that have weathered excessively or are dusted shall be primed with a solution of 1 to 4 parts cool, clean water and 1 part of SS-1-H. Apply at the rate of 1 gallon per sq. ft. and allow to dry. If in doubt a test patch shall be tried.

C. Seal Coat Application: Thoroughly mix materials and apply in accordance with manufacturer's written instructions. A minimum of 2 applications will be required; utilizing 30 gallons of material per 1000 sq. feet.

D. Clean-Up and Precautions: As recommended by pavement sealer material manufacturer.

3.05 PAVING MARKINGS

A. Painted pavement markings shall be done only after the seal coat has thoroughly dried.

B. Clean surfaces to be painted with traffic paint of dust, dirt, grime, oil, rust or other contaminants which will impair the quality of work or interfere with proper bond of paint coats. Surfaces shall be cleaned to the extent and by whatever means that will satisfactorily accomplish the purpose without damage to asphalt concrete.

C. Provide measured layouts, temporary markings, templates, and other means necessary to provide required marking.

D. Prepare and apply paint in accordance with manufacturer's instructions; paint shall be applied by spray and shall achieve complete coverage free from voids and thin spots.

E. Where indicated on the Drawings, paint parking stall strips, lettering, arrows, accessible symbols, playfield markings, etc. on asphalt concrete paving. Paint strips shall be 4 inches wide (except otherwise indicated) and applied with two (2) coats of herein specified Traffic Line Paint; white (except as otherwise specified or indicated).

1. International Symbol of Accessibility: Symbol shall be white figures on a blue background with white border. Blue shall be equal to color No. 15090 in Fed. Std. 595B.

F. Lines and symbols shall be accurately formed and true to line and form; lines shall be straight and uniform in width.

G. Painted edges shall be clean cut and free from raggedness, and corners shall be cut sharp and square.

H. Tolerances: Unless noted otherwise, apply striping within a tolerance of 1/2 inch in 50 feet. Apply markings and striping to widths indicated with a tolerance of 1/4 inch on straight sections and 1/2 inch on curved sections.

1. No tolerances shall be allowed for striping which violates minimum requirements for accessible parking stalls, loading aisles, and access aisles. Contractor shall be responsible for the removal and replacement of striping which violates the accessible dimensions noted on the Construction Documents.

3.06 PAVING PATCHING AND REPAIR

A. Paving Patching and Repair: All paving that is damaged due to trenching, etc., or that is damaged due to construction under this Contract, shall be repaired and/or replaced hereunder as determined by Architect with new paving and base. All work shall be in accordance with the applicable material and application requirements specified herein.

1. Saw cut existing asphalt concrete paving at all areas indicated or required for new construction work and at edges of paving to be replaced and remove debris from the site. Excavation work and removal of material and backfill below bottom of base shall be the responsibility of the trade involved in the work.

3.07 TESTING

A. Complete surfacing shall be thoroughly compacted smooth, true to grade and cross section, free from ruts, humps, depressions or irregularities. After the surfacing has been placed the entire area shall be tested for proper drainage by applying water in sufficient amount to cover the surface. If any portion fails to drain properly, the condition shall be corrected by patching with asphalt concrete until correction of improper drainage is completed.

1. No ponding water is acceptable on new paving or adjacent areas caused by new work.

3.08 PROTECTION

A. After final rolling, do not permit vehicular traffic on asphalt concrete pavement until it has cooled and hardened, and in no case sooner than six (6) hours.

1. Provide barricades and warning devices as required to protect pavement.

[END OF SECTION 32 12 00]

SECTION 32 13 00

PORTLAND CEMENT CONCRETE PAVING

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. The Section describes the requirements for providing Portland cement concrete paving, including accessibility ramps, sidewalks, accessible routes of travel, vehicular travel, and for other non-structural or non-vehicular applications.

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 03 30 00: Cast-in-Place Concrete.

C. Section 05 50 00: Metal Fabrications.

D. Section 32 17 26: Truncated Domes.

1.03 SUBMITTALS

A. Product data: Furnish for proprietary materials and items, including reinforcement and forming accessories, admixtures, joint systems, curing compounds, and other materials requested by the Architect.

B. Colorant: Provide manufacturer's full written installation instructions and color charts.

C. Design Mixes: Furnish for each class of concrete.

D. Laboratory Test Reports: Submit evaluation of concrete materials and mix design tests.

E. Control/Expansion Joints: Submit proposed control and expansion joint layout clearly identifying locations/types of each and joint patterns as shown in the Contract Documents.

F. Concrete mockup of separate concrete finishes including medium broom finish, control joint depth, expansion joint, and radius edging. Mockup shall be completed by actual crew to perform work on site. Size of mockup shall be 4'-0" x 4'-0" and shall be used to review all other site work by. At end of project, contractor shall dispose of mockup. Mockup shall include sample of acid colorant.

1.04 QUALITY ASSURANCE

A. Concrete Standards: Comply with provisions of the following standards except where more stringent requirements are specified:

1. ACI 211.1, "Standard Practice for Selecting Proportions for Normal Weight, Heavy Weight and Mass Concrete".

2. ACI 304R, "Guide for Measuring, Mixing, Transporting and Placing Concrete".

3. ACI 305R, "Hot Weather Concreting".

4. ACI 306R, "Cold Weather Concreting".

5. ACI 309R, "Guide for Consolidation of Concrete".

6. CRSI, “Manual of Standard Practice”.

7. ACI 232.2R-96 Use of Fly Ash in Concrete

B. Concrete Manufacturer: Complying with ASTM C94 / C94Ma requirements for production facilities and equipment.

C. Concrete Testing Service: Owner shall engage and pay all costs associated with an independent testing agency to perform materials evaluation tests, onsite concrete slump tests, and obtain concrete cylinders for compression testing. The lab will provide a certified concrete technician who will provide continuous concrete batch plant inspection.

1. Contractor shall pay for all batch plant inspections.

2. Contractor may request in writing a waiver of continuous batch plant inspection providing the batch plant meets the requirements in Title 24, Section 1704A.4.4, 1&2 and the following;

a. Approved inspector of the testing laboratory shall check the first batching at the start of the work and furnish mix proportions to the licensed weighmaster.

b. Licensed weighmaster to positively identify materials as to quantity and certify each load by a ticket.

c. Tickets shall be transmitted to the inspector of record by a truck driver with load identified thereon. The inspector will not accept the load without a load ticket identifying the mix and will keep a daily record of placements, identifying each truck, its load and time of receipt and approximate location of deposit on the site and will transmit a copy of the daily record to the enforcing agency.

1.05 JOB CONDITIONS

A. Traffic Control: Maintain access for vehicular and pedestrian traffic as required for construction activities.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Forms: Steel, wood, or other suitable materials of size and strength to resist movement during concrete placement and to retain alignment until removal.

1. Use straight forms, free of distortion and defects.

2. Use flexible spring steel forms or laminated boards to form radius bends as required.

3. Coat with a non-staining form release agent that will not discolor or deface concrete.

B. Concrete Reinforcement:

1. Reinforcing Bars and Tie Bars: ASTM A615 / A615M-09b, Grade 60, deformed.

2. Welded Wire Mesh: Welded plain cold-drawn steel wire fabric, W 2.1 X W2.1, ASTM A185 / A185M-07. Furnish in flat sheets, roll goods will not be allowed.

3. Expansion Joints/Connection to Existing Concrete,: Plain steel smooth bars, ASTM A615 / A615M-09b, Grade 40. Cut bars to length as shown in the drawings with ends square and free of burrs.

4. Supports and Reinforcement: Chair, spacers, dowel bar supports and other devices for spacing, supporting, and fastening reinforcing bars., welded wire fabric, and dowels in place. Use wire bar-type supports complying with CRSI specifications.

5. Tie Wire; 14 ga. annealed wire.

C. Concrete:

1. Portland Cement: ASTM C150 / C150M-09, Type–2

2. Fly Ash: ASTM C618 – 08a, Type F.

3. Normal-Weight Aggregates: ASTM C33 / C33M-08, Class 4, and as follows. Provide aggregates from a single source.

a. Maximum Aggregate Size: 1 inch.

b. Do not use fine or coarse aggregates that contain substances that cause spalling.

c. Local aggregate not complying with ASTM C33 / C330-08 that have been shown to produce concrete of adequate strength and durability may be used when acceptable to the Architect.

D. Water: Potable.

E. Admixtures:

1. Water-Reducing Admixture: ASTM C494 / C494M-08a Type A.

2. High-Range Water-Reducing Admixture: ASTM C494 / C494M-08a, Type F or G.

3. Water-Reducing and accelerating Admixture: ASTM C494 / C494M-08a, Type E.

4. Water-Reducing and Retarding Admixture: ASTM C494 / C494M-08a, Type D.

F. Curing Materials:

1. Absorptive Cover: Burlap cloth made from jute or kenaf.

2. Moisture-Retaining Cover: Waterproof paper or polyethylene film, 6mil or equal.

3. Clear Waterborne Membrane-Forming Curing Compound: ASTM C309 - 07, Type I, Class B.

4. Evaporation Control: Monomolecular film-forming compound applied to exposed concrete slab surfaces for temporary protection from rapid moisture loss.

G. Related Materials:

1. Bonding Agent: Acrylic or styrene butadiene.

2. Epoxy Adhesive: ASTM C881 / C881M-02, two-component material suitable for dry or damp surfaces. Provide material, type, grade, and class to suit requirements.

H. Handrail and Guardrail Plastic Sleeves:

1. At all embedded pipe supports into new concrete, contractor shall use a plastic tapered insert that shall be removed prior to rail installation. Product shall be equal to EZ SLEEVE as manufactured by Wagner (888) 243-6914.

2. Contractor shall set all inserts plumb and level with finished surface. Locations of inserts shall be closely coordinated by Contractor with handrail requirements including spacing and pipe size requirements as identified in approved handrail shop drawings as required by other specification sections.

3. Joint Sealant; Provide sealant per section 3305, and seal pipe at sleeve. Sealant shall be ¼" minimum in thickness. Provide and use backer rod if necessary.

I. Colorant:

1. At areas indicated on the Drawings, provide acid stain equal to LM Scofield Lithochrome Chemstain.

2.02 CONCRETE MIX

A. Class "B": Concrete shall have 1" max. size aggregate, shall have 3000 psi min. at 28-day strength with a maximum water to cementitious ratio no greater than 0.50. Use for exterior slabs, including walks, vehicular paved surfaces, manhole bases, poured-in-place drop inlets, curbs, valley gutters, curb & gutter and other concrete of like nature. This mix design is not intended for structural concrete footings, foundations, retaining walls, mortar or grout. See Specification Section 03 31 00, Structural Concrete.

B. Slump Limits: Provide concrete, at point of final discharge, of proper consistency determined by Test Method ASTM C143 with a slumps of 4" plus or minus 1".

C. Mix Design: All concrete used in this work will be designed for strength in accordance with provisions of ASI 318-14 Section 26.4. Should the Contractor desire to pump concrete, a modified mix design will need to be submitted for review. Fly ash may be used in concrete to improve workability in amounts up to 15% of the total cementitious weight.

D. Air Entrainment; Per the Local Jurisdiction minimum requirements, but no less than 3%.

2.03 CONCRETE MIXING

E. Ready-Mixed Concrete: Comply with ASTM C94 / C94M – 09a, and CBC, Chapter 19A.

1. When air temperature is between 85-deg. F. and 90-deg. F., reduce mixing and delivery time from 1-1/2 hours to 75-minutes. When air temperature is above 90-deg. F., reduce mixing and delivery time to 60-minutes.

2.04 JOINT MATERIAL:

A. Provide 3/8" wide fiber expansion joint material, Model No. 320-F, as manufactured by W.R. Meadows or equal.

B. Provide Snap-Cap as manufactured by W.R. Meadows or equal. Snap-Cap shall have a top plastic edge that can be used for leveling concrete. Once concrete has set up, top edge of Snap-Cap can be pulled free and discarded. Joint shall then be sealed.

C. Joint sealing material shall be a two-component, self-leveling, polyurethane elastomeric sealant. Product shall be Sikaflex 2cSL as manufactured Sika Corporation, or equal. Color shall be shall be chosen from the full range of manufacturer's standard colors.

PART 3 – EXECUTION

3.01 SURFACE PREPARATION

A. Refer to section 31 00 00 for compaction requirements.

B. Proof-roll prepared sub-grade surface to check for unstable areas and required additional compaction.

C. Remove loose material from compacted sub-grade immediately before placing concrete. There shall be “NO” dirt clods of any size in the compacted sub-grade.

D. If necessary, or directed by the Project Inspector, re-compact the sub-grade to provide complete consolidation of loose soils, and dirt clods.

E. Thoroughly saturate sub-grade prior to concrete placement.

1. Saturate sub-grade thoroughly the night before concrete placement.

2. Saturate sub-grade the second time immediately prior to concrete placement.

3. Remove any standing water.

F. Do not begin concrete paving / or concrete work until unsatisfactory conditions have been corrected.

3.02 FORM CONSTRUCTION

A. Set forms to required grades and lines, rigidly braced and secured.

1. Install sufficient quantity to allow continuous progress of work.

2. Check completed formwork for grade and alignment to following tolerances:

a. Top of forms not more than 1/8 inch in 10 feet.

b. Vertical face on longitudinal axis, not more than 1/8 inch in 10 feet.

3. All retaining walls and seatwalls edges shall be chamfered both horizontally and vertically with ¾” beveled material. All expansion joints shall be beveled on each side of joint.

4. Clean forms after each use, and coat with form release agent as required.

3.03 REINFORCEMENT

A. General: Comply with CRSI recommended practice for “Placing Reinforcing Bars” for placing and supporting reinforcement, unless otherwise noted in the drawing and or details.

B. Clean reinforcement of loose rust and mill scale, earth, or other bond-reducing materials.

C. Arrange, space, and securely tie bars and bar supports to hold reinforcement in position during concrete placement. Maintain minimum cover, 2 inches, over reinforcement. Bars shall be centered in slab unless otherwise noted in the drawings

D. Install welded wire fabric in lengths as long as possible. Lap adjoining pieces at least two full meshs and tie with tie wire at 3 ‘-0” on center at a minimum. Offset laps 3 ft. of adjoining widths to prevent continuous laps in either direction.

E. All non-vehicular concrete flatwork shall be reinforced with welded wire fabric whether shown or not.

F. All vehicular concrete paving shall be reinforced at a minimum with # 4 bar spaced at 24” on center each way, unless otherwise noted in the drawings

3.04 JOINTS

A. General: Construct contraction, construction, and isolation joints true to line with faces perpendicular to surface plane of concrete. Construct transverse joints at right angles to the centerline unless otherwise indicted.

B. Joints at Existing Concrete: All joints between existing concrete and new concrete are to include dowels a minimum of #4 bars at 2'-0" on center, 6" maximum from the ends. Epoxy set into existing concrete a minimum of 6" in length.

C. Contraction Joints (Control Joints): Provide weakened-plane contraction joints, sectioning concrete into areas indicated. Construct contraction joints for a depth equal to at least 1/4 of the concrete thickness, or 1" minimum in depth. Form in fresh concrete by grooving and finishing each edge of joint with a ¼ "radius jointer tool. These joints shall be placed to divide up new concrete paving into sections no larger than 75 sq. ft.

1. Control joints shall also be placed at each side of columns, at corners of utility boxes, corners of building structures, each side of wire fabric fence posts, concrete mow strips

D. Construction Joints: Set construction joints at side and end terminations of paving and at locations where paving operations are stopped for more than 1/2 hour, unless paving terminates at isolation joints.

1. Provide preformed galvanized steel or plastic keyway-section forms or bulkhead forms with keys. Embed keys at least 1-1/2 inches into concrete.

2. Continue reinforcement across construction joints, and maintain position at mid-depth of concrete section.

E. Isolation Joints (Expansion Joints): Form isolation joints of preformed joint filler strips abutting concrete curbs, catch basin, manholes, inlets, structures, walks, structural columns and other fixed objects, and/or where indicated on drawings.

1. Provide 3/8" wide fiber expansion joint material, Model No. 320-F, as manufactured by W.R. Meadows or equal. Fiber joint shall be full depth of concrete section including thickened edges.

2. Provide Snap-Cap as manufactured by W.R. Meadows or equal. Snap-Cap shall have a top plastic edge that can be used for leveling concrete. Once concrete has set up, top edge of Snap-Cap can be pulled free and discarded. Joint shall then be sealed.

3. Maximum spacing shall be 20'-0" on center, each way, or as otherwise noted on drawings.

3.05 CONCRETE PLACEMENT

A. Adjacent finish surfaces shall be protected at all times during the concrete pour and finishing. Verify that all formwork is tight and leak-proof before concrete is poured. Finish work defaced during the concrete pour and finishing shall be replaced at no extra cost to the owner.

B. Transport concrete from mixer to place of final deposit as rapidly as practicable by methods which will prevent separation or loss of ingredients. Deposit as close as practicable in final position to avoid re-handling or flowing. Partially hardened concrete must not be deposited in work. Concrete shall not be wheeled directly on top of reinforcing steel.

C. Placing: Once started, continue concrete pour continuously until section is complete between predetermined construction joints. Prevent splashing of concrete onto adjacent forms or reinforcement and remove such accumulation of hardened or partially hardened concrete from forms or reinforcement before work proceeds in that area. Free fall of concrete shall not to

exceed 4'-0" in height. If necessary, provide lower openings in forms to inject concrete and to reduce fall height.

D. Remove form spreaders as placing of concrete progresses.

E. Place footings as monolithic and in one continuous pour.

F. Keep excavations free of standing water, but moisture condition sub-grade before concrete placement.

G. Compacting: All concrete shall be compacted by mechanical vibrators. Concrete shall be thoroughly worked around reinforcement and embedded fixtures and into corners of forms. Vibrating shall not be applied to concrete which has already begun to initially set nor shall it be continued so long as to cause segregation of materials.

H. Grout under column bearing plates: Dry pack with specified Non-shrink Grout, as recommended by manufacturer. Use as little water as practicable. Ram grout solid into place.

I. Concrete Flatwork:

4. All flatwork shall be formed and finished to required line and grades. Flatwork shall be true and flat with a maximum tolerance of 1/8" in 10’ for flatness. Flatwork which is not flat and are outside of the maximum specified tolerances shall be made level by the Contractor at no additional expense to the Owner.

5. Thoroughly water and soak the flatwork subgrade as required to achieve required moisture content prior to the concrete pour. Provide damming as required to keep water within the formed area and to allow for proper saturation of the subgrade.

6. Concrete vibrator shall be used to assist concrete placement. Contractor shall have spare concrete vibrator on site during concrete placement.

J. Placing in hot weather: Comply with ACI 305R-91. Concrete shall not exceed 85 degrees F at time of placement. Concrete shall be delivered, placed and finished in a sufficiently short period of time to avoid surface dry checking. Concrete shall be kept wet continuously after tempering until implementation of curing compound procedure in accordance with this specification.

K. Placing in cold weather: Comply with ACI 306R-02. Protect from frost or freezing. No antifreeze admixtures are permitted. When deposited concrete during freezing or near-freezing weather, mix shall have temperature of at least 50 degrees F but not more than 90 degrees F. Concrete shall be maintained at temperature of at least 50 degrees F for not less than 72 hours after placing or until it has thoroughly hardened. Provide necessary thermal coverings for any flat work exposed to freezing temperatures.

L. Horizontal construction joint: Keep exposed concrete face of construction joints continuously moist from time of initial set until placing of concrete; thoroughly clean contact surface by chipping entire surface not earlier than 5 days after initial pour to expose clean hard aggregate solidly embedded, or by approved method that will assure equal bond, such as green cutting. If contact surface becomes contaminated with soil, sawdust or other foreign matter, clean entire surface and re-chip entire surface to assure proper adhesion.

3.06 CONCRETE FINISHING

A. Concrete Slab Finishing: Finish slab as required by ACI 302.1R. Use manual screeds, vibrating screeds to place concrete level and smooth. Use “jitterbugs” or other special tools designed for the purpose of forcing the course aggregate below the surface leaving a thick layer of mortar 1 inch in thickness. Surface shall be free from trowel marks, depressions, ridges or other blemishes. Tolerance for flatness shall be 1/8" in 10'. Provide final finish as follows:

7. Flatwork, medium broom finish: Typical finish to be used at all exterior walks, stairs and ramps. Brooming direction shall run perpendicular to slope to form non-slip surface.

8. Under no circumstances can water be added to the top surface of freshly placed concrete.

B. Curb Finishing: Steel trowel.

C. Joints and Edges: Mark-off exposed joints, where indicated, with ¼" radius x 1" deep jointer or edging tool. Joints to be clean, cut straight, parallel or square with respect to concrete walk edge. Tool all edges of exposed expansion and contraction joints, walk edges, and wherever concrete walk adjoins other material or vertical surfaces.

1. The expansion joints shall be full depth as shown in the plan details. Failure to do so will result in non-compliance and shall be immediately machine cut by the contractor at his expense.

D. Exposed Concrete Surface Finishing (not including top surface of flatwork): Remove fins and rough spots immediately following removal of forms from concrete which is to be left exposed. Damaged and irregular surfaces and holes left by form clamps and sleeves shall be patched with grout. Tie wires are to be removed to below exposed surface and holes pointed up with neat cement paste similar to procedure noted under "Patching" below. Removal of tie wires shall extend to distance of 2" below established grade lines. Ends of tie wires shall be cut off flush at all other, unexposed locations. Care shall be taken to match adjacent finishes of exposed concrete surface. After patching, all concrete that is to remain exposed, shall be sacked with a grout mixture of 1-part cement, 1 1/2- parts fine sand and sufficient water to produce a consistency of thick paint. After first wetting the concrete surface, apply mixture with a brush and immediately float entire surface vigorously using a wood float. Keep damp during periods of hot weather. When set, excess grout shall be scraped from wall with edge of steel trowel, allowed to set for a time, then wiped or rubbed with dry burlap. Entire finishing operation of any area shall be completed on the same day. This treatment shall be carried to 4" below grade, and all patching and sacking shall be done immediately upon removal of the forms.

E. Stair Treads and Risers: Tool exterior stair tread nosing per ADA requirements and as detailed. Paint or stain tooled area at every stair tread nosing or as detailed. Stair tread nosing shall contain no pockets, voids or spalls. Patching is not allowed. Damaged nosing shall be replaced.

F. Concrete Coloring: At areas indicated on the Drawings, provide colored acid stain treatment in pattern indicated on the Drawings. Area of colorant shall be fully bound by tooled joint for clean edge. Avoid contact with adjacent surfaces by masking or other means of protection. Apply stain in full accordance with manufacturer's written instructions and until depth of color has been achieved to the satisfaction of the Architect.

3.07 CONCRETE PROTECTION AND CURING

A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with the recommendations of ACI 306R for cold weather protection and ACI 305R for hot weather protection during curing.

B. Evaporation Control: In hot, dry, and windy weather, protect concrete from rapid moisture loss before and during finishing operations with an evaporation-control material. Apply after screeding and bull floating, but before finishing.

1. While finishing, do not under any circumstances spray the top of the concrete with water thus changing water/cement ratio. Doing this will be the reason for rejection.

C. Begin finishing concrete but not before free water has disappeared from concrete surface.

D. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing

compound, or a combination.

2. Moisture Curing: After concrete has tempered, keep surfaces continuously moist for not less than 7 days with water, a continuous water-fog spray, or absorptive cover kept continuously wet.

3. Moisture Retaining Cover: Cover concrete with moisture retaining cover with side and end laps sealed.

4. Curing Compound: Apply immediately after concrete tempers. Apply as described in 1. below. Recoat areas subjected to rainfall within 3 hours after initial application.

5. Apply compound in a method that produces a continuous liquid flow that completely encapsulates the entire concrete surface. Spotty applications will be reason for concrete rejection.

3.08 FIELD QUALITY CONTROL TESTING

A. The District will employ an accredited independent testing Laboratory to sample materials, perform tests, and submit test reports during and after concrete placement.

3.09 REPAIRS AND PROTECTION

A. Replace defective concrete, as directed by Architect and or the School District Representative.

1. Defective concrete is concrete that has cracked outside of the control/contraction joints, construction joints and or expansion joints.

2. Concrete placed at the wrong elevation.

3. Spawled concrete.

4. Concrete exceeding the 2% cross slope or 5% in the direction of travel.

5. Concrete exceeding 8.3% on ramps.

6. Cracked curbs or curb and gutters.

7. Concrete with too smooth of a finish creating a slippery condition.

8. Step where risers are placed at wrong elevation; or risers varying 3/8” greater in height from one side of stairs to the other.

B. Protect concrete from damage until acceptance of work. Prohibit traffic for at least 14 days after placement.

1. When construction traffic is permitted, remove surface stains and spillage of materials as they occur.

2. Sweep concrete pavement and wash free of stains, discolorations, dirt and other foreign material prior to final inspection.

END OF SECTION 32 13 00

SECTION 32 17 13

PRECAST WHEEL STOPS

PART 1 – GENERAL

1.01 WORK INCLUDED

A. Provide precast concrete wheel stops for adhesive and metal stake installation as indicated on Drawings and specified here.

1.03 RELATED WORK

A. Section 32 12 00: Asphalt Concrete Paving.

B. Section 32 13 00: Portland Cement Concrete Paving.

1.04 REFERENCES

A. Standard Specifications of the California State Department of Transportation (CALTRANS), latest edition.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Precast concrete wheel stops, 3,500 psi concrete, fully reinforced.

B. Epoxy Adhesive: Comply with the requirements of Caltrans Standard Specification Section 95-2.05, “Standard Set Epoxy for Pavement Markers”, (State Spec. 8040-21M-09).

C. Anchor Stakes: #4 steel rebar x minimum 18 inches long, minimum two stakes per stop.

PART 3 – EXECUTION

3.01 INSTALLATION

A. Carefully coordinate placement of wheel stops with the layout of parking stalls and traffic aisles, providing proper angle to engage wheels and proper locations to prevent overtravel of vehicles.

B. Install wheel stop in full bed of epoxy adhesive and by driving rebar stake through holes provided in stops. Rebar shall not extend above top of wheel stop.

C. At portland cement concrete paving, pre-drill pavement prior to driving rebar stakes.

D. Upon completion of installation, visually inspect each installed wheel stop and verify that each is in perfect condition and properly set.

3.02 ADJUST AND CLEAN

A. Remove all excess adhesive.

[END OF SECTION 32 17 13]

SECTION 32 17 26

DETECTABLE WARNING SURFACES

PART 1 – GENERAL

1.01 SECTION INCLUDES

A. Cast in Place Tactile Detectable Warning Tiles where shown on Drawings.

B. Surface Applied Tactile Detectable Warning Tiles where shown on Drawings.

1.02 RELATED SECTIONS

A. Section 32 13 13: Portland Cement Concrete Paving.

1.03 REFERENCES

A. California Building Code (2016) – Title 24

1.04 SUBMITTALS

A. Submit shop drawings of installation at each location indicated on the Drawings clearly showing full extent of area of work.

B. Provide product data on specified products, describing physical and performance characteristics, sizes, patterns and colors.

C. Submit two samples approximately 6 x 12 inches in size, of each type, illustrating color and pattern for tile specified. Submit color chart clearly indicating manufacturer’s full range of standard colors.

D. Submit manufacturer's installation instructions under provisions of Section 00 72 00.

1.05 MAINTENANCE DATA

A. Submit cleaning and maintenance data under provisions of Section 00 72 00.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Environmental Conditions and Protection: Maintain minimum temperature of 40 degrees F in spaces to receive tactile tiles for at least 48 hours prior to installations, during installation, and for not less than 48 hours after installation. Store the detectable/tactile tiles material in spaces where they will be installed for at least 48 hours before beginning installation. Subsequently, maintain minimum temperature of 40 degrees F in areas where work is completed.

1.07 EXTRA MATERIALS

A. Provide 2 individual 24” x 36” tiles, of each type, under provisions of Section 00 72 00.

PART 2 – PRODUCTS

2.01 MATERIALS

A. Cast in Place Tactile Detectable Warning Tiles:

1. Vitrified Polymer Composite (VPC) Cast In Place Detectable/Tactile Warning Surface Tiles shall be an epoxy polymer composition with an ultra violet stabilized coating employing aluminum oxide particles in the truncated domes.

2. The tile shall incorporate an in-line pattern of truncated domes configuration conforming to the requirements of the DSA IR 11B-04.

3. For wheelchair safety the field area shall consist of a non-slip surface with truncated domes with a diameter of .9 inch at the base tapered to .45 inch at the top, with nominal height of .2 inch and spaced 2.35” apart when measured on the perpendicular. See detail on Drawings.

4. Color to be “Federal Yellow” (FS 33538, 11B-705.1.1.5 and 11B-705.1.2.5)

5. Tiles to be Nominal 3 ft. by 2 ft. by 1.375 inches thick; 1.575 inches thick at the domes, with 1-3/8” inch deep perimeter flange and seven 1 3/8” deep internal flanges and be designed for cast in place installation as manufactured by:

   a. Access Products, Inc.
      241 Main Street, Suite 100
      Buffalo, NY 14203
      888-679-4022
      sales@accessproducts.com

   b. Approved equal.

PART 3 – EXECUTION

3.01 PREPARATION

A. Thoroughly clean new or existing surface. Remove all debris, dirt, grease, etc., at full extent of area to receive tile application.

3.02 INSTALLATION

A. Cast in Place Tactile Detectable Warning Tiles:

1. During Cast-In-Place Detectable/Tactile Warning Tile installation procedures, ensure adequate safety guidelines are in place and that they are in accordance with the applicable industry and government standards.

2. The specifications of the structural embedment flange system and concrete sealants and related materials shall be in strict accordance with the contract documents and the guidelines set by their respective manufacturers.

3. The physical characteristics of the concrete shall be consistent with the contract specifications while maintaining a slump range of 4 - 7 to permit solid placement of the Cast-In-Place Detectable/Tactile Warning Tile system. An overly wet mix will cause the tile to float, therefore under all conditions, suitable weights such as concrete blocks or sandbags (25 lb) shall be placed on each tile module.

4. Prior to placement of the Cast In Place Detectable/Tactile Warning Tile system, the contract drawings shall be reviewed and a layout drawing prepared by the installation contractor to resolve the issues related to pattern repeat, tile cuts, expansion joints, control joints, platform curves, platform end returns and platform surface interferences.

5. The concrete pouring and finishing operations require typical mason’s tools, however, a mason’s line, radius edge (1/8 x 3/16” return) tool, 4’ long x 2” wide x 1/8” thick steel straight edge, 25 lb. weights, vibrator wand and small sledge hammer with 2” x 6” x 20” wood tamping plate are specific to the installation of the Cast-In-Place System.

6. The concrete shall be poured and finished level, true and smooth to the required

dimensions prior to tile placement. Immediately after pouring concrete, a mason's line should be strung parallel to track to act as a reference line for placement of tile, and then the tile assembly shall be placed true to the platform edge and to each other on the concrete. The Cast-In-Place tiles shall be tamped or vibrated into the fresh concrete to ensure that the field level of tile is flush to the adjacent concrete or platform edge surface. The shop drawings indicate that the tile field level (base of truncated dome) is flush to adjacent surfaces to permit proper water drainage and eliminate tripping hazards between adjacent finishes. The tolerance for elevation differences between tile and adjacent surface is 1/16".

7. Immediately after tile placement, the tile elevation is to be checked to adjacent concrete or rubbing board heights with a steel straight edge. The tile elevation should be set consistent with shop drawings to permit water drainage to or away from track as the platform design dictates.

8. While concrete is workable steel edging trowel 1/8" radius x 3/16" return is to be used to edge the tile to adjacent concrete surfaces running parallel to track. While edging, ensure that a clean edge definition is created between tile and adjacent concrete and that tile to concrete elevations meet the shop drawing tolerances.

9. The placement of Cast-In-Place Tile assemblies to each other and to the mason's line or form edge shall be true and parallel to develop a true line consistent with the platform edge. A tight tile to tile placement can best be achieved by raking out the concrete at the butting edge to avoid trapping concrete or aggregate between tiles and/or form edge.

10. During and after the tile installation and the concrete curing stage, it is imperative that there is no walking, leaning or external force placed on the tile to rock the tile, causing a void between the underside of tile and concrete.

11. Following tile placement, review installation tolerances to shop drawings and adjust tile before the concrete sets, suitable weights of 25 lb. shall be placed on each tile and additional weights at tile to tile assemblies as necessary to ensure solid contact of tile underside to concrete.

12. Following the curing of the concrete, the protective plastic wrap is to be removed from the tile face by cutting the plastic with a sharp knife tight to the concrete/tile interface. If concrete bleeding occurs between tiles, a wire brush will clean the residue without damage to the tile surface.

13. An elastomeric polyurethane sealant can be applied (not typical) to the tile edges running parallel to the track or curb. Proper surface preparation requires that the tile and adjacent surfaces are mechanically etched with sandpaper or a carbide burr and wiped clean and dry with acetone. Applications of the polyurethane sealant shall be level to the adjacent surface and a straight line formed to the tile edge. A quality installation of the sealant may require that the tile face be masked off with duct tape to ensure a clean definition of sealant to the adjacent surfaces.

14. Following the concrete curing stage, protective plastic wrap is to be removed from the tile surface by cutting the plastic with a sharp knife, tight to the concrete/tile interface. If concrete bled under the plastic, a soft brass wire brush will clean the residue without damage to the tile surface.

3.04 CLEANING AND PROTECTION

A. Protect tiles against damage during construction period to comply with manufacturer's specification.

B. Protect tiles against damage from rolling loads following installation by covering with plywood.

C. Clean tiles not more than four days prior to date scheduled for inspection intended to establish date of substantial completion in each area of project. Clean tiles by method specified by tile manufacturer.

[END OF SECTION 32 17 26]

SECTION 32 31 13

CHAIN LINK FENCES AND GATES

PART 1 – GENERAL

1.01 SUMMARY

A. Furnish all labor, materials, equipment, facilities, transportation and services to complete all chain link fencing installations and related work as shown on the Drawings and/or specified herein.

B. Scope of work: The general extent of the chain link fencing improvements is shown on the Drawings, and can include but is not necessarily limited to the following:

1. Galvanized chain link fabric, posts, gates, hardware, and related appurtenances

2. Thermally fused and bonded PVC coated (“vinyl coated”) Galvanized chain link fabric with painted posts, gates, hardware, and related appurtenances

3. Chain link fence with integrally woven privacy plastic "slats"

4. Concrete footings and/or mowbands

1.02 RELATED SECTIONS

A. General Conditions.

B. Section 32 13 00: Portland Cement Concrete Paving.

1.03 REFERENCES

A. ANSI/ASTM A53/A53M-04a Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

B. ANSI/ASTM A123/A123M-02 Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

C. ANSI/ASTM A123 / A123M-09 - Zinc (Hot Dip Galvanized) Coatings on Iron and Steel Products.

D. ANSI/ASTM F567- 07 - Installation of Chain Link Fence.

E. ANSI/ASTM A153/A153M-04 Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

F. ASTM A153- A153M-09 - Zinc Coating (Hot-Dip) on Iron and Steel Hardware.

G. ASTM A392-03 Standard Specification for Zinc-Coated Steel Chain-Link Fence Fabric

H. ASTM F1043 Standard Specification for Strength and Protective Coatings on Steel Industrial Chain Link Fence Framework

I. ASTM F1083 Standard Specification for Pipe, Steel, Hot-Dipped Zinc-Coated (Galvanized) Welded, for Fence Structures

J. ASTM A500 (HSS) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes

K. ASTM C94 / C94M – 09a - Ready-mixed Concrete.

L. Chain Link Fence Manufacturers' Institute (CLFMI) - Product Manual.

M. Industrial Steel Guide for Fence, Rails, Posts, Gates and Accessories

N. State of California Department of Transportation Standard Specifications, current edition.

1.04 SYSTEM DESCRIPTION

A. Fence Height: 6'-0" unless otherwise noted. Refer to drawings.

B. Line Post Spacing: At intervals not exceeding 10 feet.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacturing the products specified in this section with minimum three years experience.

B. Installer: Company specializing in installations of chain-link fencing with a minimum of five years of experience. If any welding is required provide welders' certificates, verifying AWS qualification within the previous 12 months.

1.06 FIELD MEASUREMENTS

A. Verify field measurements are as indicated on shop drawings.

1.07 SUBMITTALS

A. Product Data: Submit manufacturer's descriptive literature and/or standard catalog "cut-sheets" of all materials, coatings, fittings and equipment proposed to be furnished and installed under this portion of the work. Include the manufacturer's name and catalog number for each item where applicable. Clearly annotate (star or asterisk-in black ink) which portions of "cut-sheets" are applicable if more than one product is shown.

B. Shop Drawings: Submit complete Shop Drawings for all different types and sizes of backstop unit(s), gates and fencing systems.

1. Shop Drawings shall include, but may not be limited to:

a. All information regarding clearances, connections, components and any miscellaneous related appurtenances (such as wood baseboards at backstops, locking mechanisms etc.)

b. Concrete footing and reinforcement information

C. Installation Instructions and/or Drawings: Submit as applicable.

D. Samples:

1. Color selections for finishes of “vinyl coated” and/or “powder coated” fencing systems.

2. Sample of privacy slat system

1.08 SEQUENCE AND SCHEDULING

A. Contractor shall coordinate construction timing of all chain link fencing and related work with installation of concrete work (Section 32 13 13 - Portland Cement Concrete) and all other work.

1.09 WARRANTY:

A. Manufacture of slats to provide a 25 year warranty against color fading and breakage of slats.

PART 2 – PRODUCTS

2.01 MATERIALS: General. Conform to CLFMI Product Manual

A. Fabric:

1. Type A - Privacy Slatted Fabric: Industrial grade. 3-1/2 inch x 5” diamond mesh interwoven wire with factory install 2.310” wide PDS “IDS” slats full height or approved equal. Secure slats with monel-clinch-lock staples. 9 gauge zinc coated steel wire, top selvage twisted tight, bottom selvage knuckled end closed. Color as selected by Owner from Manufacturer’s Standard range of colors. Slats to be fabricated of extruded high density virgin polyethylene, containing color pigmentation and U.V. inhibitors. Height shall be 6”-0” unless otherwise noted.

2. Type B - Non-Slatted Fabric: Standard Industrial grade, 2” mesh, 9 gauge zinc coated steel wire, top selvage twisted tight, bottom selvage knuckled end closed.

3. Type C - Non-Slatted Fabric: Black vinyl coated tight weave:, 1” mesh, 9 gauge zinc coated steel wire coated with black vinyl, top selvage twisted tight, bottom selvage knuckled end closed. Posts to be powder coated where vinyl coated fabric occurs. Finish: ASTM F 668 Class 2b, 7mil (0.18 mm) thickness thermally fused over zinc-coated wire. Color shall be: BLACK, GREEN, BROWN, BEIGE (to be chosen by Owner’s Representative).

4. Type D - Non-Slatted Fabric: Black vinyl coated tight weave:, 2” mesh, 9 gauge zinc coated steel wire coated with black vinyl, top selvage twisted tight, bottom selvage knuckled end closed. Posts to be powder coated where vinyl coated fabric occurs. Finish: ASTM F 668 Class 2b, 7mil (0.18 mm) thickness thermally fused over zinc-coated wire. Color shall be: BLACK, GREEN, BROWN, BEIGE (to be chosen by Owner’s Representative).

B. Selvage: Knuckled finish top and bottom.

Steel Fabric: Comply with Chain Link Fence Manufacturers Institute (CLFMI) Product Manual. Furnish one-piece fabric widths for fencing up to 16 feet high. Wire sizes includes zinc coating.

C. Galvanized Wire: Zinc coated wire-ASTM A 392, Class 1, with not less than 1.2 oz. zinc. per sq. ft.

D. Framing:

1. Strength requirements for posts and rails shall conform to ASTM F 1043.

2. Pipe shall be straight, true to section, material, and sizes specified, and shall conform to the following weights per foot:

NPS in inches	Outside Diameter (OD) in inches	Type 1 Steel	Type II Steel
1	1.315	1.68	1.35
1.25	1.660 (1-5/8")	2.27	1.84
1.5	1.900 (2")	2.72	2.28
2	2.375 (2-1/2")	3.65	3.12
2.5	2.875 (3")	5.79	4.64
3	3.500	7.58	5.71
3.5	4.000	9.11	6.56
4	4.500	10.79	---
6	6.625	18.97	---
8	8.625	28.55	---

E. Steel Framework:

1. Posts, Rails, Braces, and Gate Frames:

   a. Type I Steel Pipe: Hot-dipped galvanized steel pipe conforming to ASTM F 1083, plain ends, standard weight (Schedule 40) with not less than 1.8 oz. zinc per sq. ft. of surface area coated.

   b. Type II pipe: not applicable

   c. Finish: powder coated black.

2. End, corner, and pull posts for following fabric heights: Per plans. Or

   a. Under 6 feet: 2.375" OD (2-1/2" OD)

   b. 6 feet to 10 feet: 2.875" OD (3" OD) (with privacy slats provide 3.5" OD)

   c. 10 feet to 15 feet: 3.5" OD

   d. 15 feet to 20 feet: 4" OD

3. Line or intermediate posts for following fabric heights: Per plans or

   a. Under 6 feet: 1.90" OD (2" OD)

   b. 6 feet to 8 feet: 2.375" OD (2-1/2" OD) (with privacy slats provide 3" OD)

   c. 8 feet to 15 feet: 2.875" OD (3" OD)

   d. 15 feet to 20 feet: 3.5" OD

4. Top, Bottom and Horizontal Intermediate Rails:

   a. Top, bottom and horizontal intermediate rails (as applicable) shall be 1.66" OD (1-5/8"OD)

5. Gate Posts: Furnish posts for supporting single gate leaf, or one leaf of a double gate installation, for nominal gate widths as follows: Per plans or

   a. 6 feet to 10 feet: 3.5" OD

   b. Under 6 feet: 2-7/8" OD

6. Gate Frames: Furnish frames (single or double gate), for nominal gate widths as follows:

   a. 6 feet to 10 feet: 1.90" OD (2" OD)

   b. Under 6 feet:1.66" OD (1-5/8"OD)

F. Concrete: ASTM C94 / C94M-09a; Portland Cement, 2,500 p.s.i. strength at 28 days, 3 inch slump; one inch maximum sized coarse aggregate.

G. Fittings and Accessories

1. Material: Comply with ASTM F 626. Mill-finished aluminum or galvanized iron or steel, to suit manufacturer's standards.

   a. Zinc Coating: Unless specified otherwise, steel fence fittings and accessories shall be galvanized in accordance with ASTM A 153, with zinc weights per Table 1 of

ASTM A153

2. Tension Wire: 7 gauge (.177 inch diameter) steel single strand with black vinyl coating.

3. Tie Wires: 12 gauge (.148 inch diameter) aluminum alloy steel wire with black vinyl coating.

4. Caps: Cast steel galvanized; sized to post diameter, set screw retainer.

   a. Provide weather tight closure cap for each post. Provide line post caps with loop to receive wire or top rail with finish to match fabric.

   b. Tension Clips: Minimum 3/4 inch wide 12-gauge (.105 inch) thick with finish to match fabric.

5. Truss Rods: Hot dipped galvanized steel rods with a minimum diameter of 5/16" (7.9 mm).

6. Fittings: Sleeves, bands, clips, rail ends, tension bars, fasteners and fittings; steel galvanized and powder coated black.

7. Gate Hardware: Fork latch with gravity drop mechanical keepers; three 180 degree gate hinges per leaf and hardware for padlock. Padlock to be provided by District.

H. Finishes

1. Components and Fabric: Galvanized to ANSI/ASTM A123 / A123M - 09; 1.2 oz./sq. ft. and powder coated or covered with black vinyl.

2. Hardware: Galvanized to ASTM A153 / A153M-09, 1.2 oz./sq. ft. coating and powder coated black.

2. Accessories: For fencing with vinyl coated fabric, fittings and accessories shall be painted with two applications of exterior grade paint. Color shall match vinyl color.

I. Gate Hardware

1. See drawings for gate elevations and hardware groups.

2. Lever Hardware Kit – LOCINOX USA – LAKQ U2 chain link lock kit. For use at passage type gates not requiring panic devices.

3. Self Closing Hinge System – LOCINOX USA – Mammoth 180 Degree Closer and Hinge Kit. Opening force shall be less than 5 lbs.

J. Edgebands: All fencing shall be provided with concrete edgebands unless otherwise noted. Edgebands shall have a minimum 4” clearance from edge of post to edge of concrete. Gates will have the same edgeband width as adjacent fencing.

K. Knox Box: Model 3200 series, black. Fully weld to gate frame. Prime and paint affected finish. Location and quantity as shown on drawings.

2.02 WARRANTY:

A. Manufacture of slats to provide a 25 year warranty against color fading and breakage of slats.

PART 3 – EXECUTION

3.01 PREPARATION

A. Prior to excavation, layout all fencing locations for review and acceptance by Owner's

Representative.

3.02 INSTALLATION

A. Conform to layout shown on Drawings, except as modified by the Owner's Representative.

B. Erect fencing in strict conformance with reviewed and accepted Drawings, Shop Drawings, and manufacturer's recommendations.

C. Install new footings as shown on Drawings.

D. Posts shall be installed vertical and plumb.

E. General: Install fence in compliance with ASTM F 567. Do not begin installation and erection before final grading is completed, unless otherwise permitted.

F. Excavation: Drill or hand-excavate holes for posts to diameter and spacing indicated in firm, undisturbed or compacted soil.

1. Unless noted otherwise, excavate holes for each post to minimum diameter recommended by fence manufacturer, but not less than 4 times largest cross section of post.

2. Unless noted otherwise, excavate hole depths approximately 3 inches lower than post bottom, with bottom of posts set not less than 36 inches below finish grade surface.

G. Setting Posts: Center and align posts in holes 3 inches above bottom of excavation. Space chain link posts maximum 8 feet o.c. unless noted otherwise. Surface mount posts with mounting plates where indicated. Fasten with lag bolts and shields. Set intermediate, terminal and gate posts plumb in concrete footings. Slope top of concrete for water runoff.

H. Top Rails: Run rail continuously through line posts caps, bending to radius for curved runs and at other posts termination into rail end attached to posts or post caps fabricated to receive rail. Provide expansion couplings as recommended by fencing manufacturer.Provide top rail through line post tops and splice with 6 inch long rail sleeves.

I. Center and Bottom Rails: Install bottom rails between posts with fittings and accessories as shown in Drawings (as applicable). Install center and bottom brace rail at corner gate leaves and all around enclosure.

J. Brace Assemblies: Install braces so posts are plumb when diagonal rod is under proper tension. Install center brace for all fences higher than 6 feet.

K. Fabric: Leave approximately 2 inches between finish grade and bottom selvages (1 inch at backstops) unless otherwise indicated. Pull fabric taut and tie to posts, rails, and tension wires. Install fabric on infield or primary use side of fence (unless noted otherwise), and anchor to framework so that fabric remains in tension after pulling force is released.

1. Fasten fabric to top rail, line posts and bottom tension wire with tie wire at maximum 15 inches on centers.

2. Attach fabric to end, corner and gate posts with tension bars and tension bar clips.

L. Tension Bars: Provide one bar for each gate and end post, and two for each corner and pull post, except where fabric integrally woven into post. Thread through fabric, and secure to end, corner, pull, and gate posts with tension clips spaced not over fifteen (15) inches on center.

M. Tie Wires: Use U-shaped wire of proper length to secure fabric firmly to posts and rails with ends twisted at least 2 full turns. Bend ends of wire to minimize hazard to persons or clothing. Tie fabric to line posts 12 inches maximum on center and to rails and braces 24 inches maximum on center.

N. Fasteners: Install nuts for tension clips and hardware bolts on side of fence opposite fabric side. Peen ends of bolts or score threads to prevent removal of nuts. Cut all bolts within three threads of nut or less.

O. Terminal and Gate Post:

1. Line Terminal and Gate Post Footing Depth Below Finish Grade: 3 feet and 12 inches diameter.

2. Brace each gate and corner post to adjacent line post with horizontal center brace rail and diagonal truss rods. Install brace rail, one bay from end and gate post.

3. Install bottom tension wire stretched taut between terminal posts.

4. Do not swing gate from building wall; provide gate posts.

5. Install gate with fabric to match fence. Install three hinges per leaf, latch, catches, retainer and locking clamp.

P. Welding: All welds shall be shop fabricated prior to galvanizing unless otherwise acceptable to Owner's Representative. Any and all field welds shall be completed by a Certified Structural Welder and shall be "spray-galvanized" or otherwise treated subject to the discretion of the Owner's Representative.

1. All field welding to be performed by certified welder and all welds are to be ground down smooth.

2. All areas of welds are to be thoroughly cleaned and treated with two coats of cold galvanized spray.

3. All hinges shall be spot welded to the gate post.

Q. All clamping bolts protruding from clamp shall be cut off flush to nut and exposed end of bolt shall be galvalumed. Galvanized acorn nut is also an acceptable means of protecting students from sharp edges.

R. All fence post caps and backstop caps shall be spot welded to post.

3.02 ERECTION TOLERANCES

A. Maximum variation from plumb: 1/8 inch.

B. Maximum offset from true position: 3/8 inch.

C. Components shall not infringe adjacent property lines.

3.03 EXTRA STOCK

A. Provide a 25 foot roll of each fencing type for every 400 linear feet of each fencing type.

[END OF SECTION 32 31 13]

SECTION 32 31 19

DECORATIVE METAL FENCES AND GATES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Ornamental picket fencing, gates and accessories.

1.02 RELATED SECTIONS

A. Section 32 13 00: Portland Cement Concrete Paving.

1.03 SUMBITTALS

A. Shop Drawings: Layout of all fences and gates with dimensions, details and finishes of component accessories and post foundations.

B. Product Data: Manufacturer's catalogue cuts indicating material compliance and specified options including steel tube sizes.

C. Samples: Color selections for polyester powder coat finish.

PART 2 PRODUCTS

2.01 MANUFACTURER

A. Products from other qualified manufacturers having a minimum of 5 years experience manufacturing ornamental picket fencing will be acceptable by the architect as equal if they meet the following specifications for design, size, gauge of metal parts and fabrication (or equal).

B. Ornamental Picket Fence and Swing Gates:
Style: Imperial B-3 Horizontal Rails.
Heights: 6'0" or as otherwise indicated on the Drawings.

C. Approved Manufacturers:

1. Monumental Iron Works, Baltimore, MD,
Phone (888) MH-Fence, (888) 643-3623

2. Ameristar, Tulsa, OK
Phone (888) 333-3422

3. Merchant Metals
Phone (770) 741-0300
211 Perimeter Way, Suite 250
Atlanta, GA 30346

2.02 ORNAMENTAL PICKET FENCE

A. Pickets: Square tubular members, ASTM A513, hot-rolled structural quality steel. 50,000 psi (310 Mps) tensile strength, 60,000 psi (372 Mpa) yield strength. Minimum size pickets ¾ inches square x 18 ga. Space pickets 3-15/16" maximum (100mm) face to face. Attach each picket to each rail with ¼" (6mm) industrial drive rivets. Size #4. Minimum gauge wall thickness solid gauge.

B. Rails: "U" channels formed from hot-rolled structural steel having no pockets or shelves to hold water or moisture, 1-3?8" (35 mm) wide x 1-1/2" (38 mm) deep, 11 gauge (0.120" (3.05 mm) wall thickness. Punch rails to receive pickets and rivets and attach rails to rail brackets with 2 each, ¼"

(6 mm) industrial drive rivets. Size #4. Steel for rail produced under ASTM A446. Provide top rail, bottom rail, and third rail 6" below top rail.

C. Posts: Square tubular members, ASTM A500, hot-rolled structural quality steel, 50,000 psi (310 Mpa) Tensile strength, 60,000 psi (372 Mpa) yield strength, with ASTM A525 hot-dipped galvanized G90 coating. Minimum post size 4" sq., having minimum 12 gauge wall thickness. Post size at gates as required to support specified gate leaf size.

D. Accessories: post caps.

E. Finish: After all steel components have been galvanized, clean and prepare the surface of all components to assure complete adhesion of finish coat. Apply 2.5 mil (0.0635) thickness of polyester resin based powder coating by electrostatic spray process. Bake finish for 20 minutes at 450°C (232°C) metal temperature. Color as selected by Architect from manufacturer's full range of standard colors.

2.03 GATES

A. Ornamental picket swing gates in same style configuration and height as specified fencing.

B. Gate posts shall be of extra heavy-duty construction and size to adequately support each specified gate leaf size without sag.

C. Provide panic hardware at non vehicular gates.

2.04 ACCESSORIES

A. Rail Attachment Brackets – die cast of zinc (ZAMAC #3 Alloy) per ASTM B86-83Z 33521. Ball and socket design capable of 30° swivel (up/down – left/right). Bracket to fully encapsulate rail end for complete security that is aesthetically pleasing.

B. Industrial Drive Rivets: Of sufficient length to attach items in a secure non-rattling position. Rivet to have a minimum of 1100 lbs. (4894 N) holding power and a shear strength of 1500 lbs. (6674 N).

C. Ornamental Picket Fence Accessories: Provide indicated items required to complete fence system. Galvanize each ferrous metal item in accordance with ASTM B695 and finish to match framing.

D. Post Caps: Formed steel, cast of malleable iron or aluminum alloy, weathertight closure cap. Provide one flat style post cap for each post.

E. Picket Tops: Flat top with polymer plug.

F. Hinges: Provide heavy-duty weld hinges of size capable of supporting specified leaf width without sag or failure. Gorilla hinge or equal.

G. Locking Clasps: Provide heavy-duty hardware to receive padlock at location where gate leaves meet each other or strike post.

H. Cane Bolt: Provide heavy-duty cane bolt at all 2-leaf gate configurations. Provide at each leaf to secure each leaf into pavement below. Cane bolt shall be capable of being raised and locked in the retracted position when not in use.

I. Knox Box: Model 3200 series, black. Fully weld to gate frame. Prime and paint affected finish. Location and quantity as shown on drawings.

2.05 SETTING MATERIAL

A. Concrete: Minimum 28 day compressive strength of 3,000 psi.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify areas to receive fencing are completed to final grades and elevations.

B. Ensure property lines and legal boundaries of work are clearly established.

3.02 INSTALLATION

A. Install fence in accordance with manufacturer's instructions.

B. Space posts uniformly at 7' 8-3/4" (2356 mm) maximum face to face unless otherwise indicated.

C. Concrete Fence Set Posts: 24" min. Ø x36" min. deep or as otherwise indicated on drawings.

D. Concrete Gate Swing Posts: Provide reinforced concrete footings as indicated on the Drawings.

E. Check each post for vertical and top alignment, and maintain in position during placement and finishing operation.

F. Align fence panels between posts. Firmly attach rail brackets to posts with ¼" (6 mm) bolt and lock nut, ensuring panels and posts remain plumb.

G. Position bottom of fabric 2 inches above existing/new finished grade.

H. Where touch up paint is necessary, paint shall match powder coated finish. Unacceptable finishes will require re-powder coating.

3.03 GATE INSTALLATION

A. Install gates plumb, level and secure for full opening without interference.

B. Attach hardware by means, which will prevent unauthorized removal.

C. Adjust hardware for smooth operation.

3.04 ACCESSORIES

A. Install post caps and other accessories to complete fence. Post caps shall be riveted to post with two rivets on opposite sides of post.

3.05 CLEANING

A. Clean up debris and unused material, and remove from site.

3.06 ADDITIONAL SUPPLIED ITEMS

A. Provide a bag of rivets to District for projects exceeding 200 linear feet (including gates).

B. Provide one additional panel of fence with brackets for every 200 linear feet of fencing for each height used.

C. Provide one additional bracket for every 100 linear feet of fencing.

[END OF SECTION 32 31 19]

SECTION 32 80 00

IRRIGATION

PART 1 - GENERAL

Construction Documents and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification sections, apply to this section.

1.01 DESCRIPTION

A. Scope of Work: Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the installation of an automatic sprinkler irrigation system, including all piping, sprinkler heads, controls, connections, testing, etc. aas shown on the Drawings and as specified herein. The water source for this project is potable water.

B. Utilize and accept as standards manufacturer's recommendations and/or installation details for any information not specifically detailed on the Drawings.

1.02 RELATED SECTIONS

A. ELECTRICAL: Division 26.

B. FINISH GRADING: Section 31 10 00.

C. EARTH MOVING: Section 31 20 00.

D. LANDSCAPING: Section 32 90 00.

1.03 GUARANTEE

A. Guarantee all workmanship and materials hereunder against defective workmanship and materials, including damage by leaks and settlement of irrigation trenches, for the duration specified in Division 01 of these Specifications. (The Contractor is not responsible for vandalism or theft after date of final acceptance.)

1.04 QUALITY CONTROL

A. Qualifications of Contractor: Provide proof of five years continuous experience in landscaping and irrigation of projects of similar size.

B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.

C. Reviews: Specifically request reviews of all items listed below in "Inspection Requirements" prior to progressing to the next level of work.

D. Certification: Ensure that the contractor installing the Central Control System is trained and certified in the installation of the Central Control System. The training and certification must have been completed within two years prior to the installation date.

E. Standards:

1. Provide work and material in full accordance with the rules and regulations of the National Electric Code; the Uniform Plumbing Code; and other applicable state or local laws or regulations.

2. Furnish, without extra charge, additional material and labor required to comply with these

rules and regulations, though the work may not be specifically indicated in the Specifications or Drawings.

3. Where the Specification requirements exceed those of the above-mentioned codes and regulations, comply with the requirements in the Specifications.

F. Delivery, Storage, and Handling:

1. Use all means necessary to protect irrigation system materials before, during, and after installation and to protect related work and material.

2. Handle plastic pipe carefully, especially protecting it from prolonged exposure to sunlight. Store pipe on beds that are the full length of the pipe, and keep pipe flat and off the ground with blocks.

G. Comply with the requirements of Section 01 70 00 – EXECUTION AND CLOSEOUT REQUIREMENTS.

1.05 INSPECTION REQUIREMENTS

A. Request and hold a pre-construction meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and the Landscape Architect.

B. Prior to commencement of the work of this Section, obtain written verification from the project Civil Engineer that the rough grade in landscape areas is in conformance with Section 31 20 00 - EARTH MOVING.

C. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:

1. Pressure testing of all mainlines and lateral lines (See "Hydrostatic Tests – Open Trench" in Part 3.18 of this Section),

2. Trench depth,

3. Sleeves under pavement,

4. Flushing of all mainlines and lateral lines,

5. Installation of mainline thrust blocks,

6. Backfill and pipe bedding,

7. Layout bubbler heads,

8. Installation of subsurface inline drip tubing (with Landscape Architect),

9. Operation of system and coverage adjustments (with Landscape Architect) after system is fully automated and operational, backfill of trenching is completed, and surface has been restored to original grades.

D. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

1.06 SUBMITTALS AND SUBSTITUTIONS

A. Comply with requirements of Section 01 33 00 – SUBMITTAL PROCEDURES.

B. Product names are used as standards; provide proof as to equality of any proposed material and do not use other materials or methods unless approved in writing by the Owner's Representative. Submit no more than one request for substitution for each item. The decision of the Owner's Representative is final.

C. Use equipment capacities specified herein as the minimum acceptable standards.

D. List materials in the order in which they appear in Specifications; include substitutions. Submit the list for approval by the Owner's Representative.

E. Make any mechanical, electrical, or other changes required for installation of any approved, substituted equipment to satisfaction of Owner's Representative and without additional cost to Owner. Approval by Owner's Representative of substituted equipment and/or dimensional drawing does not waive these requirements.

F. Do not construe approval of material as authorization for any deviations from Specifications unless attention of Owner's Representative has been directed to specified deviations.

1.07 PROJECT CONDITIONS, AND PROTECTION

A. Information on Drawings relative to existing conditions is approximate. During progress of construction, make deviations necessary to conform to actual conditions, as approved by Owner's Representative, without additional cost to Owner. Accept responsibility for any damage caused to existing services. Promptly notify Owner's Representative if services are found which are not shown on Drawings.

B. Protect existing trees-to-remain as specified in "Existing Tree Protection" in Part 3.02 of this Section.

C. Protect existing utilities within construction area. Repair damages to utility lines that occur as a result of operations of this work.

D. Verify dimensions at building site and check existing conditions before beginning work. Make changes necessary to install work in harmony with other crafts after receiving approval by Owner's Representative.

1.08 MAINTENANCE AND OPERATING INSTRUCTIONS

A. Furnish three complete sets of operating maintenance instructions bound in a hardback binder and indexed. Start compiling data upon approval of list of materials. Do not request final inspection until booklets are approved by Owner's Representative.

B. Incorporate the following information in these sets:

1. Complete operating instructions for each item of irrigation equipment.

2. Typewritten maintenance instructions for each item of irrigation equipment.

3. Manufacturer's bulletins which explain installation, service, replacement parts, and maintenance.

4. Service telephone numbers and/or addresses posted in an appropriate place as designated by Owner's Representative.

1.09 RECORD DRAWINGS

Upon completion of work, and as a precedent to final payment, deliver to Owner's Representative one complete set of reproducible originals of Drawings showing work exactly as installed. (See "Record

Drawings" in Part 3.21 of this Section)

PART 2 - PRODUCTS

2.01 GENERAL

Use materials as specified; any deviation from the Specifications must first be approved by the Owner's Representative in writing. All material containers or certificates shall be clearly marked by manufacturer as to contents for inspection.

2.02 MATERIALS

A. Central Control System: Existing.

B. Automatic Control Valves: As indicated on Drawings.

C. Gate Valve: As indicated on Drawings.

D. Pipe and Fittings:

1. PVC pipe: As indicated on Drawings.

2. PVC fittings three-inch (3") size and smaller: High impact, standard weight, Schedule 40, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

3. PVC fittings four-inch (4") size and larger: High impact, standard weight, Class 200 gasketed, molded PVC as manufactured by George Fischer, Lasco, Spears, or approved equal.

4. All plastic pipe and fittings: Continuously and permanently marked with manufacturer's name, type of material, IPS size, schedule, NSF approval, and code number.

5. Threaded PVC pipe and nipples: IPS Schedule 80 when necessary to use threaded connections to gauges, valves, or control valves. Threaded adapters may be used in place of nipples when making pipe to valve connections.

6. Use 45-degree fittings for changes in depth of pipe, and at transition from main line to automatic control valves.

7. Piping above ground: Schedule 40 galvanized steel with cast-iron fittings.

8. Piping used for electrical purposes to be Schedule 40 PVC Rigid Nonmetallic Conduit electrical conduit.

E. Booster Pump: Existing.

F. PVC Primer: Weld-On P-70 Purple Primer or approved equal.

G. PVC Glue: Weld-On 711 Gray heavy bodied PVC Cement or approved equal.

H. Sprinkler Heads: As indicated on Drawings.

I. Quick Coupler Valves: As indicated on Drawings.

J. Sleeves: As indicated on Drawings.

K. All Valve Boxes and Covers: Manufactured, purple with "Irrigation – Non-Potable" permanently

embossed on cover. Carson, Rainbird or approved equal.

L. Sub-surface Inline Drip Tubing:

1. Tubing: As indicated on Drawings. Make all tubing connections with manufacturer-approved fittings. See Drawings for emitter flow rates and spacing.

2. Soil Staple: Hold tubing in place with soil staples spaced evenly every three to five feet (3' - 5') on center, and with two staples at each change of direction.

3. Line Flushing Valve: As indicated on Drawings.

4. Pressure Regulator: As indicated on Drawings.

5. Disc Filter/Screen Filter: As indicated on Drawings.

M. Reduced Pressure Backflow Preventer: Existing.

N. Automatic Sprinkler Control Wire:

1. Connections between remote control valves and controller: UF-14 direct burial plastic coated wire. Common wire to be white, and lead wire to be colored. If multiple controllers are used, a different color is to be used for each controller's lead wire. (Use red for the first controller). Spare wires are to be yellow.

2. UL Listed waterproof sealing pack for wire connections: 3M DBR/Y-6, or approved equal.

3. Provide adequate working space around electrical equipment in compliance with local codes and ordinances.

4. Electrical, other than low voltage, such as power wiring, conduit, fuses, thermal overloads and disconnect switches, is included under Division 26 of these Specifications.

O. Unions And Flanges:

1. Steel unions and flanges two inches (2") and smaller: 150 lb. screwed black (brass to iron seat) or galvanized malleable iron (ground joint).

2. Steel unions and flanges two and one-half inches (2 ½") and larger: 150 lb. black flange union, flat-faced, full gasket.

3. Gaskets: One-sixteenth inch (1/16") thick rubber Garlock No. 122, Johns-Manville or approved equal.

4. Flange Bolts: Open-hearth bolt steel, square heads with cold pressed hexagonal nuts, cadmium plated in ground. Provide copper-plated steel bolts and nuts or brass bolts and nuts for brass flanges.

P. Valve Identification Tags: Christy's irrigation ID tags, standard yellow color or approved equal.

Q. Sand for Trench Backfill: Natural sand, free of roots, bark, sticks, rags, or other extraneous material.

PART 3 - EXECUTION

3.01 SITE CONDITIONS

Locations of existing utilities and other improvements shown on the Drawings are approximate. Verify

existing conditions and, should any utilities be encountered that are not indicated on the plans, notify the Owner's Representative immediately. Accept responsibility for any damages caused to existing services.

3.02 PREPARATION

A. Scheduling: Notify the Project Inspector prior to commencing and/or continuing the work of this Section. Remove and replace, at no cost to Owner, any work required as a result of failure to give the appropriate notification.

B. Examination: Examine conditions of work in place before beginning work; report defects.

C. Measurements: Take field measurements; report variance between plan and field dimensions.

D. Protection: Maintain warning signs, shoring and barricades as required. Prevent injury to, or defacement of, existing improvements. At no additional cost to Owner, repair or replace items damaged by installation operations.

E. Existing Tree Protection:

1. Avoid unnecessary root disturbance, compaction of soils within drip line, or limb breakage.

2. Do not store material or dispose of any material other than clean water within the drip line.

3. Provide adequate irrigation during construction.

4. Replace any tree damaged during construction with a tree of equal size and value at no additional cost to Owner.

5. Adjust trench locations in field to minimize damage to existing elements and plant roots of trees-to-remain at no additional cost to Owner.

F. Surface Preparation: Prior to beginning sprinkler irrigation work, complete placement of topsoil as specified in Section 31 20 00 – EARTH MOVING. Notify Project Inspector of irregularities if any.

3.03 GRADING

Install all irrigation features to their finished grade and at depths indicated. Complete and /or accommodate all rough grading and/or finish grading before commencing with trenching. See Section 31 00 00 – FINISH GRADING for more information.

3.04 LAYOUT

A. Lay out work as accurately as possible to Drawings. Drawings are generally diagrammatic to extent that swing joint offsets and fittings are not shown. Record all changes on the Record Drawings.

B. Do not willfully install the irrigation system as shown on Drawings when it is obvious, in the field, that obstructions or other discrepancies exist which may not have been considered in the design. Notify Owner's Representative of discrepancies before proceeding.

3.05 EXCAVATING AND TRENCHING

A. General: Perform excavations as required for installation of work included under this Section, including shoring of earth banks to prevent cave-ins. Restore surfaces, existing underground installations, etc., damaged or cut as result of this work to their original condition and in a manner approved by the Landscape Architect.

B. Width:

1. Make trenches wide enough to allow a minimum of six inches (6”) between parallel pipelines and three inches (3”) between side of pipe and side of trench. Do not allow stacking of pipe within trench.

2. Allow a minimum clearance of twelve inches (12”) in any direction from parallel pipes of other trades.

C. Preparation of Excavations: Remove rubbish and rocks from trenches. Bed pipe on a minimum of three inches (3”) of clean, rock-free soil to provide a firm, uniform bearing for entire length of pipeline. Cover pipe with a minimum of three inches (3”) of clean, rock-free soil. If clean, rock-free soil is not available, use sand for pipe bedding and three inches (3”) of backfill above the pipe. The remainder of the trench backfill material can be native soil. Do not allow wedging or blocking of pipe.

D. Minimum depth of cover: Unless shown otherwise, provide the following minimums:

1. Mainline: twenty-four inches (24”) cover.

2. Lateral line: twelve inches (12”) cover for spray heads, and eighteen inches (18”) cover for rotor heads.

3. Sub-surface inline drip tubing: on surface of finish grade.

E. Conflicts with other trades:

1. Hand-excavate trenches where potential conflict with other underground utilities exist.

2. Where other utilities interfere with irrigation trenching and piping work, adjust the trench depth as instructed by Owner’s Representative.

3.06 THRUST BLOCKS

A. To resist system pressure on ring-tite pipe and fittings, provide thrust blocks at any change of direction, change of size, dead end, and/or valves at which thrust develops when closed. See thrust block details for examples.

B. Use cast-in-place concrete and size thrust blocks based on an average soil-safe bearing load of 700 lbs. per square foot.

C. Form thrust blocks in such a manner that concrete comes in contact only with the fittings. Place thrust block between adequately compacted soil and the fitting.

D. Thrust blocks are to be constructed of concrete with a minimum of 2500psi.

E. Thrust blocks are to be free, separate, and independent of adjacent or nearby thrust blocks.

3.07 BACKFILL AND COMPACTING

A. General: Do not begin until hydrostatic tests are completed. When system is operating and after required tests and inspections have been made, backfill trenches under paving areas to the compaction rate specified in Section 31 20 00 – EARTH MOVING.

B. Place backfill in six-inch (6”) layers and compact with an acceptable mechanical compactor.

1. Compact backfill material in landscape areas to eighty-five percent (85%) maximum dry density of the soil.

2. If settlement occurs along trenches, make adjustments in pipes, valves, and sprinkler

heads, soil, sod or paving as necessary to bring the system, soil, sod or paving to the proper level or the permanent grade, without additional cost to the Owner.

C. Excess Soil: Remove all rocks, debris, and excess soil that results from sprinkler irrigation trenching operations, landscape planting, and soil preparation operations off site at no additional cost to the Owner. If soil meets topsoil requirements in Section 31 20 00 – EARTH MOVING, it may be used for finish grading.

D. Finishing: Dress-off areas to eliminate construction scars.

3.08 CONTROL WIRES

A. General: Install control wires beneath sprinkler main line whenever possible; tape wiresto mainline pipe

B. Slack Wire: Provide eighteen inches (18”) of slack wire for each wire connected to automatic control valve. Slack wire shall be coiled and left in the valve box. Tape wires in bundles every ten feet (10’); do not tape wires in sleeves.

C. Expansion and Contraction: Snake wire in trench to allow for contraction of wire.

D. Wire Passing Under Existing or Future Paving or Construction: Encase in PVC Schedule 40 or galvanized steel conduit extending at least twelve inches (12”) beyond edges of paving or construction.

E. Wire Connections: Install wire connections in a waterproof sealing pack.

F. Wire Splicing: Permit splicing only on runs exceeding 500 feet. Locate all splices within valve boxes.

G. Wire Termination: Install wire in a valve box with eighteen inches (18”) of slack wire coiled and individually capped with approved waterproof sealing pack.

3.09 FLUSHING LINES

Thoroughly flush lines prior to installing valves, performing hydrostatic testing, or installing sprinklers. Divert water to prevent washouts.

3.10 AUTOMATIC CONTROL AND QUICK COUPLER VALVES

A. Install where shown and where practical; place no closer than twelve inches (12”) to walk edges, building walls, or fences. Refer to detail for example.

B. Thoroughly flush mainline before installing valve.

C. Install valves in ground cover areas where possible.

3.11 PIPING

A. General: Install in conformance with reference standards, manufacturer’s written directions, as shown on Drawings and as herein specified.

B. Workmanship:

1. General: Install sprinkler irrigation equipment in planted areas throughout the site.

2. Coordination: Organize location of sleeves with other trades as required.

C. Pipe Line Assembly:

1. General:

a. Cutting: Cut pipe square; remove rough edges or burrs.

b. Solvent-welded Connections: Use materials and methods recommended by the pipe manufacturer.

c. Brushes: Use non-synthetic brushes to apply solvents and primer.

d. Cleaning: Clean pipe and fittings of dirt, moisture, and debris prior to applying solvent or primer.

e. Assembly: Allow pipe to be assembled and welded on the surface or in the trench.

f. Expansion and Contraction: Snake pipe from side to side of trench to allow for expansion and contraction.

g. Location: Locate pipes as shown on Drawings except where existing supply valves, utilities or obstructions prohibit or where slight changes are approved to better suit field conditions.

2. Flexible Elastometric Seal Joints:

a. General: Assemble in strict conformance with the pipe manufacturer's instruction.

b. Rubber Rings: Use rubber rings specific for water service systems.

c. Cleaning: Thoroughly clean ring and groove of dirt, moisture and debris using a clean, dry cloth. Do not use solvents, lubricants, cleaning fluids or other material for cleaning.

d. Seating: Properly seat ring in groove.

e. Spigot:

1.) General: Clean spigot-end of pipe as in "Cleaning" above prior to applying lubricant recommended by pipe manufacturer.

2.) Seating: Insert spigot into bell and seat to full depth required.

3. Connections:

a. Threaded Plastic Pipe Connection:

1.) Use Teflon tape or pipe joint compound.

2.) When assembling to threaded pipe, take up joint no more than one full turn beyond hand-tight.

b. Metal Valves and Plastic Pipe: Use threaded plastic male adapters.

c. Metal to Metal Connections:

1.) Use specific joint compound or gasket material for type of joint made. Where pipe of dissimilar metals are connected, use dielectric fittings.

2.) Where assembling, do not allow more than three full threads to show when joint is made up.

d. Where assembling soft metal (brass or copper) or plastic pipe, use strap-type friction wrench only; do not use a metal-jawed wrench.

e. Threading:

1.) Do not permit the use of field-threading of plastic pipe or fittings. Use only factory-formed threads.

2.) Use factory-made nipples wherever possible. Permit the use of field-cut threads in metallic pipe only where absolutely necessary. When field-threading, cut threads accurately on axis with sharp dies.

3.) Use pipe joint compound for all threaded joints. Apply compound to male thread only.

4. Sleeves and conduits:

a. Use sleeves of adequate size to accommodate retrieval for repair of wiring or piping and extend a minimum of twelve inches (12”) beyond edges of walls or paving.

b. Provide removable, non-decaying plug at end of sleeve to prevent entrance of soil.

5. Unions: Locate unions for easy removal of equipment or valve.

6. Joint Restraints: Install per manufacturer’s recommendations.

7. Capping: Plug or seal opening as lines are installed to prevent entrance materials that would obstruct pipe. Leave in place until removal is necessary for completion of installation.

D. Sub-surface Inline Drip Tubing:

1. Install as per Drawings and as per manufacturer’s recommendations. Prior to installation of tubing, obtain approval of finish grade in all planters where tubing is to be installed. (See inspection requirements.)

2. After tubing is installed, operate system for coverage test. Obtain approval of the Project Inspector and/or Landscape Architect prior to backfill.

3.12 FIELD QUALITY CONTROL

A. Visual Inspection: Verify that all pipe is homogenous throughout and free from visual cracks, holes, or foreign materials. Inspect each length of pipe. All materials are subject to impact test at the discretion of the Landscape Architect.

B. Hydrostatic Tests – Open Trench:

1. Center-load piping with a small amount of backfill to prevent arching or slipping under pressure.

2. Request the presence of the Project Inspector in writing at least forty-eight hours in advance of testing.

3. At no additional cost to Owner, test in the presence of the Project Inspector.

4. Apply continuous static water pressure of 100 psi when welded plastic joints have cured at least twenty-four hours, and with the risers capped, as follows: test main lines and submains for four hours; test lateral lines for two hours.

5. Repair leaks resulting from tests; and repeat tests.

6. Test to determine that all sprinkler heads function according to manufacturer's data and give full coverage according to intent of Drawings. Replace any sprinklers not functioning as specified with ones that do, or otherwise correct system to provide satisfactory performance.

C. Continuity Testing: Test locating device and control wires for continuity prior to and after back-filling operations.

3.13 CLEAN-UP

Remove debris resulting from work of this Section.

3.14 ADJUSTMENTS AND MAINTENANCE

A. Adjusting System: Prior to acceptance, satisfactorily adjust and regulate entire system. Set watering schedule on controller appropriate to types of plants and season of year. Adjust remote control valves to operate sprinkler heads at optimum performance based on pressure and simultaneous demands through supply lines.

B. System Layout: Provide reduced prints of Record Document irrigation plans, laminated in four (4) mil. plastic, of size to fit controller door. Enlarge remote-control valve designations as necessary for legibility. Color-code areas covered by each station. Affix plans to inside of controller door.

C. Instructions: Upon completion of work, instruct maintenance personnel on operation and maintenance procedures for entire system.

D. Flow Charts: Record and prepare an accurate flow-rate chart for each automatic control valve.

3.15 RECORD DRAWINGS

A. Regularly update plans of the system and any changes made to the system throughout the project. Record all changes on this plan before trenches are back-filled.

B. Record the as-built information on reproducible plans provided by the Architect. Complete and submit the Record Drawings to the Architect before applying for payment for work installed.

C. Show the following on the Record Drawings accurately to scale and dimensioned from two permanent points of reference:

1. Distance of mainline from nearby hardscape.

2. Location of automatic control valves, quick couplers, and gate valves.

3. Location and size of all sleeves.

4. Location of automatic control wires and spares.

3.16 OPERATION MANUALS

Deliver two complete sets of manufacturer's warranties, Contractor guarantees, instruction sheets, parts lists and operation manuals to the Architect before requesting final acceptance of the project. Do not request final inspection until the sets are approved.

[END OF SECTION 32 80 00]

SECTION 32 80 00

LANDSCAPING

PART 1 - GENERAL

Construction Documents and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specifications sections, apply to this section.

1.01 DESCRIPTION

A. Scope of Work: Furnish all labor, materials, tools, equipment, and transportation required to perform and complete the following work as specified herein:

1. Soil Preparation and Fertilization
2. Planting
3. Weed Control
4. Mulch
5. Clean-up
6. Landscape Maintenance Period
7. Guarantee

B. Work not included in this Section: Landscape elements such as concrete walks, fencing, outdoor lighting, rough grading, and clearing are not a part of this Section unless shown on the landscape Drawings.

1.02 RELATED SECTIONS

A. SUBMITTAL REQUIREMENTS: Section 01 33 00.

B. EXECUTION AND CLOSEOUT REQUIREMENTS: Section 01 70 00.

C. SUSTAINABLE DESIGN REQUIREMENT: Section 01 81 13

D. FINISH GRADING: Section 31 10 00.

E. EARTH MOVING: Section 31 20 00.

F. IRRIGATION: Section 32 80 00.

1.03 GUARANTEE

A. The guarantee period for plant material shall be the duration of the landscape maintenance period, from commencement until final acceptance of the work of this Section. See Division 01 for other applicable guarantee requirements.

B. During the guarantee period, repair and/or replace plants and lawn not in satisfactory growing condition, as determined by Owner's Representative, without additional cost to Owner. Plants are to be replaced as per "Landscape Maintenance" in Part 3.12 of this Section, using plants of the same kind and size specified in plant list.

1.04 QUALITY CONTROL

A. Qualifications: Provide proof of five years of continuous experience in landscaping and irrigation of projects of similar size (+\- 20% of the construction cost) and scope for education campuses. Contractor to have a minimum of two projects either completed or in construction in the last five years.

B. Work Force: Ensure that an experienced foreman is present at all times during installation. Keep the same foreman and workers on the job from commencement to completion.

C. Reviews: Specifically request reviews of all items listed below in "Inspection Requirements" prior to progressing to the next level of work. The Owner's Representative reserves the right to inspect and reject material, both at place of growth and at site, before and/or after planting, for compliance with requirements for name, variety, size and quality.

D. Reference Standards: Meet or exceed Federal, State and County laws requiring inspection of all plants and planting materials for plant disease and insect control.

E. Delivery, Storage, and Handling:

1. Packaged Materials: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of conformance with state and federal laws if applicable.

2. Bulk Materials:

a. Do not dump or store bulk materials near structures, utilities, walkways or pavements, or on existing turf areas or plants.

b. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways.

c. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

F. Plant Material:

1. Conform to the current edition of Horticultural Standards for quality of Number 1 grade nursery stock as adopted by the American Association of Nurserymen. Conform to sizes specified on plant legend. Select plants which have a natural shape and appearance.

2. Select only plants that are true to name, and tag one of each bundle or lot with the name of the plant in accordance with the standards of practice of the American Association of Nurserymen. In all cases, botanical names shall take precedence over common names.

3. Tag each plant of a patented variety with the variety and identification number, where applicable, as it is delivered to the job site.

4. Select only plants which have been nursery-grown in accordance with good horticultural practices and which have been grown under climatic conditions similar to those in the locality of the project for at least one year.

5. Select only plants which are typical of their species or variety; have normal habits of growth; are sound, healthy, vigorous, well-branched and densely-foliated when in leaf; are free of disease, insect pests, eggs or larvae; and have a healthy and well-developed root system.

6. Select only container stock that has been grown in the containers in which delivered for at

least six (6) months, but not over two (2) years. Provide samples to show that there are no root-bound conditions.

7. Do not use plants that are severely pruned or headed-back to meet size requirements.

8. Do not plant container-grown plants that have cracked or broken balls of earth when taken from the container. Remove canned stock carefully from cans after containers have been cut on two sides with tin snips or other approved cutter.

9. Coordinate a time for the Landscape Architect to inspect the plants upon their delivery to the project site.

10. At any time prior to final acceptance, be prepared to replace any plants that are rejected by the Owner's Representative because of physical damage to the plant.

11. Do not remove container-grown stock from containers before time of planting.

12. Be prepared to replace plants which are rejected by the Owner's Representative for the following reasons:

    a. Trunk bark damage caused by sunburn,

    b. Trunk bark wounds caused by rubbing stakes or ties,

    c. Trunk bark damage caused by ties that have girdled the tree,

    d. Tree head development that is lopsided and not symmetrical in form,

    e. Tree branches that cross or touch,

    f. Tree branches with double leaders (unless multi-trunk trees are specified).

13. Stake shrubs with one-inch by one-inch by eighteen-inch (1"x1"x18") stakes in such manner that the stakes are not visible, and tie to upright position if they lean and/or are not growing in a vertical position.

14. Furnish quantities necessary to complete the work as shown on the Drawings and, if necessary, make up for any discrepancies in the quantities given in the Plant List at no additional cost to Owner.

G. Comply with the requirements of Section 01 70 00 – EXECUTION AND CLOSEOUT REQUIREMENTS.

1.05 INSPECTION REQUIREMENTS

A. Landscape Architect reserves the right to examine and reject plant material both at place of growth and at site, before and after planting, for compliance with requirements of name, variety, size, and quality.

B. Request and hold a pre-construction meeting prior to beginning the work of this Section. Parties required to be in attendance are the Landscape Contractor, Project Inspector, Owner's Representative, and Landscape Architect.

C. Obtain verification from Project Inspector for the following at the appropriate times during construction and prior to further progression of work in this Section:

1. Rough grading is to tolerances specified in Section 31 20 00 – EARTH MOVING.

2. The placement of landscape backfill material is as specified in this Section.

3. Prior to the commencement of the work specified in this Section, the coverage and operation of the sprinkler irrigation system are as specified in Section 32 80 00 - IRRIGATION.

4. The soil amendment does not include any metal fragments. (Obtain a letter from the manufacturer stating that the material submitted for use on this project has no metal or foreign objects. Submit this letter as part of the Data Sheet submittal package [see "Submittals and Substitutions" in this Section])

5. Required Test: For each load of soil amendment delivered to the site, spread at least two cubic yards (2 cy) of material onto a paved surface approximately two inches (2") deep. Pass a magnetic rake over the material in two directions. If any metal is found, test the entire load in the same manner. Perform all testing in the presence of the Project Inspector.

6. Soil amendments, fertilizer, bark mulch and materials used for hydroseeding have been delivered to the site by the supplier, the invoices from the supplier indicate the project name and quantities delivered, and the Project Inspector has received copies of all such documents.

7. Prior to planting, amendments and conditioners have been incorporated as per pre-planting recommendations, and planting areas have been made ready to receive planting.

D. In case of failure to obtain any verification by the Project Inspector as required above, remove and replace work as necessary to obtain the verification at no additional cost to the Owner.

E. Beginning of Maintenance Period: Verify all work is complete, then request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative for authorization to begin the landscape maintenance period.

F. End of Maintenance: Verify that all work is complete and acceptable, and that the maintenance has been completed per specifications; and continue to provide landscape maintenance until the Owner's Representative has accepted the work.

1.06 SUBMITTALS AND SUBSTITUTIONS

A. See Section 01 33 00 – SUBMITTAL PROCEDURES for additional requirements.

B. Plant Material: Within fifteen (15) days after award of contract, locate plant materials required for construction. Ensure that trees and shrubs are contract- grown from a certified nursery. Notify Owner's Representative of plant material "tied off" for review at selected nursery. If specified material is not obtainable, submit the following to Owner's Representative: proof of non-availability, proposal for use of equivalent material, photographs of alternative choices of plant material. Include clear, written description of type, size, condition, and general character of plant material.

C. Data Sheets: Provide product data for each type of landscape material indicated in the Drawings and Specifications.

D. Samples: Submit samples of the following materials to Landscape Architect for approval:

1. Soil amendment: (3) one-quart zip-locked plastic bags.

2. Bark Mulch: (3) one-quart zip-locked plastic bags.

3. Imported Topsoil: (3) one-quart zip-locked plastic bags.

E. Provide soils analysis reports prepared by a qualified soils laboratory in compliance with the Soil

Testing Requirements under "Soil Testing" in Part 3.02 of this Section.

F. Prior to planting, submit copies of all trucking or packaging tags for all soil amendment, fertilizer and other additives to Landscape Architect so the quantities can be verified.

1.07 PROTECTION AND CLEAN-UP

A. Provide protection for persons and property throughout progress of work. Use temporary barricades as required. Proceed with work in such manner as to minimize spread of dust and flying particles and to provide safe working conditions for personnel. Store materials and equipment where directed.

B. Existing Construction: Execute work in an orderly and careful manner to protect paving, work of other trades, and other improvements.

C. Existing Utilities: Provide protection for existing utilities within construction area. At no additional cost to Owner, repair any damages to utility lines that occur as a result of this work.

D. Landscaping: Protect landscape work and materials from damage due to landscape operations, operations by other contractors and trades, and trespassers. Maintain protection during installation and maintenance periods.

E. Paving: Maintain cleanliness of paving areas and other public areas used by equipment, and immediately remove spillage; remove rubbish, debris, and other material resulting from landscaping work, leaving site in a safe and clean condition.

1.08 PLANTING SCHEDULE / ENVIRONMENTAL REQUIREMENTS

A. Install, establish, and maintain all lawn areas for a minimum of ninety (90) days prior to date of substantial completion. Coordinate schedule with other work and overall project schedule. Failure to install lawn areas by this date shall result in assessment of liquidated damages.

B. Proceed with work in an orderly and timely manner to complete installation of landscaping within contract limits.

C. Planting Season Limits: Do not plant when grounds are wet or temperature is below 25° F. Do not proceed with any soil preparation and fertilization if all planting cannot be completed within Planting Season Limit.

1.09 LANDSCAPE MAINTENANCE PERIOD REQUIREMENTS

A. Beginning of Landscape Maintenance Period:

1. General: Landscape Maintenance Period does not begin until all work is installed and lawn has evenly germinated to an approximated blade height of one and one-half inches (1 ½"), as determined by Landscape Architect, in writing.

2. On-site Inspection: When all work is complete, request and hold a meeting to include the Landscape Architect, Project Inspector, Architect and Owner's Representative who must together authorize and determine the start date for the landscape maintenance period. Coordinate and give notice of the date and time of the on-site meeting to all parties at least forty-eight (48) hours in advance.

B. Duration of Landscape Maintenance Period:

1. The Landscape Maintenance Period shall continue for a minimum of ninety (90) calendar days. During this time, continuously maintain all areas involved until final acceptance of the work by the Owner's Representative. See Landscape Maintenance Period procedure

in Part 3.12 of this Section.

C. Final Acceptance of the Landscape Maintenance Period:

1. Request the final inspection forty-eight (48) hours in advance. If items require attention, hold on-site meetings until Landscape Architect can certify, in writing, and in concurrence with the Owner's Representative, the successful completion of the Landscape Maintenance Period.

1.10 RECORD DRAWINGS

Upon completion of work, and as a precedent to final payment, deliver to Owner's Representative one complete set of reproducible originals of Drawings showing work exactly as installed.

PART 2 - PRODUCTS

2.01 GENERAL

Use material in new and perfect condition as specified. Any deviations or substitutions from the Specification and Drawings must first be approved by Owner's Representative in writing prior to use.

2.02 SOIL PREPARATION MATERIALS

A. Topsoil: Fertile; friable; natural loam surface soil; reasonably free of subsoil, clay lumps, brush, weeds and other litter; and free of roots, stumps, stones/rocks, and other extraneous or toxic matter harmful to plant growth.

B. Soil Amendment: One-percent nitrogen-impregnated bark product with a ninety-percent (90%) bark base and zero to one-quarter inch (0-1/4") particle size, or approved equivalent. **Do not spread until testing requirements have been satisfied.**

C. Fertilizer/Soil Conditioner: Gro-Power Plus or approved equal.

D. Fertilizer for Trees and Shrubs: Seven-gram Gro-Power Planting Tablets (12-8-8 NPK) or approved equal.

E. Vitamin B-1: "Superthrive", "Liquinox Start", "Cal-Liquid", or approved equal.

2.03 MISCELLANEOUS LANDSCAPE MATERIALS

A. Bark Mulch: Untreated, shredded cedar.

B. Tree-staking System: As indicated on Drawings.

C. Pre-Emergent Weed Control: Oxadiazon, "Treeflan", "Ronstar 2G", "Surflan" (Elano Products Company), or approved equal.

D. Root Barrier: As indicated on Drawings.

2.04 PLANT MATERIAL:

A. Nursery Plant Stock:

1. As indicated on Drawings. Do not remove container-grown stock from containers until planting time. Plants shall be true to name.

2. Healthy, shapely, well-rooted, not pot-bound, free from insect pests or plant diseases and properly "hardened off" before planting. Replace plants that are not alive or are not in

satisfactory growing condition, as determined by the Landscape Architect, without additional cost to Owner. The Landscape Architect may reject plants before and/or after planting.

3. Labeled. Label at least one tree and one shrub of each species with a securely-attached, waterproof tag bearing legible designation of botanical and common name.

PART 3 - EXECUTION

3.01 SITE CONDITIONS

A. Examine the site, verify grade elevations, and observe conditions under which work is to be performed. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to the Owner's Representative.

B. Proceed with complete landscape work as rapidly as portions of the site become available, working within seasonal limitations for each kind of landscape work required.

C. Determine location of underground utilities and perform work in a manner which will avoid possible damage. Hand-excavate, as required, to minimize possibility of damage to underground utilities. Maintain grade stakes set by others until removal is mutually agreed upon by parties concerned.

D. When conditions detrimental to sod or plant growth are encountered, such as rubble fill, adverse drainage condition, or other obstructions, notify the Owner's Representative before planting.

3.02 SOIL TESTING

A. Coordinate soil testing in an expeditious and timely manner as required for on-site topsoil materials. Contract with a soil laboratory and include cost of sampling and testing in contract price. Take one (1) sample for every 5,000 square feet of landscape area up to a maximum of six (6) samples under the direction of and in the presence of the Owner's Representative.

B. Submit each sample, according to the quantity of soil required by testing laboratory, to a competent laboratory approved by the Owner's Representative.

C. Provide analysis of soil samples for pH, salinity, ammonia, phosphate, potassium, calcium, magnesium, boron, and sodium levels. Provide appraisal of chemical properties, including particle size determination, and recommendations for types and quantities of amendments and fertilizers.

3.03 PREPARATION

A. Clearing of Vegetation:

1. If live perennial weeds exist on site at the beginning of work, spray with a non-selective systemic contact herbicide as recommended and applied by an approved licensed landscape pest control advisor and applicator. Leave sprayed plants intact for at least 15 days.

2. Clear and remove existing weeds by mowing or grubbing off all plant parts at least one-quarter inch (¼") inch below surface of soil over entire areas to be planted.

B. Soil preparation:

1. Loosen soil in all planting areas, and on slopes flatter than 3:1 gradient, to a depth of six to eight inches (6" - 8") below finish grade. All debris, foreign matter, and stones shall be removed prior to the placing of any fertilizers or conditioners. Soil preparation is for all shrub planting beds, lawn hydroseeded areas and sodded lawn areas.

2. Conduct the required soil tests and instruct the lab to include a minimum of the following soil improvements in the recommendation on the soils report.

   a. Soil Amendment: Two cubic yards (2 cy) per 1,000 square feet.

   b. Gro-Power Plus: One hundred fifty pounds (150 lbs) per 1,000 square feet.

   c. If the lab recommends less than six cubic yards (6 cy) of soil amendment, the excess bid amount shall be applied to the cost of any additional recommended soil improvements, or returned to the Owner as a credit

3. Apply amendments as follows, using rates recommended by the soils testing laboratory (the rates of amendments shown below are for bidding purposes only):

   a. Fertilizer/Soil Conditioner: Broadcast 150 pounds of Gro Power Plus per 1,000 square feet in all planting areas and rototill to a depth of six to eight inches (6" - 8"). Remove from the site any rock and debris brought to the surface by cultivations. "Cultipack" all areas to receive sod or hydroseed.

   b. Apply soil amendment to all planting areas at the rate of six cubic yards (6 cy) per 1,000 sf and rototill into the top six to eight inches (6" – 8").

4. Upon completion of finish grading, request a review and obtain approval of Landscape Architect prior to commencement of planting or hydroseeding.

C. Finish Grading for all Planting areas

1. Refer to Earthwork Specification Section for Rough Grading.

2. Grade to elevations and contours shown on Drawings. Fill low spots with landscape backfill material and grade to surface drain in manner indicated on Drawings.

3. Finish-grade so that the entire area within the contract lines has a natural and pleasing appearance as specified and as directed by Landscape Architect.

4. Adjust sprinkler heads flush to finish grade in preparation to receive hydroseeding or one-half inch above finish grade in preparation to receive sod. Reset sprinkler heads flush to grade after turf has germinated.

5. Flag the sprinkler heads and valve markers.

D. Planting Pits for Trees:

1. Excavate pits with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.

2. Set container-grown stock in center of pit on earth pedestal. Separate roots and/or prune roots as directed by Landscape Architect. In hot weather, pre-wet pit. Loosen outside roots from sides and bottom of root ball. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Water after placing final layer of backfill.

3. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.

4. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

E. Planting Pits for Shrubs/Groundcover:

1. Excavate pits and trenches with vertical sides and with bottom of excavation slightly raised at center to provide proper drainage.

2. Loosen hard subsoil in bottom of excavation. Extend excavation as required to insure proper drainage from plant pits.

3. Fill excavated planting pits with water to half the depth of pit. Pits should drain within four hours (4 hrs). If planting pits do not drain, notify Project Inspector immediately. Do not proceed with planting until Landscape Architect has resolved a method to provide drainage.

3.04 ROOT BARRIER INSTALLATION

A. Install root barrier where trees are planted within sixty inches (60”) of paving or other hardscape elements, such as walls, curbs, and walkways, unless otherwise shown on Drawings.

B. Align root barrier vertically and run it linearly along and adjacent to the paving or other hardscape elements to be protected from invasive roots.

C. Install root barrier continuously for a distance of five feet (5’) in each direction from the tree trunk, for a total distance of ten feet (10’) per tree. If trees are spaced closer, use a single continuous piece of root barrier.

1. Position top of root barrier one inch (1”) below finish grade.

2. Do not distort or bend root barrier during construction activities.

3. Do not install root barrier surrounding the root ball of tree.

3.05 PLANTING

A. Trees, Shrubs, and Groundcover:

1. Lay out individual tree and shrub locations and areas for multiple plantings. Stake the locations, outline the areas, and secure the Owner’s Representative's acceptance before beginning the planting work. Make minor adjustments as requested.

2. Scarify root ball prior to planting. Plant in holes twice the diameter of the root ball and to a depth equal to the container’s height. Place the shrub and/or groundcover so the top of the root ball is one inch (1”) higher than the surrounding grade; place the tree so that the crown of the trunk is two inches (2") higher than the surrounding grade. Set container-grown stock in center of pit. In hot weather, pre-wet the pit. When set, place additional backfill around base and sides of root ball. Work each layer to settle backfill and eliminate voids and air pockets. Thoroughly compact lower half of backfill in plant pit. See staking or guying detail. Water after planting. Provide a berm or watering basin for each tree. Add Vitamin B-1, in the proper solution as recommended by the manufacturer, to the second watering of the basin.

3. Place fertilizer planting tablets in root zone and alongside each plant. Follow manufacturer's instructions for number of tablets to use for each container size.

4. See Drawings for additional information.

5. Grooming and Staking of Trees:

a. Prune, thin-out and shape trees in accordance with standard horticultural practice. Prune trees to retain required height and spread. Unless otherwise directed by

Landscape Architect, do not cut tree leaders, and remove only injured or dead branches from flowering trees.

b. Paint cuts over one-half inch (½") in size with standard tree paint or compound, covering exposed, living tissue. Use paint that is waterproof, antiseptic, adhesive, elastic and free of kerosene, coal tar, creosote, and other substances harmful to plants. Do not use shellac.

c. Stake or guy trees immediately after planting, as indicated on Drawings.

6. Grooming of Shrubs:

a. Prune, thin-out and shape shrubs in accordance with standard horticultural practice. Prune shrubs to retain natural character and to accomplish their use in landscape design. The required plant size is its size after pruning.

b. Remove and replace excessively pruned or malformed new plants resulting from improper pruning.

B. Request review by the Landscape Architect after locating, but prior to planting all trees. Under the direction of the Landscape Architect, make slight adjustments to plant material location as necessary to reflect original intention of Drawings.

3.06 WEED CONTROL

Apply pre-emergent weed control to all planting areas (except lawn) after completion of all planting and one complete watering. Follow manufacturer's directions. To prevent washing away of weed control, do not over-water after its application. Do not allow any weed control into lawn areas. Treat any existing noxious weeds, such as Johnson grass, with Roundup in successive treatments until all roots are destroyed, then remove all grass and roots. Notify Owner's Representative of time of installation for verification of application.

3.07 BARK MULCH

Apply mulch at the rate of two inches (2") deep to all planting areas, exclusive of lawn, after the planting and weed control are completed. Twelve inches (12") from planter edges, taper full depth of mulch to meet adjacent grades. Do not place mulch within three inches (3") of trunk or stems.

CLEAN-UP

A. During construction, keep the site free of rubbish and debris, and clean up the site promptly when notified to do so. Take care to prevent spillage on streets from hauling and immediately clean up any such spillage and/or debris deposited on streets due to the work of this Section.

B. During all phases of the construction work, take all precautions to abate dust nuisance by clean-up, sweeping, sprinkling with water, or other means as necessary.

3.08 LANDSCAPE MAINTENANCE

A. The Landscape Maintenance Period will begin when all the Landscape Maintenance Period Requirements have been met (See Part 1 of these Specifications).

B. Cleaning: Maintain cleanliness on paving areas and other public areas used by equipment and immediately remove all spillage. Remove from project site all rubbish and debris found thereon and all material and debris resulting from landscaping work, leaving the site in a safe and clean condition.

C. Maintenance:

1. Sprinkler Irrigation System:

   a. Check system weekly for proper operation. Flush lateral lines out after removing last sprinkler head or two at each end of lateral. Adjust all heads as necessary for unimpeded coverage.

   b. Set and program automatic controllers for seasonal water requirements. Provide the Owner's Representative with keys to the controllers and instructions on how to turn off system in case of emergency.

   c. Repair all damages to sprinkler irrigation system as part of the contract work. Make repairs within one watering period or one week, whichever is the least amount of time.

2. Trees and Shrubs:

   a. Water enough that moisture penetrates throughout root zone and only as frequently as necessary to maintain healthy growth.

   b. Construct and/or remove water basins around each plant, depending on the time of the year and as directed.

   c. Do not prune unless directed by the Landscape Architect.

   d. Re-stake and re-tie trees as needed and as directed by the Landscape Architect. Do not allow tops of tree stakes to protrude into head of tree.

   e. Replace any dead, dying or vandalized plant material on a weekly basis throughout the Landscape Maintenance Period.

3. Insecticide and Herbicide Application:

   a. If needed, control weeds with selective herbicides and sprays. In areas where crabgrass has infested the lawn, apply pre-emergent herbicides such as Dacthal by Amvac, Balan, or Betasan by Gowan for control prior to crabgrass germination. Control insect pests if necessary.

   b. Use only a licensed Pest Control Operator to apply herbicides and sprays and to maintain a log for applications indicating material, timing, and rate.

4. Pre-scheduled On-site Meetings: Hold regularly-scheduled (monthly or bimonthly as determined by the Landscape Architect) on-site meetings with the Landscape Architect, Project Inspector and Owner's Representative. Dates and times will be jointly agreed upon.

5. Request, forty-eight hours (48 hrs.) in advance, on-site visits by the Landscape Architect to determine the end of the Landscape Maintenance Period.

[END OF SECTION 32 90 00]

SECTION 33 40 00

SITE DRAINAGE

PART 1 - GENERAL

1.01 INCLUSION OF OTHER CONTRACT DOCUMENTS

A. The General Conditions, Supplementary Conditions and Division 1 are fully applicable to this Section, as if repeated herein.

1.02 RELATED WORK SPECIFIED ELSEWHERE

A. Section 31 22 00: Excavating, Grading and Site Preparation.

B. Section 32 12 00: Asphalt Concrete Paving.

C. Section 32 13 00: Portland Cement Concrete Paving

1.03 QUALITY ASSURANCE

A. Use only new materials and products, unless existing materials or products are specifically shown otherwise on the Drawings to be salvaged and re-used.

B. All materials, components, assemblies, workmanship and installation are to be observed by the Owner's Inspector of Record. Work not so inspected is subject to uncovering and replacement.

C. The representatives of the Owner’s testing lab will not act as supervisor of construction, nor will they direct construction operations. Neither the presence of the Owner’s testing lab representatives nor the testing by the Owner’s testing lab shall excuse the contractors or subcontractors for defects discovered in their work during or following completion of the project. Correcting inadequate compaction is the sole responsibility of the contractor.

D. Contractor shall be solely responsible for all subgrades built. Any repairs resulting from inadequate compaction are the responsibility of the contractor.

1.04 SUBMITTALS

A. Refer to Section 013300.

B. Manufacturer's Data: Submit list and complete descriptive data of all products proposed for use. Include manufacturer's specifications, published warranty or guarantee, installation instructions, and maintenance instructions.

1.05 WARRANTY

A. Refer to General Conditions and Section 017836.

1.06 REFERENCES AND STANDARDS

A. ANSI/ASTM D698-00 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures, Using 5.5 lb (2.49 Kg) Rammer and 12 inch (304.8 mm) Drop.

B. ANSI/ASTM D1556-00 - Test Method for Density of Soil in Place by the Sand-Cone Method.

C. ANSI/ASTM D1557-02 - Test Methods for Moisture-Density Relations of Soils and Soil-Aggregate Mixtures Using 10 lb. (4.54 Kg) Rammer and 18 inch (457 mm) Drop.

D. ANSI/ASTM D 3017-05 Test Methods for Moisture Content of Soils and Soil-Aggregate Mixture by

Nuclear Methods (Shallow Depth).

E. ANSI/ASTM D 422-63 Test Method for Particle Size Analysis of Soil.

F. ANSI/ASTM D 4318-05 Test Method for Liquid Limit, Plastic Limit, and Plasticity Limit.

G. CALTRANS Standard Specifications.

H. CAL-OSHA, Title 8, Section 1590 (e).

I. Any work within the street, highway or right-of-way shall be performed in accordance with the requirement of the governmental agencies having jurisdiction, and shall not begin until all of those governing authorities have been notified.

J. California Plumbing Code current edition.

1.07 DELIVERY, STORAGE AND HANDLING

A. Transport, store and handle in strict accord with the local jurisdiction.

B. Make delivery to job when notified by Contractor verifying that the job is ready to receive the work of this Section and that arrangements have been made to properly store, handle and protect such materials and work.

1.08 PROJECT CONDITIONS

A. Existing civil, mechanical and electrical improvements are shown on respective site plans to the extent known. Should the Contractor encounter any deviation between actual conditions and those shown, he is to immediately notify the Architect before continuing work.

1.09 EXISTING SITE CONDITIONS

A. Contractor shall acquaint himself with all site conditions. If unknown active utilities are encountered during work, notify Architect promptly for instructions. Failure to notify will make Contractor liable for damage to these utilities arising from Contractor's operations subsequent to discovery of such unknown active utilities.

1.10 PROTECTION

A. Adequate protection measures shall be provided to protect workmen and passers-by on and off the site. Adjacent property shall be fully protected throughout the operations. Blasting will not be permitted. Prevent damage to adjoining improvements and properties both above and below grade. Restore such improvements to original condition should damage occur. Replace trees and shrubs outside building area disturbed by operations.

B. In accordance with generally accepted construction practices, the Contractor shall be solely and completely responsible for working conditions at the job site, including safety of all persons and property during performance of the work. This requirement shall apply continuously and shall not be limited to normal working hours.

C. Any construction review of the Contractor's performance conducted by the Geotechnical Engineer is not intended to include review of the adequacy of the Contractor's safety measures, in, on, or near the construction site.

D. Provide shoring, sheeting, sheet piles and/or bracing to prevent caving, erosion or gullying of sides of excavation.

E. Surface Drainage: Provide for surface drainage during period of construction in manner to avoid creating nuisance to adjacent areas. The contractor shall make a reasonable effort on a daily

basis to provide pumps and all equipment necessary to keep all excavations and the site free from water during entire progress of work, regardless of cause, source, or nature of water.

F. Adjacent streets and sidewalks shall be kept free of mud, dirt or similar nuisances resulting from earthwork operations.

G. The site and adjacent influenced areas shall be watered as required to suppress dust nuisance. Dust control measures shall be in accordance with the local jurisdiction.

H. Trees: Carefully protect existing trees that are to remain.

1.11 SEASONAL LIMITS

A. No fill material shall be placed, spread or rolled during unfavorable weather conditions. When work is interrupted by rains, fill operations shall not be resumed until field tests indicate that moisture content and density of fill are satisfactory.

1.12 TESTING

A. General: Refer to Section 014000 – Quality Requirements.

B. Geotechnical Engineer: Owner is retaining a Geotechnical Engineer to determine compliance of fill with Specifications, and to direct adjustments in fill operations. Costs of Geotechnical Engineer will be borne by Owner; except those costs incurred for re-tests or re-inspection will be paid by Owner and backcharged to Contractor.

1.13 RECORD DRAWINGS

A. Keep a daily record of all pipe placed in ground, verified by Project Inspector.

B. Upon completion of this Contract, furnish one tracing showing all outside utility lines, piping, etc., installed under this Contract. Locate and dimension all work with reference to permanent landmarks.

C. All symbols and designations used in preparing "RECORD" drawings shall match those used in Contract drawings.

D. Properly identify all stubs for future connections, as to location and use, by setting of concrete marker at finished grade in the manner suitable to Architect.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Pipe: Use one of the following, unless noted on the Drawings otherwise.

1. Polyvinyl Chloride Pipe (PVC): SDR35 conforming to ASTM D3034 with elastomeric joints conforming to ASTM D3212 for pipe to 12". Sun damaged pipe will be rejected.

2. High density polyethylene pipe (HDPE): The pipe shall be corrugated exterior/smooth interior pipe. 12” to 60" maximum diameter shall conform to AASHTO M294, water tight per ASTM D3212 with water tight gasket fittings.

B. Perforated Pipe (for subdrains): Shall be ADS N12 pipe, 3 hole, ASTM F 405, AASHTO M 252; PCV ASTM D3034 SDR-35 storm drain pipe

C. Manhole: Shall be as shown on the drawing details.

D. Drop Inlet: Shall be as shown on the drawing details.

E. Curb Inlet: Shall be as shown on the drawing details.

F. Mortar: For pipe connections to concrete drainage structures, conform to ASTM C270 type N mortar. Place within one half hour after adding water.

G. Crushed Rock: Imported washed crushed rock. Minimum 100% passing 3/4 inch sieve.

H. Trench drain: Polycast, Polydrain or equal and as shown on drawings.

I. Area Drains: Shall be as shown on the drawing details.

J. Floor Drains: Shall be as shown on the drawing details.

K. Clean-outs: Shall be as shown on the drawing details.

L. Planter drains: Shall be as detailed on the drawing details.

M. Filter Fabric: Mirafi 140N.

PART 3 - EXECUTION

3.01 INSPECTION LAYOUT AND PREPARATION

A. Prior to installation of the work of this Section, carefully inspect and verify by field measurements that installed work of all other trades is complete to the point were this installation may properly commence

B. Layout all work, establish grades, locate existing underground utilities, set markers and stakes, setup and maintain barricades and protection facilities; all prior to beginning actual earthwork operations. Layout and staking shall be done by a licensed Land Surveyor or Professional Civil Engineer.

C. Verify that specified items may be installed in accordance with the approved design.

D. In event of discrepancy, immediately notify Owner and the Architect. Do not proceed in discrepant areas until discrepancies have been fully resolved.

3.02 INSTALLATION

A. General: Installation shall be in strict conformance with referenced standards, the manufacturer's written directions, as shown on the drawings and as herein specified.

B. Verify invert elevations at points of connection to existing systems prior to any excavation. If invert elevations differ from that shown on drawings, notify Architect immediately.

C. Excavation and Bedding:

1. General: Trench straight and true to line and grade with bottom smooth and free of irregularities or rock points. Trench width in accordance with pipe manufacturer's recommendations and as per the drawings. Follow manufacturer's recommendations for use of each kind and type of pipe.

2. Bedding: Provide bedding as detailed on plans for the full length of the pipe. Bedding shall have a minimum thickness beneath the pipe of 4" or 1/8 the outside diameter of the pipe, which ever is greater. Provide bell holes and depressions for pipe joints only of size required to properly make joint.

3. If the trenches for the site drainage fall within areas to be lime treated, the piping shall be

installed prior to any lime treatment operations.

a. If additional piping is added to previously lime treated areas, the contractor shall backfill the trench with class 2 aggregate base and compact to 95%.

D. Laying of Pipe:

1. General: Inspect pipe prior to placing. Set aside any defective or damaged material. Do not place pipe in water nor place pipe when trenches or weather are unsuitable. Lay pipe upgrade, true to line and grade.

2. Bell and Spigot Joints: Lubricate inside of bells and outside of spigots with soap solution or as recommended by manufacture. Wedge joints tight. Bell of bell and spigot pipe to be pointed upgrade.

3. Pipe shall be bedded uniformly throughout its length.

4. Pipe elevation shall be within 0.02 feet of design elevation as shown on plans.

5. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the governing agency.

E. Backfilling:

1. General: Do not start backfill operations until required testing has been accomplished.

2. Trenches and Excavations: Backfill with material as detailed on plans, filling both sides of the pipe at the same time, carefully tamping to hold pipe in place without movement. Refer to Section 312333 – TRENCHING AND BACKFILLING for fill above this layer.

F. Grouting of Pipes: Grout pipes smooth and water tight at drop inlet, manholes, and curb inlets. Grout back side of hood at curb inlets all grouting shall be smooth and consistent.

G. Off Site Work: All work beyond the property lines shall be done in strict conformance with the requirements of the local agency.

A. Cutting and Patching: Remove and replace existing surface features per applicable specification section (i.e. asphaltic concrete or concrete paving) where pipe is installed in areas of existing improvements.

3.03 TOLERANCES

A. Storm Drain structure grates

1. In landscape and lawn areas +- 0.05’.

2. In sidewalk and asphalt pavement +-0.025’.

3. In curb and gutter application +-0.0125’.

B. Cleanout Boxes and Lids

1. In landscape areas; 0.10 higher than surrounding finish grade, +-0.05’.

2. In sidewalks and asphalt pavement; Flush with surrounding finish grade, +-0.025’.

3.04 DEWATERING

A. Contractor to provide trench dewatering as necessary, no matter what the source is, at no

additional cost to the owner.

B. If the previously excavated material from trenching is too wet to achieve trench backfill compaction the contractor shall make a reasonable effort to aerate and dry the material per section 310000, 3.08, B

3.05 FLUSHING

A. The Contractor shall thoroughly ball and flush the storm drain system to remove all dirt and debris. Discharge water to an approved location.

3.06 CLEANING

A. Refer to Section 017400.

B. Upon completion of work of this Section promptly remove from the working area all scraps, debris and surplus material of this Section.

C. Clean the dirt, rocks, and debris from the drop inlets and storm drain manholes.

[END OF SECTION 33 40 00]