

PROJECT MANUAL FOR:

# AN ADDITION FOR: GRAND OAKS ELEMENTARY GYMNASIUM

1033 OLIVER SPRINGS HWY.  
CLINTON, TN

ANDERSON COUNTY SCHOOL BOARD  
101 SOUTH MAIN STREET  
SUITE 500  
CLINTON, TN 37716

COMM. NO. 170759  
DECEMBER 17, 2018

PROFESSIONALS OF RECORD:

- CHARLES M. GRANT, AIA – ARCHITECT
- W. NICHOLAS DEAL, PE – STRUCTURAL ENGINEER
- JOHN BUCHANAN, PE – MECHANICAL ENGINEER
- CHARLES H. POWELL Jr., PE – ELECTRICAL ENGINEER
- DAVID MATLOCK, PE – CIVIL ENGINEER

## Michael Brady Inc.

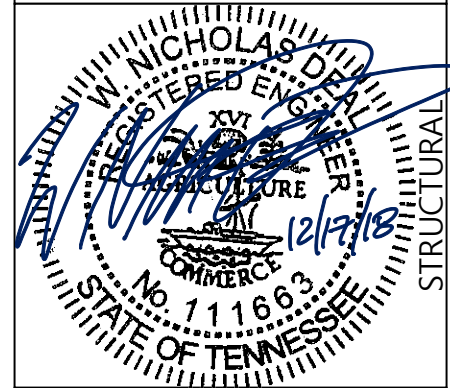
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SET NO. \_\_\_\_\_

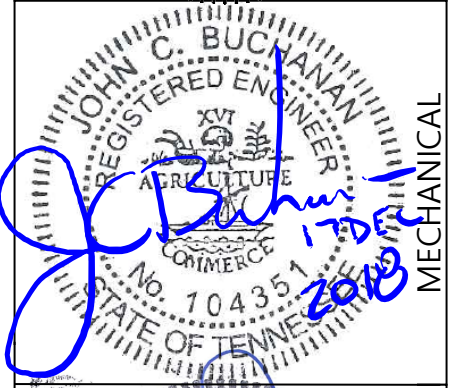
KNOXVILLE, TENNESSEE



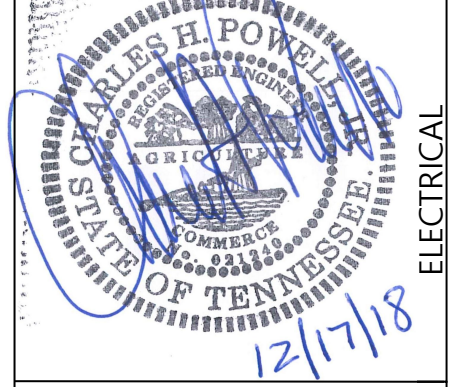
ARCHITECTURE



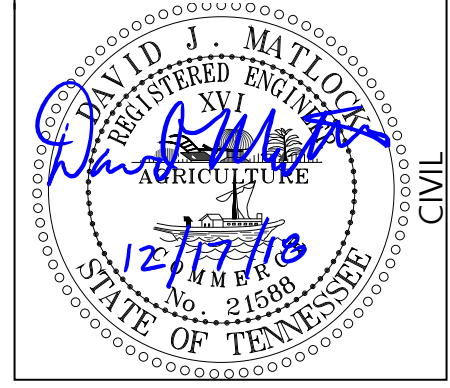
STRUCTURAL



MECHANICAL



ELECTRICAL



CIVIL

**A NEW ADDITION FOR: GRAND OAKS ELEMENTARY GYMNASIUM  
1033 OLIVER SPRINGS HWY. CLINTON, TN**

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### Civil and Site Engineering

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C1.0 Erosion Prevention and Sediment Control Plan  
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C3.0 Site Layout Plan  
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C8.1 Civil Details

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A0.0 General Notes and Accessibility Details  
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M0.1 Mechanical Legends, Specification and Notes

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E4.1 Riser Diagram and Panel Board Schedules

End of Section

## INVITATION TO BID - General Contract

Sealed bids for the construction of An Addition For: Grand Oaks Elementary Gymnasium, 1033 Oliver Springs Hwy. Clinton, TN will be received at the office of:

Purchasing Department  
Anderson County Courthouse  
100 North Main Street, Room 214  
Clinton, TN 37716

until Thursday, February 21, 2019 @ 2:00 p.m., at which time and place they will be publicly opened and read.

Drawings and Specifications and other Contract Documents may be examined at the following locations:

The office of the Architect – Michael Brady Inc.; 299 Weisgarber Road, Knoxville, TN 37919  
Knoxville Builders Exchange, ph: 866-941-BXTN (2986)  
McGraw-Hill Construction Dodge, ph: 877-784-9556  
BidClerk (a ConstructConnect company), ph: 877-737-6482

Copies of the Contract Documents may be obtained for bidding purposes by general contractors at the office of the Architect, upon a deposit of a check for Fifty Dollars (\$50.00) made payable to Michael Brady Inc. for one (1) one CD with PDFs of drawings and specifications. Payment is not refundable. Subcontractors, vendors, and others who desire individual drawings and specification sections may obtain them from Knox Blue, Knoxville, Tennessee, 546-7601, by paying the costs of reproduction, which is not refundable. Addenda will be issued only to those parties obtaining documents directly from the Architect. Bidders not obtaining documents directly from the Office of the Architect do so at their own risk and will be held to the requirements of the documents and addenda as issued by that office.

Each bid must be accompanied by a Bid Security in the form of a Cashiers Check or a Bidders Bond, executed by the bidder and a surety company in the sum of not less than five percent (5%) of the total amount of the bid including all additive alternates, as a guarantee that, if the bid is accepted, the required contract will be executed and the required performance and payment bonds furnished. Bid Bond shall be executed on AIA Document A310. Said bond will be returned to the unsuccessful bidders as soon as the contract has been awarded and the successful bidder has executed the contract and furnished the necessary bonds and the contract has been executed by the Owner. Such bond shall be from a surety Company authorized to transact business in the State of Tennessee and Company shall be registered in Federal Register, Department of the Treasury, Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Attorneys in Fact who sign any bonds must file with each instrument a certified and effective dated copy of their power of attorney.

The successful bidder will be required to execute a performance bond in an amount equal to one hundred percent (100%) of the Contract Sum and a payment bond covering and including labor and materials in an amount equal to one hundred percent (100%) of the Contract Sum. Performance and Labor and Material Payment Bond shall be on AIA Form A311.

All bidders must be licensed contractors as required by the contractors Licensing Act of 1976, enacted by the General Assembly of the State of Tennessee on March 18, 1976 and as amended to date as codified by Tennessee Code Annotated (TCA) Sections §62-6-119. Bidder's name, license number, date of expiration of license, license limit, and that part of license classification applying to the bid must be placed on the envelope containing the bid, otherwise the bid cannot be opened or considered. As applicable by Tennessee Annotated Code and/or TDEC regulations, the names of the Mechanical, Plumbing, Electrical, Masonry, Roofing and/or Geothermal Subcontractors, License numbers, date of expiration of their licenses, license limit, and license classification must also be on the bid envelopes otherwise the bid

cannot be opened or considered. General Contractors performing Mechanical, Plumbing, Electrical, Masonry, Roofing and/or Geothermal work must designate this information on the outside of the envelope.

Each bidder and each person signing on behalf of any bidder certifies, and in the case of a joint bid each party thereto certifies as to its own organization, under penalty of perjury, that to the best of its knowledge and belief that each bidder is not a person included within or on the list created pursuant to TCA §12-12-106.

No bidder will be permitted to withdraw his bid within sixty (60) days after the date of opening of bids. The Owner reserves the right to reject any or all bids and to waive any informalities therein.

A Prebid Conference will be held on Wednesday, February 6, 2019 @ 2:30 p.m. at the project site 1033 Oliver Springs Hwy, Clinton, TN. Attendance at this Prebid Conference is mandatory for Prime Bidders and HVAC, Plumbing, and Electrical Sub-bidders. Representatives of the Owner, the Architect, and Architect's Engineering Consultants will be present to describe and explain the scope of the work to be bid and to answer questions. Representative of all Subcontractors bidding are invited and urged to attend.

Upon award of the construction contract to the successful bidder, construction shall commence on a date to be specified in the "Notice to Proceed" to the Contractor and shall be completed on or before the completion date specified in the Contract Documents as time is of the essence in the performance of the contract for construction.

Upon receipt of Notice to Proceed, the Contractor will prosecute the work regularly, diligently, and uninterruptedly at such rate of progress as will insure full completion thereof within the time specified on the Bid Form.

The Owner reserves the right to waive any information in or to reject any or all bids and to accept the bid deemed favorable to the interest of the Owner.

End of Section



## General Terms and Conditions

### **BID ENVELOPE SUBMISSION INSTRUCTIONS:**

**Bids are to be received in a sealed envelope/package with the bid number, company name and opening date clearly marked. Failure to comply may result in rejection of the entire bid. Anderson County will not be responsible for any lost or misdirected mail. Late bids, e-mailed bids and faxed bids will not be considered nor returned. It is the sole responsibility of the bidder to ensure their bid is delivered to the Purchasing Department. Late bids will not be considered.**

Please note that Anderson County Government does not receive a guaranteed delivery time for express mail and/or packages. PLEASE MAIL ACCORDINGLY.

**ANDERSON COUNTY PURCHASING DEPARTMENT  
100 NORTH MAIN STREET, SUITES 214 AND 218  
CLINTON, TN 37716**

**Email: [purchasing@andersontn.org](mailto:purchasing@andersontn.org)  
Website: <http://andersontn.org/purchasing>**

(865) 457-6218 Phone  
(865) 457-6252 Fax

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**Bid documents must be completed in ink or typed, signed in ink,  
and free from alterations, erasures or mark-throughs.**

### **SECTION 1 - GENERAL TERMS AND CONDITIONS**

**1.1 ALTERATIONS OR AMENDMENTS:** Alterations, amendments, changes, modifications or additions to this solicitation shall not be binding on Anderson County without prior written approval.

**1.2 NO CONTACT POLICY:** After vendor receives a copy of this bid, any contact initiated by any vendor with any Anderson County representative, other than the Purchasing Department, concerning this invitation for bid is prohibited and agreements made thereto will not be considered binding on Anderson County. Any such unauthorized contact may cause the disqualification of the bidder from this procurement transaction.

**1.3 QUESTIONS:** Pursuant to TCA §12-4-113, questions regarding the specifications or bid procedures must be received by the Purchasing Agent and/or designer no less than ninety-six (96) hours before the bid opening date. No addenda within less than forty-eight (48) hours of the bid opening date shall be permitted. Any questions concerning the bid document must be submitted to [purchasing@andersontn.org](mailto:purchasing@andersontn.org) no less than ninety-six (96) hours before bid opening date.

**1.4 BID CLOCK:** The bid/time clock in the Anderson County Purchasing office will be the time of record.

**1.5 TAXES:** Anderson County is not liable for Federal excise or State sales tax. Tax exemption certificates will be provided upon request.

**1.6 CONFLICT OF INTEREST:** If requested by the Purchasing Agent, vendors must complete and submit a "Conflict of Interest Affidavit Statement" prior to contract award, see T.C.A. 5-14-114 and T. C. A. 12-4-101.

**1.7 NON-COLLUSION:** Vendors, by submitting a signed bid, certify that the accompanying bid is not the result of, or affected by, any unlawful act of collusion with any other person or company engaged in the same line of business or commerce, or any other fraudulent act punishable under Tennessee or United States law.

**1.8 NON-DISCRIMINATION:** Contracted vendors will not discriminate against any employee or applicant for employment because of race, religion, sex, national origin or disability except where religion, sex, national origin or disability is a bona fide occupational qualification reasonably necessary to the normal operation of the contractor.

**1.9 SAME AS OR EQUIVALENT TO:** Vendors are to bid as specified herein or propose an approved equal. Determination of equality is solely Anderson County's responsibility. Any designated brands are for reference purpose only, not a statement of preference. When an alternate manufacturer, brand, model or make is bid, Anderson County will determine if the item bid meets or exceeds the items as specified. If the bidder does not indicate that an alternate manufacturer, brand, model or make is being bid, it is understood that the item(s) bid are the same manufacturer, brand, model or make as requested in the Invitation to Bid. Comparable products of other manufacturers will be considered if proof of comparability is contained in the bid submission. It shall be the responsibility of the vendors, including vendors whose product is referenced to furnish upon request catalog pages, brochures or other data to provide an adequate basis for determining the quality and functional capabilities of the product offered. Failure to provide this data may be considered valid justification for rejection of bid.

**1.10 MULTIPLE BIDS/AWARDS:** Anderson County may consider multiple bid awards.

**1.11 STATE OF TENNESSEE CONTRACTORS' LICENSE LAW (T.C.A. 62-6-119) b):** Bids for which the total cost of the project is twenty-five thousand dollars (\$25,000) or more, the outside of the sealed bid envelope/package containing the bid provides the following information: the Company Name, the Contractor's license number, license classification, the date of the license expiration and that part of each license classification applying to the bid. In addition, each heating ventilation or air conditioning, plumbing and electrical subcontractor's license number, date of the license expiration and that part of each classification applying to the bid if the value of the work is \$25,000 or greater, must be notated. If the value of either the contractor or the subcontractor's work is less than \$25,000, the bid envelope/package containing the bid is to be notated with the phrase "Contractor or Subcontractor's Bid is Less than \$25,000" after each appropriate heading. In the case of joint ventures, each party submitting the bid must provide this information. If no subcontractors are being used, the outside of the envelope/package containing the bid must state, "No Subcontractors are being used on this project."

**1.12 ACCEPTANCE:** Vendors shall hold their price firm and subject to acceptance by Anderson County for a minimum period of sixty (60) working days from the date of the bid opening, unless otherwise indicated in their bid. Any or all bids may be rejected for good cause.

**1.13 BID AWARDS:** Bids will be awarded to the lowest and best bidder, taking into consideration the qualities of the articles to be supplied, their conformity with specifications and their suitability to the requirements of Anderson County and the delivery terms. Anderson County also reserves the right to not award this bid.

**1.14 PROTEST:** Any vendor wishing to protest the bid award shall notify in writing the Anderson County Purchasing Agent and the County Law Director, 101 S. Main Street, Suite 310, Clinton, TN 37716. No protest will be accepted, except those protests made in writing and received within (10) ten calendar days of the bid award. Protests must be in writing and envelopes/package containing protest must be clearly marked with bid number and words "BID PROTEST". The Purchasing Agent, in conjunction with the Purchasing Committee, and with the advice and counsel of the County Law Director, shall review and make a final decision as to any bid protest. Appeals shall be filed in the Circuit or Chancery Courts of Anderson County within sixty (60) days of the final decision.

**VENDORS PLEASE NOTE: ANDERSON COUNTY WILL NOT STOP THE PURCHASE PROCESS. THE PURCHASE MAY BE COMPLETED OR THE PROJECT MAY BE RE-BID WHILE THE PROTEST PROCEDURE IS STILL IN OPERATION. IF A RE-BID IS MADE, THE PROTESTING VENDOR SHOULD SUBMIT A NEW BID. OTHERWISE, THEY WILL BE WITHOUT A BID ON THE RE-BID. FURTHER, THE RE-BIDDING WILL NOT END THE APPEALS PROCESS. IT WILL CONTINUE UNTIL A FINAL DECISION IS REACHED OR THE COMPLAINANT WITHDRAWS THE APPEAL.**

**1.15 DELIVERY:** Bid pricing is to include complete supply and delivery to Anderson County, Tennessee. Vendors are to state the delivery time in the bid. Anderson County requires that vendors deliver all products “free on board” to final destination unless indicated otherwise in the bid requirements.

**1.16 PROOF OF FINANCIAL AND BUSINESS CAPABILITY:** Bidders must, upon the request of Anderson County, provide satisfactory evidence of their ability to furnish products or services in accordance with the terms and conditions of these specifications. Anderson County will make the final determination as to the bidder’s ability.

**1.17 VENDOR’S DEFAULT:** Anderson County reserves the right, in case of vendor default, to procure the articles or services from other sources and hold the defaulting vendor responsible for any excess costs occasioned thereby.

**1.18 DUPLICATE COPIES:** Vendors are to submit one original and at least one exact copy of their bids, including brochures; unless additional copies are requested in bid specifications.

**1.19 DRUG-FREE WORKPLACE:** Under the provisions of Tennessee Code Annotated §50-9-113 enacted by the General Assembly effective 2001, all employers with five (5) or more employees who contract with either the state or a local government to provide construction services are required to submit an affidavit stating that they have a drug free workplace program that complies with Title 50, Chapter 9, in effect at the time of submission of a bid at least to the extent required of governmental entities. The statute imposes other requirements on the contractor and contractors should consult private legal counsel if legal questions arise under this section or any other provision of this document. All contractors with five (5) or more employees that will be providing construction services are to return the provided written affidavit signed by the principal officer of a covered employer acknowledging that the contracting entity is in compliance with the Drug Free Workplace laws of State of Tennessee.

**1.20 RESTRICTIVE OR AMBIGUOUS SPECIFICATIONS:** It is the responsibility of the bidder to review the entire Invitation to Bid document and to notify the Purchasing Department if the Invitation to Bid is formulated in a manner that would unnecessarily restrict competition or if it is ambiguous in what is being requested. The Purchasing Agent must receive questions regarding the specifications or bid procedures no less than ninety-six (96) hours prior to the time set for the bid opening.

**1.21 SCHOOL CAFETERIA BIDS:** If this bid is for Anderson County School’s Cafeteria Food Service Department, bidders must be in compliance with Section 104(d) of the William F. Goodling Child Nutrition Reauthorization Act of 1998 which requires school and institutions participating in the National School Lunch Program (NSLP) and School Breakfast Program (SBP) to “Buy American” to the maximum extent practicable.

**1.22 TERMINATION:** Anderson County reserves the right to terminate contracts in whole or in part with thirty (30) days written notification to the contractor. In the event of termination, the County shall not be liable for any costs other than the cost of services performed and materials delivered and accepted prior to termination date.

**1.23 OSHA SAFETY:** The Vendor is responsible for training their employees in Safety and Health Regulations for the job, assuring compliance with Tennessee Occupational Safety and Health regulations and any other Regulatory Agency.

**1.24 PERFORMANCE BOND:** A standard surety or performance bond or an irrevocable letter of credit in favor of Anderson County Government at a federally insured financial institution will be required to be submitted with bid, if indicated in section four, item six insurance requirement checklist.

**1.25 BACKGROUND CHECKS:** Contractors shall comply with Public Chapter 587 of 2007, as codified in Tennessee Code Annotated Section 49-5-413, which requires all contractors to facilitate a criminal history records check conducted by the Tennessee Bureau of Investigation and the Federal Bureau of Investigation for each employee prior to permitting the employee to have contact with students or enter school grounds when students are present.

**1.26 AWARD RESULTS:** As soon as practicable after proposal or bid evaluations, Anderson County shall post the award decision to Vendor Registry at [www.vendorregistry.com](http://www.vendorregistry.com). Individual notices are normally not mailed or e-mailed except to the successful vendor.

**1.27 PRICE INCREASE/DELIVERY CHARGES:** Request for price or delivery charge increases must in be received in writing 30-days prior to implementation. The Anderson County Purchasing Agent will review requests and make a determination to continue or cancel services.

**1.28 INDEMNIFICATION/HOLD HARMLESS:** Vendor shall indemnify, defend, save and hold harmless Anderson County and, its officers, agents and employees from all suits, claims, actions or damages of any nature brought because of, arising out of, or due to breach of the agreement by Vendor, its subcontractors, suppliers, agents, or employees or due to any negligent act or occurrence or any omission or commission of Vendor, its subcontractors, suppliers, agents or employees.

**1.29 DECLARATIVE STATEMENT:** Any statement or words (i.e.: must, shall, will, etc.) are declarative statements and the proposer must comply with the condition. Failure to comply with any such condition may result in their bid being non-responsive and disqualified.

**1.30 WAIVING OF INFORMALITIES:** Anderson County reserves the right to waive minor informalities or technicalities when it is in the best interest of Anderson County.

**1.31 APPROPRIATION:** Funding for multi-year contracts are subject to budget appropriations. In the event no funds are appropriated by Anderson County for the goods or services in any fiscal year or insufficient funds exist to purchase the goods or services of a contract, then that contract shall expire upon the expenditure of previously appropriated funds or the end of the current fiscal year, whichever occurs first, with no further obligations owed to or by either party.

**1.32 ASSIGNMENT:** Vendor shall not assign or sub-contract any agreement, its obligations or rights hereunder to any party, company, partnership, incorporation or person without the prior written specific consent of Anderson County.

**1.33 QUANTITIES:** Anderson County does not guarantee quantities to be purchased off this bid.

**1.34 UNIT PRICE:** In case of discrepancy between any unit price and an extended price, the unit price will be presumed to be correct, subject, however, to correction to the same extent and in the same manner as any other mistake.

**1.35 MODIFICATION OR WITHDRAWAL OF BIDS:** When it is certain that a mistake has been made in the preparation of the bid, a request will be made to the bidder to confirm the bid. Provisions must be made so that mistakes can be taken care of and the ambiguity resolved satisfactorily. Bids may be modified or withdrawn by written notice received in the Purchasing Department prior to the time and date set for the bid opening. The changes or withdrawal of the bids shall be in writing and signed by an official of the company. The envelope containing the modification should clearly state "modification to bid." Either the entire bid or a particular item may be withdrawn or modified in this manner.

**1.36 PRE-BID CONFERENCES:** Attendance at Pre-bid Conferences is strongly encouraged. When deemed necessary a Mandatory Pre-bid Conference will be held. A company representative MUST be in attendance and sign the Pre-bid sign-in sheet in order to be considered for bid award.

**1.37 ADDENDUM:** § T.C.A. 12-14-113 Anderson County Government reserves the right to amend this solicitation by addendum. Addenda will be posted to the vendor registry up to 48 hours in advance of the bid/proposals due date and time. It is the bidder's responsibility to check the website for addendum. If in the County's opinion revisions are of such a magnitude, the deadline for this solicitation may be extended in an addendum. Addenda may change specifications, reply sheets, and times and dates for pre-bid meetings as well as due dates/deadlines for questions and bids/proposals.

**1.38 OWNERSHIP:** All bids, once received, become property of Anderson County Government and will not be returned.

**1.39 WEATHER AND COURTHOUSE CLOSINGS:** In the event of a situation severe enough to necessitate the closing of Anderson County Government offices during a planned bid opening, vendors will receive notification of the new date and time upon re-opening of county government offices. No bids will be opened until the rescheduled date for bid opening and all bidders/proposers whose submissions meet the extended deadline will be given equal consideration at that time. Anderson County shall not be liable for any commercial carrier's decision regarding deliveries during inclement weather.

**1.40 IRAN DIVESTMENT ACT OF 2014:** Pursuant to the Iran Divestment Act of 2014, Tenn. Code Ann. § 12-12-106 requires the State of Tennessee Chief Procurement Officer to publish, using creditable information freely available to the public, a list of persons it determines engage in investment activities in Iran, as described in § 12-12-105. Inclusion on this list makes a person ineligible to contract with Anderson County; if a person ceases its engagement in investment activities in Iran, it may be removed from the list. The State of Tennessee list is available here: <http://tennessee.gov/generalservices/article/Public-Information-library>.



# AIA<sup>®</sup> Document A701<sup>™</sup> – 1997

## Instructions to Bidders

### for the following PROJECT:

*(Name and location or address)*

Grand Oaks Elementary Gymnasium  
1033 Oliver Springs Highway  
Clinton, TN 37716

MBI Comm. No.: 170759

### THE OWNER:

*(Name, legal status and address)*

Anderson County School Board  
101 South Main Street  
Suite 500  
Clinton, TN 37716

### THE ARCHITECT:

*(Name, legal status and address)*

Michael Brady Inc.  
299 N. Weisgarber Road  
Knoxville, TN 37919

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### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

## ARTICLE 1 DEFINITIONS

§ 1.1 Bidding Documents include the Bidding Requirements and the proposed Contract Documents. The Bidding Requirements consist of the Advertisement or Invitation to Bid, Instructions to Bidders, Supplementary Instructions to Bidders, the bid form, and other sample bidding and contract forms. The proposed Contract Documents consist of the form of Agreement between the Owner and Contractor, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications and all Addenda issued prior to execution of the Contract.

§ 1.2 Definitions set forth in the General Conditions of the Contract for Construction, AIA Document A201, or in other Contract Documents are applicable to the Bidding Documents.

§ 1.3 Addenda are written or graphic instruments issued by the Architect prior to the execution of the Contract which modify or interpret the Bidding Documents by additions, deletions, clarifications or corrections.

§ 1.4 A Bid is a complete and properly executed proposal to do the Work for the sums stipulated therein, submitted in accordance with the Bidding Documents.

§ 1.5 The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which Work may be added or from which Work may be deleted for sums stated in Alternate Bids.

§ 1.6 An Alternate Bid (or Alternate) is an amount stated in the Bid to be added to or deducted from the amount of the Base Bid if the corresponding change in the Work, as described in the Bidding Documents, is accepted.

§ 1.7 A Unit Price is an amount stated in the Bid as a price per unit of measurement for materials, equipment or services or a portion of the Work as described in the Bidding Documents.

§ 1.8 A Bidder is a person or entity who submits a Bid and who meets the requirements set forth in the Bidding Documents.

§ 1.9 A Sub-bidder is a person or entity who submits a bid to a Bidder for materials, equipment or labor for a portion of the Work.

## ARTICLE 2 BIDDER'S REPRESENTATIONS

§ 2.1 The Bidder by making a Bid represents that:

§ 2.1.1 The Bidder has read and understands the Bidding Documents or Contract Documents, to the extent that such documentation relates to the Work for which the Bid is submitted, and for other portions of the Project, if any, being bid concurrently or presently under construction.

§ 2.1.2 The Bid is made in compliance with the Bidding Documents.

§ 2.1.3 The Bidder has visited the site, become familiar with local conditions under which the Work is to be performed and has correlated the Bidder's personal observations with the requirements of the proposed Contract Documents.

§ 2.1.4 The Bid is based upon the materials, equipment and systems required by the Bidding Documents without exception.

## ARTICLE 3 BIDDING DOCUMENTS

### § 3.1 COPIES

§ 3.1.1 Bidders may obtain complete sets of the Bidding Documents from the issuing office designated in the Advertisement or Invitation to Bid in the number and for the deposit sum, if any, stated therein. The deposit will be refunded to Bidders who submit a bona fide Bid and return the Bidding Documents in good condition within ten days after receipt of Bids. The cost of replacement of missing or damaged documents will be deducted from the deposit. A Bidder receiving a Contract award may retain the Bidding Documents and the Bidder's deposit will be refunded.

§ 3.1.2 Bidding Documents will not be issued directly to Sub-bidders unless specifically offered in the Advertisement or Invitation to Bid, or in supplementary instructions to bidders.

§ 3.1.3 Bidders shall use complete sets of Bidding Documents in preparing Bids; neither the Owner nor Architect assumes responsibility for errors or misinterpretations resulting from the use of incomplete sets of Bidding Documents.

§ 3.1.4 The Owner and Architect may make copies of the Bidding Documents available on the above terms for the purpose of obtaining Bids on the Work. No license or grant of use is conferred by issuance of copies of the Bidding Documents.

## § 3.2 INTERPRETATION OR CORRECTION OF BIDDING DOCUMENTS

§ 3.2.1 The Bidder shall carefully study and compare the Bidding Documents with each other, and with other work being bid concurrently or presently under construction to the extent that it relates to the Work for which the Bid is submitted, shall examine the site and local conditions, and shall at once report to the Architect errors, inconsistencies or ambiguities discovered.

§ 3.2.2 Bidders and Sub-bidders requiring clarification or interpretation of the Bidding Documents shall make a written request which shall reach the Architect at least seven days prior to the date for receipt of Bids.

§ 3.2.3 Interpretations, corrections and changes of the Bidding Documents will be made by Addendum. Interpretations, corrections and changes of the Bidding Documents made in any other manner will not be binding, and Bidders shall not rely upon them.

## § 3.3 SUBSTITUTIONS

§ 3.3.1 The materials, products and equipment described in the Bidding Documents establish a standard of required function, dimension, appearance and quality to be met by any proposed substitution.

§ 3.3.2 No substitution will be considered prior to receipt of Bids unless written request for approval has been received by the Architect at least ten days prior to the date for receipt of Bids. Such requests shall include the name of the material or equipment for which it is to be substituted and a complete description of the proposed substitution including drawings, performance and test data, and other information necessary for an evaluation. A statement setting forth changes in other materials, equipment or other portions of the Work, including changes in the work of other contracts that incorporation of the proposed substitution would require, shall be included. The burden of proof of the merit of the proposed substitution is upon the proposer. The Architect's decision of approval or disapproval of a proposed substitution shall be final.

§ 3.3.3 If the Architect approves a proposed substitution prior to receipt of Bids, such approval will be set forth in an Addendum. Bidders shall not rely upon approvals made in any other manner.

§ 3.3.4 No substitutions will be considered after the Contract award unless specifically provided for in the Contract Documents.

## § 3.4 ADDENDA

§ 3.4.1 Addenda will be transmitted to all who are known by the issuing office to have received a complete set of Bidding Documents.

§ 3.4.2 Copies of Addenda will be made available for inspection wherever Bidding Documents are on file for that purpose.

§ 3.4.3 Addenda will be issued no later than four days prior to the date for receipt of Bids except an Addendum withdrawing the request for Bids or one which includes postponement of the date for receipt of Bids.

§ 3.4.4 Each Bidder shall ascertain prior to submitting a Bid that the Bidder has received all Addenda issued, and the Bidder shall acknowledge their receipt in the Bid.

## ARTICLE 4 BIDDING PROCEDURES

### § 4.1 PREPARATION OF BIDS

§ 4.1.1 Bids shall be submitted on the forms included with the Bidding Documents.



§ 4.1.2 All blanks on the bid form shall be legibly executed in a non-erasable medium.

§ 4.1.3 Sums shall be expressed in both words and figures. In case of discrepancy, the amount written in words shall govern.

§ 4.1.4 Interlineations, alterations and erasures must be initialed by the signer of the Bid.

§ 4.1.5 All requested Alternates shall be bid. If no change in the Base Bid is required, enter "No Change."

§ 4.1.6 Where two or more Bids for designated portions of the Work have been requested, the Bidder may, without forfeiture of the bid security, state the Bidder's refusal to accept award of less than the combination of Bids stipulated by the Bidder. The Bidder shall make no additional stipulations on the bid form nor qualify the Bid in any other manner.

§ 4.1.7 Each copy of the Bid shall state the legal name of the Bidder and the nature of legal form of the Bidder. The Bidder shall provide evidence of legal authority to perform within the jurisdiction of the Work. Each copy shall be signed by the person or persons legally authorized to bind the Bidder to a contract. A Bid by a corporation shall further give the state of incorporation and have the corporate seal affixed. A Bid submitted by an agent shall have a current power of attorney attached certifying the agent's authority to bind the Bidder.

#### § 4.2 BID SECURITY

§ 4.2.1 Each Bid shall be accompanied by a bid security in the form and amount required if so stipulated in the Instructions to Bidders. The Bidder pledges to enter into a Contract with the Owner on the terms stated in the Bid and will, if required, furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Should the Bidder refuse to enter into such Contract or fail to furnish such bonds if required, the amount of the bid security shall be forfeited to the Owner as liquidated damages, not as a penalty. The amount of the bid security shall not be forfeited to the Owner in the event the Owner fails to comply with Section 6.2.

§ 4.2.2 If a surety bond is required, it shall be written on AIA Document A310, Bid Bond, unless otherwise provided in the Bidding Documents, and the attorney-in-fact who executes the bond on behalf of the surety shall affix to the bond a certified and current copy of the power of attorney.

§ 4.2.3 The Owner will have the right to retain the bid security of Bidders to whom an award is being considered until either (a) the Contract has been executed and bonds, if required, have been furnished, or (b) the specified time has elapsed so that Bids may be withdrawn or (c) all Bids have been rejected.

#### § 4.3 SUBMISSION OF BIDS

§ 4.3.1 All copies of the Bid, the bid security, if any, and any other documents required to be submitted with the Bid shall be enclosed in a sealed opaque envelope. The envelope shall be addressed to the party receiving the Bids and shall be identified with the Project name, the Bidder's name and address and, if applicable, the designated portion of the Work for which the Bid is submitted. If the Bid is sent by mail, the sealed envelope shall be enclosed in a separate mailing envelope with the notation "SEALED BID ENCLOSED" on the face thereof.

§ 4.3.2 Bids shall be deposited at the designated location prior to the time and date for receipt of Bids. Bids received after the time and date for receipt of Bids will be returned unopened.

§ 4.3.3 The Bidder shall assume full responsibility for timely delivery at the location designated for receipt of Bids.

§ 4.3.4 Oral, telephonic, telegraphic, facsimile or other electronically transmitted bids will not be considered.

#### § 4.4 MODIFICATION OR WITHDRAWAL OF BID

§ 4.4.1 A Bid may not be modified, withdrawn or canceled by the Bidder during the stipulated time period following the time and date designated for the receipt of Bids, and each Bidder so agrees in submitting a Bid.

§ 4.4.2 Prior to the time and date designated for receipt of Bids, a Bid submitted may be modified or withdrawn by notice to the party receiving Bids at the place designated for receipt of Bids. Such notice shall be in writing over the

signature of the Bidder. Written confirmation over the signature of the Bidder shall be received, and date- and time-stamped by the receiving party on or before the date and time set for receipt of Bids. A change shall be so worded as not to reveal the amount of the original Bid.

**§ 4.4.3** Withdrawn Bids may be resubmitted up to the date and time designated for the receipt of Bids provided that they are then fully in conformance with these Instructions to Bidders.

**§ 4.4.4** Bid security, if required, shall be in an amount sufficient for the Bid as resubmitted.

## **ARTICLE 5 CONSIDERATION OF BIDS**

### **§ 5.1 OPENING OF BIDS**

At the discretion of the Owner, if stipulated in the Advertisement or Invitation to Bid, the properly identified Bids received on time will be publicly opened and will be read aloud. An abstract of the Bids may be made available to Bidders.

### **§ 5.2 REJECTION OF BIDS**

The Owner shall have the right to reject any or all Bids. A Bid not accompanied by a required bid security or by other data required by the Bidding Documents, or a Bid which is in any way incomplete or irregular is subject to rejection.

### **§ 5.3 ACCEPTANCE OF BID (AWARD)**

**§ 5.3.1** It is the intent of the Owner to award a Contract to the lowest qualified Bidder provided the Bid has been submitted in accordance with the requirements of the Bidding Documents and does not exceed the funds available. The Owner shall have the right to waive informalities and irregularities in a Bid received and to accept the Bid which, in the Owner's judgment, is in the Owner's own best interests.

**§ 5.3.2** The Owner shall have the right to accept Alternates in any order or combination, unless otherwise specifically provided in the Bidding Documents, and to determine the low Bidder on the basis of the sum of the Base Bid and Alternates accepted.

## **ARTICLE 6 POST-BID INFORMATION**

### **§ 6.1 CONTRACTOR'S QUALIFICATION STATEMENT**

Bidders to whom award of a Contract is under consideration shall submit to the Architect, upon request, a properly executed AIA Document A305, Contractor's Qualification Statement, unless such a Statement has been previously required and submitted as a prerequisite to the issuance of Bidding Documents.

### **§ 6.2 OWNER'S FINANCIAL CAPABILITY**

The Owner shall, at the request of the Bidder to whom award of a Contract is under consideration and no later than seven days prior to the expiration of the time for withdrawal of Bids, furnish to the Bidder reasonable evidence that financial arrangements have been made to fulfill the Owner's obligations under the Contract. Unless such reasonable evidence is furnished, the Bidder will not be required to execute the Agreement between the Owner and Contractor.

### **§ 6.3 SUBMITTALS**

**§ 6.3.1** The Bidder shall, as soon as practicable or as stipulated in the Bidding Documents, after notification of selection for the award of a Contract, furnish to the Owner through the Architect in writing:

- .1 a designation of the Work to be performed with the Bidder's own forces;
- .2 names of the manufacturers, products, and the suppliers of principal items or systems of materials and equipment proposed for the Work; and
- .3 names of persons or entities (including those who are to furnish materials or equipment fabricated to a special design) proposed for the principal portions of the Work.

**§ 6.3.2** The Bidder will be required to establish to the satisfaction of the Architect and Owner the reliability and responsibility of the persons or entities proposed to furnish and perform the Work described in the Bidding Documents.

**§ 6.3.3** Prior to the execution of the Contract, the Architect will notify the Bidder in writing if either the Owner or Architect, after due investigation, has reasonable objection to a person or entity proposed by the Bidder. If the Owner or Architect has reasonable objection to a proposed person or entity, the Bidder may, at the Bidder's option, (1)

withdraw the Bid or (2) submit an acceptable substitute person or entity with an adjustment in the Base Bid or Alternate Bid to cover the difference in cost occasioned by such substitution. The Owner may accept the adjusted bid price or disqualify the Bidder. In the event of either withdrawal or disqualification, bid security will not be forfeited.

**§ 6.3.4** Persons and entities proposed by the Bidder and to whom the Owner and Architect have made no reasonable objection must be used on the Work for which they were proposed and shall not be changed except with the written consent of the Owner and Architect.

## **ARTICLE 7 PERFORMANCE BOND AND PAYMENT BOND**

### **§ 7.1 BOND REQUIREMENTS**

**§ 7.1.1** If stipulated in the Bidding Documents, the Bidder shall furnish bonds covering the faithful performance of the Contract and payment of all obligations arising thereunder. Bonds may be secured through the Bidder's usual sources.

**§ 7.1.2** If the furnishing of such bonds is stipulated in the Bidding Documents, the cost shall be included in the Bid. If the furnishing of such bonds is required after receipt of bids and before execution of the Contract, the cost of such bonds shall be added to the Bid in determining the Contract Sum.

**§ 7.1.3** If the Owner requires that bonds be secured from other than the Bidder's usual sources, changes in cost will be adjusted as provided in the Contract Documents.

### **§ 7.2 TIME OF DELIVERY AND FORM OF BONDS**

**§ 7.2.1** The Bidder shall deliver the required bonds to the Owner not later than three days following the date of execution of the Contract. If the Work is to be commenced prior thereto in response to a letter of intent, the Bidder shall, prior to commencement of the Work, submit evidence satisfactory to the Owner that such bonds will be furnished and delivered in accordance with this Section 7.2.1.

**§ 7.2.2** Unless otherwise provided, the bonds shall be written on AIA Document A312, Performance Bond and Payment Bond. Both bonds shall be written in the amount of the Contract Sum.

**§ 7.2.3** The bonds shall be dated on or after the date of the Contract.

**§ 7.2.4** The Bidder shall require the attorney-in-fact who executes the required bonds on behalf of the surety to affix thereto a certified and current copy of the power of attorney.

## **ARTICLE 8 FORM OF AGREEMENT BETWEEN OWNER AND CONTRACTOR**

Unless otherwise required in the Bidding Documents, the Agreement for the Work will be written on AIA Document A101, Standard Form of Agreement Between Owner and Contractor Where the Basis of Payment Is a Stipulated Sum.

# **Additions and Deletions Report for** **AIA® Document A701™ – 1997**

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 15:48:30 ET on 11/26/2018.

## **PAGE 1**

Grand Oaks Elementary Gymnasium  
1033 Oliver Springs Highway  
Clinton, TN 37716

MBI Comm. No.: 170759

...

*(Name, legal status and address)*

Anderson County School Board  
101 South Main Street  
Suite 500  
Clinton, TN 37716

...

Michael Brady Inc.  
299 N. Weisgarber Road  
Knoxville, TN 37919

## **Certification of Document's Authenticity**

**AIA® Document D401™ – 2003**

I, \_\_\_\_\_, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 15:48:30 ET on 11/26/2018 under Order No. 1121556219 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A701™ – 1997, Instructions to Bidders, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Dated)*

## SUPPLEMENTARY INSTRUCTIONS TO BIDDERS

### PART I GENERAL:

#### 1.01 GENERAL:

- A. The following amendments modify, change, delete from or add to the Instructions to Bidders (AIA Document A701, 1997 Edition). Where any part of the Instructions to Bidders is modified or voided by these amendments, the unaltered provisions of that part shall remain in effect.

#### 1.02 BID SECURITY:

Bid security shall be in the form of a bid bond secured by a Surety Company or a Cashiers Check, and shall be in the amount of not less than five percent (5%) of the amount of the bid.

#### 1.03 SUBMISSION OF BIDS:

In addition to the information listed in Subparagraph 4.3.1, the sealed envelope containing the bid shall be plainly marked on the outside with the bidding contractor's license number, date of expiration of the license, license limitation, and that part of license classification applying to the bid. If this information is not marked on the outside of the envelope, the Architect and the Owner are prohibited from opening and considering the bid by the requirements of The contractor's Licensing Act of 1976 enacted by the General Assembly of the State of Tennessee, as amended by Chapter 9 and Chapter 406 of the Public Acts of 1977. The names of the Mechanical and Electrical Subcontractors, License numbers and date of expiration of their licenses must be on the bid envelopes.

Notes: Bidders' attention is called to the provisions of the Contractor's Licensing Act that particular subcontractors (Electrical, Mechanical, HVAC, Masonry, Roofing, Geothermal, etc.) must have a contractor's license if the aggregate amount of their subcontract is equal to or exceeds monetary limits enumerated in that Act for each subcontractor's trade.

#### 1.04 CONTRACT FOR CONSTRUCTION:

The Contract for Construction of the Project will be executed on AIA Document A101, 2007 version.

#### 1.05 PERFORMANCE AND LABOR AND MATERIALS PAYMENT BOND:

The successful bidder will be required to furnish a Performance Bond and a Labor and Materials Payment Bond in the amount of one hundred percent (100%) of the contract sum. Bonds shall be executed on AIA Document A311.

#### 1.06 DEFINITIONS:

- A All definitions set forth in the General Conditions of the Contract for Construction, AIA Document A-201 - 2007 Edition, are applicable to these Instructions to Bidders.
- B Bidding documents include the Invitation to Bid, Instructions to Bidders, the Bid Forms, Agreement between Owner and Contractor and the proposed Contract Documents including any Addenda issued prior to receipt of Bids.
- C Addenda are written or graphic instruments issued prior to the execution of the Contract which modify or interpret the bidding documents, including Drawings and Specifications, by additions, deletions, clarifications or corrections. Addenda will become part of the Contract Documents when the Construction Contract is executed.

- D All correspondence concerning the bid process shall be addressed to the Architect.
- E A Bid is a complete and properly signed proposal to do the Work or designated portion thereof for the sums stipulated therein, submitted in accordance with the Bidding Documents.
- F The Base Bid is the sum stated in the Bid for which the Bidder offers to perform the Work described in the Bidding Documents as the base, to which work may be added or from which work may be deleted for sums stated in any Alternate Bids.
- G A Bidder is a person or entity who submits a Bid.
- H A Sub-Bidder is a person or entity who submits a bid to a Bidder for materials or labor for a portion of the Work.

1.07 EXAMINATION OF DOCUMENTS AND SITE:

- A. Each Bidder, by making his Bid, represents that he has read and understands the Bidding Documents.
- B. Each Bidder, by making his Bid, represents that he has visited the site and familiarized himself with the local conditions under which the Work is to be performed.
- C. Each Bidder, by making his Bid, represents that his Bid is based upon the materials, systems and equipment required by the Bidding Documents unless exceptions are noted on the Bid Form.

1.08 BIDDING PROCEDURES:

- A. All Bids shall be prepared on the forms provided by the Owner and submitted in accordance with the Instructions to Bidders. The Owner will furnish Bidders with Bid Forms which will provide for the following Bid Items:
  - 1. A single contract price for the Work as detailed and described in these Instructions.
  - 2. Acknowledgment of Addenda.
  - 3. Number of calendar days to complete project.
  - 4. Subcontractors required to be listed by state law (See 1.03 above).
- B. A Bid is invalid if it has not been received at the designated location prior to the time and date for receipt of bids indicated in the Invitation to Bid, or prior to any extension thereof issued to the Bidders.
- C. Unless otherwise provided in any supplement to these Instructions to Bidders, no bidder shall modify, withdraw or cancel his Bid or any part thereof for forty-five (45) after the time designated for the receipt of Bids in the Invitation to Bid.
- D. Prior to the receipt of Bids, Addenda will be mailed or delivered to each person or firm recorded by the Architect and Engineer as having received the Bidding Documents. Addenda issued after receipt of Bids will be mailed or delivered only to the selected Bidder.
- E. Bids shall not contain any recapitulation of the Work (except as noted on the Bid Form) to be done and no oral or telephone proposals or modifications will be considered.

- F. The Bidder shall make no additional stipulations on the Bid Form or limit or qualify his Bid in any other manner. Bids so qualified will be subject to disqualification.
- G. Only written instructions will be binding. The Architect or Engineer will not be responsible for any oral, telegraphic or telephonic instructions.
- H. The names of all Subcontractors and material suppliers proposed to be employed shall be submitted for approval by the Owner before they are employed, and all such Subcontractors and material suppliers must be known to perform work of a high standard in their respective trades. If the Owner has reasonable objection to any such proposed person or entity, and notifies the Bidder in writing of such objection, the Bidder shall provide an acceptable substitute person or entity in accordance with Article 5.2 of the General Conditions.
- I. The Bidder shall submit with the bid form executed documents "Non-Collusion Affidavit", "Diversity Business Information", "Insurance Requirement Acknowledgment", "Background Check Compliance Form", "Drug-Free Workplace Affidavit", and "Specification Compliance Form".

1.09 DISCREPANCIES AND AMBIGUITIES:

- A. Each Bidder shall examine the Bidding Documents carefully and, not later than ten (10) days prior to the date for receipt of Bids, shall make written request to the Architect or Engineer via email only, for interpretations or correction of any ambiguity, inconsistency or error therein which he may discover. The Architect or Engineer will issue any interpretation or correction as an Addendum. Only a written interpretation or correction by Addendum shall be binding. No Bidder shall rely upon any interpretation or correction given by any other method.

1.10 SUBSTITUTIONS:

- A. Each Bidder represents that his Bid is based upon the materials and equipment described in the Bidding Documents.
- B. Where products or systems are specified by naming only one manufacturer and no provisions for substitutions are listed, no substitutions are allowed. Where substitution provisions are listed, they will only be considered if approved by Addenda prior to Bidding.

1.11 QUALIFICATION OF BIDDERS:

- A. If required, a Bidder shall submit to the Owner a properly executed Contractor's Qualification Statement, AIA Document A-305 and/or properly documented experience record.
- B. Bidders may be disqualified and their Bids not considered for any of the following specific reasons:
  - 1. Reason for believing collusion exists among Bidders.
  - 2. The Bidder being interested in any litigation against the Owner.
  - 3. The Bidder being in arrears on any existing contract or having defaulted on a previous contract.
  - 4. Lack of competency as revealed by the financial statement, experience and equipment, questionnaires, or qualification statement.
  - 5. Uncompleted work which in the judgment of the Owner will prevent or hinder the prompt completion of additional work if awarded.



- C. If required, a Bidder shall submit to the Owner a confidential Financial Statement in a sealed envelope.

End of Section

Bid Form - General Contract

TO: Frank Hillon  
Anderson County School Board  
101 South Main Street  
Suite 500  
Clinton, TN 37716

DATED: \_\_\_\_\_, 2019

ANDERSON COUNTY BID #4920

Having carefully examined the Invitation and Instructions to Bidders, the General Conditions of the Contract and Specifications entitled An Addition For: Grand Oaks Elementary Gymnasium, 1033 Oliver Springs Hwy. Clinton, TN and the Drawings similarly entitled, as well as the premises and conditions affecting the work, the Undersigned proposes to furnish all materials and labor called for by them for the work in accordance with said documents for the sum of:

\_\_\_\_\_ Dollars (\$\_\_\_\_\_).

hereinafter referred to as the Base Bid.

We further submit the following proposal for the described alternate below. The work under this alternate will conform to all applicable provisions of specifications, except as specifically noted otherwise. The amount quoted includes the cost of all incidental omissions, additions, adjustments required because of the change, and the modification and/or removal of existing items as necessary for the new work. All items not specifically identified as an alternate item is included in the Base Bid above.

Alternate "1"

If Alternate "1" for providing material, equipment, labor, and supervision necessary to construct Heavy Duty Asphalt Paving as described in the specifications and shown on the drawings as Alternate "1" is accepted, add to the Base Bid the sum of

\_\_\_\_\_ Dollars (\$\_\_\_\_\_).

Alternate "2"

If Alternate "2" for providing material, equipment, labor, and supervision necessary to construct VolleyBall Court Striping with VolleyBall Net Standards Sleeves as described in the specifications and shown on the drawings as Alternate "2" is accepted, add to the Base Bid the sum of

\_\_\_\_\_ Dollars (\$\_\_\_\_\_).

The Bidder sets forth the following Unit Prices, including delivery, installation, insurance, overhead, taxes, profit, etc. as a price per indicated unit of measurement for materials and/or services to be added to or deducted from the Contract Sum by appropriate modifications during construction.

Unit Price on Removing and Replacing Unsuitable Soil \_\_\_\_\_ Per Cu. Yd.

Unit Price for Solid Rock Excavation in connection with the Trench Excavation Work \_\_\_\_\_ Per Cu. Yd.

Unit Price for removal of Unsuitable Soil in Trench  
Excavation and Replacement with Compacted  
Stone.

\_\_\_\_\_  
Per Cu. Yd.

Unit Price for providing and installing Geotextile  
Fabric above and below Foundation Drainage  
Stone.

\_\_\_\_\_  
Per Sq. Yd.

Unit Price for providing and installing Foundation  
Drainage Stone

\_\_\_\_\_  
Per Ton

If written notice of the acceptance of this bid is mailed, telegraphed, or delivered to the Undersigned within sixty (60) days after the date of receipt of bids or at anytime thereafter before this bid is withdrawn, the Undersigned agrees that he will execute and deliver a Contract on the forms which will be provided him in accordance with bid as specified; and that he will give performance and payment bonds as specified with good and sufficient surety or sureties all within ten (10) days, unless a longer period is allowed after the prescribed forms are presented to him for signature.

The Bidder proposes to complete the work within \_\_\_\_\_ consecutive calendar days from the Notice to Proceed. The Bidder, by submitting this Bid, agrees to furnish labor, materials, equipment, etc., necessary to complete the work by the above stated dates and to accept the conditions for liquidated damages in the amount of **Two Hundred Fifty Dollars (\$250.00)** per calendar day. The above stated dates for completion of this project are of utmost importance to the Owner.

The Undersigned hereby acknowledges receipt of all Contract Documents including all pages of the Specifications, all sheets of the Drawings, and the following Addenda:

Addendum No. ___ Date: _____	Addendum No. ___ Date: _____
Addendum No. ___ Date: _____	Addendum No. ___ Date: _____
Addendum No. ___ Date: _____	Addendum No. ___ Date: _____

Sincerely,

\_\_\_\_\_  
Bidder (If by a Corporation, this Bid must have the Signature Required by its By-Laws)

\_\_\_\_\_  
Title

\_\_\_\_\_  
Firm Name

\_\_\_\_\_  
State of Incorporation

\_\_\_\_\_  
State License No.

\_\_\_\_\_  
Official Address

End of Bid Form

**THIS FORM MUST BE FIRMLY ATTACHED TO THE OUTSIDE OF THE ENVELOPE CONTAINING THE BID. NO BID WILL BE CONSIDERED IF THIS FORM IS INCOMPLETE OR NOT ATTACHED TO THE OUTSIDE OF THE BID ENVELOPE.**

<b>To:</b>	Anderson County School Board 101 South Main Street Suite 500 Clinton, Tennessee 37716	<b>PROJECT:</b>	An Addition for: Grand Oaks Elementary Gymnasium 1033 Oliver Springs Hwy. Clinton, TN 37716
<b>DATE:</b>		<b>TIME:</b>	
<b>LOCATION:</b>			

<b>NAME OF BIDDER:</b>		<b>BIDDER'S LICENSE CLASSIFICATION:</b>	
<b>LICENSE NO.:</b>	<i>(If bidder is licensed in more than one classification that applies to work being bid, include the license number, classification &amp; expiration date of all classifications)</i>	<b>EXPIRATION DATE:</b>	
		<b>MONETARY LIMITS:</b>	

**PART II: IF THE BID INVOLVES: (1) ELECTRICAL WORK, (2) PLUMBING WORK, (3) HEATING, VENTILATION OR AIR CONDITIONING WORK, (4) MASONRY WORK, (5) ROOFING WORK OR (6) GEOTHERMAL WORK, THE BIDDER MUST COMPLETE PART II. IF NOT, ENTER "NONE" IN THE SPACE FORM ITEM (A) BELOW.**

<b>Electrical</b>	<b>Plumbing</b>	<b>HVAC</b>	<b>Masonry</b>	<b>Roofing</b>	<b>Geothermal</b>
A. Name of Sub holding electrical license:	A. Name of Sub holding plumbing license:	A. Name of Sub holding HVAC license:	A. Name of Sub holding Masonry license:	A. Name of Sub holding Roofing license:	A. Name of Sub holding Geothermal license:
B. License No. of Contractor holding electrical license:	B. License No. of Contractor holding plumbing license:	B. License No. of Contractor holding HVAC license:	B. License No. of Contractor holding Masonry license:	B. License No. of Contractor holding Roofing license:	B. TDEC Lic.No. of Contractor holding Geothermal license:
C. License classification and limits:	C. License classification and limits:	C. License classification and limits:	C. License classification and limits:	C. License classification and limits:	C. TDEC License classification and limits:
D. Expiration date of electrical license:	D. Expiration date of plumbing license:	D. Expiration date of HVAC license:	D. Expiration date of Masonry license:	D. Expiration date of Roofing license:	D. Expiration date of Geothermal license:

Attachment 2

**Non-Collusion Affidavit**

- This Non-Collusion Affidavit is material to any contract awarded pursuant to this bid.
- This Non-Collusion Affidavit must be executed by the member, officer, or employee of the bidder who makes the final decision on prices and the amount quoted in the bid.
- Bid rigging and other efforts to restrain competition and the making of false sworn statements in connection with the submission of bids are unlawful and may be subject to criminal prosecution. The person who signs the affidavit should examine it carefully before signing and assure himself or herself that such statement is true and accurate, making diligent inquiry, as necessary, of all other persons employed by or associated with the bidder with responsibilities for the preparation, approval, or submission of the bid.
- In the case of a bid submitted by a joint venture, each party to the venture must be identified in the bid documents, and an affidavit must be submitted separately on behalf of each party.
- The term "complementary bid" as used in the affidavit has the meaning commonly associated with that term in the bidding process and includes the knowing submission of bids higher than the bid of another firm, an intentionally high or noncompetitive bid, and any other form of bid submitted for the purpose of giving a false appearance of competition.
- Failure to file an affidavit in compliance with these instructions may result in disqualification of the bid.

**Non-Collusion Affidavit**

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

I state that I am (Title) \_\_\_\_\_ of (Name of My Firm) \_\_\_\_\_ and that I am authorized to make this affidavit on behalf of my firm and its owners, directors, and officers. I am the person responsible in my firm to the price(s) and the amount of this bid.

**I STATE THAT:**

- The price(s) and amount of this bid have been arrived at independently and without consultation, communication, or agreement with any other contractor, bidder, or potential bidder.
- Neither the price(s) nor the amount of this bid and neither the approximate price(s) nor approximate amount of this bid, have been disclosed to any other firm or person who is a bidder or potential bidder, and they will not be disclosed before bid opening.
- No attempt has been made or will be made to induce any firm or person to refrain from bidding on this contract, or to submit a bid higher than this bid, or to submit any intentionally high or noncompetitive bid or other form of complementary bid.
- The bid of my firm is made in good faith and not pursuant to any agreement or discussion with, or inducement from, any firm or person to submit a complementary or other noncompetitive bid.
- (Name of My Firm) \_\_\_\_\_, its affiliates, subsidiaries, officers, directors, and employees are not currently under investigation by any governmental agency and have not in the last three years been convicted or found liable for any act prohibited by State of Federal law in any jurisdiction involving conspiracy or collusion with respect to bidding on any public contract, except as follows:

\_\_\_\_\_  
\_\_\_\_\_

I state that (Name of My Firm) \_\_\_\_\_ understands and acknowledges that the above representation are material and important and will be relied on by Anderson County in awarding the contract(s) for which this bid is submitted. I understand and my firm understands that any misstatement in this affidavit is and shall be treated as fraudulent concealment from Anderson County of the true facts relating to submission of bids for this contract.

\_\_\_\_\_  
Representative's Signature

\_\_\_\_\_  
Title

Sworn to and subscribed before me this \_\_\_\_\_ day of \_\_\_\_\_, \_\_\_\_\_.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_



## DIVERSITY BUSINESS INFORMATION

---

### Definitions for Determining Minority, Women And Small-Owned Firms

The guidelines for determining minority, women and small-owned firms are defined as follows:

- “MINORITY”** means a person who is a citizen or lawful permanent resident of the United States and who is:
- Black (a person having origins in any of the black racial groups of Africa);
  - Hispanic (a person of Mexican, Puerto Rican, Cuban, Central or South American, or other Spanish culture or origin, regardless of race);
  - Asian American (a person having origins in any of the original peoples of the Far East, Southeast Asia, the Indian subcontinent, or the Pacific Islands); or
  - American Indian and Alaskan Native (a person having origins in any of the original peoples of North America).

**“MINORITY BUSINESS ENTERPRISE”** shall mean a minority business:

A continuing, independent, for profit business which performs a commercially useful function, and is at least 51 percent owned and controlled by one or more minority individuals; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned and controlled by one or more minorities. Whose management and daily business operations are controlled by one or more of minority individuals. “Control” as used in the above clause, means exercising the power to make policy decision. “Operate,” as used in the above clause, means being actively involved in the day-to-day management of the business.

**“WOMEN BUSINESS ENTERPRISE”** shall mean women business:

A continuing, independent, for profit business which performs a commercially useful function, and which is at least 51 percent owned and controlled by one or more women; or, in the case of any publicly owned business, at least 51 percent of the stock of which is owned and controlled by one or more women. Whose management and daily business operations are controlled by one or more of such individuals. “Control” as used in the above clause, means exercising the power to make policy decision. “Operate,” as used in the above clause, means being actively involved in the day-to-day management of the business.

**DIVERSITY BUSINESS INFORMATION  
ANDERSON COUNTY GOVERNMENT**

**NOTE:** This form is to be submitted only by those who qualify. Bidders do not have to be a minority business to be considered.

**IMPORTANT! NOTARY AND COPY OF CERTIFICATION REQUIRED**

**SECTION 6 – DIVERSITY INFORMATION**

**VENDOR/CONTRACTOR NAME:** \_\_\_\_\_

**Type of Company:** (Check One)

(\_\_\_\_) Corporation    (\_\_\_\_) Partnership    (\_\_\_\_) Limited Liability    (\_\_\_\_) Sole Proprietor

Is your company 51% Owned or Operated by a Minority Group? Yes \_\_\_ No\_\_\_

If yes, check the ethnic category and indicate % of ownership:

- American Indian/Alaskan Native \_\_\_\_%
- African American \_\_\_\_%
- Hispanic \_\_\_\_%
- Asian/Pacific Islander \_\_\_\_%
- Other \_\_\_\_% \_\_\_\_\_ (please indicate)

Please name the entity of certification: \_\_\_\_\_

Please provide copy of certification letter or certificate

**I, HEREBY CERTIFY THAT THE ABOVE INFORMATION IS TRUE AND COMPLETE TO THE BEST OF MY KNOWLEDGE.**

**Signature:** \_\_\_\_\_ **OFFICER OF THE COMPANY**

**Name:** \_\_\_\_\_ **Title:** \_\_\_\_\_

**NOTARY ACKNOWLEDGEMENT:**

STATE OF \_\_\_\_\_ )

COUNTY OF \_\_\_\_\_ )

ON \_\_\_\_\_, 20\_\_\_\_, BEFORE ME, \_\_\_\_\_,

PERSONALLY APPEARED \_\_\_\_\_, PERSONALLY KNOWN TO ME (OR PROVED TO ME 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), AND THAT BY HIS/HER/THEIR SIGNATURE(S) ON THE INSTRUMENT THE PERSON(S), OR THE ENTITY UPON BEHALF OF WHICH THE PERSON (S) ACTED, EXECUTED THE INSTRUMENT.

WITNESS MY HAND AND OFFICIAL SEAL.

SIGNATURE OF NOTARY: \_\_\_\_\_

PRINTED FULL NAME OF NOTARY: \_\_\_\_\_

MY COMMISION EXPIRES: \_\_\_\_\_

**Attachment 4  
Insurance Requirement Acknowledgment**

The bidder awarded this bid or contract will maintain, at their expense adequate insurance coverage to protect them from claims arising under the Worker's Compensation Act, any and all claims for bodily injury and property damage to the Bidder and to Anderson County Government while delivery and service are being done. A certificate of insurance must be on file in the Purchasing Department before work may begin and must be maintained until work is completed.

**Only the items marked with an "X" are applicable to this bid and or contract.**

- 1.  **Workers Compensation  
Employers Liability** Statutory limits  
100,000/100,000/500,000
- 2.  **Commercial General Liability** \$500,000 per occurrence  
\$1,000,000 aggregate
  - Occurrence Form Only
  - Include Premises Liability
  - Include Contractual
  - Include XCU
  - Include Products and Completed Operations
  - Include Personal Injury
  - Include Independent Contractors
  - Include Vendors Liability
  - Include Professional or E&O Liability
- 3.  **Business Auto**
  - Include Garage Liability
  - Include Garage Keepers Liability
  - Copy of Valid Driver's License
  - Copy of Current Motor Vehicle Record
  - Copy of Current Auto Liability Declarations Page
- 4.  **Crime Coverages**
  - Employee Dishonesty
  - Employee Dishonesty Bond
- 5.  **Property Coverages**
  - Builders Risk
  - Inland Marine
  - Transportation
- 6.  Performance Bond Required – A One Hundred Percent (100%) performance or an irrevocable letter of credit in favor of Anderson County Government at a federally insured financial institution. This **MUST** be submitted before purchase order issued.

**Certificate Holder Shall Be:** Anderson County Government, Clinton, Tennessee, and shall show the bid number and title. Anderson County Government shall be named as an additional insured on all policies except worker's compensation and auto. Insurance carrier ratings shall have a Best's rating of A-VII or better, or its equivalent. Cancellation clause on certificate should strike out "endeavor to" and include a 30-day notice of cancellation where applicable. Any deviations from the above requirements must be disclosed to the Anderson County Purchasing Agent. Any liability deductibles or exclusions must also be disclosed. Exceptions can be granted if applicable.

**Bidders Statement and Certification**

I understand the insurance requirements of these specifications and will comply in full within **21 (twenty-one) calendar days** if awarded this bid and or contract. I agree to furnish the county with proof of insurance for the entire term of the bid and or contract.

\_\_\_\_\_  
**Vendor Name**

\_\_\_\_\_  
**Authorized Signature**

\_\_\_\_\_  
**Bid Representative Name (Please Print)**

\_\_\_\_\_  
**Date**



**BACKGROUND CHECK COMPLIANCE FORM****ANDERSON COUNTY GOVERNMENT**

PURCHASING DEPARTMENT  
 100 N. MAIN STREET, ROOM 214 or 218  
 CLINTON, TN 37716  
 (865) 457-6251  
 (865) 457-6252 (Fax)

**BID NUMBER**   4920  
**CONTRACT NUMBER** \_\_\_\_\_

**BACKGROUND CHECKS** Contractors shall comply with Public Chapter 587 of 2007, as codified in Tennessee Code Annotated Section 49-5-413, which requires all contractors to facilitate a criminal history records check conducted by the Tennessee Bureau of Investigation and the Federal Bureau of Investigation for each employee prior to permitting the employee to have contact with students or enter school grounds when students are present.

Any person, corporation or other entity who enters or any employee of any person, corporation or entity who enters into or renews a contract with a local board of education or child care program on or after September 1, 2007, must:

- (1) Provide a fingerprint sample
- (2) Submit to a criminal history records check to be conducted by the Tennessee Bureau of Investigations and the Federal Bureau of Investigations.

Contact the Anderson County School's Human Resources Department at (865) 463-2800 ext. 2811 for fingerprint instructions.

Company or Individuals (Name)

Address

City, State, Zip Code

Telephone Number

(        )

Contractor License Number (If Applicable)

I agree to abide by Public Chapter 587 of 2007, as codified in Tennessee Code Annotated Section 49-5-413, and certify that I am authorized to sign. The undersigned further agrees if this bid or contract is accepted, to furnish any and all of the Background Check Information on himself and all of his employees as required by law, at the request of Anderson County Government. I hereby agree to release all criminal history and other required information to Anderson County Government, the Tennessee Bureau of Investigation and the Federal Bureau of Investigation in accordance with Tennessee law and I further certify that all information supplied by me regarding this inquiry is true and accurate. I agree to release and hold harmless the above-mentioned governmental entities for the use of this information related to the purposes mandated under Tennessee law. I further certify that I have obtained acceptable criminal history information on all current employees and will obtain said information on future employees associated with the performance of the work defined in this bid or contract, pursuant to Tennessee Code Annotated 49-5-413 and that neither I nor any employee of mine is prohibited from direct contact with school children for the reasons enumerated in Tennessee Code annotated Section §§ 49-5-401 et seq.

**Signature** \_\_\_\_\_ **Title** \_\_\_\_\_

**Printed Name:** \_\_\_\_\_ **Date** \_\_\_\_\_  
(Please Print Clearly) (Month, Day, Year)
**INTERNAL OFFICE USE ONLY**
 Notes \_\_\_\_\_  
 \_\_\_\_\_

Attachment 7

DRUG-FREE WORKPLACE AFFIDAVIT

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

The undersigned, principal officer of \_\_\_\_\_, an employer of five (5) or more employees contracting with \_\_\_\_\_ County Government to provide construction services, hereby states under oath as follows:

1. The undersigned is a principal officer of \_\_\_\_\_ (hereinafter referred to as the "Company"), and is duly authorized to execute this Affidavit on behalf of the Company.
2. The Company submits this Affidavit pursuant to T.C.A. 50-9-113, which requires each employer with no less than five (5) employees receiving pay who contracts with the state or any local government to provide construction services to submit an affidavit stating that such employer has a drug-free workplace program that complies with Title 50, Chapter 9 of the *Tennessee Code Annotated*.
3. The Company is compliance with T.C.A. 50-9-113

Further affiant saith not.

\_\_\_\_\_  
Principal Officer

STATE OF \_\_\_\_\_

COUNTY OF \_\_\_\_\_

Before me personally appeared \_\_\_\_\_, with whom I am personally acquainted (or proved to me on the basis of satisfactory evidence), and who acknowledged that such person executed the foregoing affidavit for the purpose therein contained.

Witness my hand and seal office this \_\_\_\_\_ day of \_\_\_\_\_, 20\_\_\_\_\_.

\_\_\_\_\_  
Notary Public

My commission expires: \_\_\_\_\_, 20\_\_\_\_\_.

**SPECIFICATION COMPLIANCE FORM**

TO: Anderson County School Board, 101 South Main Street, Suite 500, Clinton, Tennessee 37716

PROJECT: An Addition For: Grand Oaks Elementary Gymnasium, 1033 Oliver Springs Hwy. Clinton, Tennessee, 37716

Having carefully and thoroughly examined the Project Manual, including all Specifications, and all Drawings for the above referenced project, the Undersigned proposes to perform all Work contained therein in strict compliance with ALL included requirements.

The undersigned certifies that the following statements are correct and acknowledges each by initially the space adjacent to each:

\_\_\_\_\_ I understand that manufacturers and products provided on the Drawings and in the Project Manual ARE NOT specified as such to only provide a standard of quality but are, in fact, specified as such to also indicate the exact manufacturer and/or product intended by the Owner, Architect and/or Engineer for use in the construction of the above referenced project.

\_\_\_\_\_ I will not at any time use or install products that have not been approved in compliance with Division 1 requirements.

\_\_\_\_\_ I understand that I, nor any of those in my employ, have the authority to determine whether or not a product is "equal" to the specified product or basis of design.

\_\_\_\_\_ The proposed Base Bid includes all specified manufacturers, products and materials or manufacturers, products and materials which were approved in compliance with Division 1 requirements prior to submission of Bid proposal.

\_\_\_\_\_ I understand that my bid may be rejected if I did not bid all aspects of the project as specified.

Having certified the above to best of my knowledge, I further certify, by signature below, that failure(s) to comply with the specified products, procedures and/or requirements and the subsequent correction thereof, by course determined by the Architect or Engineer, shall not be grounds for additional compensation of time or monies whether or not such failures were intentional.

Signature & Date \_\_\_\_\_

Print Name \_\_\_\_\_

Title \_\_\_\_\_

Contractor Company Name \_\_\_\_\_

Contractor's License No. \_\_\_\_\_

Date of Expiration \_\_\_\_\_

License Classification \_\_\_\_\_

Address \_\_\_\_\_

\_\_\_\_\_

# Michael Brady Incorporated Electronic Release Form

At your request, Michael Brady Inc. (MBI) will provide electronic files for your convenience and use in the preparation of documents related to \_\_\_\_\_, subject to the following terms and conditions:

**Electronic File(s) Transfer Fees are based on the following:**

- Adobe PDF format:** \$60.00 for the first drawing/file and \$30.00 for each additional drawing/file will be required. This fee is payable in advance and by credit card only.
- Autodesk DWF format:** \$60.00 for the first drawing/file and \$30.00 for each additional drawing/file will be required. This fee is payable in advance and by credit card only.
- Autodesk 2010 AutoCAD DWG format:** \$80.00 per drawing/file. This fee is payable in advance and by credit card only.
- Autodesk 2010 Revit RVT format(if available):** \$1500.00 Architectural model/file \$1000.00 Structural model/file \$1000.00 Mechanical model/file \$1000 Plumbing model/file \$1000.00 Electrical model/file \$1000.00 Fire protection model  \$4000.00 all model sets. This fee is payable in advance and by credit card only.  
Large requests will be evaluated for the effort required to bundle and transfer the information and will be assessed on a case by case basis.

MBI makes no representation as to the compatibility of these files with your hardware or your software beyond the specified release of the referenced software.

Data contained on these electronic files is part of MBI's instruments of service and shall not be used by you or anyone else receiving this data through or from you for any purpose other than as a convenience in the preparation of documents pertaining to the referenced project. Any use by you or others, will be your sole risk and without liability or legal exposure to MBI. You agree to make no claim and hereby waive, to the fullest extent permitted by law, any claim or cause of action of any nature against MBI, its officers, directors, employees, agents or sub-consultants which may arise out of or in connection with your use of the electronic files.

Furthermore, you shall, to the fullest extent permitted by law, indemnify and hold harmless MBI from all claims, damages, losses and expenses, including attorney's fees arising out of or resulting from your use of these electronic files.

These electronic files are not Contract Documents. Significant differences may exist between these electronic files and corresponding hard copy Contract Documents due to addenda, change orders or other revisions. MBI makes no representation regarding the accuracy or completeness of the electronic files you receive. In the event that a conflict arises between the signed Contract Documents prepared by MBI and Electronic Files, signed Contract Documents shall govern. You are responsible for determining if any conflict exists. By your use of these electronic files, you are not relieved of your duty to fully comply with the Contract Documents, including and without limitation, the need to check, confirm and coordinate all dimensions and details, take field measurements, verify field conditions and coordinate your work with that of other Contractors for the project.

The fees listed above are for costs to un-archive, gather and transmit files only, and under no circumstances shall delivery of the electronic files for use by you be deemed a sale of the file(s) by MBI and MBI makes no warranties, either express or implied, of merchantability and fitness for any particular purpose. In no event shall MBI be liable for any loss of profit or any consequential damages. Usage by any parties of the data contained in the electronic files released shall constitute agreement to these terms.

Any requests for updated electronic files shall incur additional charges.

Please return this completed form by facsimile at the following number (865) 584-5213. Once the fees have been paid, the file(s) will be transferred to the indicated e-mail address and a receipt will be returned by mail.

Transfer Fee Amount: \_\_\_\_\_

Email Address: \_\_\_\_\_ Phone Number: \_\_\_\_\_

Method of Payment: \_\_\_\_ VISA \_\_\_\_ MasterCard \_\_\_\_ AMEX

Visa Code (Last 3 digits on back of card) \_\_\_\_\_ AMEX (4 digits on front of card) \_\_\_\_\_

Credit Card Number and Expiration Date: \_\_\_\_\_

Name & Address of Cardholder: \_\_\_\_\_

Cardholder Signature & Date \_\_\_\_\_

## Contractor's Request for Information (RFI)

Project Name:	Contract No.:	Date:	RFI No.:
Contractor's Name:	To:		
Subject:			

### References

Area(s):
Specification Section(s):
Drawing No.:
Other References:
Problem / Information Requested:

Information Requested by:

Reply needed by:

Contractor's Interpretation and Proposed Resolution:

### Architect's / Engineer's Evaluation and Response

Disposition:	Clarification Only	Sketch or Drawing	Other
Approval:	Project Manager	Owner	Contractor



## SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST

Project: \_\_\_\_\_  
\_\_\_\_\_  
To (A/E): \_\_\_\_\_  
\_\_\_\_\_

From (Contractor): \_\_\_\_\_  
Date: \_\_\_\_\_  
A/E Project Number: \_\_\_\_\_  
Contract For: \_\_\_\_\_

List Subcontractors and Major Material Suppliers proposed for use on this Project as required by the Construction Documents. Attach supplemental sheets if necessary.

Section Number	Section Title	Firm	Address	Phone Number (Fax Number)	Contact
----------------	---------------	------	---------	---------------------------	---------

Attachments

Signed by: \_\_\_\_\_ Date: \_\_\_\_\_

Copies:  Owner  Consultants  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  \_\_\_\_\_  File

**SUBSTITUTION REQUEST**

TO: \_\_\_\_\_

PROJECT: An Addition For: Grand Oaks Elementary Gymnasium, 1033 Oliver Springs Hwy. Clinton, Tennessee, 37716

SPECIFIED ITEM:

Section	Page	Paragraph	Description
---------	------	-----------	-------------

The undersigned request consideration of the following:

PROPOSED SUBSTITUTION: \_\_\_\_\_

Attached data includes product description, specifications, drawings, photographs, performance and test data adequate for evaluation of the request; applicable portions of the data are clearly identified.

Attached data also includes a description of changes to the Contract Documents that the proposed substitution will require for its proper installation.

The undersigned certifies that the following statements, unless modified by attachments, are correct:

1. The proposed substitution does not affect dimensions shown on Drawings.
2. The undersigned will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
4. Maintenance and service parts will be locally available for the proposed substitution.

The undersigned further states that the function, appearance, and quality of the proposed substitution are equivalent or superior to the specified item.

Submitted by: \_\_\_\_\_

For use by the A/E: \_\_\_\_\_

Signature: \_\_\_\_\_

Firm: \_\_\_\_\_

Approved \_\_\_\_\_ Approved as noted \_\_\_\_\_

Address: \_\_\_\_\_

Not Approved \_\_\_\_\_ Received too late \_\_\_\_\_

By: \_\_\_\_\_

Date: \_\_\_\_\_

Date: \_\_\_\_\_

Telephone: \_\_\_\_\_

Remarks: \_\_\_\_\_

Attachments



# AIA® Document A201™ – 2017

## General Conditions of the Contract for Construction

### for the following PROJECT:

*(Name and location or address)*

Grand Oaks Elementary Gymnasium  
1033 Oliver Springs Highway  
Clinton, TN 37716

MBI Comm. No.: 170759

### THE OWNER:

*(Name, legal status and address)*

Anderson County School Board  
101 South Main Street  
Suite 500  
Clinton, TN 37716

### THE ARCHITECT:

*(Name, legal status and address)*

Michael Brady Inc.  
299 N. Weisgarber Road  
Knoxville, TN 37919

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|----|--|
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| 2  | OWNER  |
| 3  | CONTRACTOR                                       |
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| 5  | SUBCONTRACTORS                                   |
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| 12 | UNCOVERING AND CORRECTION OF WORK                |

### ADDITIONS AND DELETIONS:

The author of this document has added information needed for its completion. The author may also have revised the text of the original AIA standard form. An *Additions and Deletions Report* that notes added information as well as revisions to the standard form text is available from the author and should be reviewed. A vertical line in the left margin of this document indicates where the author has added necessary information and where the author has added to or deleted from the original AIA text.

This document has important legal consequences. Consultation with an attorney is encouraged with respect to its completion or modification.

For guidance in modifying this document to include supplementary conditions, see AIA Document A503™, Guide for Supplementary Conditions.

Init.

/



13	MISCELLANEOUS PROVISIONS
14	TERMINATION OR SUSPENSION OF THE CONTRACT
15	CLAIMS AND DISPUTES



Init.

/

## INDEX

(Topics and numbers in bold are Section headings.)

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## ARTICLE 1 GENERAL PROVISIONS

### § 1.1 Basic Definitions

#### § 1.1.1 The Contract Documents

The Contract Documents are enumerated in the Agreement between the Owner and Contractor (hereinafter the Agreement) and consist of the Agreement, Conditions of the Contract (General, Supplementary and other Conditions), Drawings, Specifications, Addenda issued prior to execution of the Contract, other documents listed in the Agreement, and Modifications issued after execution of the Contract. A Modification is (1) a written amendment to the Contract signed by both parties, (2) a Change Order, (3) a Construction Change Directive, or (4) a written order for a minor change in the Work issued by the Architect. Unless specifically enumerated in the Agreement, the Contract Documents do not include the advertisement or invitation to bid, Instructions to Bidders, sample forms, other information furnished by the Owner in anticipation of receiving bids or proposals, the Contractor's bid or proposal, or portions of Addenda relating to bidding or proposal requirements.

#### § 1.1.2 The Contract

The Contract Documents form the Contract for Construction. 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 Modification. The Contract Documents shall not be construed to create a contractual relationship of any kind (1) between the Contractor and the Architect or the Architect's consultants, (2) between the Owner and a Subcontractor or a Sub-subcontractor, (3) between the Owner and the Architect or the Architect's consultants, or (4) 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.

#### § 1.1.3 The Work

The term "Work" means the construction and services required by the Contract Documents, whether completed or partially completed, and includes all other labor, materials, equipment, and services provided or to be provided by the Contractor to fulfill the Contractor's obligations. The Work may constitute the whole or a part of the Project.

#### § 1.1.4 The Project

The Project is the total construction of which the Work performed under the Contract Documents may be the whole or a part and which may include construction by the Owner and by Separate Contractors.

#### § 1.1.5 The Drawings

The Drawings are the graphic and pictorial portions of the Contract Documents showing the design, location and dimensions of the Work, generally including plans, elevations, sections, details, schedules, and diagrams.

#### § 1.1.6 The Specifications

The Specifications are that portion of the Contract Documents consisting of the written requirements for materials, equipment, systems, standards and workmanship for the Work, and performance of related services.

#### § 1.1.7 Instruments of Service

Instruments of Service are representations, in any medium of expression now known or later developed, of the tangible and intangible creative work performed by the Architect and the Architect's consultants under their respective professional services agreements. Instruments of Service may include, without limitation, studies, surveys, models, sketches, drawings, specifications, and other similar materials.

#### § 1.1.8 Initial Decision Maker

The Initial Decision Maker is the person identified in the Agreement to render initial decisions on Claims in accordance with Section 15.2. The Initial Decision Maker shall not show partiality to the Owner or Contractor and shall not be liable for results of interpretations or decisions rendered in good faith.

### § 1.2 Correlation and Intent of the Contract Documents

§ 1.2.1 The intent of the Contract Documents is to include all items necessary for the proper execution and completion of the Work by the Contractor. The Contract Documents are complementary, and what is required by one shall be as binding as if required by all; performance by the Contractor shall be required only to the extent consistent with the Contract Documents and reasonably inferable from them as being necessary to produce the indicated results.

**§ 1.2.1.1** The invalidity of any provision of the Contract Documents shall not invalidate the Contract or its remaining provisions. If it is determined that any provision of the Contract Documents violates any law, or is otherwise invalid or unenforceable, then that provision shall be revised to the extent necessary to make that provision legal and enforceable. In such case the Contract Documents shall be construed, to the fullest extent permitted by law, to give effect to the parties' intentions and purposes in executing the Contract.

**§ 1.2.2** Organization of the Specifications into divisions, sections and articles, and arrangement of Drawings shall not control the Contractor in dividing the Work among Subcontractors or in establishing the extent of Work to be performed by any trade.

**§ 1.2.3** Unless otherwise stated in the Contract Documents, words that have well-known technical or construction industry meanings are used in the Contract Documents in accordance with such recognized meanings.

### **§ 1.3 Capitalization**

Terms capitalized in these General Conditions include those that are (1) specifically defined, (2) the titles of numbered articles, or (3) the titles of other documents published by the American Institute of Architects.

### **§ 1.4 Interpretation**

In the interest of brevity the Contract Documents frequently omit modifying words such as "all" and "any" and articles such as "the" and "an," but the fact that a modifier or an article is absent from one statement and appears in another is not intended to affect the interpretation of either statement.

### **§ 1.5 Ownership and Use of Drawings, Specifications, and Other Instruments of Service**

**§ 1.5.1** The Architect and the Architect's consultants shall be deemed the authors and owners of their respective Instruments of Service, including the Drawings and Specifications, and retain all common law, statutory, and other reserved rights in their Instruments of Service, including copyrights. The Contractor, Subcontractors, Sub-subcontractors, and suppliers shall not own or claim a copyright in the Instruments of Service. Submittal or distribution to meet official regulatory requirements or for other purposes in connection with the Project is not to be construed as publication in derogation of the Architect's or Architect's consultants' reserved rights.

**§ 1.5.2** The Contractor, Subcontractors, Sub-subcontractors, and suppliers are authorized to use and reproduce the Instruments of Service provided to them, subject to any protocols established pursuant to Sections 1.7 and 1.8, solely and exclusively for execution of the Work. All copies made under this authorization shall bear the copyright notice, if any, shown on the Instruments of Service. The Contractor, Subcontractors, Sub-subcontractors, and suppliers may not use the Instruments of Service on other projects or for additions to the Project outside the scope of the Work without the specific written consent of the Owner, Architect, and the Architect's consultants.

### **§ 1.6 Notice**

**§ 1.6.1** Except as otherwise provided in Section 1.6.2, where the Contract Documents require one party to notify or give notice to the other party, such notice shall be provided in writing to the designated representative of the party to whom the notice is addressed and shall be deemed to have been duly served if delivered in person, by mail, by courier, or by electronic transmission if a method for electronic transmission is set forth in the Agreement.

**§ 1.6.2** Notice of Claims as provided in Section 15.1.3 shall be provided in writing and shall be deemed to have been duly served only if delivered to the designated representative of the party to whom the notice is addressed by certified or registered mail, or by courier providing proof of delivery.

### **§ 1.7 Digital Data Use and Transmission**

The parties shall agree upon protocols governing the transmission and use of Instruments of Service or any other information or documentation in digital form. The parties will use AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, to establish the protocols for the development, use, transmission, and exchange of digital data.

### **§ 1.8 Building Information Models Use and Reliance**

Any use of, or reliance on, all or a portion of a building information model without agreement to protocols governing the use of, and reliance on, the information contained in the model and without having those protocols set forth in AIA Document E203™–2013, Building Information Modeling and Digital Data Exhibit, and the requisite AIA Document

G202™–2013, Project Building Information Modeling Protocol Form, shall be at the using or relying party's sole risk and without liability to the other party and its contractors or consultants, the authors of, or contributors to, the building information model, and each of their agents and employees.

## **ARTICLE 2 OWNER**

### **§ 2.1 General**

**§ 2.1.1** The Owner is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Owner shall designate in writing a representative who shall have express authority to bind the Owner with respect to all matters requiring the Owner's approval or authorization. Except as otherwise provided in Section 4.2.1, the Architect does not have such authority. The term "Owner" means the Owner or the Owner's authorized representative.

**§ 2.1.2** The Owner shall furnish to the Contractor, within fifteen days after receipt of a written request, information necessary and relevant for the Contractor to evaluate, give notice of, or enforce mechanic's lien rights. Such information shall include a correct statement of the record legal title to the property on which the Project is located, usually referred to as the site, and the Owner's interest therein.

### **§ 2.2 Evidence of the Owner's Financial Arrangements**

**§ 2.2.1** Prior to commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract. The Contractor shall have no obligation to commence the Work until the Owner provides such evidence. If commencement of the Work is delayed under this Section 2.2.1, the Contract Time shall be extended appropriately.

**§ 2.2.2** Following commencement of the Work and upon written request by the Contractor, the Owner shall furnish to the Contractor reasonable evidence that the Owner has made financial arrangements to fulfill the Owner's obligations under the Contract only if (1) the Owner fails to make payments to the Contractor as the Contract Documents require; (2) the Contractor identifies in writing a reasonable concern regarding the Owner's ability to make payment when due; or (3) a change in the Work materially changes the Contract Sum. If the Owner fails to provide such evidence, as required, within fourteen days of the Contractor's request, the Contractor may immediately stop the Work and, in that event, shall notify the Owner that the Work has stopped. However, if the request is made because a change in the Work materially changes the Contract Sum under (3) above, the Contractor may immediately stop only that portion of the Work affected by the change until reasonable evidence is provided. If the Work is stopped under this Section 2.2.2, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided in the Contract Documents.

**§ 2.2.3** After the Owner furnishes evidence of financial arrangements under this Section 2.2, the Owner shall not materially vary such financial arrangements without prior notice to the Contractor.

**§ 2.2.4** Where the Owner has designated information furnished under this Section 2.2 as "confidential," the Contractor shall keep the information confidential and shall not disclose it to any other person. However, the Contractor may disclose "confidential" information, after seven (7) days' notice to the Owner, where disclosure is required by law, including a subpoena or other form of compulsory legal process issued by a court or governmental entity, or by court or arbitrator(s) order. The Contractor may also disclose "confidential" information to its employees, consultants, sureties, Subcontractors and their employees, Sub-subcontractors, and others who need to know the content of such information solely and exclusively for the Project and who agree to maintain the confidentiality of such information.

### **§ 2.3 Information and Services Required of the Owner**

**§ 2.3.1** Except for permits and fees that are the responsibility of the Contractor under the Contract Documents, including those required under Section 3.7.1, the Owner shall secure and pay for necessary approvals, easements, assessments and charges required for construction, use or occupancy of permanent structures or for permanent changes in existing facilities.

**§ 2.3.2** The Owner shall retain an architect lawfully licensed to practice architecture, or an entity lawfully practicing architecture, in the jurisdiction where the Project is located. That person or entity is identified as the Architect in the Agreement and is referred to throughout the Contract Documents as if singular in number.

**§ 2.3.3** If the employment of the Architect terminates, the Owner shall employ a successor to whom the Contractor has no reasonable objection and whose status under the Contract Documents shall be that of the Architect.

**§ 2.3.4** The Owner shall furnish surveys describing physical characteristics, legal limitations and utility locations for the site of the Project, and a legal description of the site. The Contractor shall be entitled to rely on the accuracy of information furnished by the Owner but shall exercise proper precautions relating to the safe performance of the Work.

**§ 2.3.5** The Owner shall furnish information or services required of the Owner by the Contract Documents with reasonable promptness. The Owner shall also furnish any other information or services under the Owner's control and relevant to the Contractor's performance of the Work with reasonable promptness after receiving the Contractor's written request for such information or services.

**§ 2.3.6** Unless otherwise provided in the Contract Documents, the Owner shall furnish to the Contractor one copy of the Contract Documents for purposes of making reproductions pursuant to Section 1.5.2.

#### **§ 2.4 Owner's Right to Stop the Work**

If the Contractor fails to correct Work that is not in accordance with the requirements of the Contract Documents as required by Section 12.2 or repeatedly fails to carry out Work in accordance with the Contract Documents, the Owner may issue a written order to the Contractor to stop the Work, or any portion thereof, until the cause for such order has been eliminated; however, the right of the Owner to stop the Work shall not give rise to a duty on the part of the Owner to exercise this right for the benefit of the Contractor or any other person or entity, except to the extent required by Section 6.1.3.

#### **§ 2.5 Owner's Right to Carry Out the Work**

If the Contractor defaults or neglects to carry out the Work in accordance with the Contract Documents and fails within a ten-day period after receipt of notice from the Owner to commence and continue correction of such default or neglect with diligence and promptness, the Owner may, without prejudice to other remedies the Owner may have, correct such default or neglect. Such action by the Owner and amounts charged to the Contractor are both subject to prior approval of the Architect and the Architect may, pursuant to Section 9.5.1, withhold or nullify a Certificate for Payment in whole or in part, to the extent reasonably necessary to reimburse the Owner for the reasonable cost of correcting such deficiencies, including Owner's expenses and compensation for the Architect's additional services made necessary by such default, neglect, or failure. If current and future payments are not sufficient to cover such amounts, the Contractor shall pay the difference to the Owner. If the Contractor disagrees with the actions of the Owner or the Architect, or the amounts claimed as costs to the Owner, the Contractor may file a Claim pursuant to Article 15.

### **ARTICLE 3 CONTRACTOR**

#### **§ 3.1 General**

**§ 3.1.1** The Contractor is the person or entity identified as such in the Agreement and is referred to throughout the Contract Documents as if singular in number. The Contractor shall be lawfully licensed, if required in the jurisdiction where the Project is located. The Contractor shall designate in writing a representative who shall have express authority to bind the Contractor with respect to all matters under this Contract. The term "Contractor" means the Contractor or the Contractor's authorized representative.

**§ 3.1.2** The Contractor shall perform the Work in accordance with the Contract Documents.

**§ 3.1.3** The Contractor shall not be relieved of its 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 or entities other than the Contractor.

#### **§ 3.2 Review of Contract Documents and Field Conditions by Contractor**

**§ 3.2.1** Execution of the Contract by the Contractor is a representation that the Contractor has visited the site, become generally familiar with local conditions under which the Work is to be performed, and correlated personal observations with requirements of the Contract Documents.



**§ 3.2.2** Because the Contract Documents are complementary, the Contractor shall, before starting each portion of the Work, carefully study and compare the various Contract Documents relative to that portion of the Work, as well as the information furnished by the Owner pursuant to Section 2.3.4, shall take field measurements of any existing conditions related to that portion of the Work, and shall observe any conditions at the site affecting it. These obligations are for the purpose of facilitating coordination and construction by the Contractor and are not for the purpose of discovering errors, omissions, or inconsistencies in the Contract Documents; however, the Contractor shall promptly report to the Architect any errors, inconsistencies or omissions discovered by or made known to the Contractor as a request for information in such form as the Architect may require. It is recognized that the Contractor's review is made in the Contractor's capacity as a contractor and not as a licensed design professional, unless otherwise specifically provided in the Contract Documents.

**§ 3.2.3** The Contractor is not required to ascertain that the Contract Documents are in accordance with applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, but the Contractor shall promptly report to the Architect any nonconformity discovered by or made known to the Contractor as a request for information in such form as the Architect may require.

**§ 3.2.4** If the Contractor believes that additional cost or time is involved because of clarifications or instructions the Architect issues in response to the Contractor's notices or requests for information pursuant to Sections 3.2.2 or 3.2.3, the Contractor shall submit Claims as provided in Article 15. If the Contractor fails to perform the obligations of Sections 3.2.2 or 3.2.3, the Contractor shall pay such costs and damages to the Owner, subject to Section 15.1.7, as would have been avoided if the Contractor had performed such obligations. If the Contractor performs those obligations, the Contractor shall not be liable to the Owner or Architect for damages resulting from errors, inconsistencies or omissions in the Contract Documents, for differences between field measurements or conditions and the Contract Documents, or for nonconformities of the Contract Documents to applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities.

### **§ 3.3 Supervision and Construction Procedures**

**§ 3.3.1** The Contractor shall 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, and procedures, and for coordinating all portions of the Work under the Contract. If the Contract Documents give specific instructions concerning construction means, methods, techniques, sequences, or procedures, the Contractor shall evaluate the jobsite safety thereof and shall be solely responsible for the jobsite safety of such means, methods, techniques, sequences, or procedures. If the Contractor determines that such means, methods, techniques, sequences or procedures may not be safe, the Contractor shall give timely notice to the Owner and Architect, and shall propose alternative means, methods, techniques, sequences, or procedures. The Architect shall evaluate the proposed alternative solely for conformance with the design intent for the completed construction. Unless the Architect objects to the Contractor's proposed alternative, the Contractor shall perform the Work using its alternative means, methods, techniques, sequences, or procedures.

**§ 3.3.2** The Contractor shall be responsible to the Owner for acts and omissions of the Contractor's employees, Subcontractors and their agents and employees, and other persons or entities performing portions of the Work for, or on behalf of, the Contractor or any of its Subcontractors.

**§ 3.3.3** The Contractor shall be responsible for inspection of portions of Work already performed to determine that such portions are in proper condition to receive subsequent Work.

### **§ 3.4 Labor and Materials**

**§ 3.4.1** Unless otherwise provided in the Contract Documents, the Contractor shall provide and pay for labor, materials, equipment, tools, construction equipment and machinery, water, heat, utilities, transportation, and other facilities and services 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.

**§ 3.4.2** Except in the case of minor changes in the Work approved by the Architect in accordance with Section 3.12.8 or ordered by the Architect in accordance with Section 7.4, the Contractor may make substitutions only with the consent of the Owner, after evaluation by the Architect and in accordance with a Change Order or Construction Change Directive.

§ 3.4.3 The Contractor shall enforce strict discipline and good order among the Contractor's employees and other persons carrying out the Work. The Contractor shall not permit employment of unfit persons or persons not properly skilled in tasks assigned to them.

### § 3.5 Warranty

§ 3.5.1 The Contractor warrants to the Owner and Architect that materials and equipment furnished under the Contract will be of good quality and new unless the Contract Documents require or permit otherwise. The Contractor further warrants that the Work will conform to the requirements of the Contract Documents and will be free from defects, except for those inherent in the quality of the Work the Contract Documents require or permit. Work, materials, or equipment not conforming to these requirements may be considered defective. The Contractor's warranty excludes remedy for damage or defect caused by abuse, alterations to the Work not executed by the Contractor, improper or insufficient maintenance, improper operation, or normal wear and tear and normal usage. If required by the Architect, the Contractor shall furnish satisfactory evidence as to the kind and quality of materials and equipment.

§ 3.5.2 All material, equipment, or other special warranties required by the Contract Documents shall be issued in the name of the Owner, or shall be transferable to the Owner, and shall commence in accordance with Section 9.8.4.

### § 3.6 Taxes

The Contractor shall pay sales, consumer, use and similar taxes for the Work provided by the Contractor that are legally enacted when bids are received or negotiations concluded, whether or not yet effective or merely scheduled to go into effect.

### § 3.7 Permits, Fees, Notices and Compliance with Laws

§ 3.7.1 Unless otherwise provided in the Contract Documents, the Contractor shall secure and pay for the building permit as well as for other permits, fees, licenses, and inspections by government agencies necessary for proper execution and completion of the Work that are customarily secured after execution of the Contract and legally required at the time bids are received or negotiations concluded.

§ 3.7.2 The Contractor shall comply with and give notices required by applicable laws, statutes, ordinances, codes, rules and regulations, and lawful orders of public authorities applicable to performance of the Work.

§ 3.7.3 If the Contractor performs Work knowing it to be contrary to applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of public authorities, the Contractor shall assume appropriate responsibility for such Work and shall bear the costs attributable to correction.

### § 3.7.4 Concealed or Unknown Conditions

If the Contractor encounters conditions at the site that are (1) subsurface or otherwise concealed physical conditions that differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature that differ materially from those ordinarily found to exist and generally recognized as inherent in construction activities of the character provided for in the Contract Documents, the Contractor shall promptly provide notice to the Owner and the Architect before conditions are disturbed and in no event later than 14 days after first observance of the conditions. The Architect will promptly investigate such conditions and, if the Architect determines that they differ materially and cause an increase or decrease in the Contractor's cost of, or time required for, performance of any part of the Work, will recommend that an equitable adjustment be made in the Contract Sum or Contract Time, or both. If the Architect determines that the conditions at the site are not materially different from those indicated in the Contract Documents and that no change in the terms of the Contract is justified, the Architect shall promptly notify the Owner and Contractor, stating the reasons. If either party disputes the Architect's determination or recommendation, that party may submit a Claim as provided in Article 15.

§ 3.7.5 If, in the course of the Work, the Contractor encounters human remains or recognizes the existence of burial markers, archaeological sites or wetlands not indicated in the Contract Documents, the Contractor shall immediately suspend any operations that would affect them and shall notify the Owner and Architect. Upon receipt of such notice, the Owner shall promptly take any action necessary to obtain governmental authorization required to resume the operations. The Contractor shall continue to suspend such operations until otherwise instructed by the Owner but shall continue with all other operations that do not affect those remains or features. Requests for adjustments in the Contract Sum and Contract Time arising from the existence of such remains or features may be made as provided in Article 15.

### § 3.8 Allowances

§ 3.8.1 The Contractor shall include in the Contract Sum all allowances stated in the Contract Documents. Items covered by allowances shall be supplied for such amounts and by such persons or entities as the Owner may direct, but the Contractor shall not be required to employ persons or entities to whom the Contractor has reasonable objection.

§ 3.8.2 Unless otherwise provided in the Contract Documents,

- .1 allowances shall cover the cost to the Contractor of materials and equipment delivered at the site and all required taxes, less applicable trade discounts;
- .2 Contractor's costs for unloading and handling at the site, labor, installation costs, overhead, profit, and other expenses contemplated for stated allowance amounts shall be included in the Contract Sum but not in the allowances; and
- .3 whenever costs are more than or less than allowances, the Contract Sum shall be adjusted accordingly by Change Order. The amount of the Change Order shall reflect (1) the difference between actual costs and the allowances under Section 3.8.2.1 and (2) changes in Contractor's costs under Section 3.8.2.2.

§ 3.8.3 Materials and equipment under an allowance shall be selected by the Owner with reasonable promptness.

### § 3.9 Superintendent

§ 3.9.1 The Contractor shall employ a competent superintendent and necessary assistants who shall be in attendance at the Project site during performance of the Work. The superintendent shall represent the Contractor, and communications given to the superintendent shall be as binding as if given to the Contractor.

§ 3.9.2 The Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the name and qualifications of a proposed superintendent. Within 14 days of receipt of the information, the Architect may notify the Contractor, stating whether the Owner or the Architect (1) has reasonable objection to the proposed superintendent or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 3.9.3 The Contractor shall not employ a proposed superintendent to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not change the superintendent without the Owner's consent, which shall not unreasonably be withheld or delayed.

### § 3.10 Contractor's Construction and Submittal Schedules

§ 3.10.1 The Contractor, promptly after being awarded the Contract, shall submit for the Owner's and Architect's information a Contractor's construction schedule for the Work. The schedule shall contain detail appropriate for the Project, including (1) the date of commencement of the Work, interim schedule milestone dates, and the date of Substantial Completion; (2) an apportionment of the Work by construction activity; and (3) the time required for completion of each portion of the Work. The schedule shall provide for the orderly progression of the Work to completion and shall not exceed time limits current under the Contract Documents. The schedule shall be revised at appropriate intervals as required by the conditions of the Work and Project.

§ 3.10.2 The Contractor, promptly after being awarded the Contract and thereafter as necessary to maintain a current submittal schedule, shall submit a submittal schedule for the Architect's approval. The Architect's approval shall not be unreasonably delayed or withheld. The submittal schedule shall (1) be coordinated with the Contractor's construction schedule, and (2) allow the Architect reasonable time to review submittals. If the Contractor fails to submit a submittal schedule, or fails to provide submittals in accordance with the approved submittal schedule, the Contractor shall not be entitled to any increase in Contract Sum or extension of Contract Time based on the time required for review of submittals.

§ 3.10.3 The Contractor shall perform the Work in general accordance with the most recent schedules submitted to the Owner and Architect.

### § 3.11 Documents and Samples at the Site

The Contractor shall make available, at the Project site, the Contract Documents, including Change Orders, Construction Change Directives, and other Modifications, in good order and marked currently to indicate field changes and selections made during construction, and the approved Shop Drawings, Product Data, Samples, and similar required submittals. These shall be in electronic form or paper copy, available to the Architect and Owner, and

delivered to the Architect for submittal to the Owner upon completion of the Work as a record of the Work as constructed.

### **§ 3.12 Shop Drawings, Product Data and Samples**

**§ 3.12.1** Shop Drawings are drawings, diagrams, schedules, and other data specially prepared for the Work by the Contractor or a Subcontractor, Sub-subcontractor, manufacturer, supplier, or distributor to illustrate some portion of the Work.

**§ 3.12.2** Product Data are illustrations, standard schedules, performance charts, instructions, brochures, diagrams, and other information furnished by the Contractor to illustrate materials or equipment for some portion of the Work.

**§ 3.12.3** Samples are physical examples that illustrate materials, equipment, or workmanship, and establish standards by which the Work will be judged.

**§ 3.12.4** Shop Drawings, Product Data, Samples, and similar submittals are not Contract Documents. Their purpose is to demonstrate how the Contractor proposes to conform to the information given and the design concept expressed in the Contract Documents for those portions of the Work for which the Contract Documents require submittals. Review by the Architect is subject to the limitations of Section 4.2.7. Informational submittals upon which the Architect is not expected to take responsive action may be so identified in the Contract Documents. Submittals that are not required by the Contract Documents may be returned by the Architect without action.

**§ 3.12.5** The Contractor shall review for compliance with the Contract Documents, approve, and submit to the Architect, Shop Drawings, Product Data, Samples, and similar submittals required by the Contract Documents, in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness and in such sequence as to cause no delay in the Work or in the activities of the Owner or of Separate Contractors.

**§ 3.12.6** By submitting Shop Drawings, Product Data, Samples, and similar submittals, the Contractor represents to the Owner and Architect that the Contractor has (1) reviewed and approved them, (2) determined and verified materials, field measurements and field construction criteria related thereto, or will do so, and (3) checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.

**§ 3.12.7** The Contractor shall perform no portion of the Work for which the Contract Documents require submittal and review of Shop Drawings, Product Data, Samples, or similar submittals, until the respective submittal has been approved by the Architect.

**§ 3.12.8** The Work shall be in accordance with approved submittals except that the Contractor shall not be relieved of responsibility for deviations from the requirements of the Contract Documents by the Architect's approval of Shop Drawings, Product Data, Samples, or similar submittals, unless the Contractor has specifically notified the Architect of such deviation at the time of submittal and (1) the Architect has given written approval to the specific deviation as a minor change in the Work, or (2) a Change Order or Construction Change Directive has been issued authorizing the deviation. The Contractor shall not be relieved of responsibility for errors or omissions in Shop Drawings, Product Data, Samples, or similar submittals, by the Architect's approval thereof.

**§ 3.12.9** The Contractor shall direct specific attention, in writing or on resubmitted Shop Drawings, Product Data, Samples, or similar submittals, to revisions other than those requested by the Architect on previous submittals. In the absence of such notice, the Architect's approval of a resubmission shall not apply to such revisions.

**§ 3.12.10** The Contractor shall not be required to provide professional services that constitute the practice of architecture or engineering unless such services are specifically required by the Contract Documents for a portion of the Work or unless the Contractor needs to provide such services in order to carry out the Contractor's responsibilities for construction means, methods, techniques, sequences, and procedures. The Contractor shall not be required to provide professional services in violation of applicable law.

**§ 3.12.10.1** If professional design services or certifications by a design professional related to systems, materials, or equipment are specifically required of the Contractor by the Contract Documents, the Owner and the Architect will specify all performance and design criteria that such services must satisfy. The Contractor shall be entitled to rely

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upon the adequacy and accuracy of the performance and design criteria provided in the Contract Documents. The Contractor shall cause such services or certifications to be provided by an appropriately licensed design professional, whose signature and seal shall appear on all drawings, calculations, specifications, certifications, Shop Drawings, and other submittals prepared by such professional. Shop Drawings, and other submittals related to the Work, designed or certified by such professional, if prepared by others, shall bear such professional's written approval when submitted to the Architect. The Owner and the Architect shall be entitled to rely upon the adequacy and accuracy of the services, certifications, and approvals performed or provided by such design professionals, provided the Owner and Architect have specified to the Contractor the performance and design criteria that such services must satisfy. Pursuant to this Section 3.12.10, the Architect will review and approve or take other appropriate action on submittals only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents.

**§ 3.12.10.2** If the Contract Documents require the Contractor's design professional to certify that the Work has been performed in accordance with the design criteria, the Contractor shall furnish such certifications to the Architect at the time and in the form specified by the Architect.

### **§ 3.13 Use of Site**

The Contractor shall confine operations at the site to areas permitted by applicable laws, statutes, ordinances, codes, rules and regulations, lawful orders of public authorities, and the Contract Documents and shall not unreasonably encumber the site with materials or equipment.

### **§ 3.14 Cutting and Patching**

**§ 3.14.1** The Contractor shall be responsible for cutting, fitting, or patching required to complete the Work or to make its parts fit together properly. All areas requiring cutting, fitting, or patching shall be restored to the condition existing prior to the cutting, fitting, or patching, unless otherwise required by the Contract Documents.

**§ 3.14.2** The Contractor shall not damage or endanger a portion of the Work or fully or partially completed construction of the Owner or Separate Contractors by cutting, patching, or otherwise altering such construction, or by excavation. The Contractor shall not cut or otherwise alter construction by the Owner or a Separate Contractor except with written consent of the Owner and of the Separate Contractor. Consent shall not be unreasonably withheld. The Contractor shall not unreasonably withhold, from the Owner or a Separate Contractor, its consent to cutting or otherwise altering the Work.

### **§ 3.15 Cleaning Up**

**§ 3.15.1** The Contractor shall keep the premises and surrounding area free from accumulation of waste materials and rubbish caused by operations under the Contract. At completion of the Work, the Contractor shall remove waste materials, rubbish, the Contractor's tools, construction equipment, machinery, and surplus materials from and about the Project.

**§ 3.15.2** If the Contractor fails to clean up as provided in the Contract Documents, the Owner may do so and the Owner shall be entitled to reimbursement from the Contractor.

### **§ 3.16 Access to Work**

The Contractor shall provide the Owner and Architect with access to the Work in preparation and progress wherever located.

### **§ 3.17 Royalties, Patents and Copyrights**

The Contractor shall pay all royalties and license fees. The Contractor shall defend suits or claims for infringement of copyrights and patent rights and shall hold the Owner and Architect harmless from loss on account thereof, but shall not be responsible for defense or loss when a particular design, process, or product of a particular manufacturer or manufacturers is required by the Contract Documents, or where the copyright violations are contained in Drawings, Specifications, or other documents prepared by the Owner or Architect. However, if an infringement of a copyright or patent is discovered by, or made known to, the Contractor, the Contractor shall be responsible for the loss unless the information is promptly furnished to the Architect.

### § 3.18 Indemnification

§ 3.18.1 To the fullest extent permitted by law, the Contractor shall indemnify and hold harmless the Owner, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), but only to the extent caused by the negligent acts or omissions of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, regardless of whether or not such claim, damage, loss, or expense is caused in part by a party indemnified hereunder. Such obligation shall not be construed to negate, abridge, or reduce other rights or obligations of indemnity that would otherwise exist as to a party or person described in this Section 3.18.

§ 3.18.2 In claims against any person or entity indemnified under this Section 3.18 by an employee of the Contractor, a Subcontractor, anyone directly or indirectly employed by them, or anyone for whose acts they may be liable, the indemnification obligation under Section 3.18.1 shall not be limited by a limitation on amount or type of damages, compensation, or benefits payable by or for the Contractor or a Subcontractor under workers' compensation acts, disability benefit acts, or other employee benefit acts.

## ARTICLE 4 ARCHITECT

### § 4.1 General

§ 4.1.1 The Architect is the person or entity retained by the Owner pursuant to Section 2.3.2 and identified as such in the Agreement.

§ 4.1.2 Duties, responsibilities, and limitations of authority of the Architect as set forth in the Contract Documents shall not be restricted, modified, or extended without written consent of the Owner, Contractor, and Architect. Consent shall not be unreasonably withheld.

### § 4.2 Administration of the Contract

§ 4.2.1 The Architect will provide administration of the Contract as described in the Contract Documents and will be an Owner's representative during construction until the date the Architect issues the final Certificate for Payment. The Architect will have authority to act on behalf of the Owner only to the extent provided in the Contract Documents.

§ 4.2.2 The Architect will visit the site at intervals appropriate to the stage of construction, or as otherwise agreed with the Owner, to become generally familiar with the progress and quality of the portion of the Work completed, and to determine in general if the Work observed is being performed in a manner indicating that the Work, when fully completed, will be in accordance with the Contract Documents. However, the Architect will not be required to make exhaustive or continuous on-site inspections to check the quality or quantity of the Work. The Architect will not have control over, charge of, or responsibility for the construction means, methods, techniques, sequences or procedures, or for the safety precautions and programs in connection with the Work, since these are solely the Contractor's rights and responsibilities under the Contract Documents.

§ 4.2.3 On the basis of the site visits, the Architect will keep the Owner reasonably informed about the progress and quality of the portion of the Work completed, and promptly report to the Owner (1) known deviations from the Contract Documents, (2) known deviations from the most recent construction schedule submitted by the Contractor, and (3) defects and deficiencies observed in the Work. The Architect will not be responsible for the Contractor's failure to perform the Work in accordance with the requirements of the Contract Documents. The Architect will not have control over or charge of, and will not be responsible for acts or omissions of, the Contractor, Subcontractors, or their agents or employees, or any other persons or entities performing portions of the Work.

### § 4.2.4 Communications

The Owner and Contractor shall include the Architect in all communications that relate to or affect the Architect's services or professional responsibilities. The Owner shall promptly notify the Architect of the substance of any direct communications between the Owner and the Contractor otherwise relating to the Project. Communications by and with the Architect's consultants shall be through the Architect. Communications by and with Subcontractors and suppliers shall be through the Contractor. Communications by and with Separate Contractors shall be through the Owner. The Contract Documents may specify other communication protocols.

§ 4.2.5 Based on the Architect's evaluations of the Contractor's Applications for Payment, the Architect will review and certify the amounts due the Contractor and will issue Certificates for Payment in such amounts.

§ 4.2.6 The Architect has authority to reject Work that does not conform to the Contract Documents. Whenever the Architect considers it necessary or advisable, the Architect will have authority to require inspection or testing of the Work in accordance with Sections 13.4.2 and 13.4.3, whether or not the Work is fabricated, installed or completed. However, neither this authority of the Architect nor a decision made in good faith either to exercise or not to exercise such authority shall give rise to a duty or responsibility of the Architect to the Contractor, Subcontractors, suppliers, their agents or employees, or other persons or entities performing portions of the Work.

§ 4.2.7 The Architect will review and approve, or take other appropriate action upon, the Contractor's submittals such as Shop Drawings, Product Data, and Samples, but only for the limited purpose of checking for conformance with information given and the design concept expressed in the Contract Documents. The Architect's action will be taken in accordance with the submittal schedule approved by the Architect or, in the absence of an approved submittal schedule, with reasonable promptness while allowing sufficient time in the Architect's professional judgment to permit adequate review. Review of such submittals is not conducted for the purpose of determining the accuracy and completeness of other details such as dimensions and quantities, or for substantiating instructions for installation or performance of equipment or systems, all of which remain the responsibility of the Contractor as required by the Contract Documents. The Architect's review of the Contractor's submittals shall not relieve the Contractor of the obligations under Sections 3.3, 3.5, and 3.12. The Architect's review shall not constitute approval of safety precautions or of any construction means, methods, techniques, sequences, or procedures. The Architect's approval of a specific item shall not indicate approval of an assembly of which the item is a component.

§ 4.2.8 The Architect will prepare Change Orders and Construction Change Directives, and may order minor changes in the Work as provided in Section 7.4. The Architect will investigate and make determinations and recommendations regarding concealed and unknown conditions as provided in Section 3.7.4.

§ 4.2.9 The Architect will conduct inspections to determine the date or dates of Substantial Completion and the date of final completion; issue Certificates of Substantial Completion pursuant to Section 9.8; receive and forward to the Owner, for the Owner's review and records, written warranties and related documents required by the Contract and assembled by the Contractor pursuant to Section 9.10; and issue a final Certificate for Payment pursuant to Section 9.10.

§ 4.2.10 If the Owner and Architect agree, the Architect will provide one or more Project representatives to assist in carrying out the Architect's responsibilities at the site. The Owner shall notify the Contractor of any change in the duties, responsibilities and limitations of authority of the Project representatives.

§ 4.2.11 The Architect will interpret and decide matters concerning performance under, and requirements of, the Contract Documents on written request of either the Owner or Contractor. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness.

§ 4.2.12 Interpretations and decisions of the Architect will be consistent with the intent of, and reasonably inferable from, the Contract Documents and will be in writing or in the form of drawings. When making such interpretations and decisions, the Architect will endeavor to secure faithful performance by both Owner and Contractor, will not show partiality to either, and will not be liable for results of interpretations or decisions rendered in good faith.

§ 4.2.13 The Architect's decisions on matters relating to aesthetic effect will be final if consistent with the intent expressed in the Contract Documents.

§ 4.2.14 The Architect will review and respond to requests for information about the Contract Documents. The Architect's response to such requests will be made in writing within any time limits agreed upon or otherwise with reasonable promptness. If appropriate, the Architect will prepare and issue supplemental Drawings and Specifications in response to the requests for information.

## ARTICLE 5 SUBCONTRACTORS

### § 5.1 Definitions

§ 5.1.1 A Subcontractor is a person or entity who has a direct contract with the Contractor to perform a portion of the Work at the site. The term "Subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Subcontractor or an authorized representative of the Subcontractor. The term "Subcontractor" does not include a Separate Contractor or the subcontractors of a Separate Contractor.

§ 5.1.2 A Sub-subcontractor is a person or entity who has a direct or indirect contract with a Subcontractor to perform a portion of the Work at the site. The term "Sub-subcontractor" is referred to throughout the Contract Documents as if singular in number and means a Sub-subcontractor or an authorized representative of the Sub-subcontractor.

### § 5.2 Award of Subcontracts and Other Contracts for Portions of the Work

§ 5.2.1 Unless otherwise stated in the Contract Documents, the Contractor, as soon as practicable after award of the Contract, shall notify the Owner and Architect of the persons or entities proposed for each principal portion of the Work, including those who are to furnish materials or equipment fabricated to a special design. Within 14 days of receipt of the information, the Architect may notify the Contractor whether the Owner or the Architect (1) has reasonable objection to any such proposed person or entity or (2) requires additional time for review. Failure of the Architect to provide notice within the 14-day period shall constitute notice of no reasonable objection.

§ 5.2.2 The Contractor shall not contract with a proposed person or entity to whom the Owner or Architect has made reasonable and timely objection. The Contractor shall not be required to contract with anyone to whom the Contractor has made reasonable objection.

§ 5.2.3 If the Owner or Architect has reasonable objection to a person or entity proposed by the Contractor, the Contractor shall propose another to whom the Owner or Architect has no reasonable objection. If the proposed but rejected Subcontractor was reasonably capable of performing the Work, the Contract Sum and Contract Time shall be increased or decreased by the difference, if any, occasioned by such change, and an appropriate Change Order shall be issued before commencement of the substitute Subcontractor's Work. However, no increase in the Contract Sum or Contract Time shall be allowed for such change unless the Contractor has acted promptly and responsively in submitting names as required.

§ 5.2.4 The Contractor shall not substitute a Subcontractor, person, or entity for one previously selected if the Owner or Architect makes reasonable objection to such substitution.

### § 5.3 Subcontractual Relations

By appropriate written agreement, 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 obligations and responsibilities, including the responsibility for safety of the Subcontractor's Work that the Contractor, by these Contract Documents, assumes toward the Owner and Architect. Each subcontract agreement shall preserve and protect the rights of the Owner and Architect under the Contract Documents with respect to the Work to be performed by the Subcontractor so that subcontracting thereof will not prejudice such rights, and shall allow to the Subcontractor, unless specifically provided otherwise in the subcontract agreement, the benefit of all rights, remedies, and redress against the Contractor that the Contractor, by the Contract Documents, has against the Owner. Where appropriate, the Contractor shall require each Subcontractor to enter into similar agreements with Sub-subcontractors. The Contractor shall make available to each proposed Subcontractor, prior to the execution of the subcontract agreement, copies of the Contract Documents to which the Subcontractor will be bound, and, upon written request of the Subcontractor, identify to the Subcontractor terms and conditions of the proposed subcontract agreement that may be at variance with the Contract Documents. Subcontractors will similarly make copies of applicable portions of such documents available to their respective proposed Sub-subcontractors.

### § 5.4 Contingent Assignment of Subcontracts

§ 5.4.1 Each subcontract agreement for a portion of the Work is assigned by the Contractor to the Owner, provided that

- .1 assignment is effective only after termination of the Contract by the Owner for cause pursuant to Section 14.2 and only for those subcontract agreements that the Owner accepts by notifying the Subcontractor and Contractor; and
- .2 assignment is subject to the prior rights of the surety, if any, obligated under bond relating to the Contract.



When the Owner accepts the assignment of a subcontract agreement, the Owner assumes the Contractor's rights and obligations under the subcontract.

§ 5.4.2 Upon such assignment, if the Work has been suspended for more than 30 days, the Subcontractor's compensation shall be equitably adjusted for increases in cost resulting from the suspension.

§ 5.4.3 Upon assignment to the Owner under this Section 5.4, the Owner may further assign the subcontract to a successor contractor or other entity. If the Owner assigns the subcontract to a successor contractor or other entity, the Owner shall nevertheless remain legally responsible for all of the successor contractor's obligations under the subcontract.

## **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 The term "Separate Contractor(s)" shall mean other contractors retained by the Owner under separate agreements. The Owner reserves the right to perform construction or operations related to the Project with the Owner's own forces, and with Separate Contractors retained under Conditions of the Contract substantially similar to those of this Contract, including those provisions of the Conditions of the Contract related to insurance and waiver of subrogation.

§ 6.1.2 When separate contracts are awarded for different portions of the Project or other construction or operations on the site, the term "Contractor" in the Contract Documents in each case shall mean the Contractor who executes each separate Owner-Contractor Agreement.

§ 6.1.3 The Owner shall provide for coordination of the activities of the Owner's own forces and of each Separate Contractor with the Work of the Contractor, who shall cooperate with them. The Contractor shall participate with any Separate Contractors and the Owner in reviewing their construction schedules. The Contractor shall make any revisions to its construction schedule deemed necessary after a joint review and mutual agreement. The construction schedules shall then constitute the schedules to be used by the Contractor, Separate Contractors, and the Owner until subsequently revised.

§ 6.1.4 Unless otherwise provided in the Contract Documents, when the Owner performs construction or operations related to the Project with the Owner's own forces or with Separate Contractors, the Owner or its Separate Contractors shall have the same obligations and rights that the Contractor has under the Conditions of the Contract, including, without excluding others, those stated in Article 3, this Article 6, and Articles 10, 11, and 12.

### **§ 6.2 Mutual Responsibility**

§ 6.2.1 The Contractor shall afford the Owner and Separate Contractors reasonable opportunity for introduction and storage of their materials and equipment and performance of their activities, and shall connect and coordinate the Contractor's construction and operations with theirs as required by the Contract Documents.

§ 6.2.2 If part of the Contractor's Work depends for proper execution or results upon construction or operations by the Owner or a Separate Contractor, the Contractor shall, prior to proceeding with that portion of the Work, promptly notify the Architect of apparent discrepancies or defects in the construction or operations by the Owner or Separate Contractor that would render it unsuitable for proper execution and results of the Contractor's Work. Failure of the Contractor to notify the Architect of apparent discrepancies or defects prior to proceeding with the Work shall constitute an acknowledgment that the Owner's or Separate Contractor's completed or partially completed construction is fit and proper to receive the Contractor's Work. The Contractor shall not be responsible for discrepancies or defects in the construction or operations by the Owner or Separate Contractor that are not apparent.

§ 6.2.3 The Contractor shall reimburse the Owner for costs the Owner incurs that are payable to a Separate Contractor because of the Contractor's delays, improperly timed activities or defective construction. The Owner shall be responsible to the Contractor for costs the Contractor incurs because of a Separate Contractor's delays, improperly timed activities, damage to the Work or defective construction.

§ 6.2.4 The Contractor shall promptly remedy damage that the Contractor wrongfully causes to completed or partially completed construction or to property of the Owner or Separate Contractor as provided in Section 10.2.5.

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§ 6.2.5 The Owner and each Separate Contractor shall have the same responsibilities for cutting and patching as are described for the Contractor in Section 3.14.

### § 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, the Owner may clean up and the Architect will allocate the cost among those responsible.

## ARTICLE 7 CHANGES IN THE WORK

### § 7.1 General

§ 7.1.1 Changes in the Work may be accomplished after execution of the Contract, and without invalidating the Contract, by Change Order, Construction Change Directive or order for a minor change in the Work, subject to the limitations stated in this Article 7 and elsewhere in the Contract Documents.

§ 7.1.2 A Change Order shall be based upon agreement among the Owner, Contractor, and Architect. A Construction Change Directive requires agreement by the Owner and Architect and may or may not be agreed to by the Contractor. An order for a minor change in the Work may be issued by the Architect alone.

§ 7.1.3 Changes in the Work shall be performed under applicable provisions of the Contract Documents. The Contractor shall proceed promptly with changes in the Work, unless otherwise provided in the Change Order, Construction Change Directive, or order for a minor change in the Work.

### § 7.2 Change Orders

§ 7.2.1 A Change Order is a written instrument prepared by the Architect and signed by the Owner, Contractor, and Architect stating their agreement upon all of the following:

- .1 The change in the Work;
- .2 The amount of the adjustment, if any, in the Contract Sum; and
- .3 The extent of the adjustment, if any, in the Contract Time.

### § 7.3 Construction Change Directives

§ 7.3.1 A Construction Change Directive is a written order prepared by the Architect and signed by the Owner and Architect, directing a change in the Work prior to agreement on adjustment, if any, in the Contract Sum or Contract Time, or both. The Owner may by Construction Change Directive, without invalidating the Contract, order changes in the Work within the general scope of the Contract consisting of additions, deletions, or other revisions, the Contract Sum and Contract Time being adjusted accordingly.

§ 7.3.2 A Construction Change Directive shall be used in the absence of total agreement on the terms of a Change Order.

§ 7.3.3 If the Construction Change Directive provides for an adjustment to the Contract Sum, the adjustment shall be based on one of the following methods:

- .1 Mutual acceptance of a lump sum properly itemized and supported by sufficient substantiating data to permit evaluation;
- .2 Unit prices stated in the Contract Documents or subsequently agreed upon;
- .3 Cost to be determined in a manner agreed upon by the parties and a mutually acceptable fixed or percentage fee; or
- .4 As provided in Section 7.3.4.

§ 7.3.4 If the Contractor does not respond promptly or disagrees with the method for adjustment in the Contract Sum, the Architect shall determine the adjustment on the basis of reasonable expenditures and savings of those performing the Work attributable to the change, including, in case of an increase in the Contract Sum, an amount for overhead and profit as set forth in the Agreement, or if no such amount is set forth in the Agreement, a reasonable amount. In such case, and also under Section 7.3.3.3, the Contractor shall keep and present, in such form as the Architect may prescribe, an itemized accounting together with appropriate supporting data. Unless otherwise provided in the Contract Documents, costs for the purposes of this Section 7.3.4 shall be limited to the following:

- .1 Costs of labor, including applicable payroll taxes, fringe benefits required by agreement or custom, workers' compensation insurance, and other employee costs approved by the Architect;
- .2 Costs of materials, supplies, and equipment, including cost of transportation, whether incorporated or consumed;
- .3 Rental costs of machinery and equipment, exclusive of hand tools, whether rented from the Contractor or others;
- .4 Costs of premiums for all bonds and insurance, permit fees, and sales, use, or similar taxes, directly related to the change; and
- .5 Costs of supervision and field office personnel directly attributable to the change.

§ 7.3.5 If the Contractor disagrees with the adjustment in the Contract Time, the Contractor may make a Claim in accordance with applicable provisions of Article 15.

§ 7.3.6 Upon receipt of a Construction Change Directive, the Contractor shall promptly proceed with the change in the Work involved and advise the Architect of the Contractor's agreement or disagreement with the method, if any, provided in the Construction Change Directive for determining the proposed adjustment in the Contract Sum or Contract Time.

§ 7.3.7 A Construction Change Directive signed by the Contractor indicates the Contractor's agreement therewith, including adjustment in Contract Sum and Contract Time or the method for determining them. Such agreement shall be effective immediately and shall be recorded as a Change Order.

§ 7.3.8 The amount of credit to be allowed by the Contractor to the Owner for a deletion or change that results in a net decrease in the Contract Sum shall be actual net cost as confirmed by the Architect. When both additions and credits covering related Work or substitutions are involved in a change, the allowance for overhead and profit shall be figured on the basis of net increase, if any, with respect to that change.

§ 7.3.9 Pending final determination of the total cost of a Construction Change Directive to the Owner, the Contractor may request payment for Work completed under the Construction Change Directive in Applications for Payment. The Architect will make an interim determination for purposes of monthly certification for payment for those costs and certify for payment the amount that the Architect determines, in the Architect's professional judgment, to be reasonably justified. The Architect's interim determination of cost shall adjust the Contract Sum on the same basis as a Change Order, subject to the right of either party to disagree and assert a Claim in accordance with Article 15.

§ 7.3.10 When the Owner and Contractor agree with a determination made by the Architect concerning the adjustments in the Contract Sum and Contract Time, or otherwise reach agreement upon the adjustments, such agreement shall be effective immediately and the Architect will prepare a Change Order. Change Orders may be issued for all or any part of a Construction Change Directive.

#### § 7.4 Minor Changes in the Work

The Architect may order minor changes in the Work that are consistent with the intent of the Contract Documents and do not involve an adjustment in the Contract Sum or an extension of the Contract Time. The Architect's order for minor changes shall be in writing. If the Contractor believes that the proposed minor change in the Work will affect the Contract Sum or Contract Time, the Contractor shall notify the Architect and shall not proceed to implement the change in the Work. If the Contractor performs the Work set forth in the Architect's order for a minor change without prior notice to the Architect that such change will affect the Contract Sum or Contract Time, the Contractor waives any adjustment to the Contract Sum or extension of the Contract Time.

### ARTICLE 8 TIME

#### § 8.1 Definitions

§ 8.1.1 Unless otherwise provided, Contract Time is the period of time, including authorized adjustments, allotted in the Contract Documents for Substantial Completion of the Work.

§ 8.1.2 The date of commencement of the Work is the date established in the Agreement.

§ 8.1.3 The date of Substantial Completion is the date certified by the Architect in accordance with Section 9.8.

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

## § 8.2 Progress and Completion

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

§ 8.2.2 The Contractor shall not knowingly, except by agreement or instruction of the Owner in writing, commence the Work prior to the effective date of insurance required to be furnished by the Contractor and Owner.

§ 8.2.3 The Contractor shall proceed expeditiously with adequate forces and shall achieve Substantial Completion within the Contract Time.

## § 8.3 Delays and Extensions of Time

§ 8.3.1 If the Contractor is delayed at any time in the commencement or progress of the Work by (1) an act or neglect of the Owner or Architect, of an employee of either, or of a Separate Contractor; (2) by changes ordered in the Work; (3) by labor disputes, fire, unusual delay in deliveries, unavoidable casualties, adverse weather conditions documented in accordance with Section 15.1.6.2, or other causes beyond the Contractor's control; (4) by delay authorized by the Owner pending mediation and binding dispute resolution; or (5) by other causes that the Contractor asserts, and the Architect determines, justify delay, then the Contract Time shall be extended for such reasonable time as the Architect may determine.

§ 8.3.2 Claims relating to time shall be made in accordance with applicable provisions of Article 15.

§ 8.3.3 This Section 8.3 does not preclude recovery of damages for delay by either party under other provisions of the Contract Documents.

## ARTICLE 9 PAYMENTS AND COMPLETION

### § 9.1 Contract Sum

§ 9.1.1 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.

§ 9.1.2 If unit prices are stated in the Contract Documents or subsequently agreed upon, and if quantities originally contemplated are materially changed so that application of such unit prices to the actual quantities causes substantial inequity to the Owner or Contractor, the applicable unit prices shall be equitably adjusted.

### § 9.2 Schedule of Values

Where the Contract is based on a stipulated sum or Guaranteed Maximum Price, the Contractor shall submit a schedule of values to the Architect before the first Application for Payment, allocating the entire Contract Sum to the various portions of the Work. The schedule of values shall be prepared in the form, and supported by the data to substantiate its accuracy, required by the Architect. This schedule, unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's Applications for Payment. Any changes to the schedule of values shall be submitted to the Architect and supported by such data to substantiate its accuracy as the Architect may require, and unless objected to by the Architect, shall be used as a basis for reviewing the Contractor's subsequent Applications for Payment.

### § 9.3 Applications for Payment

§ 9.3.1 At least ten days before the date established for each progress payment, the Contractor shall submit to the Architect an itemized Application for Payment prepared in accordance with the schedule of values, if required under Section 9.2, for completed portions of the Work. The application shall be notarized, if required, and supported by all data substantiating the Contractor's right to payment that the Owner or Architect require, such as copies of requisitions, and releases and waivers of liens from Subcontractors and suppliers, and shall reflect retainage if provided for in the Contract Documents.

§ 9.3.1.1 As provided in Section 7.3.9, such applications may include requests for payment on account of changes in the Work that have been properly authorized by Construction Change Directives, or by interim determinations of the Architect, but not yet included in Change Orders.



**§ 9.3.1.2** Applications for Payment shall not include requests for payment for portions of the Work for which the Contractor does not intend to pay a Subcontractor or supplier, unless such Work has been performed by others whom the Contractor intends to pay.

**§ 9.3.2** Unless otherwise provided in the Contract Documents, payments shall be made on account of materials and equipment delivered and suitably stored at the site for subsequent incorporation in the Work. If approved in advance by the Owner, payment may similarly be made for materials and equipment suitably stored off the site at a location agreed upon in writing. Payment for materials and equipment stored on or off the site shall be conditioned upon compliance by the Contractor with procedures satisfactory to the Owner to establish the Owner's title to such materials and equipment or otherwise protect the Owner's interest, and shall include the costs of applicable insurance, storage, and transportation to the site, for such materials and equipment stored off the site.

**§ 9.3.3** The Contractor warrants that title to all Work covered by an Application for Payment will pass to the Owner no later than the time of payment. The Contractor further warrants that upon submittal of an Application for Payment all Work for which Certificates for Payment have been previously issued and payments received from the Owner shall, to the best of the Contractor's knowledge, information, and belief, be free and clear of liens, claims, security interests, or encumbrances, in favor of the Contractor, Subcontractors, suppliers, or other persons or entities that provided labor, materials, and equipment relating to the Work.

#### **§ 9.4 Certificates for Payment**

**§ 9.4.1** The Architect will, within seven days after receipt of the Contractor's Application for Payment, either (1) issue to the Owner a Certificate for Payment in the full amount of the Application for Payment, with a copy to the Contractor; or (2) issue to the Owner a Certificate for Payment for such amount as the Architect determines is properly due, and notify the Contractor and Owner of the Architect's reasons for withholding certification in part as provided in Section 9.5.1; or (3) withhold certification of the entire Application for Payment, and notify the Contractor and Owner of the Architect's reason for withholding certification in whole as provided in Section 9.5.1.

**§ 9.4.2** The issuance of a Certificate for Payment will constitute a representation by the Architect to the Owner, based on the Architect's evaluation of the Work and the data in the Application for Payment, that, to the best of the Architect's knowledge, information, and belief, the Work has progressed to the point indicated, the quality of the Work is in accordance with the Contract Documents, and that the Contractor is entitled to payment in the amount certified. The foregoing representations are subject to an evaluation of the Work for conformance with the Contract Documents upon Substantial Completion, to results of subsequent tests and inspections, to correction of minor deviations from the Contract Documents prior to completion, and to specific qualifications expressed by the Architect. However, the issuance of a Certificate for Payment will not be a representation that the Architect has (1) made exhaustive or continuous on-site inspections to check the quality or quantity of the Work; (2) reviewed construction means, methods, techniques, sequences, or procedures; (3) reviewed copies of requisitions received from Subcontractors and suppliers and other data requested by the Owner to substantiate the Contractor's right to payment; or (4) made examination to ascertain how or for what purpose the Contractor has used money previously paid on account of the Contract Sum.

#### **§ 9.5 Decisions to Withhold Certification**

**§ 9.5.1** The Architect may withhold a Certificate for Payment in whole or in part, to the extent reasonably necessary to protect the Owner, if in the Architect's opinion the representations to the Owner required by Section 9.4.2 cannot be made. If the Architect is unable to certify payment in the amount of the Application, the Architect will notify the Contractor and Owner as provided in Section 9.4.1. If the Contractor and Architect cannot agree on a revised amount, the Architect will promptly issue a Certificate for Payment for the amount for which the Architect is able to make such representations to the Owner. The Architect may also withhold a Certificate for Payment or, because of subsequently discovered evidence, may nullify the whole or a part of a Certificate for Payment previously issued, to such extent as may be necessary in the Architect's opinion to protect the Owner from loss for which the Contractor is responsible, including loss resulting from acts and omissions described in Section 3.3.2, because of

- .1 defective Work not remedied;
- .2 third party claims filed or reasonable evidence indicating probable filing of such claims, unless security acceptable to the Owner is provided by the Contractor;
- .3 failure of the Contractor to make payments properly to Subcontractors or suppliers for labor, materials or equipment;

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- .4 reasonable evidence that the Work cannot be completed for the unpaid balance of the Contract Sum;
- .5 damage to the Owner or a Separate Contractor;
- .6 reasonable evidence that the Work will not be completed within the Contract Time, and that the unpaid balance would not be adequate to cover actual or liquidated damages for the anticipated delay; or
- .7 repeated failure to carry out the Work in accordance with the Contract Documents.

§ 9.5.2 When either party disputes the Architect's decision regarding a Certificate for Payment under Section 9.5.1, in whole or in part, that party may submit a Claim in accordance with Article 15.

§ 9.5.3 When the reasons for withholding certification are removed, certification will be made for amounts previously withheld.

§ 9.5.4 If the Architect withholds certification for payment under Section 9.5.1.3, the Owner may, at its sole option, issue joint checks to the Contractor and to any Subcontractor or supplier to whom the Contractor failed to make payment for Work properly performed or material or equipment suitably delivered. If the Owner makes payments by joint check, the Owner shall notify the Architect and the Contractor shall reflect such payment on its next Application for Payment.

## § 9.6 Progress Payments

§ 9.6.1 After the Architect has issued a Certificate for Payment, the Owner shall make payment in the manner and within the time provided in the Contract Documents, and shall so notify the Architect.

§ 9.6.2 The Contractor shall pay each Subcontractor, no later than seven days after receipt of payment from the Owner, the amount to which the Subcontractor is entitled, reflecting percentages actually retained from payments to the Contractor on account of the Subcontractor's portion of the Work. The Contractor shall, by appropriate agreement with each Subcontractor, require each Subcontractor to make payments to Sub-subcontractors in a similar manner.

§ 9.6.3 The Architect will, on request, furnish to a Subcontractor, if practicable, information regarding percentages of completion or amounts applied for by the Contractor and action taken thereon by the Architect and Owner on account of portions of the Work done by such Subcontractor.

§ 9.6.4 The Owner has the right to request written evidence from the Contractor that the Contractor has properly paid Subcontractors and suppliers amounts paid by the Owner to the Contractor for subcontracted Work. If the Contractor fails to furnish such evidence within seven days, the Owner shall have the right to contact Subcontractors and suppliers to ascertain whether they have been properly paid. Neither the Owner nor Architect shall have an obligation to pay, or to see to the payment of money to, a Subcontractor or supplier, except as may otherwise be required by law.

§ 9.6.5 The Contractor's payments to suppliers shall be treated in a manner similar to that provided in Sections 9.6.2, 9.6.3 and 9.6.4.

§ 9.6.6 A Certificate for Payment, a progress payment, or partial or entire use or occupancy of the Project by the Owner shall not constitute acceptance of Work not in accordance with the Contract Documents.

§ 9.6.7 Unless the Contractor provides the Owner with a payment bond in the full penal sum of the Contract Sum, payments received by the Contractor for Work properly performed by Subcontractors or provided by suppliers shall be held by the Contractor for those Subcontractors or suppliers who performed Work or furnished materials, or both, under contract with the Contractor for which payment was made by the Owner. Nothing contained herein shall require money to be placed in a separate account and not commingled with money of the Contractor, create any fiduciary liability or tort liability on the part of the Contractor for breach of trust, or entitle any person or entity to an award of punitive damages against the Contractor for breach of the requirements of this provision.

§ 9.6.8 Provided the Owner has fulfilled its payment obligations under the Contract Documents, the Contractor shall defend and indemnify the Owner from all loss, liability, damage or expense, including reasonable attorney's fees and litigation expenses, arising out of any lien claim or other claim for payment by any Subcontractor or supplier of any tier. Upon receipt of notice of a lien claim or other claim for payment, the Owner shall notify the Contractor. If approved by the applicable court, when required, the Contractor may substitute a surety bond for the property against which the lien or other claim for payment has been asserted.

### § 9.7 Failure of Payment

If the Architect does not issue a Certificate for Payment, through no fault of the Contractor, within seven days after receipt of the Contractor's Application for Payment, or if the Owner does not pay the Contractor within seven days after the date established in the Contract Documents, the amount certified by the Architect or awarded by binding dispute resolution, then the Contractor may, upon seven additional days' notice to the Owner and Architect, stop the Work until payment of the amount owing has been received. The Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable costs of shutdown, delay and start-up, plus interest as provided for in the Contract Documents.

### § 9.8 Substantial Completion

§ 9.8.1 Substantial Completion is the stage in the progress of the Work when the Work or designated portion thereof is sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work for its intended use.

§ 9.8.2 When the Contractor considers that the Work, or a portion thereof which the Owner agrees to accept separately, is substantially complete, the Contractor shall prepare and submit to the Architect a comprehensive list of items to be completed or corrected prior to final payment. Failure to include an item on such list does not alter the responsibility of the Contractor to complete all Work in accordance with the Contract Documents.

§ 9.8.3 Upon receipt of the Contractor's list, the Architect will make an inspection to determine whether the Work or designated portion thereof is substantially complete. If the Architect's inspection discloses any item, whether or not included on the Contractor's list, which is not sufficiently complete in accordance with the Contract Documents so that the Owner can occupy or utilize the Work or designated portion thereof for its intended use, the Contractor shall, before issuance of the Certificate of Substantial Completion, complete or correct such item upon notification by the Architect. In such case, the Contractor shall then submit a request for another inspection by the Architect to determine Substantial Completion.

§ 9.8.4 When the Work or designated portion thereof is substantially complete, the Architect will prepare a Certificate of Substantial Completion that shall establish the date of Substantial Completion; establish responsibilities of the Owner and Contractor for security, maintenance, heat, utilities, damage to the Work and insurance; and fix the time within which the Contractor shall finish all items on the list accompanying the Certificate. Warranties required by the Contract Documents shall commence on the date of Substantial Completion of the Work or designated portion thereof unless otherwise provided in the Certificate of Substantial Completion.

§ 9.8.5 The Certificate of Substantial Completion shall be submitted to the Owner and Contractor for their written acceptance of responsibilities assigned to them in the Certificate. Upon such acceptance, and consent of surety if any, the Owner shall make payment of retainage applying to the Work or designated portion thereof. Such payment shall be adjusted for Work that is incomplete or not in accordance with the requirements of the Contract Documents.

### § 9.9 Partial Occupancy or Use

§ 9.9.1 The Owner may occupy or use any completed or partially completed portion of the Work at any stage when such portion is designated by separate agreement with the Contractor, provided such occupancy or use is consented to by the insurer and authorized by public authorities having jurisdiction over the Project. Such partial occupancy or use may commence whether or not the portion is substantially complete, provided the Owner and Contractor have accepted in writing the responsibilities assigned to each of them for payments, retainage, if any, security, maintenance, heat, utilities, damage to the Work and insurance, and have agreed in writing concerning the period for correction of the Work and commencement of warranties required by the Contract Documents. When the Contractor considers a portion substantially complete, the Contractor shall prepare and submit a list to the Architect as provided under Section 9.8.2. Consent of the Contractor to partial occupancy or use shall not be unreasonably withheld. The stage of the progress of the Work shall be determined by written agreement between the Owner and Contractor or, if no agreement is reached, by decision of the Architect.

§ 9.9.2 Immediately prior to such partial occupancy or use, the Owner, Contractor, and 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.

§ 9.9.3 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.

### § 9.10 Final Completion and Final Payment

§ 9.10.1 Upon receipt of the Contractor's notice that the Work is ready for final inspection and acceptance and upon receipt of a final Application for Payment, the Architect will promptly make such inspection. When the Architect finds the Work acceptable under the Contract Documents and the Contract fully performed, the Architect will promptly issue a final Certificate for Payment stating that to the best of the Architect's knowledge, information and belief, and on the basis of the Architect's on-site visits and inspections, the Work has been completed in accordance with the Contract Documents and that the entire balance found to be due the Contractor and noted in the final Certificate is due and payable. The Architect's final Certificate for Payment will constitute a further representation that conditions listed in Section 9.10.2 as precedent to the Contractor's being entitled to final payment have been fulfilled.

§ 9.10.2 Neither final payment nor any remaining retained percentage shall become due until the Contractor submits to the Architect (1) an affidavit that payrolls, bills for materials and equipment, and other indebtedness connected with the Work for which the Owner or the Owner's property might be responsible or encumbered (less amounts withheld by Owner) have been paid or otherwise satisfied, (2) a certificate evidencing that insurance required by the Contract Documents to remain in force after final payment is currently in effect, (3) a written statement that the Contractor knows of no reason that the insurance will not be renewable to cover the period required by the Contract Documents, (4) consent of surety, if any, to final payment, (5) documentation of any special warranties, such as manufacturers' warranties or specific Subcontractor warranties, and (6) if required by the Owner, other data establishing payment or satisfaction of obligations, such as receipts and releases and waivers of liens, claims, security interests, or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner. If a Subcontractor refuses to furnish a release or waiver required by the Owner, the Contractor may furnish a bond satisfactory to the Owner to indemnify the Owner against such lien, claim, security interest, or encumbrance. If a lien, claim, security interest, or encumbrance remains unsatisfied after payments are made, the Contractor shall refund to the Owner all money that the Owner may be compelled to pay in discharging the lien, claim, security interest, or encumbrance, including all costs and reasonable attorneys' fees.

§ 9.10.3 If, after Substantial Completion of the Work, final completion thereof is materially delayed through no fault of the Contractor or by issuance of Change Orders affecting final completion, and the Architect so confirms, the Owner shall, upon application by the Contractor and certification by the Architect, and without terminating the Contract, make payment of the balance due for that portion of the Work fully completed, corrected, and accepted. If the remaining balance for Work not fully completed or corrected is less than retainage stipulated in the Contract Documents, and if bonds have been furnished, the written consent of the surety to payment of the balance due for that portion of the Work fully completed and accepted shall be submitted by the Contractor to the Architect prior to certification of such payment. Such payment shall be made under terms and conditions governing final payment, except that it shall not constitute a waiver of Claims.

§ 9.10.4 The making of final payment shall constitute a waiver of Claims by the Owner except those arising from

- .1 liens, Claims, security interests, or encumbrances arising out of the Contract and unsettled;
- .2 failure of the Work to comply with the requirements of the Contract Documents;
- .3 terms of special warranties required by the Contract Documents; or
- .4 audits performed by the Owner, if permitted by the Contract Documents, after final payment.

§ 9.10.5 Acceptance of final payment by the Contractor, a Subcontractor, or a supplier, shall constitute a waiver of claims by that payee except those previously made in writing and identified by that payee as unsettled at the time of final Application for Payment.

## ARTICLE 10 PROTECTION OF PERSONS AND PROPERTY

### § 10.1 Safety Precautions and Programs

The Contractor shall be responsible for initiating, maintaining, and supervising all safety precautions and programs in connection with the performance of the Contract.

### § 10.2 Safety of Persons and Property

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

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- .1 employees on the Work and other persons who may be affected thereby;
- .2 the Work and materials and equipment to be incorporated therein, whether in storage on or off the site, under care, custody, or control of the Contractor, a Subcontractor, or a Sub-subcontractor; and
- .3 other property at the site or adjacent thereto, such as trees, shrubs, lawns, walks, pavements, roadways, structures, and utilities not designated for removal, relocation, or replacement in the course of construction.

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

**§ 10.2.3** The Contractor shall implement, 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 the owners and users of adjacent sites and utilities of the safeguards.

**§ 10.2.4** When use or storage of explosives or 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.

**§ 10.2.5** The Contractor shall promptly remedy damage and loss (other than damage or loss insured under property insurance required by the Contract Documents) to property referred to in Sections 10.2.1.2 and 10.2.1.3 caused in whole or in part by the Contractor, a Subcontractor, a Sub-subcontractor, or anyone directly or indirectly employed by any of them, or by anyone for whose acts they may be liable and for which the Contractor is responsible under Sections 10.2.1.2 and 10.2.1.3. The Contractor may make a Claim for the cost to remedy the damage or loss to the extent such damage or loss is attributable to acts or omissions of the Owner or Architect or anyone directly or indirectly employed by either of them, or by anyone for whose acts either of them may be liable, and not attributable to the fault or negligence of the Contractor. The foregoing obligations of the Contractor are in addition to the Contractor's obligations under Section 3.18.

**§ 10.2.6** The Contractor shall designate a responsible member of the Contractor's organization at the site whose duty shall be the prevention of accidents. This person shall be the Contractor's superintendent unless otherwise designated by the Contractor in writing to the Owner and Architect.

**§ 10.2.7** The Contractor shall not permit any part of the construction or site to be loaded so as to cause damage or create an unsafe condition.

**§ 10.2.8 Injury or Damage to Person or Property**

If either party suffers injury or damage to person or property because of an act or omission of the other party, or of others for whose acts such party is legally responsible, notice of the injury or damage, whether or not insured, shall be given to the other party within a reasonable time not exceeding 21 days after discovery. The notice shall provide sufficient detail to enable the other party to investigate the matter.

**§ 10.3 Hazardous Materials and Substances**

**§ 10.3.1** The Contractor is responsible for compliance with any requirements included in the Contract Documents regarding hazardous materials or substances. If the Contractor encounters a hazardous material or substance not addressed in the Contract Documents and if reasonable precautions will be inadequate to prevent foreseeable bodily injury or death to persons resulting from a material or substance, including but not limited to asbestos or polychlorinated biphenyl (PCB), encountered on the site by the Contractor, the Contractor shall, upon recognizing the condition, immediately stop Work in the affected area and notify the Owner and Architect of the condition.

**§ 10.3.2** Upon receipt of the Contractor's notice, the Owner shall obtain the services of a licensed laboratory to verify the presence or absence of the material or substance reported by the Contractor and, in the event such material or substance is found to be present, to cause it to be rendered harmless. Unless otherwise required by the Contract Documents, the Owner shall furnish in writing to the Contractor and Architect the names and qualifications of persons or entities who are to perform tests verifying the presence or absence of the material or substance or who are to perform the task of removal or safe containment of the material or substance. The Contractor and the Architect will

promptly reply to the Owner in writing stating whether or not either has reasonable objection to the persons or entities proposed by the Owner. If either the Contractor or Architect has an objection to a person or entity proposed by the Owner, the Owner shall propose another to whom the Contractor and the Architect have no reasonable objection. When the material or substance has been rendered harmless, Work in the affected area shall resume upon written agreement of the Owner and Contractor. By Change Order, the Contract Time shall be extended appropriately and the Contract Sum shall be increased by the amount of the Contractor's reasonable additional costs of shutdown, delay, and start-up.

**§ 10.3.3** To the fullest extent permitted by law, the Owner shall indemnify and hold harmless the Contractor, Subcontractors, Architect, Architect's consultants, and agents and employees of any of them from and against claims, damages, losses, and expenses, including but not limited to attorneys' fees, arising out of or resulting from performance of the Work in the affected area if in fact the material or substance presents the risk of bodily injury or death as described in Section 10.3.1 and has not been rendered harmless, provided that such claim, damage, loss, or expense is attributable to bodily injury, sickness, disease or death, or to injury to or destruction of tangible property (other than the Work itself), except to the extent that such damage, loss, or expense is due to the fault or negligence of the party seeking indemnity.

**§ 10.3.4** The Owner shall not be responsible under this Section 10.3 for hazardous materials or substances the Contractor brings to the site unless such materials or substances are required by the Contract Documents. The Owner shall be responsible for hazardous materials or substances required by the Contract Documents, except to the extent of the Contractor's fault or negligence in the use and handling of such materials or substances.

**§ 10.3.5** The Contractor shall reimburse the Owner for the cost and expense the Owner incurs (1) for remediation of hazardous materials or substances the Contractor brings to the site and negligently handles, or (2) where the Contractor fails to perform its obligations under Section 10.3.1, except to the extent that the cost and expense are due to the Owner's fault or negligence.

**§ 10.3.6** If, without negligence on the part of the Contractor, the Contractor is held liable by a government agency for the cost of remediation of a hazardous material or substance solely by reason of performing Work as required by the Contract Documents, the Owner shall reimburse the Contractor for all cost and expense thereby incurred.

#### **§ 10.4 Emergencies**

In an emergency affecting safety of persons or property, the Contractor shall act, 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 15 and Article 7.

### **ARTICLE 11 INSURANCE AND BONDS**

#### **§ 11.1 Contractor's Insurance and Bonds**

**§ 11.1.1** The Contractor shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Contractor shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located. The Owner, Architect, and Architect's consultants shall be named as additional insureds under the Contractor's commercial general liability policy or as otherwise described in the Contract Documents.

**§ 11.1.2** The Contractor shall provide surety bonds of the types, for such penal sums, and subject to such terms and conditions as required by the Contract Documents. The Contractor shall purchase and maintain the required bonds from a company or companies lawfully authorized to issue surety bonds in the jurisdiction where the Project is located.

**§ 11.1.3** Upon the request of any person or entity appearing to be a potential beneficiary of bonds covering payment of obligations arising under the Contract, the Contractor shall promptly furnish a copy of the bonds or shall authorize a copy to be furnished.

**§ 11.1.4 Notice of Cancellation or Expiration of Contractor's Required Insurance.** Within three (3) business days of the date the Contractor becomes aware of an impending or actual cancellation or expiration of any insurance required by the Contract Documents, the Contractor shall provide notice to the Owner of such impending or actual cancellation or

expiration. Upon receipt of notice from the Contractor, the Owner shall, unless the lapse in coverage arises from an act or omission of the Owner, have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by the Contractor. The furnishing of notice by the Contractor shall not relieve the Contractor of any contractual obligation to provide any required coverage.

## **§ 11.2 Owner's Insurance**

**§ 11.2.1** The Owner shall purchase and maintain insurance of the types and limits of liability, containing the endorsements, and subject to the terms and conditions, as described in the Agreement or elsewhere in the Contract Documents. The Owner shall purchase and maintain the required insurance from an insurance company or insurance companies lawfully authorized to issue insurance in the jurisdiction where the Project is located.

**§ 11.2.2 Failure to Purchase Required Property Insurance.** If the Owner fails to purchase and maintain the required property insurance, with all of the coverages and in the amounts described in the Agreement or elsewhere in the Contract Documents, the Owner shall inform the Contractor in writing prior to commencement of the Work. Upon receipt of notice from the Owner, the Contractor may delay commencement of the Work and may obtain insurance that will protect the interests of the Contractor, Subcontractors, and Sub-Subcontractors in the Work. When the failure to provide coverage has been cured or resolved, the Contract Sum and Contract Time shall be equitably adjusted. In the event the Owner fails to procure coverage, the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent the loss to the Owner would have been covered by the insurance to have been procured by the Owner. The cost of the insurance shall be charged to the Owner by a Change Order. If the Owner does not provide written notice, and the Contractor is damaged by the failure or neglect of the Owner to purchase or maintain the required insurance, the Owner shall reimburse the Contractor for all reasonable costs and damages attributable thereto.

**§ 11.2.3 Notice of Cancellation or Expiration of Owner's Required Property Insurance.** Within three (3) business days of the date the Owner becomes aware of an impending or actual cancellation or expiration of any property insurance required by the Contract Documents, the Owner shall provide notice to the Contractor of such impending or actual cancellation or expiration. Unless the lapse in coverage arises from an act or omission of the Contractor: (1) the Contractor, upon receipt of notice from the Owner, shall have the right to stop the Work until the lapse in coverage has been cured by the procurement of replacement coverage by either the Owner or the Contractor; (2) the Contract Time and Contract Sum shall be equitably adjusted; and (3) the Owner waives all rights against the Contractor, Subcontractors, and Sub-subcontractors to the extent any loss to the Owner would have been covered by the insurance had it not expired or been cancelled. If the Contractor purchases replacement coverage, the cost of the insurance shall be charged to the Owner by an appropriate Change Order. The furnishing of notice by the Owner shall not relieve the Owner of any contractual obligation to provide required insurance.

## **§ 11.3 Waivers of Subrogation**

**§ 11.3.1** The Owner and Contractor waive all rights against (1) each other and any of their subcontractors, sub-subcontractors, agents, and employees, each of the other; (2) the Architect and Architect's consultants; and (3) Separate Contractors, if any, and any of their subcontractors, sub-subcontractors, agents, and employees, for damages caused by fire, or other causes of loss, to the extent those losses are covered by property insurance required by the Agreement or other property insurance applicable to the Project, except such rights as they have to proceeds of such insurance. The Owner or Contractor, as appropriate, shall require similar written waivers in favor of the individuals and entities identified above from the Architect, Architect's consultants, Separate Contractors, subcontractors, and sub-subcontractors. The policies of insurance purchased and maintained by each person or entity agreeing to waive claims pursuant to this section 11.3.1 shall not prohibit this waiver of subrogation. This waiver of subrogation shall be effective as to a person or entity (1) even though that person or entity would otherwise have a duty of indemnification, contractual or otherwise, (2) even though that person or entity did not pay the insurance premium directly or indirectly, or (3) whether or not the person or entity had an insurable interest in the damaged property.

**§ 11.3.2** If during the Project construction period the Owner insures properties, real or personal or both, at or adjacent to the site by property insurance under policies separate from those insuring the Project, or if after final payment property insurance is to be provided on the completed Project through a policy or policies other than those insuring the Project during the construction period, to the extent permissible by such policies, the Owner waives all rights in accordance with the terms of Section 11.3.1 for damages caused by fire or other causes of loss covered by this separate property insurance.

#### **§ 11.4 Loss of Use, Business Interruption, and Delay in Completion Insurance**

The Owner, at the Owner's option, may purchase and maintain insurance that will protect the Owner against loss of use of the Owner's property, or the inability to conduct normal operations, due to fire or other causes of loss. The Owner waives all rights of action against the Contractor and Architect for loss of use of the Owner's property, due to fire or other hazards however caused.

#### **§11.5 Adjustment and Settlement of Insured Loss**

**§ 11.5.1** A loss insured under the property insurance required by the Agreement shall be adjusted by the Owner as fiduciary and made payable to the Owner as fiduciary for the insureds, as their interests may appear, subject to requirements of any applicable mortgagee clause and of Section 11.5.2. The Owner shall pay the Architect and Contractor their just shares of insurance proceeds received by the Owner, and by appropriate agreements the Architect and Contractor shall make payments to their consultants and Subcontractors in similar manner.

**§ 11.5.2** Prior to settlement of an insured loss, the Owner shall notify the Contractor of the terms of the proposed settlement as well as the proposed allocation of the insurance proceeds. The Contractor shall have 14 days from receipt of notice to object to the proposed settlement or allocation of the proceeds. If the Contractor does not object, the Owner shall settle the loss and the Contractor shall be bound by the settlement and allocation. Upon receipt, the Owner shall deposit the insurance proceeds in a separate account and make the appropriate distributions. Thereafter, if no other agreement is made or the Owner does not terminate the Contract for convenience, the Owner and Contractor shall execute a Change Order for reconstruction of the damaged or destroyed Work in the amount allocated for that purpose. If the Contractor timely objects to either the terms of the proposed settlement or the allocation of the proceeds, the Owner may proceed to settle the insured loss, and any dispute between the Owner and Contractor arising out of the settlement or allocation of the proceeds shall be resolved pursuant to Article 15. Pending resolution of any dispute, the Owner may issue a Construction Change Directive for the reconstruction of the damaged or destroyed Work.

### **ARTICLE 12 UNCOVERING AND CORRECTION OF WORK**

#### **§ 12.1 Uncovering of Work**

**§ 12.1.1** If a portion of the Work is covered contrary to the Architect's request or to requirements specifically expressed in the Contract Documents, it must, if requested in writing by the Architect, be uncovered for the Architect's examination and be replaced at the Contractor's expense without change in the Contract Time.

**§ 12.1.2** If a portion of the Work has been covered that the Architect has not specifically requested to examine prior to its being covered, the Architect may request to see such Work and it shall be uncovered by the Contractor. If such Work is in accordance with the Contract Documents, the Contractor shall be entitled to an equitable adjustment to the Contract Sum and Contract Time as may be appropriate. If such Work is not in accordance with the Contract Documents, the costs of uncovering the Work, and the cost of correction, shall be at the Contractor's expense.

#### **§ 12.2 Correction of Work**

##### **§ 12.2.1 Before Substantial Completion**

The Contractor shall promptly correct Work rejected by the Architect or failing to conform to the requirements of the Contract Documents, discovered before Substantial Completion and whether or not fabricated, installed or completed. Costs of correcting such rejected Work, including additional testing and inspections, the cost of uncovering and replacement, and compensation for the Architect's services and expenses made necessary thereby, shall be at the Contractor's expense.

##### **§ 12.2.2 After Substantial Completion**

**§ 12.2.2.1** In addition to the Contractor's obligations under Section 3.5, if, within one year after the date of Substantial Completion of the Work or designated portion thereof or after the date for commencement of warranties established under Section 9.9.1, or by terms of any 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 notice from the Owner to do so, unless the Owner has previously given the Contractor a written acceptance of such condition. The Owner shall give such notice promptly after discovery of the condition. During the one-year period for correction of Work, if the Owner fails to notify the Contractor and give the Contractor an opportunity to make the correction, the Owner waives the rights to require correction by the Contractor and to make a claim for breach of warranty. If the Contractor fails to correct nonconforming Work within a reasonable time during



that period after receipt of notice from the Owner or Architect, the Owner may correct it in accordance with Section 2.5.

**§ 12.2.2.2** The one-year period for correction of Work shall be extended with respect to portions of Work first performed after Substantial Completion by the period of time between Substantial Completion and the actual completion of that portion of the Work.

**§ 12.2.2.3** The one-year period for correction of Work shall not be extended by corrective Work performed by the Contractor pursuant to this Section 12.2.

**§ 12.2.3** The Contractor shall remove from the site portions of the Work that are not in accordance with the requirements of the Contract Documents and are neither corrected by the Contractor nor accepted by the Owner.

**§ 12.2.4** The Contractor shall bear the cost of correcting destroyed or damaged construction of the Owner or Separate Contractors, whether completed or partially completed, caused by the Contractor's correction or removal of Work that is not in accordance with the requirements of the Contract Documents.

**§ 12.2.5** Nothing contained in this Section 12.2 shall be construed to establish a period of limitation with respect to other obligations the Contractor has under the Contract Documents. Establishment of the one-year period for correction of Work as described in Section 12.2.2 relates only to the specific obligation of the Contractor to correct the Work, and has no relationship to the time within which the obligation to comply with the Contract Documents may be sought to be enforced, nor to the time within which proceedings may be commenced to establish the Contractor's liability with respect to the Contractor's obligations other than specifically to correct the Work.

### **§ 12.3 Acceptance of Nonconforming Work**

If the Owner prefers to accept Work that is not in accordance with the requirements of the Contract Documents, the Owner may do so instead of requiring its removal and correction, in which case the Contract Sum will be reduced as appropriate and equitable. Such adjustment shall be effected whether or not final payment has been made.

## **ARTICLE 13 MISCELLANEOUS PROVISIONS**

### **§ 13.1 Governing Law**

The Contract shall be governed by the law of the place where the Project is located, excluding that jurisdiction's choice of law rules. If the parties have selected arbitration as the method of binding dispute resolution, the Federal Arbitration Act shall govern Section 15.4.

### **§ 13.2 Successors and Assigns**

**§ 13.2.1** The Owner and Contractor respectively bind themselves, their partners, successors, assigns, and legal representatives to covenants, agreements, and obligations contained in the Contract Documents. Except as provided in Section 13.2.2, neither party to the Contract shall assign the Contract as a whole without written consent of the other. If either party attempts to make an assignment without such consent, that party shall nevertheless remain legally responsible for all obligations under the Contract.

**§ 13.2.2** The Owner may, without consent of the Contractor, assign the Contract to a lender providing construction financing for the Project, if the lender assumes the Owner's rights and obligations under the Contract Documents. The Contractor shall execute all consents reasonably required to facilitate the assignment.

### **§ 13.3 Rights and Remedies**

**§ 13.3.1** 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.

**§ 13.3.2** No action or failure to act by the Owner, Architect, or Contractor shall constitute a waiver of a right or duty afforded them under the Contract, nor shall such action or failure to act constitute approval of or acquiescence in a breach thereunder, except as may be specifically agreed upon in writing.

## § 13.4 Tests and Inspections

§ 13.4.1 Tests, inspections, and approvals of portions of the Work shall be made as required by the Contract Documents and by applicable laws, statutes, ordinances, codes, rules, and regulations or lawful orders of public authorities. Unless otherwise provided, the Contractor shall make arrangements for such tests, inspections, and approvals with an independent testing laboratory or entity acceptable to the Owner, or with the appropriate public authority, and shall bear all related costs of tests, inspections, and approvals. The Contractor shall give the Architect timely notice of when and where tests and inspections are to be made so that the Architect may be present for such procedures. The Owner shall bear costs of tests, inspections, or approvals that do not become requirements until after bids are received or negotiations concluded. The Owner shall directly arrange and pay for tests, inspections, or approvals where building codes or applicable laws or regulations so require.

§ 13.4.2 If the Architect, Owner, or public authorities having jurisdiction determine that portions of the Work require additional testing, inspection, or approval not included under Section 13.4.1, the Architect will, upon written authorization from the Owner, instruct the Contractor to make arrangements for such additional testing, inspection, or approval, by an entity acceptable to the Owner, and the Contractor shall give timely notice to the Architect of when and where tests and inspections are to be made so that the Architect may be present for such procedures. Such costs, except as provided in Section 13.4.3, shall be at the Owner's expense.

§ 13.4.3 If procedures for testing, inspection, or approval under Sections 13.4.1 and 13.4.2 reveal failure of the portions of the Work to comply with requirements established by the Contract Documents, all costs made necessary by such failure, including those of repeated procedures and compensation for the Architect's services and expenses, shall be at the Contractor's expense.

§ 13.4.4 Required certificates of testing, inspection, or approval shall, unless otherwise required by the Contract Documents, be secured by the Contractor and promptly delivered to the Architect.

§ 13.4.5 If the Architect is to observe tests, inspections, or approvals required by the Contract Documents, the Architect will do so promptly and, where practicable, at the normal place of testing.

§ 13.4.6 Tests or inspections conducted pursuant to the Contract Documents shall be made promptly to avoid unreasonable delay in the Work.

## § 13.5 Interest

Payments due and unpaid under the Contract Documents shall bear interest from the date payment is due at the rate the parties agree upon in writing or, in the absence thereof, at the legal rate prevailing from time to time at the place where the Project is located.

## ARTICLE 14 TERMINATION OR SUSPENSION OF THE CONTRACT

### § 14.1 Termination by the Contractor

§ 14.1.1 The Contractor may terminate the Contract if the Work is stopped for a period of 30 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, for any of the following reasons:

- .1 Issuance of an order of a court or other public authority having jurisdiction that requires all Work to be stopped;
- .2 An act of government, such as a declaration of national emergency, that requires all Work to be stopped;
- .3 Because the Architect has not issued a Certificate for Payment and has not notified the Contractor of the reason for withholding certification as provided in Section 9.4.1, or because the Owner has not made payment on a Certificate for Payment within the time stated in the Contract Documents; or
- .4 The Owner has failed to furnish to the Contractor reasonable evidence as required by Section 2.2.

§ 14.1.2 The Contractor may terminate the Contract if, through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, their agents or employees, or any other persons or entities performing portions of the Work, repeated suspensions, delays, or interruptions of the entire Work by the Owner as described in Section 14.3, constitute in the aggregate more than 100 percent of the total number of days scheduled for completion, or 120 days in any 365-day period, whichever is less.

§ 14.1.3 If one of the reasons described in Section 14.1.1 or 14.1.2 exists, the Contractor may, upon seven days' notice to the Owner and Architect, terminate the Contract and recover from the Owner payment for Work executed, as well as reasonable overhead and profit on Work not executed, and costs incurred by reason of such termination.

§ 14.1.4 If the Work is stopped for a period of 60 consecutive days through no act or fault of the Contractor, a Subcontractor, a Sub-subcontractor, or their agents or employees or any other persons or entities performing portions of the Work because the Owner has repeatedly failed to fulfill the Owner's obligations under the Contract Documents with respect to matters important to the progress of the Work, the Contractor may, upon seven additional days' notice to the Owner and the Architect, terminate the Contract and recover from the Owner as provided in Section 14.1.3.

#### § 14.2 Termination by the Owner for Cause

§ 14.2.1 The Owner may terminate the Contract if the Contractor

- .1 repeatedly refuses or fails to supply enough properly skilled workers or proper materials;
- .2 fails to make payment to Subcontractors or suppliers in accordance with the respective agreements between the Contractor and the Subcontractors or suppliers;
- .3 repeatedly disregards applicable laws, statutes, ordinances, codes, rules and regulations, or lawful orders of a public authority; or
- .4 otherwise is guilty of substantial breach of a provision of the Contract Documents.

§ 14.2.2 When any of the reasons described in Section 14.2.1 exist, and upon certification by the Architect that sufficient cause exists to justify such action, the Owner may, without prejudice to any other rights or remedies of the Owner and after giving the Contractor and the Contractor's surety, if any, seven days' notice, terminate employment of the Contractor and may, subject to any prior rights of the surety:

- .1 Exclude the Contractor from the site and take possession of all materials, equipment, tools, and construction equipment and machinery thereon owned by the Contractor;
- .2 Accept assignment of subcontracts pursuant to Section 5.4; and
- .3 Finish the Work by whatever reasonable method the Owner may deem expedient. Upon written request of the Contractor, the Owner shall furnish to the Contractor a detailed accounting of the costs incurred by the Owner in finishing the Work.

§ 14.2.3 When the Owner terminates the Contract for one of the reasons stated in Section 14.2.1, the Contractor shall not be entitled to receive further payment until the Work is finished.

§ 14.2.4 If the unpaid balance of the Contract Sum exceeds costs of finishing the Work, including compensation for the Architect's services and expenses made necessary thereby, and other damages incurred by the Owner and not expressly waived, such excess shall be paid to the Contractor. If such costs and damages exceed the unpaid balance, the Contractor 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 Initial Decision Maker, upon application, and this obligation for payment shall survive termination of the Contract.

#### § 14.3 Suspension by the Owner for Convenience

§ 14.3.1 The Owner may, without cause, order the Contractor in writing to suspend, delay or interrupt the Work, in whole or in part for such period of time as the Owner may determine.

§ 14.3.2 The Contract Sum and Contract Time shall be adjusted for increases in the cost and time caused by suspension, delay, or interruption under Section 14.3.1. Adjustment of the Contract Sum shall include profit. No adjustment shall be made to the extent

- .1 that performance is, was, or would have been, so suspended, delayed, or interrupted, by another cause for which the Contractor is responsible; or
- .2 that an equitable adjustment is made or denied under another provision of the Contract.

#### § 14.4 Termination by the Owner for Convenience

§ 14.4.1 The Owner may, at any time, terminate the Contract for the Owner's convenience and without cause.

§ 14.4.2 Upon receipt of notice from the Owner of such termination for the Owner's convenience, the Contractor shall

- .1 cease operations as directed by the Owner in the notice;

- .2 take actions necessary, or that the Owner may direct, for the protection and preservation of the Work; and
- .3 except for Work directed to be performed prior to the effective date of termination stated in the notice, terminate all existing subcontracts and purchase orders and enter into no further subcontracts and purchase orders.

**§ 14.4.3** In case of such termination for the Owner's convenience, the Owner shall pay the Contractor for Work properly executed; costs incurred by reason of the termination, including costs attributable to termination of Subcontracts; and the termination fee, if any, set forth in the Agreement.

## **ARTICLE 15 CLAIMS AND DISPUTES**

### **§ 15.1 Claims**

#### **§ 15.1.1 Definition**

A Claim is a demand or assertion by one of the parties seeking, as a matter of right, payment of money, a change in the Contract Time, or other relief with respect to the terms of the Contract. The term "Claim" also includes other disputes and matters in question between the Owner and Contractor arising out of or relating to the Contract. The responsibility to substantiate Claims shall rest with the party making the Claim. This Section 15.1.1 does not require the Owner to file a Claim in order to impose liquidated damages in accordance with the Contract Documents.

#### **§ 15.1.2 Time Limits on Claims**

The Owner and Contractor shall commence all Claims and causes of action against the other and arising out of or related to the Contract, whether in contract, tort, breach of warranty or otherwise, in accordance with the requirements of the binding dispute resolution method selected in the Agreement and within the period specified by applicable law, but in any case not more than 10 years after the date of Substantial Completion of the Work. The Owner and Contractor waive all Claims and causes of action not commenced in accordance with this Section 15.1.2.

#### **§ 15.1.3 Notice of Claims**

**§ 15.1.3.1** Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered prior to expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party and to the Initial Decision Maker with a copy sent to the Architect, if the Architect is not serving as the Initial Decision Maker. Claims by either party under this Section 15.1.3.1 shall be initiated within 21 days after occurrence of the event giving rise to such Claim or within 21 days after the claimant first recognizes the condition giving rise to the Claim, whichever is later.

**§ 15.1.3.2** Claims by either the Owner or Contractor, where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2, shall be initiated by notice to the other party. In such event, no decision by the Initial Decision Maker is required.

#### **§ 15.1.4 Continuing Contract Performance**

**§ 15.1.4.1** Pending final resolution of a Claim, except as otherwise agreed in writing or as provided in Section 9.7 and Article 14, the Contractor shall proceed diligently with performance of the Contract and the Owner shall continue to make payments in accordance with the Contract Documents.

**§ 15.1.4.2** The Contract Sum and Contract Time shall be adjusted in accordance with the Initial Decision Maker's decision, subject to the right of either party to proceed in accordance with this Article 15. The Architect will issue Certificates for Payment in accordance with the decision of the Initial Decision Maker.

#### **§ 15.1.5 Claims for Additional Cost**

If the Contractor wishes to make a Claim for an increase in the Contract Sum, notice as provided in Section 15.1.3 shall be given before proceeding to execute the portion of the Work that is the subject of the Claim. Prior notice is not required for Claims relating to an emergency endangering life or property arising under Section 10.4.

#### **§ 15.1.6 Claims for Additional Time**

**§ 15.1.6.1** If the Contractor wishes to make a Claim for an increase in the Contract Time, notice as provided in Section 15.1.3 shall be given. The Contractor's Claim shall include an estimate of cost and of probable effect of delay on progress of the Work. In the case of a continuing delay, only one Claim is necessary.

**§ 15.1.6.2** If adverse weather conditions are the basis for a Claim for additional time, such Claim shall be documented by data substantiating that weather conditions were abnormal for the period of time, could not have been reasonably anticipated, and had an adverse effect on the scheduled construction.

### **§ 15.1.7 Waiver of Claims for Consequential Damages**

The Contractor and Owner waive Claims against each other for consequential damages arising out of or relating to this Contract. This mutual waiver includes

- .1 damages incurred by the Owner for rental expenses, for losses of use, income, profit, financing, business and reputation, and for loss of management or employee productivity or of the services of such persons; and
- .2 damages incurred by the Contractor for principal office expenses including the compensation of personnel stationed there, for losses of financing, business and reputation, and for loss of profit, except anticipated profit arising directly from the Work.

This mutual waiver is applicable, without limitation, to all consequential damages due to either party's termination in accordance with Article 14. Nothing contained in this Section 15.1.7 shall be deemed to preclude assessment of liquidated damages, when applicable, in accordance with the requirements of the Contract Documents.

### **§ 15.2 Initial Decision**

**§ 15.2.1** Claims, excluding those where the condition giving rise to the Claim is first discovered after expiration of the period for correction of the Work set forth in Section 12.2.2 or arising under Sections 10.3, 10.4, and 11.5, shall be referred to the Initial Decision Maker for initial decision. The Architect will serve as the Initial Decision Maker, unless otherwise indicated in the Agreement. Except for those Claims excluded by this Section 15.2.1, an initial decision shall be required as a condition precedent to mediation of any Claim. If an initial decision has not been rendered within 30 days after the Claim has been referred to the Initial Decision Maker, the party asserting the Claim may demand mediation and binding dispute resolution without a decision having been rendered. Unless the Initial Decision Maker and all affected parties agree, the Initial Decision Maker will not decide disputes between the Contractor and persons or entities other than the Owner.

**§ 15.2.2** The Initial Decision Maker will review Claims and within ten days of the receipt of a Claim take one or more of the following actions: (1) request additional supporting data from the claimant or a response with supporting data from the other party, (2) reject the Claim in whole or in part, (3) approve the Claim, (4) suggest a compromise, or (5) advise the parties that the Initial Decision Maker is unable to resolve the Claim if the Initial Decision Maker lacks sufficient information to evaluate the merits of the Claim or if the Initial Decision Maker concludes that, in the Initial Decision Maker's sole discretion, it would be inappropriate for the Initial Decision Maker to resolve the Claim.

**§ 15.2.3** In evaluating Claims, the Initial Decision Maker may, but shall not be obligated to, consult with or seek information from either party or from persons with special knowledge or expertise who may assist the Initial Decision Maker in rendering a decision. The Initial Decision Maker may request the Owner to authorize retention of such persons at the Owner's expense.

**§ 15.2.4** If the Initial Decision Maker requests a party to provide a response to a Claim or to furnish additional supporting data, such party shall respond, within ten days after receipt of the request, and shall either (1) provide a response on the requested supporting data, (2) advise the Initial Decision Maker when the response or supporting data will be furnished, or (3) advise the Initial Decision Maker that no supporting data will be furnished. Upon receipt of the response or supporting data, if any, the Initial Decision Maker will either reject or approve the Claim in whole or in part.

**§ 15.2.5** The Initial Decision Maker will render an initial decision approving or rejecting the Claim, or indicating that the Initial Decision Maker is unable to resolve the Claim. This initial decision shall (1) be in writing; (2) state the reasons therefor; and (3) notify the parties and the Architect, if the Architect is not serving as the Initial Decision Maker, of any change in the Contract Sum or Contract Time or both. The initial decision shall be final and binding on the parties but subject to mediation and, if the parties fail to resolve their dispute through mediation, to binding dispute resolution.

**§ 15.2.6** Either party may file for mediation of an initial decision at any time, subject to the terms of Section 15.2.6.1.



§ 15.2.6.1 Either party may, within 30 days from the date of receipt of an initial decision, demand in writing that the other party file for mediation. If such a demand is made and the party receiving the demand fails to file for mediation within 30 days after receipt thereof, then both parties waive their rights to mediate or pursue binding dispute resolution proceedings with respect to the initial decision.

§ 15.2.7 In the event of a Claim against the Contractor, the Owner may, but is not obligated to, notify the surety, if any, of the nature and amount of the Claim. If the Claim relates to a possibility of a Contractor's default, the Owner may, but is not obligated to, notify the surety and request the surety's assistance in resolving the controversy.

§ 15.2.8 If a Claim relates to or is the subject of a mechanic's lien, the party asserting such Claim may proceed in accordance with applicable law to comply with the lien notice or filing deadlines.

### § 15.3 Mediation

§ 15.3.1 Claims, disputes, or other matters in controversy arising out of or related to the Contract, except those waived as provided for in Sections 9.10.4, 9.10.5, and 15.1.7, shall be subject to mediation as a condition precedent to binding dispute resolution.

§ 15.3.2 The parties shall endeavor to resolve their Claims by mediation which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Mediation Procedures in effect on the date of the Agreement. A request for mediation shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the mediation. The request may be made concurrently with the filing of binding dispute resolution proceedings but, in such event, mediation shall proceed in advance of binding dispute resolution proceedings, which shall be stayed pending mediation for a period of 60 days from the date of filing, unless stayed for a longer period by agreement of the parties or court order. If an arbitration is stayed pursuant to this Section 15.3.2, the parties may nonetheless proceed to the selection of the arbitrator(s) and agree upon a schedule for later proceedings.

§ 15.3.3 Either party may, within 30 days from the date that mediation has been concluded without resolution of the dispute or 60 days after mediation has been demanded without resolution of the dispute, demand in writing that the other party file for binding dispute resolution. If such a demand is made and the party receiving the demand fails to file for binding dispute resolution within 60 days after receipt thereof, then both parties waive their rights to binding dispute resolution proceedings with respect to the initial decision.

§ 15.3.4 The parties shall share the mediator's fee and any filing fees equally. The mediation shall be held in the place where the Project is located, unless another location is mutually agreed upon. Agreements reached in mediation shall be enforceable as settlement agreements in any court having jurisdiction thereof.

### § 15.4 Arbitration

§ 15.4.1 If the parties have selected arbitration as the method for binding dispute resolution in the Agreement, any Claim subject to, but not resolved by, mediation shall be subject to arbitration which, unless the parties mutually agree otherwise, shall be administered by the American Arbitration Association in accordance with its Construction Industry Arbitration Rules in effect on the date of the Agreement. The Arbitration shall be conducted in the place where the Project is located, unless another location is mutually agreed upon. A demand for arbitration shall be made in writing, delivered to the other party to the Contract, and filed with the person or entity administering the arbitration. The party filing a notice of demand for arbitration must assert in the demand all Claims then known to that party on which arbitration is permitted to be demanded.

§ 15.4.1.1 A demand for arbitration shall be made no earlier than concurrently with the filing of a request for mediation, but in no event shall it be made after the date when the institution of legal or equitable proceedings based on the Claim would be barred by the applicable statute of limitations. For statute of limitations purposes, receipt of a written demand for arbitration by the person or entity administering the arbitration shall constitute the institution of legal or equitable proceedings based on the Claim.

§ 15.4.2 The award rendered by the arbitrator or arbitrators shall be final, and judgment may be entered upon it in accordance with applicable law in any court having jurisdiction thereof.

§ 15.4.3 The foregoing agreement to arbitrate and other agreements to arbitrate with an additional person or entity duly consented to by parties to the Agreement, shall be specifically enforceable under applicable law in any court having jurisdiction thereof.

**§ 15.4.4 Consolidation or Joinder**

§ 15.4.4.1 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may consolidate an arbitration conducted under this Agreement with any other arbitration to which it is a party provided that (1) the arbitration agreement governing the other arbitration permits consolidation, (2) the arbitrations to be consolidated substantially involve common questions of law or fact, and (3) the arbitrations employ materially similar procedural rules and methods for selecting arbitrator(s).

§ 15.4.4.2 Subject to the rules of the American Arbitration Association or other applicable arbitration rules, either party may include by joinder persons or entities substantially involved in a common question of law or fact whose presence is required if complete relief is to be accorded in arbitration, provided that the party sought to be joined consents in writing to such joinder. Consent to arbitration involving an additional person or entity shall not constitute consent to arbitration of any claim, dispute or other matter in question not described in the written consent.

§ 15.4.4.3 The Owner and Contractor grant to any person or entity made a party to an arbitration conducted under this Section 15.4, whether by joinder or consolidation, the same rights of joinder and consolidation as those of the Owner and Contractor under this Agreement.



# **Additions and Deletions Report for** **AIA® Document A201™ – 2017**

This Additions and Deletions Report, as defined on page 1 of the associated document, reproduces below all text the author has added to the standard form AIA document in order to complete it, as well as any text the author may have added to or deleted from the original AIA text. Added text is shown underlined. Deleted text is indicated with a horizontal line through the original AIA text.

Note: This Additions and Deletions Report is provided for information purposes only and is not incorporated into or constitute any part of the associated AIA document. This Additions and Deletions Report and its associated document were generated simultaneously by AIA software at 15:46:30 ET on 11/26/2018.

## **PAGE 1**

Grand Oaks Elementary Gymnasium  
1033 Oliver Springs Highway  
Clinton, TN 37716

MBI Comm. No.: 170759

...

*(Name, legal status and address)*

Anderson County School Board  
101 South Main Street  
Suite 500  
Clinton, TN 37716

...

Michael Brady Inc.  
299 N. Weisgarber Road  
Knoxville, TN 37919

## **Certification of Document's Authenticity**

**AIA® Document D401™ – 2003**

I, \_\_\_\_\_, hereby certify, to the best of my knowledge, information and belief, that I created the attached final document simultaneously with its associated Additions and Deletions Report and this certification at 15:46:30 ET on 11/26/2018 under Order No. 1121556219 from AIA Contract Documents software and that in preparing the attached final document I made no changes to the original text of AIA® Document A201™ – 2017, General Conditions of the Contract for Construction, as published by the AIA in its software, other than those additions and deletions shown in the associated Additions and Deletions Report.

\_\_\_\_\_  
*(Signed)*

\_\_\_\_\_  
*(Title)*

\_\_\_\_\_  
*(Dated)*

## SECTION 00 73 00 - SUPPLEMENTARY CONDITIONS

### PART I GENERAL:

1.01 The following amendments modify, change, delete from or add to the General Conditions of the Contract for Construction (AIA Document A201, 2007 Edition), hereinafter referred to as the General Conditions. Where any part of the General Conditions is modified or voided by these amendments the unaltered provisions of that part shall remain in effect.

#### 1.02 INTENT OF CONTRACT DOCUMENTS:

A. Add the following Subparagraphs 1.2.4 and 1.2.5 at the end of Paragraph 1.2, Execution, Correlation, and Intent:

**1.2.4 If there is any conflict or discrepancy within or between any of the Contract Documents involving the quality or quantity of work required, it is the intention of the Contract that the work of highest quality or greatest quantity shown or specified shall be furnished,** unless such conflict or discrepancy shall have been brought to the Architect's attention and clarified by Addendum prior to the opening of bids.

1.2.5 Whether or not the word "ALL" is used in the specifications, coverage is intended to be complete, except where partial coverage is specifically and expressly noted. In all cases where an item is referred to in the singular number, it is intended that the reference shall apply to as many such items as are required to complete the work. **Words such as "Install", "Provide", "Furnish", and "Supply" shall be construed as meaning complete furnishing, installing, and constructing unless modified by additional information.**

#### 1.03 DOCUMENTS FURNISHED TO THE CONTRACTOR:

A. Revise Subparagraph 2.2.5 to read as follows: Copies of the Drawings and Specifications will be available to the General Contractor at the cost of reproduction subject to the provisions of Paragraph 1.5, Ownership and use of Drawings, Specifications, and other Instruments of Service. All Drawings and Specifications furnished to the Contractor shall be subject to the provisions of Paragraph 1.5, Ownership and use of Drawings, Specifications, and other Instruments of Service.

B. Add Subparagraph 2.2.6 at the end of Paragraph 2.2, Information and Services Required of the Owner:

2.2.6 Electronic data files produced by the Architect containing information about the project are instruments of service and shall be subject to the provisions of Paragraph 1.5, Ownership and use of Drawings, Specifications, and other Instruments of Service. Electronic data files are not Contract Documents and differences may exist between these electronic files and the hard copy documents issued as Contract Documents. These files may be made available to the Contractor for convenience in preparing documents relating to the project upon execution of an electronic files release and payment of transfer fees as stated in the electronic files release.

#### 1.04 REVIEW OF CONTRACT DOCUMENTS:

A. Add the following Subparagraph 3.2.5 at the end of Paragraph 3.2, Review of Contract Documents and Field Conditions by Contractor:

**3.2.5 Should discrepancies or conflicts in the requirements of the Drawings and Specifications be discovered after the work has started, the Contractor shall report such discrepancies or conflicts to the Architect immediately and no work affected thereby shall be started, or if started, shall be stopped immediately until the Contractor and the Architect agree upon clarification of the discrepancy or conflict.**

1.05 PERMITS, FEES AND NOTICES:

- A. Add the following Subparagraph 3.7.6 at the end of Paragraph 3.7, Permits, Fees, Notices, and Compliance with Laws:

3.7.6 The Contractor shall obtain a Certificate of Occupancy from the Building Inspection Department having jurisdiction for each phase of the project as it is completed and ready for occupancy and shall deliver such certificate to the Architect.

1.06 SUBMITTALS:

- A. Add the following Subparagraphs 3.12.11 and 3.12.12 at the end of Paragraph 3.12, Shop Drawings, Product Data and Samples:

3.12.11 Additional provisions pertaining to shop drawings and samples are included in Division 1, General Requirements.

**3.12.12 Submittals that have not been marked as reviewed, signed and dated by the Contractor may be returned by the Architect without action.**

1.07 SUBCONTRACTURAL RELATIONS:

- A. Add the following Subparagraphs 5.3.1 and 5.3.2 to Paragraph 5.3, Subcontractual Relations:

5.3.2 The Contractor shall be directly responsible for all of the work included in the Contract, whether performed by his own forces or by his subcontractors. Except in extreme emergencies, all instructions, clarifications, and approvals will be given by the Architect to subcontractors only through the Contractor and all shop drawings, samples, and correspondence from the subcontractor shall be submitted to the Architect through the Contractor.

5.3.3 Insofar as it does not affect the quality of workmanship or materials, the Contractor shall settle all questions of responsibility arising among his various subcontractors and shall determine the extent of work and responsibility of each of the subcontractors.

1.08 CHANGES IN THE WORK:

- A. Add the following Subparagraph 7.4.1 to Paragraph 7.4, Minor Changes in the Work:

7.4.1 In order to facilitate checking of quotations for extras or credits, all proposals, except those so minor that their propriety can be seen by inspection, shall be accompanied by a complete itemization of costs including labor, materials, and subcontractors. **Where major cost items are subcontracts, they shall be itemized also. In no case will a change involving over \$500.00 be approved without such itemization.**

- B. Change Sub-subparagraph .5 of Subparagraph 7.3.7 to the following:

.5 Overhead and profit of which the maximum amount of allowable given in this Subparagraph shall be considered to include, but is not limited to, job-site staff and office expense, incidental job burdens, small tools, bonds, insurance and home office overhead allocation. The percentages for overhead and profit shall not exceed the following:

To Contractor on work performed by other than its own forces - 5% profit;

To first-tier Subcontractor on work performed by its Sub-subcontractors - 5% profit; and

To Contractor and/or Subcontractors for that portion of the work performed with their respective forces - 10% overhead and 5% profit.

1.09 APPLICATIONS FOR PAYMENT:

- A. Add the following Clauses 9.3.4 and 9.3.5, in Paragraph 9.3, Applications for Payment:

9.3.4 Until the work is fifty percent (50%) complete, the Owner will pay ninety percent (90%) of the amount due the Contractor on account of progress payments, provided, however, that the retainage amount may not exceed five percent (5%) of the amount of such Contract. At the time the work is fifty percent (50%) complete and thereafter, in the absence of other good and sufficient reasons, the Architect will, on presentation by the Contractor of Consent of Surety for each Application, authorize any remaining partial payments to be paid in full.

9.3.5 The Contractor is to use the 1992 Edition of AIA Document G702, Application and Certificate for Payment. **Beginning with the second Application for Payment, the Contractor shall verify that he has paid all subcontractors and major material suppliers those respective amounts representing all work and materials which have formed the basis of previous progress payments.** The application shall be submitted in three notarized copies.

1.10 PROGRESS PAYMENTS:

- A. Revise Subparagraph 9.6.1, to read as follows:

Unless otherwise provided in the agreement, the Owner will make progress payments to the Contractor on or about the fifteenth (15<sup>th</sup>) day of each calendar month on the basis of a duly certified and approved estimate of the work performed during the preceding calendar month. In preparing estimates, materials delivered to and properly stored on the site shall be given consideration. **Materials stored off-site shall not be paid for by the Owner unless the Contractor furnishes a certificate of insurance for that material showing the Owner as the Owner of said material.**

- 1.11 Add Subparagraph 9.6.8 at the end of Subparagraph 9.6, Progress Payments.

9.6.8 Upon commencement of the work, an escrow account as provided by Tennessee Code Annotated, Section 4-15-102; Section 66-11-144 and Title 66, Chapter 34, shall be established in a financial institution chosen by the Contractor and approved by the Owner. The escrow agreement shall provide that the financial institution will act as escrow agent, will pay interest on funds deposited in such account in accordance with provisions of the escrow agreement and will disburse funds from the account upon the direction of the Owner as set forth below. Compensation to the escrow agent for establishing and maintaining the escrow account shall be paid from interest accrued to the escrow account.

1.12 FINAL PAYMENT:

- A. In Subparagraph 9.10.2, item (5), delete the words "if required by the Owner"; and replace the words "releases and waivers of liens, claims, security interests or encumbrances arising out of the Contract, to the extent and in such form as may be designated by the Owner" with the following: "Contract Close Out Submittals as enumerated in Section 01 33 00 Submittals and as reviewed and approved by the Architect.

1.13 COSTS FOR DELAYS IN COMPLETION:

- A. Add the following Subparagraph 9.8.6 at the end of Paragraph 9.8, Substantial Completion:

9.8.6 As actual damages for any delay in completion are impossible of determination, the Contractor and his sureties shall be liable for and shall pay to the Owner the sum of Two Hundred Fifty Dollars (\$250.00) as fixed, agreed, and liquidated damages for each calendar day of delay until a Certificate of Substantial Completion is executed by the Owner, Architect, and Contractor.

- B. Add the following Subparagraph 9.10.6 at the end of Paragraph 9.10, Final Completion and Final Payment:

9.10.6 If after Substantial Completion of the work and issuance of the Punch List, Final Completion of the Work is delayed beyond the time allotted for completion of the Punch List through no fault of the Owner or the Architect, the Contractor shall be liable for such ongoing costs as the Architect shall incur on the Project. Such costs shall be computed and billed to the Contractor at the Architect's standard hourly rates in effect at the time the work is executed. Payment shall be required within thirty (30) days of invoice. Interest shall accrue at one percent (1%) per month on past due amounts. Contractor shall be liable for all legal fees if legal action is required for collection of unpaid amounts.

1.14 CONTRACTOR'S LIABILITY INSURANCE:

- A. In Subparagraph 11.1.1 in the second line, following the phrase "in which the Project is located", insert the following clause: ", and to which the Owner has no reasonable objections,".

1.15 LIMITS OF CONTRACTOR'S LIABILITY INSURANCE:

Add the following Clause 11.1.2.1 to Subparagraph 11.1.2:

11.1.2.1 The insurance required by Subparagraph 11.1.1 shall be written for not less than the following limits, or greater if required by law:

A. Workmen's Compensation:

- |    |                       |   |
|----|-----------------------|---|
| 1. | State:                | Statutory   |
| 2. | Employer's Liability: | \$100,000.00 Each Accident<br>\$500,000.00 Disease - Policy Limit<br>\$100,000.00 Disease - Each Employee |

B. Comprehensive General Liability (including Premises-Operations; Independent Contractors' Products/Completed Operations; Contractual; Personal injury):

- |    |  |                          |
|----|--|--------------------------|
| 1. | Bodily Injury & Property Damage, combined single limit:  |                          |
|    | Each Occurrence:   | \$1,000,000.00           |
|    | Annual Aggregate:  | \$1,000,000.00           |
| 2. | Products/Completed Operations to be maintained for One Year after Final Payment.   |                          |
|    |  | \$5,000,000.00 Aggregate |
| 3. | Property Damage Liability Insurance shall provide X, C, and U Coverage, and Coverage for any Special Hazards such as Blasting. |                          |

C. Comprehensive Automobile Liability (including Owned, Hired and Non-Owned):

- |    |   |           |
|----|---|-----------|
| 1. | Bodily Injury/Property Damage Combined: | \$500,000 |
|----|---|-----------|

D. Umbrella Liability: \$2,000,000

1.16 OWNER'S LIABILITY INSURANCE:

- A. Replace Paragraph 11.2. with the following:

11.2. The Contractor shall take out and furnish to the Owner and maintain during the life of this Contract complete Owner's Protective Liability Insurance in amounts as specified in the limits of

Contractor's Liability Insurance for Bodily Injury and Property Damage. This policy shall be made out in the name of the Owner and the Architect.

1.17 PROPERTY INSURANCE (BUILDER'S RISK)

- A. In Subparagraph 11.3.1, in the phrase: "Unless otherwise provided, the Owner", change the word "Owner" to "Contractor".
- B. Delete Subparagraph 11.3.1.2.

1.18 PROPERTY INSURANCE DEDUCTIBLES:

- A. Revise Subparagraph 11.3.1.3 to read as follows:

11.3.1.3 If by the terms of this insurance any mandatory deductibles are required, the Contractor shall be responsible for payment of the amount of the deductible in the event of a paid claim.

1.19 PERFORMANCE BOND AND PAYMENT BOND

- A. Change Subparagraph 11.4.1 to read as follows:

11.4.1 The Contractor shall execute a performance bond and a payment bond in an amount equal to one hundred percent (100%) of the Contract Sum and a payment bond covering and including labor and materials in an amount equal to one hundred percent (100%) of the Contract Sum. Bond shall be executed on AIA Document A311 and A312. Such bond shall be from a surety Company authorized to transact business in the State of Tennessee and Company shall be registered in Federal Register, Department of the Treasury, Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Attorneys in Fact who sign any bonds must file with each instrument a certified and effective dated copy of their power of attorney.

- B. Add the following Subparagraph 11.4.1.1 to the end of Subparagraph 11.4.1:

11.4.1.1 Mechanical, Plumbing and Electrical Subcontractors shall execute a performance bond in an amount equal to one hundred percent of the Contract Value of their portion of the work and a payment bond covering and including labor and materials in an amount equal to one hundred percent (100%) of the Contract Value of their portion of the work. Performance and Labor and Material Payment Bonds shall be executed on AIA Form A311 and A312. Such bond shall be from a surety Company authorized to transact business in the State of Tennessee and Company shall be registered in Federal Register, Department of the Treasury, Fiscal Service, Companies Holding Certificates of Authority as Acceptable Sureties on Federal Bonds and as Acceptable Reinsuring Companies; Notice. Attorneys in Fact who sign any bonds must file with each instrument a certified and effective dated copy of their power of attorney.

1.20 INSPECTIONS AND CORRESPONDENCE:

- A. Add the following Subparagraph 13.5.7 to the end of Paragraph 13.5, Tests and Inspections:

13.5.7 Inspections and or correspondence by the Architect required due to failure by the Contractor to obtain inspections and approval from the Public Authorities having jurisdiction are beyond the scope of Construction Contract Administration for the Architect. As additional services, the Contractor will be billed a minimum fee of Five Hundred Dollars (\$500.00) per occurrence plus the Architect's time at the Architect's standard hourly rate for the personnel required to perform these functions.

1.21 INTEREST:

- A. Revise Paragraph 13.6 to read as follows:



"Payments due and unpaid for thirty (30) days under the Contract Documents shall bear interest from the date thirty (30) days after payment is due at the rate of 1/2% (0.5 percent) per month.

1.22 ARBITRATION:

- A. Delete Paragraph 15.4 Arbitration, entirely and delete all references to arbitration elsewhere in the General Conditions.

1.23 TIME:

- A. Time is an essential consideration of the Contract and work shall commence on the date to be specified in a written notice to the Contractor to proceed and shall progress with a proper and sufficient force of workmen and ample supply of materials and equipment to complete the Contract within the time limit agreed to in the Contract for Construction.

1.24 SUBSTITUTIONS:

- A. All requests shall be submitted to the Architect in writing with a fully executed substitution request form and shall clearly define and describe materials, methods or equipment for which approval is requested.

B. Prior to Execution of a Contract for Construction:

1. If any Contractors desire to substitute any firms, materials, brands, methods, etc., other than specified, he may have the privilege at any time prior to ten days before bidding, of submitting these matters to the Architect for approval.
2. Requests shall be submitted by the General Contractor. Direct requests by manufacturer or material suppliers will not be considered.
3. If such submissions are approved by the Architect or if the Architect shall decide to enlarge the scope of the Specifications, such approvals or additional information will be made by Addendum to the Contractor.

C. After Execution of a Contract for Construction:

1. Substitutions after execution of a Contract for Construction will, generally, not be considered, except under unusual circumstances, such as strikes, lockouts, bankruptcy, discontinuing of a product, etc.
2. Requests for substitutions shall be made in writing to the Architect within ten (10) days of the date that the Contractor ascertains that he cannot obtain the material or equipment specified.
3. Requests shall be accompanied by complete description of the material or apparatus to be submitted. On request from the Architect, samples of any of all such items shall be submitted and/or set up as directed for inspection and consideration. The amount of credit or extra cost to the Owner on account of the substitution shall be a part of this request.
  - a. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - i. Statement indicating why specified material or product cannot be provided.
    - ii. The amount of credit or extra cost to the Owner on account of the substitution
    - iii. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and

separate contractors, that will be necessary to accommodate proposed substitution.

- iv. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
- v. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
- vi. Samples, where applicable or requested.
- vii. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners.
- viii. Research/evaluation reports evidencing compliance with building code in effect for Project, from a model code organization acceptable to authorities having jurisdiction.
- ix. Detailed comparison of Contractor's Construction Schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating lack of availability or delays in delivery.
- x. Contractor's certification that proposed substitution complies with requirements in the Contract Documents and is appropriate for applications indicated.
- xi. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.

D. "Or Approved Equal" or "Or Approved Substitution"

1. Where the phrase "or approved equal" or "approved substitution" occurs in the Contract Documents, do not assume that material, equipment, or methods will be approved as equal by the Architect unless the item has been specifically approved for this work by the Architect
  - a. Color choices will be one of the determining factors for approval.
2. The decision of the Architect will be final.

1.01 STANDARDS:

- A Any material or other work specified by reference to the number, symbol, or title of a specific standard, such as American National Standards Institute (ANSI) Standard, a Federal Specification, a trade association standard, or other similar standard, shall conform to the requirements in the latest revision thereof or any amendment or supplement thereto in effect on the date of the drawings and specifications, except as limited to type, class or grade, or as modified in such reference.
- B The standards referred to, except as modified in the specification, shall have full force and effect as though recited for the reason that the manufacturers and trades involved are assumed to be familiar with their requirements. The Architect will furnish, upon request, information as to how copies of the standards referred to may be obtained.

C Where material or work is specified by reference to conform to standards such as listed in Paragraph A above, or to Codes, Laws, and Regulations, but specific provisions of the Contract Drawings or Contract Specifications exceed the requirements of such references, the Contract Drawings and Specifications shall govern.

1.02 MANUFACTURER'S DIRECTIONS:

A All manufactured articles, material and equipment shall be applied, installed, connected, erected, used, cleaned, and conditioned in accordance with the manufacturer's instructions and recommendations. Any conflicts between such manufacturer's instructions and recommendations and the specifications shall be brought to the attention of the Architect and the procedures reconciled before proceeding with the work.

1.03 GUARANTEE:

A All work under this Contract shall be guaranteed for a period of one (1) year after execution of Certificate of Substantial Completion against defects caused by the use of inferior materials or workmanship. Guarantee period of incomplete items at time of execution of Certificate of Substantial Completion shall commence on date of installation into building. Repair and/or replace all such defective materials or equipment and any work damaged thereby or make any other adjustment necessary without additional cost to the Owner.

1.04 LAYING OUT WORK:

A The Contractor shall, immediately upon entering the projects for the purpose of beginning work, locate all general reference points and be responsible for all lines, elevations, and measurements.

PART II PRODUCTS:

NOT USED

PART III EXECUTION:

NOT USED

End of Section

## SECTION 01 10 00 - SUMMARY OF THE WORK

### PART I GENERAL

#### 1.01 WORK INCLUDED:

- A. Furnish all labor, materials and equipment, and perform all work to construct, as specified herein and as shown on the accompanying drawings entitled "An Addition For: Grand Oaks Elementary Gymnasium, 1033 Oliver Springs Hwy. Clinton TN." The building shall be constructed complete and ready for occupancy except for the items specifically excluded in "Work Not Included".
- B. The work shall include; selective demolition, site preparation, building construction, plumbing, heating, ventilating and air conditioning; electrical work; special equipment as specified; furnishings, and site improvements as shown and specified.
- C. Patch any existing work damaged by construction.

#### 1.02 WORK NOT INCLUDED:

- A. The following items of work will be provided by the Owner or by others under separate contracts:
  - 1. Movable furniture unless specifically shown on the drawings and specifications.
  - 2. Security System Equipment.
  - 3. Telephone System Equipment.
  - 4. Computer System Equipment.
  - 5. Point of Sale Equipment.
  - 6. Any other items noted on the drawings as "N.I.C." or "Not In Contract".
- B. The following work in connection with the items listed in paragraph 1.02A preceding shall be part of the General Contract work:
  - 1. Verification of correct location of electrical receptacles, telephone outlets, water and waste connections and similar outlets to suit equipment arrangement.
  - 2. Provision of telephone outlet boxes and conduit turned out above ceiling for use by owner's telephone contractor.

#### 1.03 OCCUPANCY OF THE BUILDING DURING CONSTRUCTION:

- A. The Contractor shall schedule and organize his work in such a manner and use such methods that will interfere as little as possible with other work in progress on the site and with the operation of adjacent buildings.
- B. The Building will be occupied during the course of construction. The Contractor shall schedule his work in a manner to minimize disruption of use of existing facilities by his construction activities

#### 1.04 CONTRACTOR'S USE OF PREMISES:

- A. Before construction is started the Contractor shall confer with the Architect and the Owner and arrange for available trucking and storage space for the delivery of materials, storage space for materials and equipment, and parking space for his workmen.
- B. Construction operations and storage of materials and equipment shall be restricted to areas of the site mutually agreed upon and in such a manner as not to block access of fire fighting equipment to the building and facilities.
- C. Construction vehicular traffic and the operation of construction equipment such as cranes, bulldozers, and other similar equipment shall be carefully supervised and controlled to avoid damage to existing structures and facilities which are to remain in place.

1.05 VERIFICATION OF DIMENSIONS:

- A. Dimensions, elevations, and locations shown on the drawings in reference to existing structures and utilities are the best available data obtainable but are not guaranteed by the Architect or the Owner and the Architect and the Owner will not be responsible for their accuracy.
- B. Before proceeding with any work dependent upon the data involved, the Contractor shall field check and verify all dimensions, grades, line levels, or other conditions of limitations at the site and building to avoid construction errors. If any work is performed by the Contractor or by his Subcontractors prior to adequate verification of applicable data, any resultant extra cost for adjustment of work to conform to existing limitations shall be borne by the Contractor without reimbursement or compensation by the Owner.

1.06 CONTROL POINTS AND LAYOUT:

- A. The initial lines, grades, and dimensions necessary for the location and control of the work under the Contract are shown on the Contract Drawings.
- B. The Contractor shall provide for himself all additional and supplementary lines and grades as may be necessary to layout the work and insure proper control of the work until completed. It shall be the Contractor's responsibility to satisfy himself as to the accuracy of all measurements before construction.

1.07 SUBSTANTIAL COMPLETION OF THE WORK:

- A. Upon substantial completion of any phase of the work, the Owner shall assume complete responsibility for the maintenance and operation of the heating, ventilating and air conditioning system and service utilities in that portion of the project.
- B. The Owner shall also become responsible for all other maintenance and damage and ordinary wear and tear and, with the exception of items under guarantee, the cost of repairs or restoration during the period between substantial and final completion.
- C. The Owner shall have the responsibility to have in effect all necessary insurance for protection against any losses not directly attributable to the Contractor's negligence.
- D. Upon substantial completion, payments for work in the substantially complete portion of the work shall be released to the Contractor, except for the retainage and an amount to cover the cost of the incomplete or deficient items included in the punch list made at the inspection to determine substantial completion. This amount shall be approximately the value of the punch list items as estimated by the Architect.

- E. The Contractor shall arrange a schedule so that punch list items are completed in the designated time by working during regular working hours. The Contractor shall be afforded access to the occupied portion of the building to perform this work during regular working hours.

1.08 ENVIRONMENTAL HAZARDOUS PRODUCTS, MATERIALS, WASTE:

- A. Do not incorporate in the Work hazardous materials or products as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended, unless the Contract Documents give no other option than to provide a material or product which contains a hazardous material, component, constituent, waste, or leachate. In studying the Contract Documents and carrying out the Work, report at once to the Designer the discovery of a product or material which contains hazardous materials, components, constituents, waste, or leachate.
- B. Do not incorporate in the Work a product or material which contains concentrations of a constituent, component, or material above the threshold levels which would require adherence to hazardous waste disposal regulations as currently defined, or could cause a release or threat of release of a hazardous substance at a level that would require a remedial response or removal action as currently defined by RCRA, CERCLA, or the EPA.
- C. Select materials and products meeting specified requirements which comply with EPA requirements as regards hazardous materials content. In making requests for substitutions, determine that materials and products proposed for substitution comply with RCRA, CERCLA, and EPA requirements.

1.09 BUILDING PRODUCTS USE:

- A. It is the responsibility of the Contractor to inform himself concerning the application of the products he uses to follow the directions of the Architect and manufacturer.
- B. In the event of disagreement between the Contract Documents and the manufacturer's directions, the Contractor will obtain written instructions from the Architect before proceeding with the installation.
- C. If the Contractor has knowledge of or reason to believe the likelihood of failure, he will transmit such knowledge to the Architect, and ask for written instructions before proceeding with the work.

1.10 OWNERSHIP OF REMOVED MATERIALS AND EQUIPMENT:

- A. All removed existing materials and equipment designated to be removed which are not to remain the property of the Owner or are not noted to be reused in the new work shall become the property of the Contractor and shall be removed from the premises and site and disposed of by him.

1.11 SEPARATE CONTRACTS:

- A. The Owner may award separate contracts in connection with the project. The work in any such separate contracts may proceed simultaneously with the execution of this Contract. The Contractor shall coordinate operations with any separate contractors. The Contractor will be required in the arrangement for the storage of materials and in the detailed execution of the work. The Contractor, including his subcontractors, shall keep himself informed of the progress and the detailed work of separate contractors and shall notify the Architect immediately of the lack of progress or defective workmanship that will interfere with his own operations. Failure of the Contractor to keep informed of the work progressing on the site and failure to give notice of lack

of progress or defective workmanship by separate contractors shall be construed as acceptance of him of the state of the work as being satisfactory for proper coordination with his own work.

- B. The separate contractors will provide competent foremen or supervisors for the installation of their equipment and they are to confer with the Contractor and his subs and other separate contractors where required in regard to connections and installations.

1.12 DISCRETIONARY FUND:

- A. The General Contractor shall include in the base bid an amount equal to **three percent (3%)** of the Base Bid amount which shall constitute a discretionary fund. This fund shall be used at the discretion of the Architect and the Owner. Upon completion of the work, the Contractor shall credit his final request for payment in the amount of all or any unused portion of this fund.

PART II PRODUCTS

NOT USED

PART III EXECUTION

NOT USED

End of Section



## SECTION 01 16 00 - REGULATORY REQUIREMENTS

### PART I GENERAL

#### 1.01 GENERAL:

- A. Where codes and standards are referenced in this and other sections of the specifications or on the drawings, whether or not a particular edition is referenced, it is the intention that these be the latest editions as adopted by the governing agency under whose jurisdiction the project is to be constructed. The latest edition shall be the edition in effect on the date approval is granted for construction to begin.

#### 1.02 CODES:

- A. Work shall conform to the requirements of the building code indicated on the drawings. If no code is listed, work shall conform to the requirements of the building code in effect for the jurisdiction having authority.
- B. Work shall conform to the requirements of the life safety code indicated on the drawings. If no code is listed, work shall conform to the requirements of the life safety code in effect for the jurisdiction having authority.
- C. Plumbing and gas piping work shall conform to the requirements of the plumbing and gas codes indicated on the drawings. If no code is listed, work shall conform to the requirements of the plumbing and gas codes in effect for the jurisdiction having authority.
- D. Work shall conform to the requirements of the electrical code indicated on the drawings. If no code is listed, work shall conform to the requirements of the electrical code in effect for the jurisdiction having authority.
- E. Work shall conform to the requirements of the latest edition of ICC/ANSI A117.1 Standard on Accessible and Usable Buildings and Facilities.
- F. Work shall conform to the requirements of the latest edition of Americans with Disabilities Act (ADA).

#### 1.03 CODE STANDARDS:

- A. Fire doors shall conform to requirements of NFPA No. 80, Standards for Fire Doors and Windows.
- B. Heating, ventilating and air conditioning work shall conform to requirements of NFPA NO. 90A, Standard for the Installation of Air Conditioning and Ventilating Systems.

#### 1.04 REGULATIONS:

- A. Electrical work shall conform to applicable regulations of the State, Department of Insurance, Division of Fire Prevention and to applicable regulations of the Local Utility Company.
- B. Work shall be performed in a manner approved by the Occupational Safety and Health Administration. The Contractor shall be responsible for job-site safety and training of workman as required by Occupational Safety and Health Administration.
- C. Contractors performing work in schools constructed before 1978 or in any facilities where children under the age of 6 are present shall be certified and shall follow work practices to prevent lead contamination as mandated by the Environmental Protection Agency.

#### 1.05 PERSONNEL BACKGROUND CHECKS:

- A. Contractor shall comply with Public Chapter 587 of 2007, as codified in Tennessee Code Annotated Section 49-5-413 and amended in Public Chapter 1080, which requires all contractors to facilitate a criminal history records check conducted by the Tennessee Bureau of Investigation and the Federal Bureau of Investigation for each employee prior to permitting the employee to have contact with students or enter school grounds when students are present.

1.06 MATERIAL AND TESTING STANDARDS:

- A. Components of the work shall conform to requirements of American Society for Testing and Materials (ASTM) Standards, American National Standards Institute (ANSI) standards, and Trade Association Standards, as listed in the various other sections of the specifications.

1.07 MANUFACTURER'S RECOMMENDATIONS:

- A. When work in accordance with manufacturer's recommendations is specified, a copy of those recommendations shall be kept in the job office.

1.08 STORM WATER DISCHARGE PERMIT:

- A. If Construction Operations will disturb the ground, the Contractor must file a "Notice of Intent" for and obtain a National Pollutant Discharge Elimination System Permit from:

Stormwater NOI Processing  
Division of Water Pollution Control  
401 Church Street  
Department of Environment and Conservation  
Nashville, Tennessee 37243-1534

- B. Any fines levied because of the Contractor's failure to obtain the necessary permit will be the responsibility of the Contractor.

PART II PRODUCTS - NOT USED

PART III EXECUTION - NOT USED

End of Section

## SECTION 01 25 00 – SUBSTITUTION PROCEDURES

### PART I GENERAL

#### 1.01 GENERAL:

- A This Section includes administrative and procedural requirements for submittal and approval of substitutions.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and other Division 1, General Requirements, apply to the work under this section.

#### 1.03 DEFINITIONS:

- A. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor.
1. Substitutions for Cause: Changes proposed by Contractor that are required due to changed Project conditions, such as unavailability of product, regulatory changes, or unavailability of required warranty terms.
  2. Substitutions for Convenience: Changes proposed by Contractor or Owner that are not required in order to meet other Project requirements but may offer advantage to Contractor or Owner.

#### 1.04 SUBMITTALS:

- A. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
1. Substitution Request Form: Use facsimile of form provided in the Project Manual.
  2. Documentation: Show compliance with requirements for substitutions and the following, as applicable:
    - a. Statement indicating why specified product or fabrication or installation cannot be provided, if applicable.
    - b. Coordination information, including a list of changes or modifications needed to other parts of the Work and to construction performed by Owner and separate contractors that will be necessary to accommodate proposed substitution.
    - c. Detailed comparison of significant qualities of proposed substitution with those of the Work specified. Include annotated copy of applicable specification section. Significant qualities may include attributes such as performance, weight, size, durability, visual effect, sustainable design characteristics, warranties, and specific features and requirements indicated. Indicate deviations, if any, from the Work specified.
    - d. Product Data, including drawings and descriptions of products and fabrication and installation procedures.
      - i. Operational efficiency and energy consumption for equipment and appliances.
    - e. Samples, where applicable or requested.

- f. Certificates and qualification data, where applicable or requested.
  - g. List of similar installations if requested, for completed projects with project names and addresses and names and addresses of architects and owners.
  - h. Material test reports from a qualified testing agency indicating and interpreting test results for compliance with requirements indicated.
  - i. Detailed comparison of Contractor's construction schedule using proposed substitution with products specified for the Work, including effect on the overall Contract Time. If specified product or method of construction cannot be provided within the Contract Time, include letter from manufacturer, on manufacturer's letterhead, stating date of receipt of purchase order, lack of availability, or delays in delivery.
  - j. Cost information, including a proposal of change, if any, in the Contract Sum.
  - k. Contractor's certification that proposed substitution complies with requirements in the Contract Documents except as indicated in substitution request, is compatible with related materials, and is appropriate for applications indicated.
  - l. Contractor's waiver of rights to additional payment or time that may subsequently become necessary because of failure of proposed substitution to produce indicated results.
3. Architect's Action: If necessary, Architect will request additional information or documentation for evaluation within seven (7) days of receipt of a request for substitution. Architect will notify Contractor of acceptance or rejection of proposed substitution within fifteen (15) days of receipt of request, or seven (7) days of receipt of additional information or documentation, whichever is later.
- a. Forms of Acceptance: Construction Change Directive, or Architect's Supplemental Instructions for minor changes in the Work.
  - b. Use product specified if Architect does not issue a decision on use of a proposed substitution within time allocated.

1.05 QUALITY ASSURANCE:

- A. Compatibility of Substitutions: Investigate and document compatibility of proposed substitution with related products and materials. Engage qualified testing agency to perform compatibility tests recommended by manufacturers.

1.06 PROCEDURES:

- A. Coordination: Modify or adjust affected work as necessary to integrate work of the approved substitutions.

PART 2 PRODUCTS

2.01 SUBSTITUTIONS:

- A. Substitutions for Cause: Submit requests for substitution immediately upon discovery of need for change, but not later than fifteen (15) days prior to time required for preparation and review of related submittals.

1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
  - a. Requested substitution is consistent with the Contract Documents and will produce indicated results.
  - b. Substitution request is fully documented and properly submitted.
  - c. Requested substitution will not adversely affect Contractor's construction schedule.
  - d. Requested substitution has received necessary approvals of authorities having jurisdiction.
  - e. Requested substitution is compatible with other portions of the Work.
  - f. Requested substitution has been coordinated with other portions of the Work.
  - g. Requested substitution provides specified warranty.
  - h. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.
- B. Substitutions for Convenience: Architect will consider requests for substitution if received within 10 days prior to the date of the Bid. Requests received after that time may be considered or rejected at discretion of Architect.
  1. Conditions: Architect will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements:
    - a. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations.
    - b. Requested substitution does not require extensive revisions to the Contract Documents.
    - c. Requested substitution is consistent with the Contract Documents and will produce indicated results.
    - d. Substitution request is fully documented and properly submitted.
    - e. Requested substitution will not adversely affect Contractor's construction schedule.
    - f. Requested substitution has received necessary approvals of authorities having jurisdiction if applicable.
    - g. Requested substitution is compatible with other portions of the Work.
    - h. Requested substitution has been coordinated with other portions of the Work.
    - i. Requested substitution provides specified warranty.

- j. If requested substitution involves more than one contractor, requested substitution has been coordinated with other portions of the Work, is uniform and consistent, is compatible with other products, and is acceptable to all contractors involved.

PART 3 EXECUTION - NOT USED

End of Section

SECTION 01 31 00 – PROJECT MANAGEMENT AND COORDINATION:

PART I GENERAL

1.01 COORDINATION OF WORK OF SUBCONTRACTORS:

- A. It is the responsibility of the Contractor to coordinate the work of his mechanical and electrical subcontractors. To this end the Contractor shall require that the mechanical and electrical subcontractors examine and familiarize themselves with the architectural and structural drawings as well as the mechanical and electrical drawings and that they frequently consult with each other and all other trades so that the work can be properly coordinated.
- B. The Contractor shall carefully check the work of his subcontractor in order to deliver to the Owner the contract work complete and properly installed in conformance with the Contract requirements.

1.02 CUTTING AND PATCHING:

- A. Cut and patch existing work that is to remain in place as necessary for the installation of new work.
- B. **It is the intention of the Contract that conduit, sleeves, thimbles, and chases for the mechanical and electrical work be installed in new concrete, masonry or stud wall work as the work progresses.** The mechanical and electrical subcontractors shall respectively install the required conduit, sleeves and thimbles in concrete forms and in masonry work and shall inform the Contractor of the size and location of any required chases to be formed in the concrete and masonry work. If this procedure is not followed, the mechanical and electrical subcontractors shall do all cutting of new concrete and masonry work required to install their work.
- C. Cutting of new work shall be held to the minimum necessary and shall be done neatly. The Contractor shall be responsible for the proper patching and finishing of all cut work whether or not cut by his own workmen or by subcontractors.
- D. Furr out walls or ceilings where necessary for the new work. Thicken walls as required to accommodate wall-mounted equipment including but not limited to electrical panel boxes, fire extinguisher cabinets, communications, security system, and fire alarm panels. Consult with the Architect about any furr outs not shown on the drawings to keep furr outs to a minimum.

1.03 PROJECT COORDINATION:

- A. Large Equipment: When possible, equipment which is to be installed in the building that may be too large to pass through doorways, shafts, or other restrictions shall be brought on the job and placed in the proper location before the enclosing structure is completed, otherwise, arrange with other Contractors to permit access at a later date, at no additional cost to the Owner.

PART II PRODUCTS

NOT USED

PART III EXECUTION

NOT USED

End of Section

SECTION 01 32 50 – WEATHER DELAYS

PART I GENERAL

1.01 DESCRIPTION:

- A. Work Included: Prepare and submit request for extensions of Time based on weather conditions.
- B. Related Work:
  - 1. Documents affecting work of this Section include, but are not limited to General Conditions, Supplementary General Conditions and Sections in Division 1 of these Specifications.
  - 2. Applications for Payment.

1.02 EXTENSIONS OF CONTRACT TIME:

- A. If the basis exists for an extension of Time in accordance with the General Conditions and Supplementary General Conditions, an extension of time on the basis of weather may be granted only for the number of Weather Delay Days in excess of the number of days listed in the standard Baseline for that month.

1.03 STANDARD BASELINE FOR AVERAGE CLIMATIC RANGE:

- A. The State of Tennessee has reviewed weather data available from the National Oceanic and Atmospheric Administration and determined a Standard Baseline of average climatic range for the State of Tennessee.
- B. Standard Baseline shall be regarded as the normal and anticipatable number of calendar days for each month during which construction activity shall be expected to be prevented and suspended by cause of adverse weather. Suspension of construction activity for the number of days each month as listed in the Standard Baseline is included in the Work and is not eligible for extension of Contract Time.
- C. Standard Baseline for each month of the year is as follows (the anticipatable delay days follow the month):

Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
12	11	8	7	7	6	7	5	4	5	6	11

1.04 ADVERSE WEATHER AND WEATHER DELAY DAYS:

- A. Adverse Weather is defined as the occurrence of one or more of the following conditions, substantiated by NOAA data, which prevents exterior construction activity or access to the site within twenty four (24) hours:
  - 1. Precipitation threshold (rain, snow, or ice) in excess of one-tenth inch (0.10") liquid measure. Snow to liquid measure ration is 10:1.
  - 2. Standing snow is excess of one inch (1.00").
- B. Additional extension of Time may be granted for drying days following periods of two or more consecutive days of precipitation for the following conditions:
  - 1. At a rate of one day extension of Time for each period of two or more consecutive days of precipitation of 1.0 inch or more (liquid measure).



2. Only if there is a hindrance to site access or site work, such as excavation, backfill and footings and the like and then only when no such work is performed.
- C. A Weather Delay Day may be counted only if adverse weather prevents work on the Project for fifty percent (50%) or more of the contractor's scheduled, critical path work, including a weekend day or holiday if Contractor has scheduled construction activity that day.
- 1.05 DOCUMENTATION AND SUBMITTALS:
- A. Contractor shall submit on a monthly basis daily job site work logs (daily reports) showing which, and to what extent, construction activities have been adversely affected by weather.
  - B. Submit actual weather data, if requested by Architect to support claim for time extension, as obtained from NOAA weather reporting station nearest the project site.
  - C. Use Standard Baseline data provided in this Section when documenting actual delays due to weather in excess of the average climatic range.
  - D. Organize claim and documentation to facilitate evaluation of a basis of calendar month periods, and submit in accordance with the procedures for Claims established in the General Conditions.
  - E. Extensions of Time requested by the Contractor and approved by the Architect on the basis of conditions stated above shall be acknowledged and communicated in writing to the Contractor periodically.
  - F. For extensions of Contract Time granted, a modification shall be issued in accordance with the provisions of the General Conditions, and the applicable General requirements. Modifications for extensions of Time may be issued quarterly or held to the end of the Project as appropriate based on Architect's approval of such extensions as noted in E above.
  - G. Extensions of Time not requested in a timely manner by the Contractor will not be granted at a later time.

PART II PRODUCTS

NOT USED

PART III EXECUTION

NOT USED

End of Section

## SECTION 01 33 00 – SUBMITTALS

### PART 1 GENERAL

#### 1.01 GENERAL:

##### A. Work Included:

1. Wherever possible, throughout the Contract Documents, the minimum acceptable quality of workmanship and materials has been defined either by manufacturer's name and catalog number or by reference to recognized industry standards.
2. To ensure that the specified products are furnished and installed in accordance with the design intent, procedures have been established for advance submittal of design data and for its review or rejection by the Architect.
3. Shop drawings, product data and samples will be required for items listed hereinafter in the various sections of the specifications. The Architect reserves the right to request samples of proposed substitutions for materials or equipment specified whether or not samples of the materials and equipment specified are called for.

#### 1.02 RELATED DOCUMENTS:

- ##### A. Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

#### 1.03 DESCRIPTION OF REQUIREMENTS:

- ##### A. The types of submittals controlled by these General Requirements include shop drawings, product data, samples and miscellaneous work-related submittals. The individual submittal requirements are specified in applicable section for each unit of Work.

- ##### B. Definitions: the work-related submittals of this section, in addition to the definitions of the General Conditions and elsewhere in the Contract Documents for the requirements of administrative submittals.

1. **Shop drawings** include custom-prepared data of all forms including drawings, diagrams, performance curves, data sheets, schedules, templates, patterns, reports, calculations, instructions, measurements, and similar information not in standard printed form applicable to other projects.
2. **Product data** includes standard printed information on materials, products and systems, not custom-prepared for this project, other than the designation of selections from available choices.
3. **Samples** include both fabricated and unfabricated physical samples of materials, products and Work; both as complete units and as smaller portions of units of Work; either for limited visual inspection or (where indicated) for more detailed testing and analysis.
4. **Miscellaneous submittals** related directly to the Work (non-administrative) include warranties, guarantees, maintenance agreements, workmanship bonds, quality testing and certifying reports, copies of industry standards, record drawings, operating and maintenance materials, overrun stock, security/protection/safety keys and similar information, devices and materials applicable to the Work and not defined as shop drawings, product data or samples.

1.04 GENERAL SUBMITTAL REQUIREMENTS:

- A. Coordination and Sequencing: Coordinate the preparation and processing of submittals with the performance of the Work so that Work will not be delayed by submittals. Coordinate and sequence different categories of submittals for the same Work, and for interfacing units of Work, so that one will not be delayed for coordination with another. Do not proceed with purchasing, fabrication and delivery of work related to a submittal until submittal procedure has been successfully completed.
- B. Preparation of Submittals: provide permanent marking on each submittal to identify it by project, date, Contractor, subcontractor, submittal name and similar information to distinguish it from other submittals. Show Contractor's approval marking prior to Architect's design intent review. Package each submittal appropriately for transmittal and handling. Submittals which are received directly from sources other than through the Contractor's office will be returned "without action".
- C. The Contractor shall not be relieved of responsibility for any deviation from the requirements of the Contract Documents by the Architect's approval of submittals unless the Contractor has specifically informed the Architect in writing of such deviation at the time of submission and the Architect has given written approval to the specific deviation. The Contractor shall not be relieved from responsibility for error or omissions in the submittals by the Architect's approval thereof.
- D. Verbal discussion between the Contractor and the Owner or the Architect of a proposed deviation and any subsequent agreements thereto shall not be considered valid unless confirmed in writing by the Owner or the Architect.
- E. The Contractor shall direct specific attention, in writing or on resubmitted submittals, to revisions other than those requested by the Architect on previous submittals.
- F. Delivery: All submittals shall be accompanied by a letter of transmittal containing an enumeration and description of the submittals and, unless otherwise specified, shall be delivered to the Architect. **The transmittal letter shall indicate whether the submittal is for a product as specified; is a pre-approved substitution; or is a request for substitution offered with supporting documentation in accordance with the Contract Documents.**

Unless directed otherwise, all submittals shall be delivered to:

Michael Brady Inc.  
299 N. Weisgarber Road  
Knoxville, Tennessee 37919-4013

1.05 SUBCONTRACTORS AND MAJOR MATERIAL SUPPLIERS LIST:

- A. Within 30 days of receipt of a notice to proceed and prior to submitting any shop drawings or requests for payment, the Contractor shall submit a list of Subcontractors and Major Material Suppliers on the form provided in this Project Manual. The form shall list all Subcontractors and suppliers for the project providing material and or labor whose dollar value equals or exceeds Five Thousand dollars (\$5,000).

1.06 SCHEDULE OF VALUES:

- A. The schedule of values specified in Subparagraph 9.2.1 of the General Conditions shall be divided into not less than one line item for each section of the specifications (except Division 1 sections). Coordinate line items in the schedule of values with portions of the contract documents which identify units or subdivisions of work. Specifically, correlate with the project manual table of contents. Divide major subcontracts into individual cost items. Submit Schedule of Values within 20 days after execution of the Contract.

1. Where applications for payment are likely to include products purchased or fabricated but not yet installed, provide individual line items for material cost, installation cost, and other applicable phases of completion.
2. Provide separate line items for each allowance included in the Contract price.

1.07 APPLICATIONS FOR PAYMENTS:

- A. Applications for payments shall be submitted on AIA Document G702, Application and Certificate for Payment, supported by AIA Document G702A, continuation sheet, and by separate lists of materials stored at the site and materials stored off the site. Three (3) original notarized copies of Applications for Payment shall be submitted.

1.08 CONTRACTORS PROGRESS SCHEDULE:

- A. Prepare a fully developed, horizontal bar-chart type, contractor's progress schedule. Submit within twenty (20) days after the date established for Commencement of the Work.
- B. Provide a separate time bar for each significant construction activity. Provide a continuous vertical line to identify the first working day of each week. Use the same breakdown of units of the work as indicated in the Schedule of Values.
- C. As work progresses, place a contrasting mark in each bar to indicate Actual Completion.
- D. Prepare the schedule on a sheet or series of sheets , of paper of sufficient width to show data for the entire construction period.
- E. Secure time commitments for performing critical elements of the Work from parties involved. Coordinate each element on the schedule with other construction activities; include minor elements involved in the sequence of the Work. Show each activity in proper sequence. Indicate graphically the sequences necessary for completion of related portions of the Work.
- F. Coordinate the Contractor's Progress Schedule with the Schedule of Values, list of subcontracts, Submittal Schedule, progress reports, payment requests, and other schedules.
- G. Indicate completion in advance of the date established for Substantial Completion. Indicate Substantial Completion on the schedule to allow time for the Architect's procedures necessary for certification of Substantial Completion.
- H. Revise the schedule monthly. Issue the updated schedule concurrently with the Application and Certification for Payment.

1.09 REVIEW OF DELEGATED ENGINEERING DOCUMENTS:

- A. Delegated Engineer: A professional engineer who undertakes a specialty service and provides services or creative work regarding a portion of the engineering project such as a fabricator or contractor so long as the engineer acts as an independent consultant or through a duly qualified engineering corporation. The delegated engineer is the engineer of record for that portion of the project.
- B. Documents prepared by a delegated engineer shall bear the name and business address of the delegated engineer on the engineering documents. When such documents are issued for preliminary or conceptual use, the engineer shall clearly note the intended purpose of such documents.
- C. Documents prepared by the delegated engineer shall be submitted to the engineer of record for review for compliance with engineering requirements and to confirm the following:

1. That the delegated engineering documents have been prepared by an engineer licensed and registered in the state of project construction.
2. That the delegated engineering documents of the delegated engineer conform with the intent of the engineer of record and meet the written criteria.
3. That the effect of the delegated engineer's work on the overall project generally conforms with the intent of the engineer of record.

1.10 SHOP DRAWINGS:

- A. General: See Paragraph 3.12 of the General Conditions for provisions pertaining to shop drawings.
- B. Preparation of Shop Drawings: Submit newly prepared information drawn accurately to scale sufficiently large to show all pertinent features of the item and its method of connection to the Work. **Highlight, encircle, or otherwise indicate deviations from the Contract Documents. Do not reproduce Contract Documents or copy standard information as the basis of Shop Drawings.** Standard information prepared without specific reference to the Project is not a Shop Drawing. **Provide a space approximately 4 inches by 5 inches on the label or beside the title block on Shop Drawings to record the Architect's approval markings and recording action taken. Do not allow shop drawing copies without appropriate final review markings by the Architect or Engineer to be used in connection with the Work.**
- C. Identification: All submittals shall be clearly identified with the **name of the project, the supplier's name, the Contractor's name, and the location of material or equipment in the building. All shop drawings shall be dated and numbered.**
- D. Contractor's Review: Shop drawings submitted without evidence that they have been reviewed by the Contractor, as specified in Paragraph 3.12 of the General Conditions, or without proper identification as specified herein, will be returned to the Contractor without action by the Architect and shall be properly resubmitted. **When the phrase "by others" appears on a shop drawing, the Contractor shall indicate on the shop drawing who is to furnish the material or operation so noted, before submitting the drawing. By approving and submitting submittals, the Contractor represents that he has determined and verified all materials, field measurements, and field construction criteria related thereto, or will do so, and that he has checked and coordinated the information contained within such submittals with the requirements of the Work and of the Contract Documents.**
- E. Coordination of Submittals: Prior to submittal for Architect's review, use all means necessary to fully coordinate all material, including, but not limited to, the following procedures:
  1. Determine and verify all field dimensions and conditions, catalog numbers, and similar data.
  2. Coordinate as required with all Trades and with all public agencies involved.
  3. Secure all necessary approval from public agencies and others; signify by stamp or other means that all required approvals have been obtained.
  4. Clearly indicate, in writing, all deviations from the Contract Documents.  
Additional copies of approved shop drawings shall be furnished as required for coordination of the work of the various trades.
- F. Number of Shop Drawings Required:
  1. One (1) hard-copy print and one electronic file copy of the entire submittal, shall be submitted of each submittal. The hard-copy shall be bound as a single entity for each submittal. ALL information present in the hard-copy, and no information absent from the hard-copy, shall be contained in a single electronic file as a single submittal.

2. After the submittal has been reviewed and stamped, a copy of the electronic file will be kept at the office of the Architect, a copy of the electronic file will be kept at the office of the Engineer.
  3. One (1) reviewed copy of the electronic file will be returned to the Contractor, from which he shall make as many hard-copies as he feels is needed for the prosecution of the Work.
  4. The Architect will not furnish additional copies to the Contractor.
- G. Architect's Review of Submittals: The Architect/Engineer shall review and approve or take other appropriate action on the Contractor submittals, such as shop drawings, product data, samples and other data, which the Contractor is required to submit, but only for the limited purpose of checking for conformance with the design concept and the information shown in the Construction Documents. This review shall not include review of the accuracy or completeness of details, such as quantities, dimensions, weights or gauges, fabrication processes, construction means or methods, coordination of the work with other trades or construction safety precautions, all of which are the sole responsibility of the Contractor. The Architect/Engineer's review shall be conducted with reasonable promptness while allowing sufficient time in the Architect/Engineer's judgment to permit adequate review. Review of a specific item shall not indicate that the Architect/Engineer has reviewed the entire assembly of which the item is a component. The Architect/Engineer shall not be responsible for any deviations from the Construction Documents not brought to the attention of the Architect/Engineer in writing by the Contractor. The Architect/Engineer shall not be required to review partial submissions or those for which submissions of correlated items have not been received.
1. The Architect shall provide 2 reviews of submittals as part of the scope of work. Additional reviews required by failure of the Contractor to make indicated corrections or submit an acceptable product will be billed to the Contractor at the Architect's standard hourly rate.
- H. Time Required for Architect's Review: Shop drawings shall be submitted in time to allow **not less than two weeks for processing by the Architect, plus an additional week for submittals requiring review by an engineer including mechanical, electrical, structural and civil engineering or those items requiring review by a consultant such as kitchen equipment, detention facility equipment and/or acoustical consultants.**

1.11 PRODUCT DATA:

- A. General: See Paragraph 3.12 of the General Conditions for provisions pertaining to shop drawings.
- B. Collect the required data into one submittal for each material, product or system; and mark each copy to show which choices and options are applicable to the project. Include manufacturer's standard printed recommendations for application and use, compliance with standards, application of labels and seals, notation of field measurements which have been checked, and special coordination requirements. Maintain one set of product data (for project site, available for reference by the Architect, Engineer or others).
- C. The Architect will require a minimum of four (4) copies to be submitted of Product Data which has not been originally prepared on copyable material. The Architect will retain one copy, one copy will be retained by the Engineer and two copies will be returned to the Contractor. Therefore, if the Contractor desires more than two (2) copies with two copies returned to him, he must add to the minimum number of copies required to be submitted.
- D. Information not exclusively pertinent to the Project shall be deleted so that there is no possible area of confusion as to what product, series or model is to be examined. The Architect or Owner will not take responsibility for having examined a product that was not intended by the Contractor to be judged.

1.12 SAMPLES AND MOCKUPS:

- A. Samples and mockups shall faithfully represent the product or the assembly as it is proposed to be installed. This shall include, but not be limited to, materials, finishes, method of construction or assembly, relationship to adjacent construction, method of attachment to adjacent construction, plus any electrical or mechanical connection that are required for the product or assembly to function. Include "range" samples (not less than 3 units) where variations occur, and identify each unit of each set.
- B. All samples shall have a label or tab containing the required information firmly affixed thereto.
- C. Unless the precise color and pattern is specifically described in the Contract Documents, whenever a choice of color or pattern is available in specified product submit accurate color charts and pattern charts to the Architect for his review and selection. Provide full sets of optional samples where Architect's selection is required. Prepare samples to match the Architect's sample where so indicated. Include information with each sample to show generic description, source or product name and manufacturer, limitations, and compliance with standards.
- D. Samples and color charts shall be physical specimens of materials or colors proposed to be provided. Selections and approval of samples will be made by the Architect from these submitted samples and color charts, without increase in costs to the Owner or Architects. Should be Contractor desire a sample returned, he shall submit a sufficient number in order for the Architect to retain one (1) sample and return the remainder to the Contractor.
- E. In order for the Architect to make a color schedule as quickly as possible and to avoid delivery and pricing problems, the Contractor shall be required to submit all items that require a color selection within 40 days of the Notice to Proceed. Delivery and pricing problems that develop because an item was not submitted within the forty (40) day time limit, shall be the sole responsibility of the Contractor and not that of the Owner.
- F. The color selection on any one item will not be made until after samples of all items that require a color selection have been submitted.

1.13 ARCHITECT'S ACTION:

- A. The stamps of the Architect on returned shop drawings, product data and samples shall be interpreted as follows:
  - 1. Received: Acknowledges receipt. No action taken.
  - 2. Reviewed, No Exceptions Taken: No corrections. Proceed with the work.
  - 3. Furnish as Noted: May proceed with work as noted; shop drawings bearing this stamp must submit revised and resubmitted for record.
  - 4. Revise and Resubmit: No work shown shall be fabricated or furnished until shop drawings have been revised and resubmitted for further checking or approval.
  - 5. Rejected: Work shown is not in accordance with Contract requirements and is rejected. Make new submittals.
  - 6. Submit Specified Item: No substitutions permitted for this item. Make new submittals.

1.14 SUBMITTAL SCHEDULE:

- A. After development and acceptance of the Contractor's Construction Schedule, prepare a complete schedule of submittals. Submit the schedule within 10 days of the date required for submittal of the Contractor's Construction Schedule.
- B. Coordinate Submittal Schedule with the list of subcontracts, Schedule of Values, and the list of products as well as the Contractor's

- C. Prepare the schedule in chronological order. Provide the following information for each submittal.

Scheduled date for the first submittal.

Related Section Number

Submittal category (Shop Drawing, Product Data, or Sample)

Name of the subcontractor

Description of the part of the Work covered

Scheduled date for Architect's final release or approval.

- D. Following approval of initial submittal, print and distribute copies to the Architect, subcontractors, and other parties required to comply with submittal dates indicated. Post copies in the Project meeting room and field office.

- E. Revise the schedule monthly and issue the updated schedule concurrently with each Application and Certificate for Payment.

1.15 SUBMITTAL SEQUENCE:

- A. The right is reserved by the Architect to examine submittals and samples in a proper sequence that reflects the logical sequence of erection, installations, and proper assembly. Submittals of products or materials that are the responsibility of separate Trades yet must be assembled in conjunction one with another, shall be submitted at the same time so that they may be examined all together. Should these not be submitted simultaneously, the Architect reserves the right to hold one set while awaiting the arrival of other submittals.

- B. All submittals within the responsibility of one Trade must be submitted at one time together (i.e. millwork). Numerous submittals of one product or item of construction over a period of time is not acceptable. In the event of this occurrence, the Architect will hold the submittal data arriving first until the last of the material has arrived. Then, and only then, will he make his examination.

1.16 TIMING OF SUBMITTALS:

- A. Make all submittals far enough in advance of scheduled dates for installation to provide all required time for reviews, for securing necessary approvals, for possible revision and resubmittals, and for placing orders and securing delivery.

- B. Costs of delays occasioned by tardiness of submittals may be back-charged as necessary and shall not be borne by the Owner.

1.17 RECORD DRAWINGS:

- A. In addition to the record drawings specified in Paragraph 3.11 of the General Conditions, the Contractor shall assure that the record drawings for the mechanical, plumbing, fire protection and electrical work, as specified under Division 15 and 16 respectively, are properly maintained by his subcontractor and upon completion of the work shall deliver them to the Architect for the Owner.

1.18 CONTRACT CLOSE-OUT SUBMITTALS:

- A. As a precedent to final acceptance of the work and issuance of Certificate of Final Payment, including the Release of Retainage, certain submittals shall be made as specified in the various sections of the specifications. All such submittals shall be delivered to the Architect, in the form and number of copies specified, prior to or with the Contractor's request for final payment. Submittals shall include but not be limited to:

1. General Contractor's Affidavit, Waiver and Release of Lien Statements and Consent of Surety, to final payment **as well as release of lien statements from all subcontractors and major material suppliers** as specified in Subparagraph 9.10.2 of the General Conditions. **These documents shall be addressed to the Owner, and shall be**



**original signed documents and not reproduced copies. Two (2) sets of these drawings shall be submitted.**

2. Written guarantees and warranties as specified in the various other sections of the specifications.
3. Record drawings as specified in the General Conditions and in Divisions 15 and 16.
4. One copy of each final approved shop drawing submitted during the course of the project.
5. Three copies of operation and maintenance data for mechanical equipment and electrical equipment.
6. Letter stating that to the best of the Contractor's knowledge, no asbestos containing materials or other Work hazardous materials or products as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended
7. Contract Close-Out Submittals, except for record drawings, shall be submitted in commercial quality three ring binders with durable plastic covers. Identify the project on the face and side of the binders. Provide a cover sheet giving complete Project Title, Contractor's and Architect's name, address, phone number, name of project superintendent, and related general information. Include a Table of Contents to identify material in the Project Data Binders and a complete listing of subcontractors and material suppliers. Provide copies of all Certificates, Warranties and related documents as well as Product Data, Maintenance and Operation Data and related information required by the Contract Documents or furnished with items included in the Project. Two (2) sets of these documents shall be submitted.

End of Section

# Submittal Cover Sheet

Submittal No.: \_\_\_\_\_

Contractor: \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Date: \_\_\_\_\_

Phone: \_\_\_\_\_

Fax: \_\_\_\_\_

Project Manager: \_\_\_\_\_

Email: \_\_\_\_\_

Project Title: \_\_\_\_\_

Architect's Comm. No.: \_\_\_\_\_

Spec Section Title: \_\_\_\_\_

Section No.: \_\_\_\_\_

Sub / Supplier: \_\_\_\_\_

Phone: \_\_\_\_\_

YES  NO

**Product is as Specified**

**Contractor's Review Stamp**

If not as specified attach Substitution Request Form

Remarks: \_\_\_\_\_

\_\_\_\_\_  
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SECTION 01 35 00 – SPECIAL PROJECT PROCEDURES:

PART 1 GENERAL

1.01 PROGRESS SCHEDULE:

- A. In addition to the progress schedule required by the General Conditions, the Contractor shall also submit his proposed scheme of work for approval, describing proposed methods and sequences of work from beginning to completion of the work and their correlation with the Owner's requirements.
- B. When the Contractor's proposed sequence of work has been approved by the Owner, it shall become the time schedule for the work and shall be adhered to as closely as possible by both the Contractor and the Owner, except that mutually agreeable modifications may be made from time to time to meet unforeseen exigencies.

1.02 TIME OF PERFORMING WORK:

- A. Generally, the Contractor will be permitted to conduct his work in the building and on the premises during his regular working hours.
- B. The building must have the HVAC system operational and maintained at a constant temperature prior to installing any building finishes, except metal support systems.

1.03 OBSTRUCTIONS:

- A. All obstructions encountered during the construction of the Contract work shall be overcome by the Contractor by removal or alteration of work in place, by adjustments in the new work, or by temporary removal and reinstallation of existing work.

1.04 CLEANING UP:

- A. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- B. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- C. Exposed Surfaces in Finished Areas: Clean exposed surfaces
- D. Upon completion of the work, remove spots, stains, dirt, and dust from finished surfaces, both new and existing, including the surfaces of all existing machinery, equipment, and exposed piping that have been soiled by the construction. Protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- E. Clean and mop hard surface flooring and resilient flooring and vacuum clean carpet flooring
- F. Wash all glass and clean plumbing fixtures, lighting fixtures, and mechanical equipment.
- G. Comply with all special cleaning instructions contained in the various other sections of the specifications.
- H. Protect new and existing surfaces from the growth and spread of mold and mildew. If mold and mildew occur, notify Architect prior to proceeding. Retain qualified testing agency to document and direct remediation. Remediate or replace surfaces to stop the growth and spread of mold and mildew as deemed necessary by a qualified testing agency acceptable to the Contractor, Owner and Architect.
  - 1. Pay for necessary testing and perform all abatement work required to remedy condition.

1.05 INSPECTION OF WORK IN PLACE:

- A. The Contractor is responsible for scheduling times for inspections, tests, taking samples and similar activities. The architect is to be given advanced notification for inspection of Structural, Mechanical, Plumbing, and Electrical work prior to said work being covered.
- B. Contractor shall give architect advanced notification for final inspection punch list prior to Owner occupying space.

1.06 SMOKING AND FIRE PRECAUTIONS

- A. No fire, or use of any fire, or explosion-producing tools or equipment will be permitted on the property
- B. This facility is a designated non-smoking facility. Smoking will not be permitted in the facility or within 20 feet of any entrance.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

End of Section

SECTION 01 40 00 – QUALITY CONTROL

PART 1 GENERAL

1.01 Quality Control is defined as testing and inspection performed by/or under the direction of the Contractor to ensure materials and construction meet the requirements of the Contract Documents and Specifications.

1.02 QUALITY CONTROL:

A. Quality Control tests and inspections consist of items identified in the Contract Documents and Specifications.

1.03 TESTS:

A. Engage inspection and test service agencies, including independent testing laboratories, which comply with “Guidelines for Effective Practice for Materials Engineering Laboratories” by the American Council of Independent Laboratories, and which specialize in the types of inspections and tests to be performed.

B. Tests required to establish compliance with the Contract requirements for quality control shall be made by a testing agency acceptable to the Contractor, the Owner and the Architect with reports certified by the laboratory and furnished in duplicate to the Architect with a copy to the Contractor.

C. Representatives of the testing agency and monitoring shall have access to the work at all times. The Contractor shall provide facilities for such access and samples as necessary so that the testing agency may properly perform its function.

D. Report Data: Written reports of each inspection, test or similar service shall include, but not be limited to the following:

Name of testing agency or testing laboratory.

Dates and locations of samples and test or inspections.

Names of individuals making the inspection or test.

Complete inspection or test data.

Test results

Interpretations of test results.

Notation of significant ambient conditions at the time of sample taking and testing.

Comments or professional opinion as to whether inspected or tested work complies with requirements of the contract documents.

Recommendations on retesting, if applicable.

E. Non-Compliant Inspection/Test Results: Within 24 hours of inspection/test being performed, notify Architect/Engineer of-Record, and the Contractor of any non-conforming/non-compliant inspections/tests. Copies of successful retests of the originally non-conforming/non-compliant work shall be submitted to the Architect/Engineer-Of-Record and the Contractor.

F. Project Closeout: the Contractor shall certify to the Architect of Record that the required quality control services, as required by this section and the contract documents have been performed and that all results indicate compliance with requirements.

1.04 COST OF TESTS:

A. The cost of the services of the testing agency and monitoring shall be paid by the Contractor. When the tests indicate noncompliance with the Contract requirements, any subsequent and retesting occasioned by noncompliance shall be performed by the same testing agency and the costs shall be borne by the Contractor.

1.05 NOTIFICATIONS OF THE ARCHITECT:

- A. Notify architect within 24 hours before any work is completed for areas as described herein. If the architect is not notified as stated above and the contractor proceeds with the work, the architect shall have authority to direct the contractor to remove part or all of the installed materials at the contractor's expense for a detailed observation.
- B. The Architect shall be notified at the following points of work:
  - 1. Footing bottoms and concrete reinforcement prior to pouring any concrete.
  - 2. Waterproofing/Damp-proofing prior to any backfilling work.
  - 3. Water drainage test on sloped concrete floors prior to finish floor materials installed.
  - 4. Thru-wall flashing installation and mortar mix prior to installing any masonry.
  - 5. Completed structural steel erection before floor slabs are poured.
  - 6. Mechanical and Electrical systems above ceiling inspection prior to installation of finish ceiling material.
- C. The respective contractor and/or subcontractor shall correct any deficiencies that may be observed. Construction work observations or lack thereof by the architect does not relieve the contractor and/or subcontractor from any liability of faulty workmanship that may have occurred or may occur at a later date.

1.06 OTHER TESTS:

- A. See provisions of the General Conditions regarding tests required by governing authorities.
- B. The provisions of Divisions 22-23 and 26 for tests required for mechanical and electrical work.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

3.01 REPAIR AND PROTECTION:

- A. Upon completion of inspection, testing, sample taking, and similar services, repair damaged work and restore substrates and finishes to eliminate all deficiencies. Repair and protection is the Contractor's responsibility, regardless of the assignment of responsibility for inspection, testing, or similar services.

End of Section

## SECTION 01 50 00 – CONSTRUCTION FACILITIES AND TEMPORARY CONTROLS

### PART 1 GENERAL

#### 1.01 UTILITIES SERVICES FOR CONSTRUCTION PURPOSES:

- A. The Contractor shall provide all necessary temporary utilities as required for construction purposes. The utility costs will be paid by the Contractor.
- B. The Contractor shall furnish and install all temporary piping and wiring required for the use of these services during construction and upon completion of the work shall remove such temporary piping and wiring.
- C. The use of existing services shall be in such a manner and by such methods that will not interrupt the services to any of the Owner's facilities that are to remain in operation during construction.

#### 1.02 BARRICADES AND SPECIAL CONTROLS:

- A. Provide temporary barriers, fences, and warning signs around the sites of new buildings to control access of unauthorized persons to work areas, and as required by law. Special care shall be taken to provide adequate barriers and warning signs to prevent access of unauthorized persons to work areas where hazardous work is being performed.
- B. Provide temporary barriers and warning signs at excavations that might be left open during nonworking hours, including warning lights at night.

#### 1.03 CONSTRUCTION AIDS:

- A. Provide necessary staging, scaffolding, and hoisting equipment and temporary walkways and ladders required for installation of the work under the Contract.

#### 1.04 TEMPORARY BUILDINGS:

- A. Provide temporary field office and storage sheds as required to carry on the work. Adequate space shall be provided in the field office for convenient use and storage of Contract Drawings and Specifications, approved shop drawings, samples, and field records. Truck trailers may be used for temporary field office and storage enclosures.
- B. Upon completion of the work, all temporary buildings shall be removed and the area of the site that they occupied shall be restored to its condition at the commencement of work under the Contract.

#### 1.05 SANITARY FACILITIES:

- A. Provide adequate temporary toilet facilities for the use of workmen, conforming to applicable laws, ordinances, and governmental regulations.
- B. Upon completion of the work, temporary toilet facilities shall be removed from the site.
- C. Provide temporary sanitary facilities for use of the Building Occupants during the course of construction during time existing sanitary facilities have been removed from service and before new facilities are available for use of building occupants.
  - 1. Provide separate portable toilets for men and women.
    - a. Service portable toilets weekly at a minimum during the time they are in service.

#### 1.06 TEMPORARY ENCLOSURES:

- A. Provide temporary weathertight closures for all exterior openings after walls and roof of the new building are constructed when it is necessary to protect the work from the weather and to permit the use of temporary heat. Provide weathertight and security protection of the existing building until what time as the new construction is able to provide weathertightness and security. Provide safety barriers as required to protect the occupants of the building.
- B. Water Protection: Provide at all items for protection of excavation, trenches, and building from damage by rain water, spring water, ground water, backing up of drains or sewers, and all other water. Provide all pumps, equipment, temporary drains or dams, and enclosures necessary to provide this protection.

1.07 TEMPORARY HEAT AND VENTILATION:

- A. Provide temporary heat and ventilation as necessary for protection and drying out of the work and to allow work to be prosecuted in cold weather.
- B. Heat shall be provided by means of approved temporary heating equipment which in installation and operation will not damage the work. Provide adequate and proper fuels and all services required to furnish heat as required. Salamanders shall not be used inside the building. Heaters used to dry out or protect freshly placed concrete shall be of a type and shall be so ventilated as to prevent carbon dioxide from damaging concrete.
  - 1. After the construction of the building has reached a point where the permanent heating and cooling systems are operable, the Contractor may use the permanent heating and cooling equipment for temporary heating and cooling. The heating and cooling systems shall not be used for temporary heat and cooling until the building is broom clean and shall not be used without all filters in place. Upon the completion of the work, all ducts and equipment shall be internally cleaned and all filters shall be replaced with new filters.
    - a. If permanent HVAC system for temporary use during construction is used, provide filter with MERV of 8 at each return-air grille in system and remove at end of construction and clean HVAC system as required in Section 01 77 00.
  - 2. Contractor shall pay the hourly rate of the Engineer's and Testing and Balancing Agent's technical personnel to observe and document the condition of equipment and ductwork (30 minutes average per unit) used for construction term temporary heating and cooling. Engineers inspection of heat transfer coils must be complete prior to start-up, test and balance, and final acceptance. All warranties shall begin upon final acceptance by the Owner, not beneficial usage by the Contractor.
- C. Costs of providing temporary heat shall be borne by the Contractor.

1.08 BULLETIN BOARD AND JOB SIGN:

- A. On or near the field office, the Contractor shall install a bulletin board upon which to post legally required notices. The bulletin board shall be of adequate size to contain all required notices and be so constructed as to protect the postings from obliteration by the weather.
- B. The Architect shall provide one painted sign stating the Architect (Michael Brady Inc.). Location of sign shall be as directed by the Architect. The Contractor shall erect a substantial wood frame to support the sign provided by the Architect.
- C. Maintain all bulletin boards and job signs in good condition from start to completion of the work.

1.09 RODENT AND VERMIN CONTROL:



- A. Provide on the project site ample and suitable refuse containers with covers. The Contractor shall be responsible for containing and removing from the site all refuse from meals eaten on the site and other rodent or vermin attracting refuse.
- B. During the construction period precaution shall be taken as necessary to control the entry and breeding of rodents and vermin in the new building.
- C. If, within three months after occupancy of the building, the building is found to be infested by rodents or vermin, the Contractor shall bear the cost of extermination.

1.10 REMOVAL OF CONSTRUCTION DEBRIS:

- A. Provide suitable containers for and maintain regular a regular schedule for the removal of debris and rubbish from the construction site and surrounding area.
- B. Pay all container rental fees, hauling, and landfill costs associated with the removal of debris and rubbish from the site.

1.11 PROTECTION:

- A. Weather Protection: Provide at all times protection against rain, wind, storms, frost, or heat so as to maintain all work, materials, equipment and fixtures free from injury or damage. At end of days work, all new work likely to be damaged by weather conditions shall be covered.
- B. Water Protection: Provide at all times protection of excavation, trenches, and building from damage by rain water, spring water, ground water, backing up of drains or sewers, and all other water. Provide all pumps, equipment, temporary drains or dams, and enclosures necessary to provide this protection.
- C. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
- D. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
  - 1. Comply with work restrictions specified in Section 011000 "Summary."
- E. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings, requirements of 2003 EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent.
  - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
  - 2. Inspect, repair, and maintain erosion- and sedimentation-control measures during construction until permanent vegetation has been established.
  - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from Project site during the course of Project.
  - 4. Remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.

1.12 TELEPHONE:

- A. Install a single party telephone or a cellular phone and a facsimile machine or computer capable of sending and receiving email in the field office. The telephone shall be available for use by all persons concerned with the construction of the project and service shall be maintained from start to completion of the work. The cost of the telephone service shall be paid by the Contractor.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

End of Section

SECTION 01 60 00 – PRODUCT REQUIREMENTS:

PART 1 GENERAL

1.01 STORAGE OF MATERIALS AND EQUIPMENT:

- A. Storage of materials and equipment, location of field office, space for truck deliveries and parking of workmen's cars shall be restricted to areas of the site mutually agreed upon by the Contractor and the Owner prior to commencement of construction.
- B. Storage of materials and equipment and truck deliveries shall not interfere with normal pedestrian and vehicular traffic.
- C. Upon completion of the work, all damage to existing ground cover, paving, site improvements, or existing structures resulting from the storage of materials and equipment, construction vehicular traffic, or other construction operations under the Contract shall be repaired by the Contractor to its condition at commencement of work under the Contract.

1.02 PROTECTION OF MATERIALS AND EQUIPMENT:

- A. Material and equipment stored on the site that are to be incorporated in the work shall be adequately protected from damage by the weather or by construction operations.
- B. Materials subject to damage by water shall be blocked off the ground and protected with waterproof coverings, stored in weathertight floored sheds or in the building after it is enclosed.
- C. Material that is subject to damage by soiling or by exposure shall be stored as to prevent physical damage to the materials and equipment.
- D. Materials and equipment shall be so transported, handled, and stored as to prevent physical damage to the materials and equipment.

1.03 SUBSTITUTIONS:

- A. All materials and equipment incorporated in the work shall be new and as specified, except such substitutions that are approved as provided by the provisions for substitutions set forth in the Supplementary Conditions.
- B. Where substitutions are implemented, the Contractor shall be responsible for insuring that:
  - 1. The proposed substitution does not affect dimensions shown on Drawings.
  - 2. He will pay for changes to the building design, including engineering design, detailing, and construction costs caused by the requested substitution.
  - 3. The proposed substitution will have no adverse affect on other trades, the construction schedule, or specified warranty requirements.
  - 4. Maintenance and service parts will be locally available for the proposed substitution.

PART II PRODUCTS

NOT USED

PART III EXECUTION

NOT USED

End of Section

## SECTION 01 73 29 - CUTTING AND PATCHING

### PART 1 GENERAL

#### 1.01 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.02 SUMMARY

- A. This Section includes procedural requirements for cutting and patching.
- B. Related Sections include the following:
  - 1. Section "02 41 16 Demolition" for demolition of selected portions of the building.
  - 2. Divisions 02 through 49 Sections for specific requirements and limitations applicable to cutting and patching individual parts of the Work.
  - 3. Division 07 Section "Firestopping" for patching fire-rated construction.

#### 1.03 DEFINITIONS:

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other Work.
- B. Patching: Fitting and repair work required to restore surfaces to original conditions after installation of other Work.

#### 1.04 SUBMITTALS:

- A. Cutting and Patching Proposal: Submit a proposal describing procedures at least **10** days before the time cutting and patching will be performed, requesting approval to proceed. Include the following information:
  - 1. Extent: Describe cutting and patching, show how they will be performed, and indicate why they cannot be avoided.
  - 2. Changes to In-Place Construction: Describe anticipated results. Include changes to structural elements and operating components as well as changes in building's appearance and other significant visual elements.
  - 3. Products: List products to be used and firms or entities that will perform the Work.
  - 4. Dates: Indicate when cutting and patching will be performed.
  - 5. Utility Services and Mechanical/Electrical Systems: List services/systems that cutting and patching procedures will disturb or affect. List services/systems that will be relocated and those that will be temporarily out of service. Indicate how long services/systems will be disrupted.
  - 6. Structural Elements: Where cutting and patching involve adding reinforcement to structural elements, submit details and engineering calculations showing integration of reinforcement with original structure.

7. Architect's Approval: Obtain approval of cutting and patching proposal before cutting and patching. Approval does not waive right to later require removal and replacement of unsatisfactory work.

1.05 QUALITY ASSURANCE:

- A. Structural Elements: Do not cut and patch structural elements in a manner that could change their load-carrying capacity or load-deflection ratio.
- B. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operating elements include the following:
  1. Primary operational systems and equipment.
  2. Air or smoke barriers.
  3. Fire-suppression systems.
  4. Mechanical systems piping and ducts.
  5. Control systems.
  6. Communication systems.
  7. Conveying systems.
  8. Electrical wiring systems.
  9. Operating systems of special construction in Division 13 Sections.
- C. Miscellaneous Elements: Do not cut and patch miscellaneous elements or related components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that result in increased maintenance or decreased operational life or safety.
  1. Water, moisture, or vapor barriers.
  2. Membranes and flashings.
  3. Exterior curtain-wall construction.
  4. Equipment supports.
  5. Piping, ductwork, vessels, and equipment.
  6. Noise- and vibration-control elements and systems.
- D. Visual Requirements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch construction exposed on the exterior or in occupied spaces in a manner that would, in Architect's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.

1.06 WARRANTY:

- A. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during cutting and patching operations, by methods and with materials so as not to void existing warranties.

## PART 2 PRODUCTS

### 2.01 MATERIALS:

- A. General: Comply with requirements specified in other Sections.
- B. In-Place Materials: Use materials identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
  - 1. If identical materials are unavailable or cannot be used, use materials that, when installed, will match the visual and functional performance of in-place materials.

## PART 3 EXECUTION

### 3.01 EXAMINATION:

- A. Examine surfaces to be cut and patched and conditions under which cutting and patching are to be performed.
  - 1. Compatibility: Before patching, verify compatibility with and suitability of substrates, including compatibility with in-place finishes or primers.
  - 2. Proceed with installation only after unsafe or unsatisfactory conditions have been corrected.

### 3.02 PREPARATION:

- A. Temporary Support: Provide temporary support of Work to be cut.
- B. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- C. Adjoining Areas: Avoid interference with use of adjoining areas or interruption of free passage to adjoining areas.
- D. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

### 3.03 PERFORMANCE:

- A. General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
  - 1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.

1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots as small as possible, neatly to size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
  2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
  3. Concrete or Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
  4. Excavating and Backfilling: Comply with requirements in applicable Division 31 Sections where required by cutting and patching operations.
  5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
  6. Proceed with patching after construction operations requiring cutting are complete.
- C. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other Work. Patch with durable seams that are as invisible as possible. Provide materials and comply with installation requirements specified in other Sections.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate integrity of installation.
  2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will eliminate evidence of patching and refinishing.
    - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
    - b. Restore damaged pipe covering to its original condition.
  3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance.
    - a. Where patching occurs in a painted surface, apply primer and intermediate paint coats over the patch and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
  4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
  5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition.
- D. Cleaning: Clean areas and spaces where cutting and patching are performed. Completely remove paint, mortar, oils, putty, and similar materials.

End of Section

SECTION 01 77 00 – CONTRACT CLOSEOUT:

PART 1 GENERAL

1.01 SECTION INCLUDES:

- A. Closeout procedures.
- B. Owner's Operating Instruction Session.
- C. Adjusting.
- D. Operation and Maintenance Data.
- E. Project record documents.
- F. Warranties

1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBSTANTIAL COMPLETION:

- A. Notify the owner not less than twenty-one (21) days prior to the date of substantial completion to allow notification of tenants.
- B. Submit written certification to Architect that Project, or designated portion of Project, is substantially complete. Include a list of items to be completed or corrected as a result of his inspection of the work.
- C. Submit the Certificate of Occupancy issued by the local building authority to the Architect for forwarding to the Owner.
- D. The Architect will make an inspection within seven (7) days after receipt of certification, together with Owner's Representative.
- E. Should the Architect consider the work substantially complete:
  - 1. The Contractor shall prepare, and submit to the Architect, a list of items to be completed or corrected, as determined by the Architect's inspection.
  - 2. The Architect will prepare and issue a certificate of substantial completion, AIA document G704, complete with signatures of Owner, Contractor, and Architect, accompanied by Contractor's list of items to be completed or corrected, as verified and amended by the Architect.
  - 3. The Owner will occupy the project, under provisions stated in certificate of substantial completion.
  - 4. The Contractor will complete work listed for completion or correction, within the designated time.
  - 5. Refer to Supplementary Conditions Article 9.10.6 for failure to complete in a timely manner.
- F. Should the Architect consider that the Work is not Substantially Complete:



1. He shall immediately notify Contractor, in writing stating reasons.
2. The Contractor shall complete the Work, and send second written notice to the Architect, certifying that the project or designated portion of project, is substantially complete.
3. The Architect will reinspect the work at the Contractor's expense.

1.04 OWNER'S OPERATING INSTRUCTION SESSION:

- A. Conduct training session for Owner's designated personnel covering various mechanical, electrical, and other operating features for familiarization with the physical plant equipment and operation. One copy of the required (see various technical sections on project closeout) mechanical operations manual shall be on hand during this session along with the mechanics familiar with all equipment. These mechanics shall have on hand such tools and/or equipment to reveal controls and mechanic access areas. The instruction session shall be scheduled for a full day but in no case less than the minimum time required to review each type of equipment/operation. The minimum areas of instruction shall be:
1. Location and operation of project site water valves, meters and other operational equipment.
  2. Location and operation of project electrical disconnects.
  3. Operation of sewage handling facilities.
  4. Sprinkler valves, alarms, test and operation.
  5. Project landscape irrigation operation.
  6. Project Site lighting operation/maintenance.
  7. Storm sewer operation/configuration.
  8. Refuse containment areas.
  9. Roof maintenance/warranty considerations. Traffic cautions.
  10. HVAC unit operations/maintenance (filters and thermostats, boiler and/or cooling tower maintenance).
  11. Interior lighting, lamp and ballast replacement.
  12. Keying and lock operations.
  13. Locations and use of required replacement finish materials such as floor and ceiling tiles and panels.
  14. Notification procedures for Contractor warranty work.
- B. Video Tape Owner's Instruction Session and provide two (2) copies on DVD to Owner as part of Close Out Documentation.

1.05 CLOSEOUT PROCEDURES AT FINAL COMPLETION:

- A. As a precedent to final acceptance of the work and issuance of Certificate of Final Payment, including the Release of Retainage, certain submittals shall be made as specified in the various sections of the specifications. All such submittals shall be delivered to the Architect, in the form and number of copies specified, prior to or with the Contractor's request for final payment. Submittals shall include but not be limited to:

1. General Contractor's Affidavit, Waiver and Release of Lien Statements and Consent of Surety, to final payment as well as release of lien statements from all subcontractors and major material suppliers as specified in Subparagraph 9.10.2 of the General Conditions. These documents shall be addressed to the Owner, and shall be original signed documents and not reproduced copies. Two (2) sets of these drawings shall be submitted.
  2. Written guarantees and warranties as specified in the various other sections of the specifications.
  3. Record drawings as specified in the General Conditions and in Divisions 15 and 16.
  4. One copy of each final approved shop drawing submitted during the course of the project.
  5. Three copies of operation and maintenance data for mechanical equipment and electrical equipment.
  6. Letter stating that to the best of the Contractor's knowledge, no asbestos containing materials or other Work hazardous materials or products as currently defined in the Resource Conservation and Recovery Act of 1976 (RCRA), the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), or Environmental Protection Agency (EPA) regulations, rules, or requirements, as amended
  7. Contract Close-Out Submittals, except for record drawings, shall be submitted in commercial quality three ring binders with durable plastic covers. Identify the project on the face and side of the binders. Provide a cover sheet giving complete Project Title, Contractor's and Architect's name, address, phone number, name of project superintendent, and related general information. Include a Table of Contents to identify material in the Project Data Binders and a complete listing of subcontractors and material suppliers. Provide copies of all Certificates, Warranties and related documents as well as Product Data, Maintenance and Operation Data and related information required by the Contract Documents or furnished with items included in the Project. Two (2) sets of these documents shall be submitted.
- B. Submit written certification that the Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for final inspection by Owner and Architect.
- C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments and sum remaining due.

1.06 WARRANTIES:

- A. Provide notarized copies.
- B. Execute and assemble transferable warranty documents from Subcontractors, suppliers, and manufacturers.
- C. Provide Table of Contents and assemble in three D side ring binders with durable plastic covers. Note: This is in addition to copies of warranties provided with operation and maintenance binders.
- D. Submit prior to final Application for Payment.
- E. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within ten (10) days after acceptance, listing date of acceptance as warranty period.

1.07 SPARE PARTS AND MAINTENANCE MATERIALS

- A. Provide products, spare parts, maintenance and extra materials in quantities specified in individual specification sections.
- B. Deliver to Project site and place in location as directed, obtain receipt prior to final payment.

End of Section

## SECTION 01 77 10 – CLEANING

### PART 1 GENERAL

#### 1.01 DESCRIPTION

- A. Work Included: Throughout the construction period, maintain the roof buildings and site in a standard of cleanliness as described in this section.
- B. Related Work Described Elsewhere: In addition to standards described in this section, comply with all requirements for cleaning up as described in various other sections of these specifications.

#### 1.02 QUALITY ASSURANCE

- A. Inspection: Conduct inspection daily, and more often if necessary, to verify that requirements for cleanliness are being met.

### PART 2 PRODUCTS

#### 2.01 CLEANING MATERIALS AND EQUIPMENT

- A. Provide all required personnel, equipment, and materials needed to maintain the specified standard of cleanliness.

#### 2.02 COMPATIBILITY

- A. Use only cleaning materials and equipment that are compatible with the surface being cleaned, as recommended by the manufacturer of the material or as approved by the A/E.

### PART 3 EXECUTION

#### 3.01 PROGRESS CLEANING

##### A. General:

1. Retain all stored items in an orderly arrangement allowing maximum access, not impeding drainage or traffic, and providing the required protection of materials.
2. Do not allow the accumulation of scrap, debris, waste material, and other items not required for the construction of this work.
3. At least once a day and more often if necessary, completely remove all scrap, debris, and waste material from the job site.
4. Provide adequate storage for all items awaiting removal from the job site, observing all requirements for fire protection and protection of the ecology.

##### B. Site:

1. Daily and more often if necessary, inspect the site and pick up all scrap, debris, and waste material. Remove all such items to the place designated for their storage.
2. Weekly, and more often if necessary, inspect all arrangements of materials stored on the site. Restock, tidy, or otherwise service all arrangements to meet the requirements of 3.01.A.1, above.
3. Maintain the site in a neat and orderly condition at all times. Use a magnet to remove small metal objects such as nails, fasteners, etc.

##### C. Structures:

1. The Contractor will be responsible for maintaining the existing level of cleanliness on any interior areas used by subcontractors or employees.

End of Section

## SECTION 01 77 23 – FINAL CLEANING

### PART 1 GENERAL

#### 1.01 GENERAL:

- A. General cleaning of construction debris is required by General Conditions and included in Section 01 77 10 Cleaning.

#### 1.02 CLEANING:

- A. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to the condition expected in a normal, 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.
  - 1. Remove labels that are not permanent labels.
  - 2. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compound and other substances that are noticeable vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials.
  - 3. Clean exposed exterior and interior hard-surfaced finishes to a dust-free condition, free of stains, films and similar foreign substances. Restore reflective surfaces to their original reflective condition. Leave concrete floors broom clean. Vacuum carpeted surfaces. Mop and polish resilient flooring.
  - 4. Wipe surfaces of mechanical and electrical equipment. Remove excess lubrication and other substances. Clean plumbing fixtures to a sanitary condition. Clean light fixtures and lamps.
  - 5. Not more than 4 days before date scheduled for final inspection, clean flooring according to manufacturer's recommendations. Strip protective floor polish that was applied after completing installation only if required to restore polish finish and if recommended by flooring manufacturer. After cleaning, reapply polish to floor surfaces to restore protective floor finish and buff according to flooring manufacturer's written recommendations. Coordinate with Owner's custodial personnel and use Owner's selected materials for sealing and polishing floors.
  - 6. Clean the site, including landscape development areas, of rubbish, litter and other foreign substances. Sweep paved areas broom clean; remove stains, spills and other foreign deposits. Rake grounds that are neither paved nor planted, to a smooth even-textured surface.

#### 1.03 REMOVAL OF PROTECTION:

- A. Remove temporary protection and facilities installed for protection of the Work during construction.

#### 1.04 COMPLIANCE:

- A. Comply with regulations of authorities having jurisdiction and safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on the Owner's property. Do not discharge volatile, harmful or dangerous materials into drainage systems. Remove waste materials from the site and dispose of in a lawful manner.

- B. Where extra materials of value remaining after completion of associated Work have become the Owner's property, arrange for disposition of these materials as directed.

PART 2 PRODUCTS

NOT USED

PART 3 EXECUTION

NOT USED

End of Section

## SECTION 02 41 16 – DEMOLITION

### PART I GENERAL

#### 1.01 GENERAL:

- A. Obtain all required demolition permits from the local jurisdiction.
- B. Do all demolition work required to remove existing masonry walls, paving, foundations, concrete slabs, existing underground piping, conduit, building finishes, doors, windows and any other necessary items to install the new work.
- C. Contractors submitting proposals shall determine the quantities of demolition work required by personal observation at the building and on the site.
- D. Occupancy: The Owner may occupy any existing facilities adjacent to areas of selective demolition. Conduct selective demolition work in a manner that will minimize need for disruption of the Owner's normal operations. Provide minimum of 72 hours advance notice to the Owner of demolition activities that will impact normal operations at any facility
- E. Condition of Structures: Every effort has been made to indicate existing site improvement and building conditions on the drawings, however, Owner assumes no responsibility for actual condition of items or structures to be demolished.
  - 1. Conditions existing at time of commencement of the contract will be maintained by the Owner insofar as practicable.
- E. Partial Demolition and Removal: Items indicated to be removed, but of salvageable value to Contractor, may be removed as work progresses. Transport salvaged items from site as they are removed. Items indicated to be removed and reused shall remain the property of the Owner.
  - 1. Storage or sale of removed items on the site will not be permitted.
- F. Protections: Provide temporary barricades and other forms of protection as required to protect The Owner's personnel and general public from injury due to selective demolition work.
  - 1. Provide protective measures as required to provide free and safe passage of Owner's personnel and general public to and from occupied portions of existing buildings.
  - 2. Protect from damage existing finish work that is to remain in place and becomes exposed during demolition operations.
  - 3. Protect existing floors with suitable coverings when necessary.
  - 4. Construct temporary insulated solid dustproof partitions where required to separate areas where noisy or excessive dirt or dust operations are performed. Equip partitions with dustproof doors and security locks if required.
  - 5. Provide temporary weather protection during interval between demolition and removal of existing construction on exterior surfaces and installation of new construction to ensure that no water leakage or damage occurs to structure or interior areas of existing building.
  - 6. Remove protections at completion of work.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A. Submit a demolition schedule to the Architect prior to execution of the work. Indicate proposed methods and sequence of operations. Include proposal for control of dust and noise, and coordination for shut-off, capping, and continuation of utility services.
- B. Submit schedule indicating proposed sequence of operations for selective demolition work to Architect for review prior to start of work. Include coordination for shutoff, capping and continuation of utility services as required, together with details for dust and noise control.
  - 1. Provide detailed sequence of demolition and removal work to ensure uninterrupted progress of Owner's on-site operations.

1.04 JOB CONDITIONS:

- A. Maintain temporary barricades for protection of job personnel and the public. Remove barricades when no longer required.
- B. Promptly repair any damages caused by demolition work, at no extra cost to the Owner.
- C. Conduct operations in such a manner as to minimize interference with use of public ways and adjacent used facilities. Do not close, block or otherwise obstruct use of public ways or facilities without written consent of authorities having jurisdiction. Provide alternate routes to closed or obstructed facilities as required by local regulations.

1.05 EXPLOSIVES:

- A. The use of explosives is not required by the scope of the work and is strictly prohibited.

1.06 UTILITY SERVICES:

- A. Existing utilities indicated to remain shall be kept in service and protected from damage during demolition operations.
- B. Do not interrupt existing utilities serving used or occupied facilities unless authorized in writing by authorities having jurisdiction. If interruption is allowed, provide alternate temporary services acceptable to governing authorities.
  - 1. Do not interrupt utilities serving occupied or used facilities, except when coordinated and authorized by the Owner. Provide temporary services during interruptions to existing facilities, as acceptable to the Owner
  - 2. Maintain fire protection services during selective demolition operations.

1.07 ENVIRONMENTAL CONTROLS:

- A. To the greatest extent practicable, limit the spread of dust and dirt through the use of water sprinkling, enclosures and other suitable methods. Comply with governing regulations with respect to environmental protection.
  - 1. Do not use water when it may create hazardous or objectionable conditions such as ice, flooding, and pollution.

PART II 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 ANSI/ASSE A10.6 and NFPA 241.



### PART III EXECUTION:

#### 3.01 PREPARATION:

- A. Inspection: Prior to commencement of selective demolition work, inspect areas in which work will be performed. Photograph existing conditions of structure surfaces, equipment, or surrounding properties that could be misconstrued as damage resulting from selective demolition work; file with Architect prior to starting work.
- B. Erect and maintain dust-proof partitions and closures as required to prevent spread of dust or fumes to occupied portions of the building.
- C. Locate, identify, shut off, cap, and disconnect utilities indicated to be removed.
  - 1. Provide by-pass connections as required to maintain services to adjacent properties and facilities.
  - 2. Provide a minimum of 72 hours advance notice to the Owner if shut-down of services is required during change-over.

#### 3.02 DEMOLITION:

- A. Perform demolition work in a systematic manner. Use such methods as necessary to perform work indicated on drawings and in compliance with schedule and governing authorities.
  - 1. Demolish concrete and masonry in small sections. Cut concrete and masonry at junctures with construction to remain using power-driven masonry saw or hand tools. Do not use power-driven impact tools unless coordinated with and approved by the Owner so as to not disrupt the Owner's regular operations due to excessive noise and vibration.
- B. If unanticipated mechanical, electrical, or structural elements that conflict with intended function or design are encountered, investigate and measure both nature and extent of conflict. Submit report to Architect in written, accurate detail. Pending receipt of directive from Architect, rearrange selective demolition schedule as necessary to continue overall job progress without delay.
- C. Provide effective safeguards against air & water pollution in compliance with governing authorities.
- D. Completely fill below-grade depressions and voids with approved fill materials free of roots, stones larger than 3" in diameter, and other deleterious or organic substances.

#### 3.03 SALVAGE & DISPOSAL:

- A. Historic artifacts, including cornerstones, their contents, commemorative plaques and tablets, antiques, and other articles of historic significance shall remain the property of the Owner. Notify Owner's representative if such articles are encountered; obtain approval regarding method of removal. Salvage such articles and turn over to Owner.
- B. Remove debris, rubbish, and other substances from the site. Legally transport and dispose of such materials off-site in a permitted disposal facility. Provide documentation that provides record of the permitted landfill where the demolition material has been disposed.
- C. If hazardous materials are encountered, comply with applicable regulations in handling, removing, and protecting against exposure or environmental pollution.
- D. Burning of removed materials on the project site is forbidden.

End of Section

## SECTION 03 30 00 – CONCRETE WORK

### PART I GENERAL

#### 1.01 SCOPE:

- A. The extent of concrete work is shown on the drawings.

#### 1.02 SUBMITTALS:

- A. Submit manufacturer's product data with application and installation instructions for proprietary materials and items, including reinforcement and forming accessories, admixtures, patching compounds, waterstops, joint systems, curing and sealing compounds, and others requested by the Architect.
- B. Submit shop drawings for fabrication, bending, and placement of concrete reinforcement. Comply with the ACI 315, Details and Detailing of Concrete Reinforcement, showing bar schedules, stirrup spacing, diagrams of bent bars, and arrangement of concrete reinforcement. Show on the shop drawings special reinforcement required and openings through concrete structures.
- C. Submit two (2) copies of laboratory test reports with standard deviation analysis or trial batch data. All concrete materials shall be listed.

#### 1.03 QUALITY ASSURANCE:

- A. Comply with the provisions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified.
  - 1. ACI 301, Specifications for Structural Concrete for Buildings
  - 2. ACI 302, Guide for Concrete Floor and Slab Placement
  - 3. ACI 304, Recommended Practice for Measuring, Mixing, Transporting, and Placing Concrete
  - 4. ACI 305, Hot Weather Concreting
  - 5. ACI 306, Cold Weather Concreting
  - 6. ACI 315, Detailing Manual
  - 7. ACI 318, Building Code Requirements for Reinforced Concrete
  - 8. ACI 347, Recommended Practice for Concrete Formwork
  - 9. CRSI Manual of Standard Practice
  - 10. ACI 211.1 Standard Practice for Selecting proportions for Normal, Heavyweight, and Mass Concrete.
  - 11. ACI 211.2 - Standard Practice for Selecting Proportions for Structural Lightweight Concrete.
- B. The Contractor is responsible for correcting concrete work that does not conform to the specified requirements, including requirements for strength, tolerances, and finishes.

#### 1.04 QUALITY CONTROL AND TESTING:

- A. Materials and operations shall be inspected and tested as work progresses. Failure to detect defective work shall not prevent rejection when defect is discovered, nor shall it obligate the Owner for final acceptance.
- B. If indicated as required by Section 01 40 00 and/or 01 45 00, Special Inspectors shall meet the "Qualifications Standards of Inspectors and Testing Technicians" noted in the Statement of Special Inspections.
- C. Testing agencies shall meet the requirements of "Standard Recommended Practice for Inspection and Testing Agencies for Concrete, Steel, and Bituminous Materials as Used in Construction," ASTM E 329.

D. The following testing service shall be performed by the designated party identified in Sections 01 40 00 and/or 01 45 00.

1. Secure composite samples in accordance with "Standard Method of Sampling Fresh Concrete," ASTM C 172.
2. Mold and cure three specimens from each test required in accordance with "Standard Method of Making and Curing Concrete Test Specimens in the Field," ASTM C 31.
3. Test specimens in accordance with "Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens," ASTM C 39. Two specimens shall be tested at 28 days for acceptance and one shall be tested at 7 days for information.
4. Make one strength test for each 100 cu. yd. (76.5 m<sup>3</sup>) or fraction thereof, of each mix design of concrete placed in any one day.
5. Determine slump of normal-weight concrete sample for each strength test in accordance with "Standard Test Method for Slump of Portland Cement Concrete," ASTM C 143.
6. Determine total air content of normal-weight concrete sample for each strength test in accordance with "Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method," ASTM C 231 or "Standard Test Method for air content of freshly mixed concrete by the Volumetric Method," C-173.
7. Determine temperature, unit weight, yield and air content (gravimetric) of concrete sample for each strength test in compliance with ASTM C 138, "Standard Test Method for Unit Weight, Yield, and Air Content (Gravimetric) of Concrete."
8. If water is added at the site, the designated agency shall retest the concrete in accordance with "Standard Test Method for Slump of Portland Cement Concrete" plus whatever other tests the designated agency feels are necessary. No water will be added at the site without the approval of the designated agency.
9. Qualification of proposed materials and the establishment of mix designs in accordance with "Building Code Requirements for Reinforced Concrete," ACI 318.
10. Non-Compliant Test Reports: All test reports indicating non-compliance should be faxed immediately to all parties on the test report distribution list. Copies shall be on different colored paper.
11. Test results will be reported to the Architect and Contractor in writing on the same day that the test is made. Reports of compressive strength tests shall contain the project identification name and number, date of concrete placement, name of concrete testing service, concrete type and class, location of concrete batch in the structure, design compressive strength at 28 days, concrete mix proportions and materials, and compressive breaking strength and type of break for both 7 day tests and 28 day tests.
12. Perform additional tests of in-place concrete when test results indicate required strength level has not been achieved and/or other characteristics have not been attained in the structure, as directed by the Architect. The testing service may conduct tests to determine the adequacy of concrete by cored cylinders that comply with ASTM C42 or by such other methods as are directed by the Architect. Contractor shall pay for such tests and any additional testing that may be required when concrete is verified to be unacceptable.
13. Employ, at the Contractor's expense, a testing laboratory to perform Flatness/Levelness Testing. Comply with ASTM E-1155-96, but provide a minimum of one line of sampling in two perpendicular directions through each structural bay.
  - a. Perform testing using a "Dipstick Profiler" within 72 hours of concrete placement.
  - b. Supplement Dipstick testing with use of 10 foot certified straight edge placed randomly on the floor. Floor surface shall not exceed 3/8" below edge of straight edge anywhere along its surface when ends are placed on adjacent high spots.

E. To facilitate testing and inspection, the Contractor shall:

1. Furnish labor to assist testing agency in obtaining and handling samples at the job site.
2. Advise testing agency in advance of operations to allow for the assignment of testing personnel and testing.

3. Provide and maintain for the use of the testing agency adequate facilities for proper curing of concrete test specimens on the project site in accordance with ASTM C 31.

## PART II PRODUCTS

### 2.01 FORM MATERIALS:

- A. Forms for Exposed Finish Concrete: Unless otherwise specified or shown on the drawings, construct formwork for exposed concrete surfaces with plywood, metal, metal framed plywood, or other panel type materials acceptable to the Architect in order to provide exposed surfaces that are continuous, straight, and smooth. To minimize the number of joints and to conform to the joint system shown on the drawings, furnish panels in the largest practicable sizes. Provide form material that is thick enough to withstand pressure of newly placed concrete without bowing or deflection.
- B. Forms for Unexposed Finish Concrete: For surfaces that will be unexposed in the finished structure, form concrete with plywood, lumber, metal, or other material acceptable to the Architect. If lumber is used, it shall be dressed on at least two edges and one side for tight fit.
- C. Automatic machine placement shall be used for curb placement. Submit revised mix design and laboratory test results that meet or exceed requirements for outdoor concrete. Produce curbs and gutters to required cross section, lines, grades, finish, and jointing as specified for formed concrete.

### 2.02 REINFORCING MATERIALS:

- A. Reinforcing Bar: ASTM A615, Grade 60.
- B. Welded Wire Fabric: ASTM A185, welded steel wire fabric.
- C. Supports for Reinforcement: Provide supports for reinforcement, including bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars and welded wire fabric in place. Unless otherwise indicated on the drawings, use wire type bar supports complying with CRSI recommendations. Concrete brick, wood, construction debris and other organic material will not be acceptable. Comply with the following:
  1. For slabs on grade, where wetted base material will not support chair legs, use supports with sand plates or horizontal runners.
  2. Use Mesh-Ups plastic wire mesh supports as manufactured by Lotel, Baton Rouge, 800-535-8375 or equal product as manufactured by Grip Rite/PROLOK or Dayton Superior/Aztec.
  3. For concrete surfaces exposed to view, where leg supports are in contact with forms, provide supports with legs that are hot dip galvanized or protected by either plastic or stainless steel.

### 2.03 CONCRETE MATERIALS:

- A. Portland Cement: ASTM C150, Type I. Use only one brand of cement throughout the project, unless otherwise acceptable to the Architect.
- B. Normal Weight Aggregates: ASTM C33, or local aggregates that do not comply with ASTM C33, but that have been shown by special test or actual service to produce concrete of adequate strength and durability may be used when acceptable to the Architect.
- C. Fine aggregate: Clean, sharp, natural sand or crushed gravel when used for vehicular wearing surfaces. Manufactured sand may be used elsewhere provided the percentage passing a No. 200 sieve is less than 3%.

- D. Coarse Aggregate: Crushed stone conforming to ASTM C 33 standard specification for concrete aggregates that is clean, uncoated, and processed from natural rock or stone and that contains no clay, mud, loam, or foreign matter.
- E. Combined aggregate gradation for slabs and other designated concrete shall be 8% - 18% for large top size aggregates (1½ in.) or 8% - 22% for smaller top size aggregates (1 in. or ¾ in.) retained on each sieve below the top size and above the No. 100.
- F. Vapor Barrier: The vapor barrier shall be placed over prepared base material where indicated below slabs on grade. Vapor Barrier shall conform to ASTM E 1745, Class A. The membrane shall have a water vapor permeance rate on no greater than 0.01 perms when tested in accordance with ASTM E 1745 Section 7.1. Membrane shall have minimum tensile strength of 58 lbf and a Resistance to Puncture of 2600 grams in accordance with ASTM test standards. Vapor barrier shall be no less than **20 mil** thick in accordance with ACI 302.1R.
1. Available Product: Subject to compliance with requirements, products that are pre-approved for incorporation into Work are Stego Wrap (20 mil) Vapor Barrier by Stego Industries LLC, Perminator EVOH by W. R. Meadows or Dura-Skrim by Raven Industries.
- G. Water: clean, fresh, drinkable.
- H. Admixtures:
1. Water Reducing Admixture: Conforming to ASTM C494, Type A, Eucon WR-75, WR-91 or MR by the Euclid Chemical Company, Pozzolith 322N or Polyheed 997 by Master Builders, or Plastocrete 161 by Sika Chemical Corporation.
  2. Water Reducing, Retarding Admixture: Conforming to ASTM C494, Type D, Eucon Retarder-75 by the Euclid Chemical Co., Pozzolith 100XR by Master Builders, Plastiment by Sika Corp. or Daratard - 17 by WR Grace and Co.
  3. High Range Water Reducing Admixture: Conforming to ASTM C494, Type F or G, (Superplasticizer): Eucon 37, 1037 or Plastol 5000 by the Euclid Chemical Co. or Rheobuild 1000 or 716 by Master Builders or Sikament 686 by Sika Corp.
  4. Non-chloride Accelerator: Accelguard 80 by the Euclid Chemical Co. or Darex Set Accelerator by W.R. Grace or SikaSet NC by Sika Corp.
  5. Air Entraining Admixture: ASTM C260.
  6. Pozzolanic Admixtures: ASTM C618.
  7. Prohibited Admixtures: Calcium Chloride or admixtures containing more than 0.05% Chloride Ions are not permitted. Admixtures indicated as prohibited on drawings shall not be used whether or not they appear in the list above.
- I. Supplementary Cementitious Materials:
1. Fly Ash: ASTM C618, Type F: Ignition loss shall not exceed three (3) percent. Only one source of fly ash shall be used.
  2. Ground Granulated Blast-Furnace Slag: ASTM C989, Grade 100 or 120.
  3. Fly ash shall be used at a maximum percentage rate of 25% of Portland Cement by weight and blast furnace slag at a maximum percentage rate of 40% of Portland Cement by weight. Do not use fly ash for concrete to receive hardeners. The exact amount selected shall be based on a successful test placement.

2.04 RELATED MATERIALS:

- A. Mineral Aggregate Base: Open graded stone conforming to ASTM No. 57

Sieve Size , Grading D	Total Percent by Weight, Passing Sieves
1-1/2 in. (37.5 mm)	100
1 in. (25 mm)	95-100
1/2 in. (12.5 mm)	50-80

No. 4 (4.75 mm)	0-10
No. 8 (2.36 mm)	0-5

- B. Waterstops shall be Vinylex RB6316H preformed PVC ribbed waterstop by Vinylex Corporation, Knoxville, Tennessee or equal by Greenstreak or Paul Murphy Plastics Co.
- C. Joint Filler: Provide preformed joint filler at slab expansion joints, joints between floor slabs and walls and other isolation joints. Provide one of the following:
1. Precompressed, impregnated open cell foam.
  2. Asphalt saturated fiberboard complying with ASTM D 1751
  3. Granulated cork between saturated felt or glass fiber felt complying with ASTM D1752 Type H.
- D. Curing Compounds:
1. Curing and Sealing Compound (VOC Compliant, 700 g/l): Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class B, 25% solids content minimum. Moisture loss shall be not more than 0.30 Kg/m<sup>2</sup> when applied at 300 sf/gal. Manufacturer's certification is required. Subject to project requirements provide one of the following products: Super Rez Seal by The Euclid Chemical Co. or Seal-Cure 309-25/30 by W.R. Meadows or Lumiseal Plus by L&M Construction Chemicals Inc.
- Or
2. Clear Curing and Sealing Compound (VOC Compliant, 350 g/l): Liquid type membrane-forming curing compound, clear styrene acrylate type, complying with ASTM C1315, Type I, Class A, 25% solids content minimum. Moisture loss shall be not more than 0.40 Kg/m<sup>2</sup> when applied at 300 sf/gal. Manufacturer's certification is required. Subject to project requirements provide one of the following products: Super Diamond Clear VOX or Super Rez Seal VOX by The Euclid Chemical Co. or Vocomp-30 by W.R. Meadows or Lumiseal WB Plus by L&M Construction Chemicals Inc.
  3. Curing Compound (Strippable for use on slabs to receive direct applied finishes): The curing compound shall conform to ASTM C309. Provide Kurez DR VOX by The Euclid Chemical Co. or 1100 Clear Series by W. R. Meadows or L&M Cure R by L&M Construction Chemicals Inc.
  4. For concrete to receive a special concrete finish (i.e., staining, polishing, etc.), curing compounds called for in those specification sections, if any, shall take precedence over curing compounds specified herein solely for those areas to receive such finish.
- E. Bonding Compound: Provide polyvinyl acetate, rewettable type compound. Do not use in areas subject to moisture. Euco Weld by Euclid Chemical Co. or Weldcrete by Larsen or LiquidWeld by Sika Corp.
- F. Epoxy Adhesive: Where called for, compound shall be a 2 component, 100% solids, 100% reactive compound suitable for use on dry or damp surfaces.
- G. Non-shrink Grout: The grout shall conform to CRD-C621-80, "Corps of Engineers Specification for Non-shrink Grout". Euco NS by the Euclid Chemical Co. or Masterflow 713 by Master Builders or SikaGrout 212 by Sika Corp.
- H. High Flow Grout: Where high fluidity and/or increased placing time is required, use high flow grout. The factory pre-mixed grout shall conform to ASTM C1107, "Standard Specification for Packages Dry, Hydraulic-Cement Grout (Non-Shrink)." In addition, the grout manufacturer shall furnish test data from an independent laboratory indicating that the grout when placed at a fluid

consistency shall achieve 95% bearing under a 18" x 36" base plate. Provide Hi-Flow Grout by The Euclid Chemical Co. or SikaGrout 328 by Sika Corp or MasterFlow 928 by Master Builders.

I. Non-Oxidizing Metallic Hardener: The specified non-oxidizing metallic floor hardener shall be formulated, processed and packaged under stringent quality control at the manufacturer's owned and controlled factory. The hardener shall be a mixture of specially processed non-rusting aggregate, selected Portland cement and necessary plasticizing agents. Product shall be Diamond-Plate by The Euclid Chemical Co.

1. For concrete to receive a special concrete finish (i.e., staining, polishing, etc.), hardeners called for in those specification sections shall take precedence over hardeners specified herein solely for those areas to receive such finish.

J. Mineral Aggregate Hardener: The specified mineral aggregate hardener shall be formulated, processed and packaged under stringent quality control at the manufacturer's owned and controlled factory. The hardener shall be a factory-blended mixture of specially processed graded mineral aggregate, selected Portland cement and necessary plasticizing agents. Product shall be Surfex by The Euclid Chemical Co. or MasterTop 100 by Master Builders.

1. For concrete to receive a special concrete finish (i.e., staining, polishing, etc.), hardeners called for in those specification sections shall take precedence over hardeners specified herein solely for those areas to receive such finish.

K. Liquid Densifier/Sealer: The liquid densifier compound shall be a silicate based sealer which penetrates concrete surfaces, increases abrasion resistance and provides a "low-sheen" surface that is easy to clean and eases the problem of tire mark removal. Product shall have a minimum solids content of 20% of which 50% must be silicate. Provide Diamond Hard by The Euclid Chemical Company or Liqui-Hard by W.R. Meadows or Seal Hard by L&M Construction Chemicals Inc. or SikaFloor 3S by Sika Corp.

1. For concrete to receive a special concrete finish (i.e., staining, polishing, etc.), densifiers/sealers called for in those specification sections shall take precedence over densifiers/sealers specified herein solely for those areas to receive such finish.

L. Integral Color Dye for Exterior Application: Colored concrete system by L.M. Scofield Company or equal approved prior to bidding, having the following characteristics:

1. Admixture shall be a colored, water-reducing, admixture containing no calcium chloride with coloring agents that are limeproof and ultra-violet resistant.
2. Colored admixture shall conform to the requirements of ACI 303.1, ASTM C979, ASTM C494 and ASSHTO M194.
3. Curing compound shall comply with ASTM C309.
4. Color: To be selected by Architect from manufacturer's standard chart.

M. One Part Repair Topping: Latex and microsilica modified cementitious mortar designed for use as a floor or deck topping at thicknesses of 1/16" to 3/8". Product shall be Thin-Top Supreme by Euclid Chemical Co. or SikaTop 122 Plus by Sika Corp. for thicknesses up to 2". Product shall be Concrete-Top Supreme by Euclid Chemical Co. or SikaTop 121 Plus by Sika Corp.

N. Underlayment Compound: Free-flowing, self-leveling, pumpable cementitious base compound, "Super Flo-Top" by The Euclid Chemical Co. or SikaLevel 315 by Sika Corp or Level Set 300 by TEC. The compound shall exhibit the following properties:

Compressive Strength (ASTM C109)	- 4400 PSI @ 7 days - 5000 PSI @ 28 days
Bond Strength (ASTM C1042)	- 700 PSI @ 7 days - 1000 PSI @ 28 days

2.05 MISCELLANEOUS MATERIALS:

- A. Fill concrete spandrel blocks with concrete and reinforce with two (2) No. 4 bars to form cap beams at top of all masonry walls unless noted otherwise.
- B. Fill steel pan stair risers and landings with non-slip concrete, poured in place and reinforced with 2" diamond mesh lath or fiber mesh. The fill shall consist by volume of 1 part Portland cement, 1-1/2 parts sand and 3 parts pea gravel. Fill shall have a smooth steel trowel finish.
- C. Provide 2'-6" x 2'-6" corner bars of same size and number as footing reinforcing in all foundation corners unless noted otherwise.
- D. Concrete slabs on grade at dumpster pads and equipment pads shall be 6 inch concrete reinforced with WWF 6 x 6 – W2.9 x W2.9 over 4 inches of crushed stone unless noted otherwise on the drawings.

2.06 MIX DESIGN:

A. Preparation

- 1. Prepare design mixes for each type and strength of concrete in accordance with ACI 318, "Building Code Requirements for Structural Concrete," Section 5.3 and with applicable provisions of ASTM C94. Submit written reports of each proposed mix for each class of concrete on the Mix Design Submittal Form included at the end of this specification at least 15 days before the start of work.
- 2. Provide special mix design for use with automatic machine placement of curbs.
- 3. The design mix shall provide normal weight concrete with 28 day compressive strength as indicated on the drawings or as shown below if not otherwise indicated.

B. Admixtures

- 1. All concrete shall contain the specified water reducing admixture or high-range water-reducing admixture. All concrete slabs placed at air temperatures below 50° F shall contain the specified non-chloride accelerator. All concrete required to be air entrained shall contain an approved air entraining mixture. All pumped concrete and concrete with a W/cm of less than 0.50 shall contain the specified high-range water-reducing admixture.
  - a. Use an air entraining admixture in all concrete structures and slabs exposed to freezing and thawing or subjected to hydrostatic pressure:
    - 2.5% to 5.5% for maximum 2 inches aggregate
    - 4.5% to 7.5% for maximum 3/4 inch aggregate
    - 5.5% to 8.5% for maximum 1/2 inch aggregate
  - b. All trowel finished interior slabs: Maximum air content of 3% (do not add air entraining admixture).
- 2. Water/Cement Ratio:
  - a. Concrete exposed to freezing and thawing: 0.50
  - b. Concrete subject to deicers and/or required to be watertight: 0.45
  - c. Concrete subject to brackish water or salt spray: 0.40
  - d. Interior trowel finished slabs subject to vehicular traffic: 0.53
  - e. All other concrete: 0.58
- 3. Use the amounts of admixtures recommended by the manufacturer for climatic conditions prevailing at the time of placing. Adjust quantities and types of admixtures as required to maintain quality control.



2.07 SELECTION OF PROPORTIONS:

A. General:

Concrete shall be composed of Portland cement, fine aggregate, coarse aggregate, water, admixtures, and as specified, Air Entraining Admixture. Proportions of ingredients shall produce concrete that will work readily into corners and angles of forms, bond to reinforcement, without segregation or excessive bleed water forming on the surface. Proportions of materials shall be in accordance with ACI 211.1, "Recommended Practice for Selecting Proportions for Normal, Heavy and Mass Weight Concrete."

1. Proportions of ingredients shall be selected by past field experience or, in lieu of past performance, laboratory trial mixes to produce placeability, durability, specified strength and properties specified.

B. Required Average Strength Above Specified Strength:

Determinations of required average strength (f 'c) shall be in accordance with ACI 318, "Building Code Requirements for Reinforced Concrete," and evaluations of compressive strength results of field concrete shall be in accordance with ACI 214, "Recommended Practice for Evaluation of Strength Test Results of Concrete."

1. Past Field Experience - Proportions shall be established on the actual field experience of the ready-mix producer with the materials proposed to be employed. Standard deviations shall be determined by 30 consecutive tests (or two groups of tests totaling 30 or more).

- a. Average strength (f 'c) shall exceed specified strength (f 'c) by at least:

400 psi (2.8 MPa)	-	standard deviation is less than 300
550 psi (3.8 MPa)	-	standard deviation is 300 to 400
700 psi (4.8 MPa)	-	standard deviation is 400 to 500
900 psi (6.2 MPa)	-	standard deviation is 500 to 600
1200 psi (8.3 MPa)	-	standard deviation is above 600 or unknown

2. Trial Mixes - When the ready-mix producer does not have a record of past performance, the combination of materials and the proportions selected shall be selected from trial mixes having proportions and consistencies suitable for the work based on ACI 211.1-91, using at least three different water-cement ratios which will produce a range of strengths encompassing those required.

- a. Average strength (f 'c) required shall be:

Specified compressive strength	--	Required average compressive strength
Less than 3000 (f 'c psi)	--	f 'c + 1000 (f 'c psi)
3000 to 5000 (f 'c psi)	--	f 'c + 1200 (f 'c psi)
Over 5000 (f 'c psi)	--	f 'c + 1400 (f 'c psi)

2.08 CONCRETE QUALITIES REQUIRED:

A. Specified Compressive Strength:

Specified Compressive (f 'c) Strength @ 28 days, unless noted higher on the drawings, shall be:

3000 psi (21 MPa) – Interior floor slabs (< 6" thick) with applied finishes and footings.  
4000 psi (28 MPa) – Interior floor slabs (> or equal to 6" thick)  
4000 psi (28 MPa) – Walks, curbs, columns, beams and other concrete exposed to the weather.

B. Slump:

1. Consolidation by vibration: 3 in. (76 mm) not to exceed 4 in. (102 mm).
2. Consolidation by other methods: 4 in. (102 mm) not to exceed 5 in. (127 mm).
3. Placement and consolidation by automatic machine: Slump as required by mix design.
  - a. Any concrete containing high-range water-reducing admixture (superplasticizer) shall have a maximum slump of 9" unless otherwise approved by the Architect. The concrete shall arrive at job site at a slump of 2" to 3", (3" to 4" for concrete receiving a "shake-on" hardener or lightweight concrete), be verified, then high-range water-reducing admixture added to increase slump to approved level. All other concrete shall have a maximum slump of 4."
  - b. Slump shall be determined by ASTM C 143-78, "Standard Test Method for Slump of Portland Cement Concrete."
- C. "Quick Dry" Concrete: Maximum W/cm – 0.40, superplasticized, 3% maximum air content. The floor finish shall be as required by the manufacturer of the specified floor coating or covering.
- D. Aggregate Size: Maximum size of coarse aggregate shall not exceed:
  1. One-fifth narrowest dimension between forms.
  2. Three-fourths minimum clear spacing between reinforcing bars.
  3. One-third the thickness of slabs.
  4. Use 1½" top size in all trowel finished interior slabs-on-grade subject to vehicular traffic.

#### 2.09 CONCRETE CLEANERS:

- A. Citrus based industrial degreaser and detergent. Acceptable products include:
  1. AC-4450 ORANGE NATURAL 20 CONCENTRATE as distributed by Interstate Products Inc. 800-474-7294
  2. Commercial Strength Contractor's Solvent as manufactured by Orange-Sol Industrial Products Inc. 800-279-8822
  3. De-Solv-It Heavy Duty 24 as manufactured by Orange-Sol Industrial Products Inc. 800-279-8822

### PART III EXECUTION

#### 3.01 PRE-CONCRETE CONFERENCE:

- A. At least 35 days prior to start of the concrete construction schedule, the contractor shall conduct a meeting to review the proposed mix designs and to discuss the required methods and procedures necessary to achieve the required concrete quality. Contractor shall send a pre-concrete conference agenda to all attendees 20 days prior to the scheduled date of the conference.

#### 3.02 PREPARATION FOR SLABS ON GRADE:

- A. Subgrade: Before any base material is installed, compact the subgrade of the area to be paved to 100% of optimum density as determined by ASTM D698 (Standard Proctor).
- B. Base: Install a mineral aggregate base of the type specified above in accordance with Section 303 of the TDOT specifications.
- C. The base must not depress more than 1/2" under a fully loaded ready-mix concrete truck.

#### 3.03 FORMWORK:

- A. Design, construct, erect, brace, and maintain formwork according to ACI 301.

- B. Use metal form ties that are factory made, adjustable in length, designed to prevent form deflection, and either removable or snap-off and that will prevent the concrete surface's being spalled when the ties are removed. If snap-off ties are used, the portion remaining within the concrete after removal must be at least 1-1/2 inches inside the concrete unless the drawings indicate otherwise.
- C. Provide openings in concrete formwork to accommodate the work of other trades. Determine the size and location of openings, recesses, and chases from the trades providing such work. Accurately place and securely support items built into forms.
- D. Clean thoroughly forms and adjacent surfaces that are to receive concrete. Remove chips, wood, sawdust, dirt, and any other debris just before the concrete is placed. After concrete placement, retighten forms if necessary to eliminate mortar leaks.

#### 3.04 PLACING VAPOR BARRIER:

- A. Install vapor barrier in accordance with ASTM E1643.
- B. Arrange layout of vapor barrier to minimize seams and penetrations.
- C. Unroll vapor barrier over compacted aggregate base.
- D. Overlap all seams a minimum of six inches and seal with tape.
- E. All penetrations must be sealed using a combination of seam tape and mastic in accordance with manufacturer's latest printed instructions.
- F. Turn vapor barrier up at edge of slab to masonry wall juncture to provide bond break.

#### 3.05 PLACING REINFORCEMENT:

- A. For details and methods of placing reinforcement and supports, comply with the specified codes and standards, the recommended practice of the CRSI as outlined in "Placing Reinforcing Bars," and these specifications.

#### 3.06 INSTALLATION OF WATERSTOPS:

- A. Provide continuous waterstops and install waterstops in concrete joints where indicated.
- B. Carry waterstops in walls into lower slabs and join to waterstops in slabs with appropriate fittings.
- C. In water bearing structures, provide waterstops in all joints, whether or not indicated on drawings.
- D. Secure waterstops accurately to position and line as indicated on the drawings using factory installed hog rings or factory pre-punched holes in the outermost rib with tie wire. Do not drive nails, screws, or other fasteners through the waterstop at any time at any location.
- E. Secure at intervals of not more than 15 inches to prevent movement during the pour of concrete.
- F. Terminate waterstops 3 inches from the top of finished surfaces of walls and slabs, unless otherwise specified on the drawings.

#### 3.07 CONCRETE PLACEMENT:

- A. Before placing concrete, inspect and complete the formwork installation, reinforcing steel, and items to be embedded or cast in.
- B. Use mechanical vibrating equipment, including a laser screed, supplemented by hand spading, rodding, or tamping to consolidate placed concrete. The equipment and procedures used to

consolidate the concrete shall comply with the recommended practices of ACI 309 and suit both the type of concrete and project conditions.

- C. Until the placing of a panel or section is completed, deposit and consolidate concrete slabs in a continuous operation within construction joints.
- D. Consolidate concrete during placing operations so that it is thoroughly worked around reinforcement and other embedded items and into corners.
- E. Bring slab surfaces to the correct level with a straightedge and strike off. Use appropriate bull floats or straightedges to smooth the surface, leaving it free from humps and hollows. Do not sprinkle water on the plastic surface. Do not disturb the slab surfaces before starting finishing operations.
- F. Maintain reinforcement in the proper position during placement operations.
- G. Cold Weather Placement: Comply with ACI 306 and the requirements therein specified to protect concrete work from physical damage or reduced strength due to frost, freezing, or low temperatures.
- H. Hot Weather Placement: When the weather is hot enough to impair the concrete's quality and strength, place the concrete as specified herein and in ACI 305.

### 3.08 JOINTS:

- A. Locate and install construction joints (which are not shown on the drawings) as approved by the Architect so that the strength and appearance of the structure will not be impaired.
- B. Provide keyways at least 1-1/2 inches deep in construction joints that are in walls and slabs or between walls and footings. Bulkheads designed for this purpose may be used if accepted by the Architect. Construction joints, in slabs subjected to vehicular traffic, shall have round, square or diamond dowels as indicated on the drawings.
- C. Place construction joints perpendicular to the main reinforcement. Continue all reinforcement across construction joints of structural members.
- D. Construct isolation joints in slabs on the ground wherever there is contact between slabs on the ground and vertical surfaces and wherever else indicated on the Drawings.
- E. Contraction (control) joints in slabs on ground as shown on the Drawings shall have a maximum spacing of 30 times slab thickness (up to a maximum of fifteen (15) feet) each way if not shown otherwise.
- F. Saw-Cut Control Joints:
  - 1. Primary Method: Soff-Cut System method, by Soff-Cut International, Corona, CA, 800-776-3328. Finisher must have documented successful experience in the use of this method prior to this project. Install cuts within 2 hours after final finish at each saw cut location. Use 1/8 inch thick blade, cutting 1-1/4 inch into slab.
  - 2. Optional Method (Where Equipment is Not Available for Primary Method): Properly time cutting with the set of the concrete. Saw-cut control joints within 12 hours after finishing. Start cutting as soon as the concrete has hardened sufficiently to prevent aggregates being dislodged by the saw. Complete cutting before shrinkage stresses become sufficient to produce cracking. Use 1/4 inch thick blade, cutting 1/4 slab depth.

### 3.09 FINISH OF FORMED SURFACES:

- A. Finishes to be in accordance with ACI 301.

- B. Trowel Finish: Apply a trowel finish to all interior slab surfaces unless otherwise noted on drawings. Concrete shall be placed, consolidated, struck-off and leveled to proper elevation using a laser screed, or vibratory screed. Begin floating when surface water has disappeared or when concrete has stiffened sufficiently to permit operation of power-driven floats, or both. Consolidate surface with power-driven floats, or by hand-floating if area is small or inaccessible to power units. Cut down high spots and fill low spots with highway straightedge. Uniformly slope surfaces to drains. Immediately after leveling, refloat surface to a uniform, smooth, granular texture. Surface shall achieve an F(F) 20 – F(L) 17 tolerance. Surface shall then be troweled, at least twice, to a smooth dense finish, free of trowel marks, uniform in texture and appearance, and achieve a tolerance of F(F) 25 and F(L) 20 minimum overall composite and F(F) 17 and F(L) 15 minimum at any individual section measured according to ASTM E 1155. For floors to receive an applied floor covering, grind smooth any surface defects that could telegraph through applied floor covering or repair as necessary with specified repair compound or underlayment to achieve specified tolerance. For finishes in which the concrete surface is exposed to view, grinding or reparations involving compounds or underlayments are not acceptable and shall not be used to achieve specified floor tolerances.
- C. Non-Oxidizing Metallic Floor Hardener: All slabs, in areas subject to vehicular traffic including all loading dock areas and any other areas noted on drawings, shall receive an application of non-oxidizing, metallic floor hardener applied at a rate of 1.5 lbs/ft<sup>2</sup>. Immediately following first floating operation, uniformly distribute approximately 2/3 of required weight of non-oxidizing metallic floor hardener over concrete surface, by mechanical spreader, and embed by means of power floating. Hardener shall be floated in and second application made. Surface shall be floated again to properly bond hardener to base concrete slab. Surface shall then be troweled, at least twice, to a smooth dense finish.
- D. Mineral Aggregate Hardener: All slabs, in areas noted on drawings, shall receive an application of mineral aggregate hardener applied at a rate of 1.2 lbs/ft<sup>2</sup>. Hardener shall be applied in two applications by mechanical spreader. First shake shall comprise 2/3 of specified amount of hardener. This application shall be made after initial floating operation unless climatic conditions dictate earlier application. Hardener shall be floated in and second application made. Surface shall be floated again to properly bond hardener to base concrete slab. Surface shall then be troweled, at least twice, to a smooth, dense finish.
- E. Non-slip Broom Finish: Apply non-slip broom finish to exterior concrete platforms, steps, and ramps and elsewhere as indicated by the drawings or schedules. Texture shall be as approved by Architect from sample panels.
- F. Liquid Densifier/Sealer Finish: Apply this compound on exposed interior floors subjected to vehicular abrasion and shake on hardener slabs as indicated on the drawings. Application shall be made in strict accordance with directions of the manufacturer and just prior to completion of construction. Spray, squeegee or roll on liquid densifier to clean, dry concrete surface. Liquid should be scrubbed into surface with mechanical scrubber. Keep the surface wet with the densifier during the application process. When product thickens, but not more than 60 minutes after initial application, surface shall be squeegeed or vacuumed to remove all excess liquid
- G. Sealer/Dustproofer Finish: Apply a second coat of the specified curing and sealing compound to interior concrete floors where shown on the drawings or in schedules to be sealed concrete. The compound shall be applied in strict accordance with the directions of the manufacturers and just prior to completion of construction.

Note to Contractor: Paint game lines on gymnasium floor prior to applying second coat of sealing compound.

### 3.10 CURING:

- A. After placing and finishing the concrete, start initial curing as soon as free water has disappeared from concrete surface. Keep continuously moist for not less than 7 days and above 50° F. When high early strength concrete is used, the temperature requirement may be reduced to three days.
- B. Begin final curing immediately after initial curing and before the concrete has dried. Continue final curing in accordance with ACI 301. Avoid rapid drying at the end of the final curing period.
- C. All exposed interior slabs, not receiving a liquid densifier, and troweled slabs receiving mastic applied adhesives or "shake-on" hardeners shall be cured with the specified curing and sealing compound. Exterior slabs, sidewalks, curbs, and architectural concrete, not receiving a penetrating sealer, shall be cured with the specified clear, non-yellowing curing and sealing compound. Maximum coverage shall be 400 ft<sup>2</sup>/gallon on steel troweled surfaces and 300 ft<sup>2</sup>/gallon on floated or broomed surfaces for the curing/sealing compound.
- D. Curing Compound (Strippable): Use the specified strippable curing compound on surfaces to be covered with finish or coating material applied directly to concrete, such as liquid densifier/sealer, waterproofing, dampproofing, membrane roofing, flooring, painting, and other coatings and finish materials. Apply in accordance with manufacturer's instructions.

### 3.11 MISCELLANEOUS CONCRETE ITEMS:

- A. Filling In: Unless the drawings show otherwise or the Architect directs, fill in holes and openings left in concrete structures for the work of other trades once that work is in place. Mix, place, and cure concrete as specified herein to blend with in-place construction. Provide other miscellaneous concrete filling shown on the drawings or necessary to complete the work.
- B. Equipment Bases and Foundations: Provide machine and equipment bases and foundations as shown on the drawings. Set anchor bolts for machines and equipment to template at correct elevations, complying with the certified diagrams or templates of the manufacturer furnishing the machines and equipment.
- C. Nonshrink Grout: Grout base plates and foundations as indicated using specified non-shrink grout. Use non-metallic grout for exposed conditions, unless otherwise indicated.
  - 1. Where high fluidity and/or increased placing time is required use the specified high flow grout. This grout shall be used for all base plates larger than 10 square feet.

### 3.12 EVALUATION AND ACCEPTANCE:

- A. Strength level of concrete will be considered satisfactory if averages of sets of three consecutive strength test results equal or exceed specified compressive strength, and no individual strength test result falls below specified compressive strength by more than 500 psi.
- B. **No cracks which affect structural integrity will be accepted.** Affected areas to be removed and replaced. Submit repair plan to structural engineer for approval before beginning repairs
- C. Cracks which do not affect structural integrity:
  - 1. Cracks consistently greater than ¼" in width will not be accepted, remove and replace section to nearest existing joint.
  - 2. Cracks showing vertical separation of plane will not be accepted remove and replace section to nearest existing joint.
  - 3. Cracks less than ¼" in width, occurring in appearance sensitive areas (i.e. front entry, front sidewalk, etc.), may require replacement. Final decision resides with the Owner.
  - 4. Cracks less than a ¼" in width in non-appearance sensitive areas will be filled with Bonsal vinyl concrete repair compound, or approved equal, following manufacturer's recommended application procedures.

### 3.13 WALKS AND CURBS:

- A. Walks and sidewalks shall be not less than 4" thick, placed over a 4" layer of porous fill as specified, and marked off with surface joints at 6'-0" o.c. as shown. Install expansion joints between walks and building, at changes in walk direction, at 30'-0" o.c., and elsewhere as shown. Expansion joints shall be formed with 1/2" thick preformed filler.
- B. Curbs shall be constructed to size and profile shown, placed over binder course of paving. Provide expansion joints at 50 feet on center maximum.
- C. All edges, joints and margins shall be straight and true and rounded with jointing and edging tools.
- D. Walks shall be sloped 1/4" per foot.

#### 3.14 REPAIR OF DEFECTIVE AREAS

- A. With prior approval of method and procedure by the Engineer, all repairs of defective areas shall conform to ACI 301, Section 5.3.7, except that the specified bonding compound must be used.
- B. Leveling of floors for subsequent finishes shall be achieved by use of the specified underlayment material.
- C. All exposed floors shall be leveled, where required, with the specified self-leveling repair topping.
- D. Repair methods not specified above may be used, subject to acceptance of Engineer.

#### 3.15 CLEANING AND PROTECTION:

- A. Protect corners, edges, and surfaces of cast-in-place architectural concrete from damage; use guards and barricades.
- B. Protect cast-in-place architectural concrete from staining, laitance, and contamination during remainder of construction period.
- C. Clean cast-in-place architectural concrete surfaces after finish treatment to remove stains, markings, dust, and debris. Use power washer set to low pressure (800 psi maximum) with orange cleaner/degreaser to clean all exposed exterior concrete.
- D. Wash and rinse surfaces according to concrete finish applicator's recommendations and cleaning solutions written instructions. Protect other Work from staining or damage due to cleaning operations.
- E. Do not use cleaning materials or processes that could change the appearance of cast-in-place architectural concrete finishes.

End of Section

# CONCRETE MIX DESIGN SUBMITTAL FORM

Project: \_\_\_\_\_  
 City: \_\_\_\_\_  
 General Contractor: \_\_\_\_\_  
 Concrete Contractor: \_\_\_\_\_  
 Concrete Strength (Class): \_\_\_\_\_  
 Use (describe): \_\_\_\_\_

## Design Mix Information

*Please check one*

Based on Standard Deviation Analysis   
 Trial Mix Test Data

## Design Characteristics:

Density  pcf  
 Strength  psi (28 day)  
 Air  % specified

*If trial mixes are used the Mix Design is proportioned to achieve  $f'_{cr} = f'_c + 1200$  psi  
 (1400 psi for strength higher than 5000 psi at 28 days)*

<u>MATERIALS</u>	<u>Type/ Source</u>	<u>Specific Gravity</u>	<u>Weight/lb.</u>	<u>Absolute Vol. cu.ft.</u>
Cement				
Flyash				
Microsilica				
Coarse Aggregate				
Fine Aggregate				
Water				
Air				
Other				
<b>TOTAL</b>				27.0 cu. ft.

\* Water/Cement Ratio (lbs. water/lbs. cement) = \_\_\_\_\_%

<u>ADMIXTURES</u>	<u>Manufacturer</u>	<u>Dosage oz/cwt</u>
Water Reducer		
Air Entraining Agent		
High Range Water Reducer		
Non-Corrosive Accelerator		
Other		

Slump before HRWR \_\_\_\_\_ inches



Slump after HRWR \_\_\_\_\_ inches

**Standard Deviation Analysis (from experience records):**

<b># of Test Cylinders Evaluated:</b>	
<b>Standard Deviation:</b>	

$f'_{cr} = f'_c + 1.34s$  or  $f'_{cr} = f'_c + 2.33s - 500$

(Refer to ACI 301 for increased deviation factor when less than 30 tests are available)

**LABORATORY TEST DATA**

*Compressive Strength*

Age (days)	Mix # 1	Mix #2	Mix #3
7	psi	psi	psi
7	psi	psi	psi
28	psi	psi	psi
28	psi	psi	psi
28 average	psi	psi	psi

**REQUIRED ATTACHMENTS:**

- Coarse Aggregate Gradation Report*
- Fine Aggregate Gradation Report*
- Concrete Compressive Strength Data or Trial Mixture Test Data*
- Admixture Compatibility certification letter*

*Please Check*


**Submitted by:**

Name: \_\_\_\_\_

Address: \_\_\_\_\_

Phone #: \_\_\_\_\_

Main Plant Location: \_\_\_\_\_

Miles from Project: \_\_\_\_\_

Secondary Plant Location: \_\_\_\_\_

Miles from Project: \_\_\_\_\_

Date: \_\_\_\_\_

## SECTION 04 20 00 – UNIT MASONRY

### 1PART 1 GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials and equipment, and perform all work required to install masonry work as shown on the drawings, including brick, concrete block, precast masonry lintels, and all necessary incidental work in connection therewith.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions, Division 1, General Requirements, and the following sections apply to the work under this section.

Section	07 62 00	Flashing and Sheet Metal
Section	07 92 00	Sealants and Caulking

#### 1.03 QUALITY ASSURANCE:

- A. Qualifications of workmen:

1. For the actual cutting and placing of concrete masonry units, use only skilled journeyman masons who are thoroughly experienced with the materials and methods specified and thoroughly familiar with the design requirements.
2. In acceptance or rejection of installed concrete masonry units, no allowance will be made for lack of skill on the part of workman.
3. Provide at least one (1) skilled journeyman mason who shall be present at all times during execution of the work of this Section and who shall personally direct the execution of this portion of the work.

- B. Masonry units exposed to view shall be obtained from a single manufacturer; each type of product shall be from a single batch or production run.

- C. Cementitious ingredients of mortar mix shall be obtained from a single manufacturer. Each aggregate for mortar mix shall be obtained from a single source.

- D. Comply with applicable portions of the American Society for Testing and Materials (ASTM) Applicable codes and regulations of authorities having jurisdiction.

#### 1.04 SUBMITTALS:

- A. Submit manufacturer's product data for each type of masonry unit, accessory and other manufactured products, including certifications that each type complies with specified requirements.

#### 1.05 SAMPLES:

- A. Contractor shall have verification in writing from the Architect which brick is to be used prior to ordering brick.

- B. **Before any exterior facebrick is laid up**, the Contractor shall erect a sample panel, including concrete block backup and mortar, approximately 4 feet wide by 4 feet high. When approved, the panel shall be left in place until facebrick work is completed to serve as a standard for all work. At Architect's option, one corner of the building may be used as a sample panel.

- C. Protect the sample panel from the elements with weather resistant membrane. Retain approved sample panel during construction as a standard for judging completed masonry work. When directed, demolish sample panel and remove debris from site.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver masonry materials in undamaged condition. Handle masonry units to prevent damage. Store in a manner to protect against excessive moisture, temperature changes, contaminants, corrosion or other causes. Limit absorption of moisture as specified for Type I units.
- B. Deliver cementitious materials in manufacturers' original, unopened containers.
- C. Store cementitious materials above ground, under cover and in dry enclosure.
- D. Store aggregates so that separation of types of materials can be maintained.
- E. Protect masonry accessories from corrosion and accumulation of dirt.

1.07 PROJECT CONDITIONS:

- A. Protect exposed masonry work against staining and mortar droppings. Keep top of walls covered with non-staining waterproof paper or plastic sheet when work is not in progress and during precipitation of rain or snow. When work is resumed, clean top surface of walls free of loose mortar and in dry weather wet the surface before proceeding.
- B. Turn scaffolding plank every night and when wet to prevent spattering mortar on face of walls.
- C. Do not superimpose any load to masonry work for 12 hours after erection. Allow 3 days before applying concentrated loads.
- D. Cold Weather Protection:
  - 1. Remove ice or snow from masonry bed by applying heat until top surface is dry to touch.
  - 2. Remove all frozen or damaged masonry work.
  - 3. Do not use wet or frozen units or units. Units must be minimum of 20°F (-7°C) when laid.
  - 4. Never allow mortar to freeze
- E. Construction Requirements While Work is Progressing:
  - 1. For all air temperatures below 40°F (4°C), heat sand or mixing water to produce mortar temperatures between 40°F (4°C) and 120°F (49°C).
  - 2. Additionally, for all air temperatures below 25°F (-4°C), provide heat sources on both sides of wall during construction AND provide windbreaks when wind exceeds 15 mph.
  - 3. Additionally, for all air temperatures 20°F (-7°C) and below, provide enclosures and heat to maintain air temperature above 32°F (0°C).
- F. Protection requirements for completed work:
  - 1. Mean daily air temperature: 40°F (4°C) to 32°F (0°C):
    - a. Protect masonry from rain or snow with weather-resistive covering for 24 hours.
  - 2. Mean daily air temperature: 32°F (0°C) to 25°F (-4°C).
    - a. Completely cover masonry with weather-resistive covering for 24 hours.
  - 3. Mean daily air temperature: 25°F (-4°C) to 20°F (-7°C).
    - a. Completely cover masonry with insulating blankets or equal protection for 24 hours.
  - 4. Mean daily air temperature: 20°F (-7°C) and below.

- a. Maintain masonry temperature above 32°F (-7°C) for 24 hours by using enclosures and supplementary heat or with electric heating blankets.

## 2PART 2 PRODUCTS

### 2.01 MASONRY MATERIALS:

- A. Field face brick shall be the following:
  1. As manufactured by General Shale Brick of Knoxville, Tennessee. Color and texture to match existing adjacent brick to remain. Submit samples for architect and owner approval of match.
- B. Face brick exposed on the exterior and interior of building shall be 7-5/8" x 3-3/4" x 2-1/4" to lay up 3 courses in 8". Range of color shall be uniformly distributed in brick as delivered.
- C. Face brick to be used in exposed locations shall conform to the requirements of ASTM C216 Grade SW and shall be Type FBS.
- D. In locations where the cores of cored brick would be exposed use solid brick with finished faces and ends as required to present a finished face on the exposed face.
- E. Brick in concealed locations shall be culled face brick or all hard-burned common brick, conforming to ASTM C62-75A, Grade SW.
- F. Concrete block shall be hollow load-bearing concrete masonry units, conforming to ASTM C 90-75, Grade N-1, made with Shalite, or equal, light-weight aggregate. Units shall be steam cured at atmospheric pressure for not less than 12 hours at temperatures between 160 and 190 degrees F., and then shall be air dried and cured at least 28 days. When delivered to the site, units shall have a moisture content of not more than specified in ASTM C 90-75.
  - a. Units generally shall be 8" x 16" nominal face size and thicknesses shown on the drawings. Furnish all special sizes, lintel blocks and other special shapes required by job conditions.
    - a. Precast U-Lintels and special shapes made from 3,500 psi concrete with reinforcing bars placed as indicated and filled with coarse grout shall be acceptable upon review and approval by the Structural Engineer of Record. Units shall have a sand block finish to match adjacent CMU.
    - b. Basis of Design: Precast concrete u-lintels are based on products manufactured by Cast Crete. Subject to compliance with requirements.
  - b. All exterior corners of interior masonry walls to be exposed to view shall be made with bull-nose (radius edge) block.
  - c. **Any split face and/or smooth face block used on the exterior of the building and exposed to view shall be cast with integral color. Architect shall select color from manufacturer's full range or will indicate an existing condition to be matched or will provide a physical sample for color-matching purposes. Color will not be white.**
  - d. All block to be used on the exterior of the building shall be cast with integral waterproofing agent similar and equal to Acme Shield or Grace Industries "Dry Block System".
- G. Where it is necessary to cut masonry, use an approved masonry saw. Use no units less than half size. Promptly remove units showing evidence of being broken and replace with properly cut units.

## 2.02 REINFORCING MATERIALS:

- A. Masonry wall reinforcing for all masonry walls and partitions shall be Dur-O-Wall ladder design, Heckmann, Hohmann and Barnard, Wire-Bond or approved equal, and shall have product approval of the International Building Code Congress. Reinforcing shall be manufactured from cold drawn steel wire conforming to ASTM A 8272 and shall consist of two deformed longitudinal rods welded at 16" intervals to a continuous diagonal cross rod forming a truss design. Out-to-out spacing of side rods shall be approximately 2" less than the nominal thickness of the wall or partition. Cross rods and side rods shall be not less than No. 9 gage.
1. Reinforcing for CMU walls shall be Dur-O-Wall DA 320.
  2. Reinforcing for use with brick veneer at C.M.U. walls shall be Dur-O-Wall D/A 360 Ladur-Eye or equal spaced 16 inches on center each way.
  3. Brick ties at metal stud framing shall be Dur-O-Wall D/A 213 with 14 gage screw on plate and 3/16" pintles at 16" on center, each way.
  4. Brick ties at wood stud framing shall be Dur-O-Wall D/A 990 22 gage corrugated brick ties at 16" on center each way
  5. Interior walls: reinforcement shall be galvanized in accordance with ASTM A 641 Class 1 (.4 ounces per square foot.)
  6. Exterior walls reinforcement shall be galvanized in accordance with ASTM A 153 Class B2 (1.5 ounces per square foot).
  7. When ordering cavity wall reinforcing, the Contractor must specify the CMU thickness, Cavity Wall Insulation thickness if any, the cavity width, and the Brick Thickness.

## 2.03 MORTAR MATERIALS:

- A. Portland Cement shall conform to ASTM C150, Type 1. Masonry cement shall conform to ASTM C91, and shall be equal to Cemex, Essroc Italcementi Group, Holcim or Lafarge North America. Hydrated lime shall conform to ASTM C207, Type S.
- B. Aggregate for mortar shall be natural or manufactured sand conforming to ASTM C 144; except for joints less than 1/4" thick, use aggregate graded with 100 percent passing the No. 16 sieve and shall be uniform in color for all masonry work.
- C. Mixing water shall be clean and free from harmful amounts of acids, alkalies, and organic materials.
- D. Mortar shall conform to requirements of ASTM C270. Mortar for masonry work below grade shall be one part Portland Cement, 1/4 part hydrated lime or lime putty, and not less than 2-1/4 nor more than 3 parts sand, by volume, or any other mix conforming to ASTM requirements for Type M or Type S mortar. Mortar for masonry work above grade shall be one part masonry cement to not less than 2-1/4 nor more than 3 parts sand, by volume, or any other mix conforming to ASTM requirements for Type S or Type N mortar.
- E. Sand for mortar shall be measured in a damp loose condition. Mix mortar with the maximum amount of water consistent with satisfactory workability for a minimum of 3 minutes in a drum type mechanical mixer. Mixer shall be thoroughly cleaned between batches. Water may be added to mortar to maintain workability. No mortar older than 1hour shall be used..

## 2.04 CAVITY DRAINAGE SYSTEM:

- A. Provide mortar/drainage netting at base of brick veneer cavities in size to completely fill width of cavity. Mortar netting shall be manufactured using recycled polyester or polyethylene. The following are acceptable products, alternate products must be approved prior to bidding:
  - 1. Mortar Net as manufactured by Mortar Net USA, LTD.
  - 2. Mortar Break as manufactured by Advanced Building Products, Inc.
  - 3. Driwall Mortar Deflection as manufactured by Keene Building Products
- B. Provide Weep Vents in masonry veneer over cavity at 24 inches on center and at the base of all cavity walls above flashing and above and below window and door openings above thru-wall flashing and as shown on the drawings. Weep Vents shall be 2-5/8 inch by 3 1/2 inch by 1/2 inch recycled polyester mesh. The following are acceptable products, alternate products must be approved prior to bidding:
  - 1. Weep Vents as manufactured by Mortar Net USA LTD.
  - 2. Cell Vent as manufactured by Advanced Building Products, Inc.
  - 3. Weep Vents 025 as manufactured by Keene Building Products

#### 2.05 CONTROL JOINTS:

- A. "Wal-Joint", wide flange type, as manufactured by Hohmann & Barnard, Inc., approved equals of Dur-o-wal, Carter-Waters, Tywal Accessories, or Vinyl's are acceptable.
- B. Provide vertical control joints in all masonry walls that exceed 32'-0" in length and/or exceed a ratio of panel length to height (L/H) of 3.
- C. All joint locations must be verified and approved by the Architect. Control joints shall not be placed above or at the side of a masonry opening except where necessary to separate masonry supported off the foundation from that supported from the structure.
- D. Steel lintels supporting masonry shall be discontinuous at control joints & expansion joints.

#### 2.06 EXPANSION JOINTS IN BRICK VENEER:

- A. Provide vertical expansion joints in brick veneer walls at thirty-five feet (35'-0") on center maximum.

### 3PART 3 EXECUTION

#### 3.01 COORDINATION WITH OTHER WORK:

- A. Coordinate with other trades to insure that they have ample opportunity to build in their work as the masonry work progresses. Build in frames, anchors, and other incidental items furnished under other sections of the specifications. Set loose steel lintels and construct chases and recesses as required. Verify dimensions and locations of anchors, chases, etc., with the other trades involved.
- B. Build in through wall flashing as masonry is laid ensuring laps at ends and end dams at end of flashing above and below openings.
- C. Coordinate the masonry work for reinforced masonry block brick walls closely with the installation of the concrete fill and steel reinforcement.
- D. Furr out around piping and electrical panels and other items wherever the existing wall or proposed walls are not thick enough to accommodate items that are scheduled to go in them.
- E. In the event of discrepancy, immediately notify the Architect. Do not proceed with installation in areas of discrepancy until all such discrepancies have been completely resolved.

### 3.02 TOLERANCES FOR CONSTRUCTION:

- A. Bed joints and head joints shall be nominal 3/8" thick with slight variations allowed (5/16" to 7/16") to adjust coursing and to avoid cutting. Standard coursing for brick: 3 bricks and 3 mortar joints shall equal 8 inches unless otherwise noted.
- B. Variation from the plumb in the lines and surfaces of columns, walls, and arises shall not exceed 1/8" in 10' and 3/8" in a story height or 3/8" in 20'-0" maximum. Variation from plumb for external corners, expansion joints and other conspicuous lines, shall not exceed 1/4" in any story or 1/4" in 20'-0" maximum.
- C. Variation from the level of the grades indicated on the Drawings for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines shall not exceed 1/4" in any bay or module or 20'-0" (whichever dimension is the least) nor 1/2" in 40'-0" or more.
- D. Variation of the linear building line from an established position in plan and related portion of columns, walls, and partitions shall not exceed 1/4" in any bay or module or 20'-0" (whichever dimension is the least) nor 3/4" in 40'-0" or more.
- E. Variation in cross-sectional dimensions of columns and thickness of walls shall not exceed minus 1/4", nor plus 1/2" from the dimensions indicated on the Drawings.

### 3.03 CAVITIES

- 1. Keep cavities clean of mortar droppings and other materials during construction.
  - a. Install Cavity Drainage Material in cavities in accordance with manufacturer's recommendations.
  - b. Use wood strips temporarily placed in cavity to collect mortar droppings. As work progresses, remove strips, clean off mortar droppings, and replace in cavity.
- B. Install Weep Vents at 24 inches on center at the base of wall cavities, above and below window openings above thru wall flashing and elsewhere as shown on the drawings.
- C. Installing Cavity-Wall Insulation: Place small dabs of adhesive, spaced approximately 12 inches o.c. both ways, on inside face of insulation boards, or attach with plastic fasteners designed for this purpose. Fit courses of insulation between wall ties and other confining obstructions in cavity, with edges butted tightly both ways. Press units firmly against inside wythe of masonry or other construction as shown.
  - a. Fill cracks and open gaps in insulation with crack sealer compatible with insulation and masonry.

### 3.04 LAYING BRICK:

- A. Wet brick prior to laying unless their gain in weight is less than 3/4 oz. when immersed in 1/4" of water for one minute. Lay in full bed of slightly furrowed mortar and fill head joints completely.
- B. Lay facebrick on exterior walls in running bond and anchor to backup and to inner wythe with steel masonry reinforcing.
- C. Concealed brickwork 8" or more thick shall be laid in English bond with every other course of full headers.
- D. Brick veneer shall be returned against CMU or sheathing at all openings in exterior wall as required to close cavity.

### 3.05 LAYING CONCRETE BLOCK:

- A. Lay with full mortar coverage on vertical and horizontal face shells. Vertical joints in exposed concrete block work shall break at center of stretcher above and below; otherwise, bond each course at corners and intersections and break vertical joints at least 4".
- B. Broken or split block shall not be used. All cutting required shall be done with a masonry saw. The mortar bedding for anchors for door bucks and frames shall be spread on strips of 1/8" mesh hardware cloth about 12" long.
- C. Install steel masonry reinforcing in all concrete block walls and partitions. Partitions abutting exterior walls shall be anchored thereto with steel masonry reinforcing unless otherwise noted.
- D. Partitions enclosing pipe and duct chases shall be built after the piping and ducts are in place and have been tested and approved.
- E. All partitions shall extend from concrete floor slabs to underside of roof deck except where specifically noted or shown otherwise. All partitions shall be not less than 1-hour fire-resistive construction and the concrete blocks shall be UL listed or shall conform to requirements of the Building Code adopted by the authority having jurisdiction for 1-hour fire-resistance.
- F. Provide centering and install bond beam block over all openings greater than 24" wide in concrete walls and partitions, including openings for panelboards, ducts, and grills. Extend bond beams 8 inches minimum beyond edge of opening each side. Reinforce bond beams as noted on the drawings or with a minimum of 1 #5 bar top and bottom if not noted on the drawings. Fill Bond beams with concrete before laying next course of block.
- G. Install spandrel blocks for bond beams at the top of all masonry walls unless noted otherwise.
- H. Where masonry is to be exposed in the interior of a building the mortar joint at the intersection of interior masonry wall with exterior masonry wall shall be raked ¼ inch deep and caulked.

### 3.06 FLASHING:

- A. Place flashing in masonry work on a bed of mortar. Cover flashing with bed of mortar before placing units on flashing. Do not puncture flashing. Join sections of flashings by overlapping 6 inches minimum and fastening with adhesive to provide watertight joints. Turn up ends of flashing to provide positive drain to exterior. Comply with flashing manufacturer's recommendations. Install thru-wall flashings where shown on the drawings and in the following locations:
  - 1. Above all openings in exterior walls extend 12" beyond opening.
  - 2. Above all intersections of floors and exterior walls.
  - 3. Above all intersections of roofs with parapet walls, penthouses and all other exterior walls.
  - 4. Weep holes shall be installed above thru-wall flashings.

### 3.07 WORKMANSHIP:

- A. Masonry work shall be sound, straight, true, and complete in every respect, and exterior walls shall be so constructed as to preclude the penetration of water. Avoid over-plumbing and pounding of masonry units after they are set in place; where adjustments must be made after mortar has started to set, the mortar shall be removed and replaced with fresh mortar.
- B. Joints shall be thickness to conform to coursing specified or shown and shall be uniform and bond shall be true.
- C. Hollow metal door frames in masonry walls shall be filled solidly with mortar as the walls are laid up, but forming a cavity behind rubber bumper opening with a wad of newspaper. Unless otherwise specifically shown or specified, the space around anchors, flashing, steel lintels, and similar items built into the masonry work shall be filled solidly with mortar.



- D. Where nails or line pins have been used, they shall be removed when they have served their purpose and the holes left by their removal shall be filled immediately with fresh mortar.

### 3.08 POINTING

- A. After masonry work is completed, remove all line pins and point up all holes and open joints.

### 3.09 TOOLING:

- A. Tool all joints concave unless otherwise noted. Joints in exposed faces of facebrick on exterior and concrete block on interior shall be tooled with a round steel jointer, except at changes in brick color, just before the mortar hardens, with sufficient force to press the mortar against the masonry units on each side of the joint.
- B. Joints where brick changes color shall be raked joints. Face joints in concealed locations shall be struck flush
- C. Cut joints flush in block surfaces which will be concealed in the finished work or to which a finish material (other than paint) shall be supplied.

### 3.10 CLEANING OF MASONRY:

- A. Face of brick work shall be kept clean of mortar droppings, stains, and soil as the work progresses insofar as possible. The completed work shall be cleaned by methods approved by the Architect, equivalent to the following:
  - 1. Cleaning shall not be started until mortar is thoroughly set and cured. Then surfaces shall be dry cleaned by removing large particles of mortar with wood paddles and scrapers, using a chisel or wire brush where necessary.
  - 2. Presoak wall by saturating the masonry with clean water and flush off all loose mortar and dirt.
  - 3. While the surface is still saturated, starting at top of wall, scrub down with a solution mixed in the proportions of one-half cup of trisodium phosphate (Calgon) and one-half cup household detergent (All) dissolved in one gallon of clean water. Scrub with stiff fiber brushes only. Keep wall area below work area wet down at all times.
  - 4. After scrubbing thoroughly, rinse off all cleaning solution, dirt and mortar crumbs, using pressurized water from a hose.
- B. In areas where the preceding procedure is not adequate, use a similar procedure, but substitute an acid solution instead of the cleaner solution for scrubbing. Acid solution shall be mixed one part clean, stain-free commercial grade of hydrochloric (Muriatic) acid to nine parts clean water, mixed in a non-metallic container. Keep all brick work below the area being cleaned, soaked and flush free of acid and dissolved mortar before it becomes dry. Do not use wire brushes or metal tools and do not allow acid solution to come in contact with any metal or cast stone work. Acid solution shall be used only as a last resort and where expressly permitted by the Architect.
- C. Exposed concrete block surfaces shall be kept clean of mortar droppings as the work progresses and the completed work shall be dry-cleaned to remove remaining mortar spots and dirt. Surface shall be brushed free of dust before painting.

End of Section

## SECTION 05 12 00 – STRUCTURAL STEEL

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all material, labor, equipment, and supervision required to provide, fabricate, and install the following:
1. Structural steel framing members.
  2. Baseplates and anchor plates.
  3. Grouting under baseplates.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
- Section 05 50 00 “Shop Fabricated Metal” for steel lintels or shelf angles not attached to structural-steel frame; miscellaneous steel fabrications; and other metal items not defined as structural steel.
- Section 13 34 19 “Metal Building System” for structural steel and other steel fabrications defined as part of pre-engineered metal building package.

#### 1.03 PERFORMANCE REQUIREMENTS:

- A Connections: Provide details of simple shear connections required by the Contract Documents to be selected or completed by structural-steel fabricator to withstand ASD-service loads indicated and comply with other information and restrictions indicated.
1. Select and complete connections using schematic details indicated and AISC's "Manual of Steel Construction"
    - a. Construction: Type 1, rigid frame and 2, simple framing.

#### 1.04 SUBMITTALS:

- A Submit under provisions of Section 01 33 00.
- B Shop Drawings:
1. Indicate profiles, sizes, spacing, and locations of structural members, openings, attachments and fasteners.
  2. Connections.
  3. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.
- C Manufacturer's Mill Certificate: If requested by the Engineer, submit under provisions of Section 01 40 00 and Section 01 45 00 certifying that products meet or exceed specified requirements.
- D Mill Test Reports: If requested by the Engineer, submit under provisions of Section 01 40 00, Manufacturer's Certificates, indicating structural strength, destructive and nondestructive test analysis.
- E Welders' Certificates: If requested by the Engineer, submit under provisions of Section 01 40 00 Manufacturer's Certificates, certifying welders employed on the Work, verifying AWS qualifications within the previous 12 months.

F Inspection test reports: Inspecting agency shall provide reports of tests conducted. Test results shall be reported to the Architect and Contractor in writing on the same day that the test is made. All tests reports indicating non-compliance should be faxed immediately to all parties on the test report distribution list.

1. Reports shall contain the project identification name and number, date of test, and location of test by column grid/ piece number as noted in the shop drawings.

#### 1.05 QUALITY ASSURANCE:

A Fabricate structural steel members in accordance with AISC-Steel Construction Manual "Specification for Structural Steel Buildings".

B Provide qualifications for review and approval during the bidding process:

1. Installer Qualifications: A qualified installer who participates in the AISC Quality Certification Program and is designated an AISC-Certified Erector, Category CSE, **OR** as approved in writing after examination of Installer history by Structural Engineer.
2. Fabricator Qualifications: A qualified fabricator who participates in the AISC Quality Certification Program and is designated an AISC-Certified Plant, Category STD" at time of bid **OR** as approved in writing after examination of Fabricator history by Structural Engineer.

C Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel."

1. Comply with applicable provisions of the following specifications and documents:
2. AISC's "Code of Standard Practice for Steel Buildings and Bridges."
3. AISC's "Seismic Provisions for Structural Steel Buildings" and "Supplement No. 2."
4. AISC's "Specification for Structural Steel Buildings"
5. AISC's "Specification for the Design of Steel Hollow Structural Sections."
6. AISC's "Specification for Allowable Stress Design of Single-Angle Members".
7. AISC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts."

#### 1.06 QUALIFICATIONS:

A Fabricator: Company specializing in performing the work of this section with minimum 3 years experience approved by the American Institute of Steel Construction Quality Certification Program, Category II or III.

1. A Fabricator not complying with Category II or III shall have an established, documented in-house quality control and testing program to assure accuracy and adequacy of fabrication procedures and completed work, or shall have fabrication procedures and fabricated steel tested and inspected by an independent testing agency as directed by the Structural Engineer. Tests and inspections are to be performed by AWS Certified Welding Inspectors. **Fabricator shall submit documentation of quality control procedures to the Structural Engineer for review. The Structural Engineer shall be the sole judge of the adequacy of the proposed quality control program.** Submit copies of the inspection reports to the Structural Engineer. Payment of these tests and inspections will be by the fabricator. Tests and inspections shall include the following:
  - a. Examine mill tests reports and verify that material being used is the same as the mill test reports.
  - b. Review the fabricator's written welding procedures. Verify that the fabricator's welding procedures are being adhered to.
  - c. Verify that welders are certified with current papers and that they demonstrate proper techniques.

- d. Examine joint preparation for complete penetration joints. Ultrasonically test complete penetration joints.
- e. Examine fillet welds for proper size, profile, throat, porosity and end returns.
- f. Examine steel members for laminations. Spot check dimensions and hole sizes.
- g. The purpose of this inspection is to enable the testing agency to verify that, in general, the steel is being fabricated in accordance with the proper specifications. A minimum of one trip should be scheduled in the early stages of fabrication.

B Adhesive Anchors: Rawl/Powers Chem-Stud or equivalent manufactured by Hilti or Ramset/Red Head.

C Erector: Company specializing in performing the work of this section with a minimum 3 years experience.

D Design connections not detailed on the Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the state where the project is located.

#### 1.07 REFERENCES:

A The following are to be used as reference standards:

- 1. Structural Steel angles, channels, and plate: ASTM A36; W-Shapes: A992.
- 2. ASTM A108 - Steel Bars, Carbon, Cold Finished, Standard quality.
- 3. ASTM A123 - Zinc (Hot Dipped Galvanized) Coatings on iron and steel products.
- 4. ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.
- 5. ASTM A325 - High Strength Bolts for Structural Steel Joints.
- 6. ASTM A500 - Cold Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- 7. AWS A2.0 - Standard Welding symbols.
- 8. AWS D1.1 - Structural Welding Code.
- 9. AISC - Specification for the design, Fabrication and Erection of Structural Steel for Buildings.
- 10. SSPC - Steel Structures Painting Council.

#### 1.08 SOURCE QUALITY CONTROL AND TESTS:

A Comply with AISC "Code of Standard practice for Steel Buildings and Bridges", latest edition.

B Comply with AISC "Specification for the Design of Cold-Formed Structural Members".

C Field alterations of structural steel are not allowed without written approval of the Engineer of Record.

D Contractor's Quality Control Testing:

- 1. Required: A certified AWS Weld Inspector shall visually inspect 100% of welded moment connections and 10% of all other welded connections.
- 2. Manually torque test 10% of all bolted connections to verify correct tightness.
- 3. Optional, if requested by the Engineer:
  - a. Welded Connections: In addition to visual inspection, shop-welded connections will be tested and inspected according to AWS D1.1, and the following inspection procedures at testing agency's option:
    - i. Liquid Penetrant Inspection: ASTM E 165.

- ii. Magnetic Particle Inspection: ASTM E 709; performed on root pas and on finished weld. Cracks or zones of incomplete fusion or penetration will not be accepted.
  - iii. Ultrasonic Inspection: ASTM E 164.
  - iv. Radiographic Inspection: ASTM E 94.
- b. Bolted Connections: Shop-bolted connections will be tested and inspected according to RSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts".
  - c. In addition to visual inspection, shop-welded shear connectors will be tested and inspected to requirements in AWS D1.1 for stud welding and as follows, if requested by Engineer:
    - i. Bend tests will be performed if visual inspections reveal either a less-than-continuous 360-degree flash or welding repairs to any shear connector.
    - ii. Tests will be conducted on additional shear connectors if weld fracture occurs on shear connectors already tested according to requirements in AWS D1.1.

E Correct deficiencies in Work that test reports and inspections indicate does not comply with the Contract Documents.

1.09 DELIVERY, STORAGE, AND HANDLING:

A Store materials to permit easy access for inspection and identification. Keep steel members off ground and spaced by using pallets, dunnage, or other supports and spacers. Protect steel members and packaged materials from erosion and deterioration.

- 1. Store fasteners in a protected place. Clean and relubricate bolts and nuts that become dry or rusty before use.
- 2. Do not store materials on structure in a manner that might cause distortion, damage, or overload to members or supporting structures. Repair or replace damaged materials or structures as directed.

1.10 COORDINATION:

A Furnish anchorage items to be embedded in or attached to other construction without delaying the Work. Provide setting diagrams, sheet metal templates, instructions, and directions for installation.

PART II PRODUCTS

2.01 MATERIALS:

A Structural Steel Members: Channels, Angles, Plates: ASTM A36; W-Shapes: A992.

B Structural Tubing: ASTM A500, Grade B.

C Headed Studs: ASTM A108, Grade 1015, forged steel, headed, uncoated.

D Bolts, Nuts, and Washers: ASTM A325.

E Anchor Bolts: ASTM A307.

F Welding Materials: AWS D1.1; type required for materials being welded.

G Grout: No-shrink type, premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days.

- H Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide or fabricator's standard.
- I Protection for Structural Steel from Earth, Stone Backfill, or Concrete Backfill: 1/8 inch thick coat Hydrocide Mastic. Use one of the following in accordance with manufacturer's recommendations:
1. One coat Hydrocide 700 or two coats Hydrocide 700B by Degussa Building Systems.
  2. One coat MasterSeal 614 or two coats MasterSeal 615 by BASF.
  3. Additional alternate manufacturers must be approved by Engineer prior to Bidding and provide product equal to or exceeding specified requirements.

## 2.02 STRUCTURAL-STEEL MATERIALS

- A Structural Steel Members: Channels, Angles, Plates, M and S shapes: ASTM A36.
- B W-Shapes: ASTM A992, Grade 50
- C Plate and Bar: ASTM A 36/A 36M.
- D Corrosion-Resisting Structural Steel: ASTM A 588/A 588M, Grade 50 (345).
- E Structural Tubing: ASTM A500, Grade B.
- F Corrosion-Resisting Cold-Formed Hollow Structural Sections: ASTM A 847, structural tubing
- G Steel Pipe: ASTM A 53/A 53M, Type E or S, Grade B.
1. Weight Class: As indicated on the drawings.
  2. Finish: Black, except where indicated to be galvanized.
- H Medium-Strength Steel Castings: ASTM A 27/A 27M, Grade 65-35 (Grade 450-240), carbon steel.
- I High-Strength Steel Castings: ASTM A 148/A 148M, Grade 80-50 (Grade 550-345), carbon or alloy steel.
- J Headed Studs: ASTM A108, Grade 1015, forged steel, headed, uncoated.
- K Welding Materials: AWS D1.1; type required for materials being welded.
- L Grout: No-shrink type, premixed compound consisting of nonmetallic aggregate, cement, water reducing and plasticizing additives, capable of developing a minimum compressive strength of 7,000 psi at 28 days.
- M Shop and Touch-Up Primer: SSPC Paint 15, Type 1, red oxide or fabricator's standard.
- N Protection for Structural Steel from Earth, Stone Backfill, or Concrete Backfill: 1/8 inch thick coat Hydrocide Mastic. Use one of the following in accordance with manufacturer's recommendations:
1. One coat Hydrocide 700 or two coats Hydrocide 700B by Degussa Building Systems.
  2. One coat MasterSeal 614 or two coats MasterSeal 615 by BASF.
  3. Additional alternate manufacturers must be approved by Engineer prior to Bidding and provide product equal to or exceeding specified requirements.

## 2.03 BOLTS, CONNECTORS, AND ANCHORS

- A. High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436
1. Finish: Plain.

2. Direct-Tension Indicators: If requested by Engineer: ASTM F 959, Type 325 (ASTM F 959M, Type 8.8,) compressible-washer type.
    - a. Finish: Plain.
  - B High-Strength Bolts, Nuts, and Washers: ASTM A 490 (ASTM A 490M), Type 1, heavy hex steel structural bolts or tension-control, bolt-nut-washer assemblies with splined ends; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers, plain.
    1. Direct-Tension Indicators: ASTM F 959, Type 490 (ASTM F 959M,) Type 10.9, compressible-washer type, plain.
  - C Tension-Control, High-Strength Bolt-Nut-Washer Assemblies: If requested by Engineer: ASTM F 1852, Type 1, heavy hex or round head steel structural bolts with splined ends; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.
    1. Finish: Plain.
  - D Shear Connectors: ASTM A 108, Grades 1015 through 1020, headed-stud type, cold-finished carbon steel; AWS D1.1, Type B.
  - E Unheaded Anchor Rods: ASTM F 1554, Grade 36.
    1. Configuration: Straight.
    2. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
    3. Plate Washers: ASTM A 36/A 36M carbon steel.
    4. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
    5. Finish: Plain.
  - F Headed Anchor Rods: ASTM F 1554, Grade 36.
    1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
    2. Plate Washers: ASTM A 36/A 36M carbon steel.
    3. Washers: ASTM F 436 (ASTM F 436M) hardened carbon steel.
    4. Finish: Plain.
  - G Threaded Rods: ASTM A 36/A 36M and ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6).
    1. Nuts: ASTM A 563 (ASTM A 563M) hex carbon steel.
    2. Washers: ASTM F 436 ASTM F 436M or hardened ASTM A 36/A 36M carbon steel where noted.
    3. Finish: Plain.
  - H Clevises/Turnbuckles: ASTM A 108, Grade 1035, cold-finished carbon steel.
  - I Eye Bolts and Nuts: ASTM A 108, Grade 1030, cold-finished carbon steel.
  - J Sleeve Nuts: ASTM A 108, Grade 1018, cold-finished carbon steel.
- 2.04 FINISH:
- A Prepare structural component surfaces in accordance with SSPC SP-2.
  - B Shop prime structural steel members. Do not prime surfaces that will be field welded or high strength bolted, or in contact with concrete or masonry.

2.05 PRIMER

- A Primer: SSPC-Paint 25, Type II, iron oxide, zinc oxide, raw linseed oil, and alkyd.
- B Primer: Fabricator's standard lead- and chromate-free, non-asphaltic, rust-inhibiting primer.

PART III EXECUTION

3.01 FIELD MEASUREMENTS:

- A Verify that field measurements are as shown on shop drawings.

3.02 FABRICATION:

A Shop Fabrication and Assembly

1. Fabricate items of structural steel in accordance with AISC specifications for Type I construction and as indicated on the approved shop drawings. Provide camber in structural members as shown.
2. Properly mark and match-mark materials for field assembly and for identification as to the structure and site for which they are intended. Fabricate for a delivery sequence that will expedite erection and minimize field handling of materials.
3. Where finishing is required, complete the assembly (including welding of units) before start of finishing operations. Provide finish surfaces of members exposed in the final structure free of markings, burrs, and other defects.

B Structural Steel: Fabricate and assemble in shop to greatest extent possible. Fabricate according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and AISC's "Specification for Structural Steel Buildings.

1. Camber structural-steel members where indicated.
2. Identify high-strength structural steel according to ASTM A 6/ A 6M and maintain markings until structural steel has been erected.
3. Mark and match-mark materials for field assembly.
4. Complete structural-steel assemblies, including welding of units, before starting shop-priming operations.

C Architecturally Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel identified as architecturally exposed structural steel.

1. Fabricate with exposed surfaces smooth, square, and free of surface blemishes including pitting, rust, scale, seam marks, roller marks, rolled trade names, and roughness.
2. Remove blemishes by filling or grinding or by welding and grinding, before cleaning, treating, and shop priming.

D Thermal Cutting: Perform thermal cutting by machine to greatest extent possible.

1. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

E Bolt Holes: Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

F Finishing: Accurately finish ends of columns and other members transmitting bearing loads.

G Cleaning: Clean and prepare steel surfaces that are to remain unpainted according to SSPC-SP 2, "Hand Tool Cleaning or SSPC-SP 3, "Power Tool Cleaning."



- H Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.
- I Steel Wall-Opening Framing: Select true and straight members for fabricating steel wall-opening framing to be attached to structural steel. Straighten as required to provide uniform, square, and true members in completed wall framing.
- J Welded Door Frames: Build up welded door frames attached to structural steel. Weld exposed joints continuously and grind smooth. Plug-weld fixed steel bar stops to frames. Secure removable stops to frames with countersunk, cross-recessed head machine screws, uniformly spaced not more than 10 inches (250 mm) o.c., unless otherwise indicated.
- K Holes: Provide holes required for securing other work to structural steel and for passage of other work through steel framing members.
1. Cut, drill, or punch holes perpendicular to steel surfaces. Do not thermally cut bolt holes or enlarge holes by burning.
  2. Base-Plate Holes: Cut, drill, mechanically thermal cut, or punch holes perpendicular to steel surfaces.
  3. Weld threaded nuts to framing and other specialty items indicated to receive other work.
- L Connections
1. Provide bolts and washers of all types and sizes required for the completion of all field erection.
  2. High Strength Bolted Construction: Install high strength threaded fasteners in accordance with AISC Specifications for Structural Joints Using ASTM A325 Bolts, 3/4" diameter, minimum. Connections are to be considered bearing connections.
  3. Install by the turn of the nut method, or direct tension indicators or alternate design bolts.
  4. Welded Construction: Comply with the AWS Code for procedures, appearance, and quality of welds and for methods used in correcting welded work. Grind smooth any welds that will be exposed.
  5. Assemble and weld built-up sections by methods that produce true alignment of axes without warp.

### 3.03 SHOP CONNECTIONS

- A High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
1. Joint Types: Snug tightened, Pretensioned.
- B Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
1. Remove backing bars or runoff tabs, back gouge, and grind steel smooth if to remain exposed.
  2. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.
  3. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.
    - a. Grind butt welds flush.

4. Grind or fill exposed fillet welds to smooth profile. Dress exposed welds.

C Holes for Other Work

1. Provide holes required for securing other work to structural steel framing and the passage of other work through steel framing members as shown on the final shop drawings. Provide threaded nuts welded to framing and other specialty items as shown to receive other work.
2. Cut, drill, or punch holes perpendicular to metal surfaces. Do not flame cut holes or enlarge holes by burning. Drill holes in bearing plates.

D Anchor Bolts

1. Provide anchor bolts and other connectors required for securing structural steel to foundations and other in-place work.
2. Provide templates and other devices necessary for presetting bolts and other anchors to accurate locations.

E Bases and Bearing Plates

1. Bases and bearing plates shall be shop welded to columns and members attached to concrete and masonry. Install slide bearing plates and protect against damage in accordance with the manufacturer's written directions.

F Splicing

1. Splice members only where indicated unless, with the Architect's approval, splices not indicated would result in lower costs due to reduced shipping costs. Submit structural calculations signed by a structural engineer licensed where the fabricator is located for all splices not indicated.

G Gas Cutting

1. Do not use gas cutting torches for correcting fabrication errors in the structural framing. Cutting will be permitted only on secondary members, as acceptable to the Architect. Finish gas cut sections equal to a sheared appearance when gas cutting is permitted.

3.04 SHOP PRIMING

A Shop prime steel surfaces except the following:

1. Surfaces embedded in concrete or mortar. Extend priming of partially embedded members to a depth of 2 inches (50 mm).
2. Surfaces to be field welded.
3. Surfaces to be high-strength bolted with slip-critical connections.
4. Surfaces to receive sprayed fire-resistive materials.
5. Galvanized surfaces.

B Surface Preparation: Clean surfaces to be painted. Remove loose rust and mill scale and spatter, slag, or flux deposits. Prepare surfaces according to the following specifications and standards:

1. SSPC-SP 2, "Hand Tool Cleaning." Other methods if approved by Engineer.

C Priming: Immediately after surface preparation, apply primer according to manufacturer's written instructions and at rate recommended by SSPC to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.

Stripe paint corners, crevices, bolts, welds, and sharp edges.

1. Apply two coats of shop paint to inaccessible surfaces after assembly or erection. Change color of second coat to distinguish it from first.

D Painting: Apply a 1-coat, non-asphaltic primer complying with SSPC-PS Guide 7.00, "Painting System Guide 7.00: Guide for Selecting One-Coat Shop Painting Systems," to provide a dry film thickness of not less than 1.5 mils (0.038 mm).

### 3.05 EXAMINATION:

A Verify that field conditions are acceptable and are ready to receive work.

B Beginning of installation means erector accepts existing conditions.

### 3.06 ERECTION:

A Allow for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

B Field weld components indicated on Drawings and Shop Drawings.

C Do not field cut or alter structural members without approval of Architect.

D After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

E Grout under baseplates and bearing plates prior to installation of secondary framing.

F Erection shall be in accordance with AISC Code of Standard Practice.

G Set structural steel accurately in locations and to elevations indicated and according to AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings".

H Base and Bearing Plates: Clean concrete- and masonry-bearing surfaces of bond-reducing materials, and roughen surfaces prior to setting base and bearing plates. Clean bottom surface of base and bearing plates.

1. Set base and bearing plates for structural members on wedges, shims, or setting nuts as required.
2. Weld plate washers to top of base plate.
3. Snug-tighten anchor rods after supported members have been positioned and plumbed. Do not remove wedges or shims but, if protruding, cut off flush with edge of base or bearing plate before packing with grout.
4. Promptly pack grout solidly between bearing surfaces and base or bearing plates so no voids remain. Neatly finish exposed surfaces; protect grout and allow to cure. Comply with manufacturer's written installation instructions for shrinkage-resistant grouts.

I Maintain erection tolerances of structural steel and architecturally exposed structural steel within AISC's "Code of Standard Practice for Steel Buildings and Bridges."

J Align and adjust various members forming part of complete frame or structure before permanently fastening. Before assembly, clean bearing surfaces and other surfaces that will be in permanent contact with members. Perform necessary adjustments to compensate for discrepancies in elevations and alignment.

1. Level and plumb individual members of structure.

- K Splice members only where indicated.
- L Remove erection bolts on welded, architecturally exposed structural steel; fill holes with plug welds; and grind smooth at exposed surfaces.
- M Do not use thermal cutting during erection unless approved by Engineer. Finish thermally cut sections within smoothness limits in AWS D1.1.
- N Do not enlarge unfair holes in members by burning or using drift pins. Ream holes that must be enlarged to admit bolts.
- O Shear Connectors: Prepare steel surfaces as recommended by manufacturer of shear connectors. Use automatic end welding of headed-stud shear connectors according to AWS D1.1 and manufacturer's written instructions.

### 3.07 FIELD CONNECTIONS

- A High-Strength Bolts: Shop install high-strength bolts according to RCSC's "Specification for Structural Joints Using ASTM A 325 or A 490 Bolts" for type of bolt and type of joint specified.
  - 1. Joint Type: Snug tightened Pretensioned.
- B Weld Connections: Comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work.
  - 1. Comply with AISC's "Code of Standard Practice for Steel Buildings and Bridges" and "Specification for Structural Steel Buildings" for bearing, adequacy of temporary connections, alignment, and removal of paint on surfaces adjacent to field welds.
  - 2. Remove backing bars or runoff tabs, back gouge, and grind steel smooth.
  - 3. Assemble and weld built-up sections by methods that will maintain true alignment of axes without exceeding tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for mill material.

### 3.08 REPAIRS AND PROTECTION

- A Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists and accessories and abutting structural steel.
  - 1. Clean and prepare surfaces by SSPC-SP 2 hand-tool cleaning or SSPC-SP 3 power-tool cleaning.
  - 2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.

End of Section

## SECTION 05 21 00 – STEEL JOISTS

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment, and supervision to design, fabricate, deliver, and install steel joists as shown on the drawings and specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 DEFINITIONS:

- A SJI "Specifications": Steel Joist Institute's "Standard Specifications, Load Tables and Weight Tables for Steel Joists and Joist Girders."
- B Special Joists: Steel joists or joist girders requiring modification by manufacturer to support non-uniform, unequal, or special loading conditions that invalidate load tables in SJI's "Specifications."

#### 1.04 SUBMITTALS:

- A Meet the requirements of Structural Shop Drafting by AISC for shop drawings.
- B Provide calculations and/or certifications showing compliance with all design criteria stated in these specifications and noted in the Drawings.
- C Product Data: For each type of joist, accessory, and product indicated.
- D Shop Drawings: Show layout, designation, number, type, location, and spacing of joists. Include joining and anchorage details, bracing, bridging, joist accessories; splice and connection locations and details; and attachments to other construction.
  - 1. Indicate locations and details of bearing plates to be embedded in other construction.
  - 2. Comprehensive engineering analysis of special joists signed and sealed by the qualified professional engineer responsible for its preparation.
- E Manufacturer Certificates: Signed by manufacturers certifying that joists comply with requirements.
- F Mill Certificates: Signed by bolt manufacturers certifying that bolts comply with requirements.

#### 1.05 QUALITY ASSURANCE:

- A Manufacturer Qualifications: A manufacturer certified by SJI to manufacture joists complying with applicable standard specifications and load tables of SJI "Specifications."
  - 1. Manufacturer's responsibilities include providing professional engineering services for designing special joists to comply with performance requirements.
- B SJI Specifications: Comply with standard specifications in SJI's "Specifications" that are applicable to types of joists indicated.
- C Welding: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

1.06 FIELD QUALITY CONTROL:

- A Testing Agency: Engage a qualified independent testing and inspecting agency to inspect field welds and bolted connections and to perform tests and inspections and prepare test and inspection reports.
- B Field welds will be visually inspected according to AWS D1.1/D1.1M.
- C In addition to visual inspection, field welds will be tested according to AWS D1.1/D1.1M and the following procedures, as applicable if noted on the drawings:
  - 1. Radiographic Testing: ASTM E 94.
  - 2. Magnetic Particle Inspection: ASTM E 709.
  - 3. Ultrasonic Testing: ASTM E 164.
  - 4. Liquid Penetrant Inspection: ASTM E 165.
- D Bolted connections will be visually inspected.
- E High-strength, field-bolted connections will be tested and verified according to procedures in RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts."
- F Correct deficiencies in Work that test and inspection reports have indicated are not in compliance with specified requirements.
- G Additional testing will be performed to determine compliance of corrected Work with specified requirements.

1.07 DELIVERY, STORAGE, AND HANDLING:

- A Deliver, store, and handle joists as recommended in SJI's "Specifications."
- B Protect joists from corrosion, deformation, and other damage during delivery, storage, and handling.

1.08 SEQUENCING:

- A Deliver steel bearing plates to be built into cast-in-place concrete and masonry construction.

PART II PRODUCTS

2.01 JOISTS:

- A Design joists for the loads indicated on the Drawings.
- B Use SJI standard camber unless the Drawings indicate otherwise; negative camber is unacceptable.

2.02 FASTENERS:

- A ASTM A325 or A490 structural bolts, nuts and hardened washers.

2.03 BRIDGING:

- A Standard of joist manufacturer, except as noted otherwise on the drawings.

2.04 SHOP PRIMER:

- A Light gray chromate or red oxide primer, 2 mil dry thickness.

## 2.05 MATERIALS

- A Steel: Comply with SJI's "Specifications" for web and steel-angle chord members.
- B Steel Bearing Plates: ASTM A 36/A 36M.
- C Carbon-Steel Bolts and Threaded Fasteners: ASTM A 307, Grade A (ASTM F 568M, Property Class 4.6), carbon-steel, hex-head bolts and threaded fasteners; carbon-steel nuts; and flat, unhardened steel washers.
  - 1. Finish: Plain, uncoated
- D High-Strength Bolts, Nuts, and Washers: ASTM A 325 (ASTM A 325M), Type 1, heavy hex steel structural bolts; ASTM A 563 (ASTM A 563M) heavy hex carbon-steel nuts; and ASTM F 436 (ASTM F 436M) hardened carbon-steel washers.
  - 1. Finish: Plain.
- E Welding Electrodes: Comply with AWS standards.

## 2.06 PRIMERS

- A Primer: SSPC-Paint 15, or manufacturer's standard shop primer complying with performance requirements in SSPC-Paint 15.

## 2.07 K-SERIES STEEL JOISTS

- A Manufacture steel joists of type indicated according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members, underslung ends, and parallel top chord.
  - 1. Joist Type: K-series steel joists and KCS-type K-series steel joists.
- B Steel Joist Substitutes: Manufacture according to "Standard Specifications for Open Web Steel Joists, K-Series" in SJI's "Specifications," with steel-angle or -channel members.
- C Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- D Provide holes in chord members for connecting and securing other construction to joists.
- E Top-Chord Extensions: Extend top chords of joists with SJI's Type S top-chord extensions where indicated, complying with SJI's "Specifications."
- F Extended Ends: Extend bearing ends of joists with SJI's Type R extended ends where indicated, complying with SJI's "Specifications."
- G Camber joists according to SJI's "Specifications."
- H Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

## 2.08 LONG-SPAN STEEL JOISTS

- A Manufacture steel joists according to "Standard Specifications for Longspan Steel Joists, LH-Series and Deep Longspan Steel Joists, DLH-Series" in SJI's "Specifications," with steel-angle top- and bottom-chord members; of joist type and end and top-chord arrangements as follows:
  - 1. Joist Type: LH-series steel joists and DLH-series steel joists.

2. End Arrangement: Underslung /Square as noted on drawings.
  3. Top-Chord Arrangement: Parallel.
- B Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C Provide holes in chord members for connecting and securing other construction to joists.
- D Camber long-span steel joists according to SJI's "Specifications."
- E Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

#### 2.09 JOIST GIRDERS

- A Manufacture joist girders according to "Standard Specifications for Joist Girders" in SJI's "Specifications," with steel-angle top- and bottom-chord members; with end and top-chord arrangements as follows:
1. End Arrangement: Underslung with bottom-chord extensions or as noted on the drawings.
  2. Top-Chord Arrangement: Parallel.
- B Comply with AWS requirements and procedures for shop welding, appearance, quality of welds, and methods used in correcting welding work.
- C Provide holes in chord members for connecting and securing other construction to joist girders.
- D Camber joist girders according to SJI's "Specifications."
- E Equip bearing ends of joists with manufacturer's standard beveled ends or sloped shoes if joist slope exceeds 1/4 inch per 12 inches (1:48).

#### 2.10 JOIST ACCESSORIES

- A Bridging: Schematically indicated. Detail and fabricate according to SJI's "Specifications." Furnish additional erection bridging if required for stability.
- B Steel bearing plates with integral anchorages are specified in Division 5 Section "Metal Fabrications."
- C Supply ceiling extensions, either extended bottom-chord elements or a separate extension unit of enough strength to support ceiling construction. Extend ends to within 1/2 inch (13 mm) of finished wall surface, unless otherwise indicated.
- D Supply miscellaneous accessories, including splice plates and bolts required by joist manufacturer to complete joist installation.

#### 2.11 CLEANING AND SHOP PAINTING

- A Clean and remove loose scale, heavy rust, and other foreign materials from fabricated joists and accessories by hand-tool cleaning, SSPC-SP 2 or power-tool cleaning, SSPC-SP 3.
- B Do not prime paint joists and accessories to receive sprayed fire-resistive materials.
- C Apply 1 coat of shop primer to joists and joist accessories to be primed to provide a continuous, dry paint film not less than 1 mil (0.025 mm) thick.

### PART III EXECUTION



3.01 EXAMINATION:

A Examine supporting substrates, embedded bearing plates, and abutting structural framing for compliance with requirements for installation tolerances and other conditions affecting performance.

1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 FABRICATION:

A Fabricate joists completely in the shop according to the latest SJI standards.

B Joists may be fabricated from hot or cold formed sections of strip or sheet steel.

3.03 INSTALLATION:

A Do not start placement until supporting work is in place and secured.

B Install and secure joists and permanent bridging before construction loading. Provide for distribution of temporary loading. Bar joists and joist girders to be erected per OSHA 1926.750.

C Joists shall bear not less than 4 inches on masonry or concrete and not less than 2-1/2 inches on steel.

D Coordinate the delivery of products with that of other materials. Avoid damage during unloading, storing, or erecting. Replace damaged joists.

E Leave members clean. Touch up the shop coat in the field.

F Do not install joists until supporting construction is in place and secured.

G Install joists and accessories plumb, square, and true to line; securely fasten to supporting construction according to SJI's "Specifications," joist manufacturer's written recommendations, and requirements in this Section.

1. Before installation, splice joists delivered to Project site in more than one piece.
2. Space, adjust, and align joists accurately in location before permanently fastening.
3. Install temporary bracing and erection bridging, connections, and anchors to ensure that joists are stabilized during construction.
4. Delay rigidly connecting bottom-chord extensions to columns or supports until dead loads have been applied.

H Field weld joists to supporting steel bearing plates and framework. Coordinate welding sequence and procedure with placement of joists. Comply with AWS requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.

I Bolt joists to supporting steel framework using high-strength structural bolts. Comply with RCSC's "Specification for Structural Joints Using ASTM A 325 or ASTM A 490 Bolts" for high-strength structural bolt installation and tightening requirements.

J Install and connect bridging concurrently with joist erection, before construction loads are applied. Anchor ends of bridging lines at top and bottom chords if terminating at walls or beams.

3.04 REPAIRS AND PROTECTION:

A Repair damaged galvanized coatings on galvanized items with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

- B Touchup Painting: After installation, promptly clean, prepare, and prime or reprime field connections, rust spots, and abraded surfaces of prime-painted joists abutting structural steel, and accessories.
1. Clean and prepare surfaces by hand-tool cleaning, SSPC-SP 2, or power-tool cleaning, SSPC-SP 3.
  2. Apply a compatible primer of same type as shop primer used on adjacent surfaces.
- C Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure that joists and accessories are without damage or deterioration at time of Substantial Completion.

End of Section

## SECTION 05 31 00 – STEEL ROOF DECKING

### PART I GENERAL

#### 1.01 SCOPE:

A The work required under this specification consists of all steel roof decking.

#### 1.02 RELATED DOCUMENTS:

A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	05 12 00	Structural Steel
Section	05 21 00	Steel Joists
Section	09 91 00	Painting

#### 1.03 CODES AND STANDARDS:

A Comply with the provisions of the following codes and standards:

1. AISI "Specification for the Design of Cold-Formed Steel Structural Members" (Standard Specifications).
2. AWS D1.3 "Structural Welding Code-Steel" and AWS D1.3 "Structural Welding Code – Sheet Steel".
3. ASTM A-611.

#### 1.04 SUBMITTALS:

A For information only, submit 2 copies of manufacturer's specifications and installation instructions for each product specified. Include manufacturer's certification as may be required to show compliance with these specifications. Indicate by transmittal form that a copy of each instruction has been distributed to the Installer.

B Submit detailed shop drawings showing layout and types of deck panels, anchorage details, and every condition requiring closure panels, supplementary framing, cut openings, special jointing or other accessories.

### PART II PRODUCTS

#### 2.01 STEEL ROOF DECK:

A Steel roof deck units shall be fabricated from steel conforming to Section 1.2 of the latest edition of the Standard Specifications.

B Deck to be Type "B" or "N". Decks indicated for applicable acoustic properties to be Type "BA".

C Depth, gauge, and finish shall be as specified on the drawings.

### PART III EXECUTION

#### 3.01 INSPECTION:

A Installer must examine the areas and conditions under which deck is to be installed and notify the Contractor in writing of conditions detrimental to the proper and timely completion of the work. Do not proceed with the work until unsatisfactory conditions have been corrected in a manner acceptable to the Installer.

3.02 INSTALLATION:

A All new roof areas shall be covered with steel roof deck unless noted otherwise in the Drawings.

B Form metal units in lengths to be supported by 3 or more supports, where applicable, with lapped ends (2" minimum) and nested side laps. Units shall be erected and welded to supports in accordance with manufacturer's specifications in a pattern as noted on the drawings.

C Place form units on supporting steel framework and adjust to final position with ends bearing on supporting members and accurately aligned before being permanently fastened. Do not stretch or contract side lap interlocks. Place units flat and square without warp or excessive deflection.

D Place deck bundles in such a manner as to not exceed allowable load capacity of structural framing.

E Do not use deck units for storage or working platforms until permanently secured and do not exceed manufacturer's specified load capacity of deck.

F Reinforce deck at openings without structural supports along all edges by means of one piece, flat sheet of 18 gauge (min.) of material of the same type and finish as the deck. Reinforcing shall be a minimum of at least 12" wide. Weld reinforcing to the forms at each corner and at intervals not exceeding 6" o.c.

G Comply with AWS requirements and procedures for welding.

H After installation, clean and patch the finish of scarred, welded, or rusted areas of the forms and supporting structure.

End of Section

SECTION 05 40 00 – COLD FORMED METAL FRAMING AND SHEATHING:

PART I GENERAL

1.01 SCOPE

A Furnish all labor, material, equipment and supervision necessary to furnish and install gypsum sheathing and structural metal stud framing and fasteners at all exterior walls as specified herein as shown on the drawings and as specified herein.

1. Furnish and install structural metal stud fabricated roof trusses.
2. Furnish and install air infiltration barrier and flexible flashing at window openings.
3. Insulate voids in metal stud assemblies during fabrication which would be inaccessible for installation of insulation at a later date.

1.02 RELATED DOCUMENTS:

A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	07 21 00	Building Insulation
Section	09 22 16	Metal Support Systems
Section	09 29 00	Gypsum Wallboard
Division	22	Plumbing
Division	23	Heating Ventilating and Air Conditioning
Division	26	Electrical
Division	27	Communications

1.03 SUBMITTALS:

A Submit Manufacturer's data on sheathing and framing in accordance with Section 013300.

1.04 QUALITY ASSURANCE:

A This project has been designed based on allowable loads and construction standards of (SSMA) Steel Stud Manufacturer's Association. To be considered as an equal product, the Contractor shall submit product data, installation details, and any other supplemental information required by the Structural Engineer in accordance with Section 013300.

B Structural steel studs shall be inspected by the Architect before they are to be concealed.

C All structural steel studs and joists shall be factory color coded to provide a suitable visible means of field checking for proper location of gauge material.

D Installer Qualifications: An experienced installer who has completed cold-formed metal framing similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

E Splices in studs shall not be permitted.

F Engineering Responsibility: Engage a qualified professional engineer to prepare design calculations, Shop Drawings, and other structural data.

G Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this Project in material, design, and extent.

- H Mill certificates signed by steel sheet producer or test reports from a qualified independent testing agency indicating steel sheet complies with requirements, including uncoated steel thickness, yield strength, tensile strength, total elongation, chemical requirements, ductility, and galvanized-coating thickness.
- I Welding: Qualify procedures and personnel according to AWS D1.1, "Structural Welding Code--Steel," and AWS D1.3, "Structural Welding Code--Sheet Steel."
- J AISI Specifications: Comply with AISI's "Specification for the Design of Cold-Formed Steel Structural Members" or "Load and Resistance Factor Design Specification for Cold-Formed Steel Structural Members" and the following for calculating structural characteristics of cold-formed metal framing:
1. CCFSS Technical Bulletin: "AISI Specification Provisions for Screw Connections."

#### 1.05 PERFORMANCE REQUIREMENTS:

- A Structural Performance: Provide cold-formed metal framing capable of withstanding design loads indicated on the drawings within limits and under conditions indicated.
- B Deflection Limits: Design framing systems to withstand design loads without deflections greater than the following:
1. Exterior Load-Bearing Wall Framing: Horizontal deflection of L/360 of the wall height.
  2. Exterior Load-Bearing Wall Framing With Brick Veneer: Horizontal deflection of L/600 of the wall height.
  3. Roof Trusses: Vertical deflection of 1/240 of the span.
- C Design framing systems to provide for movement of framing members without damage or overstressing, sheathing failure, connection failure, undue strain on fasteners and anchors, or other detrimental effects when subject to a maximum ambient temperature change of 120° F .

### PART II PRODUCTS

#### 2.01 MATERIALS:

- A Steel Sheet: ASTM A 653/A 653M, structural steel, zinc coated, of grade and coating as follows:
1. Grade: 33, Class 1.
  2. Grade: 33 for minimum uncoated steel thickness of 0.0428 inch and less; 50 Class 1 for minimum uncoated steel thickness of 0.0538 inch (1.37 mm) and greater.
  3. Coating: G60.
- B All members shall be designed in accordance with American iron and Steel institute (AISI) "Specification for the Design of Cold-Formed Steel Structural Members".
- C All framing members shall be formed from corrosion-resistant steel, corresponding to the requirements of AS5M A653, with a minimum yield strength of 40 ksi for studs, 33 ksi for runners.
- D Top and bottom track are to be the same gauge as the studs.
- E Framing members not scheduled otherwise on the drawings shall be not than less than 43 mils.
- F Steel studs shall be of size and gauge shown on the drawings. Studs not sized on the drawings shall be a minimum of 43 mils.
- G Sheathing shall be 5/8" x 48" x 96" long fire resistant, water resistant glass fiber reinforced Dens-Glass Gold as manufactured by Georgia Pacific, Fiberock aquatough sheathing as manufactured

by Unites States Gypsum Co., Gold Bond® Extended Exposure Gypsum Sheathing by National Gypsum company, or GlasRock™ sheathing by CertainTeed Gypsum.

## 2.02 AIR-INFILTRATION BARRIER:

A Proprietary building wrap with flame-spread and smoke-developed ratings of less than 25 and 450, respectively, when tested according to ASTM E 84. Provide one of the following products:

1. Spun Bonded Polyethylene sheet with aluminum coating on one face, formed by spinning continuous strands of fine, high-density-polyethylene interconnected fibers and bonding them together by heat and pressure; incorporating an additive to provide ultraviolet light resistance for up to 120 days; and with a water-vapor transmission rate equaling 535 g through 1 sq. m of surface in 24 hours according to ASTM E 96, Desiccant Method (Method A).
  - a. Product: Subject to compliance with requirements, provide "Tyvek ThermaWrap™" by DuPont Company.
2. Effective R-value: R-2 (including ¾" minimum airspace), as designated on ASHRAE tables, ASTM Handbook of Fundamentals, Chapter 25- Table 3.
3. Air Penetration: 0.001 cfm/ft<sup>2</sup> at 1.57 psf, when tested in accordance with ASTM E 2178.
4. Water Vapor Transmission: 36 perms, when tested in accordance with ASTM E 96, Method B.
5. Water Penetration Resistance: 210 cm when tested in accordance with AATCC Test Method 127.
6. Basis Weight: 2.6 oz/yd<sup>2</sup>, when tested in accordance with TAPPI Test Method T-410.
7. Air Resistance: Air infiltration at >1000 seconds, when tested in accordance with TAPPI Test Method T-460.
8. Tensile Strength: 29/27 lbs/in., when tested in accordance with ASTM D 882, Method A.
9. Tear Resistance: 12/7 lbs., when tested in accordance with ASTM D 1117.

B. Accessories:

1. Seam Tape: DuPont™ Tyvek® Metallized Tape or DuPont™ Tyvek® Tape as manufactured by DuPont.
  - a. Fasteners:
    - i. Steel Frame Construction: Tyvek® Wrap Cap Screws, as manufactured by DuPont: 1-5/8 inch rust resistant screw with 2-inch diameter plastic cap fasteners.
    - ii. Wood Frame Construction: Tyvek® Wrap Caps, as manufactured by DuPont Building Innovations: #4 nails with large 1-inch plastic cap fasteners or 1-inch cap staples.
  - b. Sealants : Provide sealants as recommended by the weather barrier manufacturer that comply with ASTM C 920, elastomeric polymer sealant to maintain watertight conditions.
  - c. Adhesives: Provide adhesive recommended by weather barrier manufacturer.

- C. Flashing: DuPont™ FlexWrap™, as manufactured by DuPont or other approved flexible membrane flashing materials for window openings and penetrations.

2.03 ROOF TRUSSES:

- A Roof Truss Members: Manufacturer's standard C-shaped steel sections, of web depths indicated, unpunched, with stiffened flanges, complying with ASTM C 955, and as follows:

1. Minimum Uncoated-Steel Thickness: 0.0329 inch.
2. Flange Width: 2 inches minimum.

2.04 FRAMING ACCESSORIES:

- A Fabricate steel-framing accessories of the same material and finish used for framing members, with a minimum yield strength of 33,000 psi (230 MPa).

- B Provide accessories of manufacturer's standard thickness and configuration, unless otherwise indicated, as follows:

1. Supplementary framing.
2. Bracing, bridging, and solid blocking.
3. Web stiffeners.
4. End clips.
5. Gusset plates.
6. Joist hangers and end closures.

2.05 ANCHORS, CLIPS, AND FASTENERS:

- A Steel Shapes and Clips: ASTM A 36/A 36M, zinc coated by hot-dip process according to ASTM A 123.

- B Anchor Bolts: ASTM F 1554, Grade 36 threaded carbon-steel headless, hooked bolts and carbon-steel nuts; and flat, hardened-steel washers; zinc coated by hot-dip process according to ASTM A 153/A 153M, Class C.

- C Mechanical Fasteners: Corrosion-resistant-coated, self-drilling, self-threading steel drill screws.

1. Head Type: Low-profile head beneath sheathing, manufacturer's standard elsewhere.

- D Welding Electrodes: Comply with AWS standards.

2.06 MISCELLANEOUS MATERIALS:

- A Galvanizing Repair Paint: SSPC-Paint 20

2.07 FABRICATION:

- A Fabricate cold-formed metal framing and accessories plumb, square, and true to line, and with connections securely fastened, according to manufacturer's written recommendations and requirements in this Section.

1. Fabricate framing assemblies using jigs or templates.
2. Cut framing members by sawing or shearing; do not torch cut.
3. Fasten cold-formed metal framing members by welding or screw fastening, as standard with fabricator. Wire tying of framing members is not permitted.



- a. Comply with AWS D1.3 requirements and procedures for welding, appearance and quality of welds, and methods used in correcting welding work.
    - b. Locate mechanical fasteners and install according to Shop Drawings, with screw penetrating joined members by not less than three exposed screw threads.
  - 4. Fasten other materials to cold-formed metal framing by welding, bolting, or screw fastening, according to Shop Drawings.
- B Reinforce, stiffen, and brace framing assemblies to withstand handling, delivery, and erection stresses. Lift fabricated assemblies to prevent damage or permanent distortion.
- C Fabrication Tolerances: Fabricate assemblies level, plumb, and true to line to a maximum allowable tolerance variation of 1/8 inch in 10 feet and as follows:
  - 1. Spacing: Space individual framing members no more than plus or minus 1/8 inch from plan location. Cumulative error shall not exceed minimum fastening requirements of sheathing or other finishing materials.
  - 2. Squareness: Fabricate each cold-formed metal framing assembly to a maximum out-of-square tolerance of 1/8 inch.
- D. Insulate Voids in built-up components: Stuff glass-fiber loose-fill insulation into miscellaneous voids and cavity spaces where shown. Compact to approximately 40 percent of normal maximum volume to a density equaling approximately 2.5 lb/cu. ft. (40 kg/cu. m).
  - 1. Contractor may use Foamed in place insulation in lieu of glass fiber insulation to insulate voids in built-up components.
    - a. Foamed-In Place Insulation: Two component thermal insulation combining a plastic resin and catalyst foaming agent surfactant, properly mixed/rationed and combined with compressed air to produce a cold-setting foam insulation in cores of hollow concrete masonry walls.
      - i. Thermal Values: Provide "R" 3.7 per inch min. @ 32 degrees F. mean.
      - ii. Density: Dry 0.5 lb/ft<sup>3</sup>.
      - iii. Flame Spread: 25
      - iv. Smoke Developed: < 450
      - v. Permeance at 3.5 inches thickness: 7.7 perms per inch or less per ASTM E96.
      - vi. Corrosion: Non-corrosive.
      - vii. Toxicity: Non-toxic.
  - 2. Acceptable Manufacturers:
    - i. PolyMaster, Inc. "PolyMaster® Incylthane 500".
    - ii. Tailored Chemical Products, Inc. "Core-Fill 500".

### PART III EXECUTION

#### 3.01 FRAMING:

- A Prior to fabrication of framing, the contractor shall submit fabrication and erection drawings to the architect.
- B All framing components shall be cut squarely for attachment to perpendicular members, or as required, for an angular fit against abutting members.

- C Axially loaded studs shall be installed in a manner which will assure that their ends are positioned against the inside of runner web prior to fastening.
- D Fastening of components shall be with self-drilling screws or welding. Screws shall be of sufficient size to insure the strength of the connection. Wire tying of components shall not be permitted. All welds shall be touched up with a zinc-rich paint.
- E Coordinate with Plumbing, Mechanical, Electrical, and Communications Subcontractors to build-in required blocking for wall mounted equipment and devices.

### 3.02 WALL FRAMING INSTALLATION:

- A Runners and studs shall be securely anchored to the supporting structure. Complete, uniform and level bearing support shall be provided for bottom runner.
- B Abutting lengths of runner shall each be securely anchored to a common structural element, butt-welded or spliced.
- C Studs shall be plumbed, aligned and securely attached to flanges of both upper and lower runners. Framing of wall openings shall include headers and supporting studs.
- D Temporary bracing, where required, shall be provided until erection is completed.
- E Resistance to bending and rotation about the minor axis shall be provided by sheathing per AISI Specification, Sec. 5.1, and diagonally brace stud wall at all corners (horizontal strap or cold-rolled channel bracing.) Additional studs, when necessary, shall be positioned as to resist the vertical components.
- F Splices in studs and cutouts in the flanges of studs shall not be permitted.
- G Provide additional bracing and anchorage as noted on the drawings.
- H Apply 4 foot wide gypsum sheathing vertically with long edges over studs with face out. Screw attach gypsum sheathing with 1 inch type screws spaced 3/8" from edges and approximately 8" O.C. at edges and in the field, unless otherwise noted on the drawings.
- I Provide slip connections allowing for vertical movement (1/2" unless noted otherwise on the drawings) of the structure without imposing vertical loads on non-load bearing studs. Submit process and detail prior to installation.

### 3.03 TRUSS INSTALLATION:

- A Do not install trusses until supporting construction is in place and is braced and secured.
- B Handling:
  - 1. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out-of-plane bending or other causes.
  - 2. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
  - 3. Space, adjust, and align trusses in location before permanently fastening.
  - 4. Install, bridge, and brace trusses according to Shop Drawings and requirements in this Section.
- C Truss Spacing: As indicated on approved shop drawings.
- D Do not alter, cut, or remove framing members or connections of trusses.

- E Erect trusses with plane of truss webs plumb and parallel to each other, align, and accurately position at spacings indicated. Securely connect each truss ply required for forming built-up girder trusses
- F Erect trusses without damaging framing members or connections.
- G Install continuous bridging and permanently brace trusses as indicated on Shop Drawings.
- H Fastening:
  - 1. Anchor trusses securely at all bearing points using metal framing anchors. Install fasteners through each fastener hole in metal framing anchor according to manufacturer's fastening schedules and written instructions.
  - 2. Anchor trusses to girder trusses as shown on approved shop drawings.
  - 3. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends of permanent bracing where terminating at walls or beams.
- I Return trusses that are damaged or do not meet requirements to fabricator and replace with trusses that do meet requirements.
- J Repair damaged galvanized coatings on exposed surfaces with galvanized repair paint according to ASTM A 780 and manufacturer's written instructions.

#### 3.04 GYPSUM SHEATHING INSTALLATION:

- A General: Install gypsum sheathing to comply with GA-253 and manufacturer's written instructions.
- B Cut boards at penetrations, edges, and other obstructions of the work; fit tightly against abutting construction, except provide a 3/8-inch (9-mm) setback where non-load-bearing construction abuts structural elements.
- C Coordinate sheathing installation with flashing and joint sealant installation so these materials are installed in the sequence and manner that prevent exterior moisture from passing through completed exterior wall assembly.
- D Apply fasteners so screw heads bear tightly against face of sheathing boards but do not cut into facing.
- E Do not bridge building expansion joints with sheathing; cut and space edges to match spacing of structural support elements.
- F Horizontal Installation: Install 24-inch- (610-mm-) wide gypsum sheathing boards horizontally with V-grooved edge down and tongue edge up. Interlock tongue with groove to bring long edges in contact with edges of adjacent boards without forcing. Abut ends of boards over centers of stud flanges and stagger end joints of adjacent boards not less than one stud spacing. Screw-attach boards at perimeter and within field of board to each steel stud at approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9 mm) from edges and ends of boards.
  - 1. Vertical Installation: Install 48-inch- (1219-mm-) wide gypsum sheathing boards vertically with vertical edges centered over flanges of steel studs. Abut ends and edges of each board with those of adjacent boards. Screw-attach boards at perimeter and within field of board to each steel stud at approximately 8 inches (200 mm) o.c. and set back a minimum of 3/8 inch (9 mm)
- G Sealing Sheathing Joints: Seal joints according to sheathing manufacturer's written recommendations and as follows:

1. Apply glass-fiber sheathing tape to glass-mat gypsum sheathing board joints, and apply and trowel silicone emulsion sealant to embed sealant in entire face of tape. Apply sealant to exposed fasteners with a trowel so fasteners are completely covered. Seal other penetrations and openings.

### 3.05 INSTALLATION - WEATHER BARRIER:

- A. Verify substrate and surface conditions are in accordance with weather barrier manufacturer recommended tolerances prior to installation of weather barrier and accessories.
- B. Install weather barrier over exterior face of exterior wall substrate in accordance with manufacturer recommendations
- C. Install weather barrier prior to installation of windows and doors.
- D. Start weather barrier installation at a building corner, leaving 6-12 inches of weather barrier extended beyond corner to overlap.
- E. Install weather barrier silver side facing air space.
- F. Install weather barrier in a horizontal manner starting at the lower portion of the wall surface with subsequent layers installed in a shingling manner to overlap lower layers. Maintain weather barrier plumb and level
- G. Sill Plate Interface: Extend lower edge of weather barrier over sill plate interface 3-6 inches. Secure to foundation with elastomeric sealant as recommended by weather barrier manufacturer.
- H. Window and Door Openings: Extend weather barrier completely over openings.
- I. Overlap weather barrier
  1. Exterior corners: minimum 12 inches.
  2. Seams: minimum 6 inches.
- J. Weather Barrier Attachment:
  1. Attach weather barrier to studs through exterior sheathing. Secure using weather barrier manufacturer recommend fasteners, space 6 -18 inches vertically on center along stud line, and 24 inch on center, maximum horizontally.
- K. Seal seams of weather barrier with seam tape at all vertical and horizontal overlapping seams.
- L. Seal any tears or cuts as recommended by weather barrier manufacturer.
- M. Opening Preparation:
  1. Cut weather barrier in a modified "I-cut" pattern.
  2. Cut weather barrier horizontally along the bottom of the header.
  3. Cut weather barrier vertically 2/3 of the way down from top center of window opening.
  4. Cut weather barrier diagonally from bottom of center vertical cut to the left and right corners of the opening.
  5. Fold side and bottom weather barrier flaps into window opening and fasten.

6. Cut a head flap at 45-degree angle in weather barrier at window head to expose 8 inches of sheathing. Temporarily secure weather barrier flap away from sheathing with tape.

N. Flashing:

1. Cut 9-inch for metal stud construction wide flashing tape a minimum of 12 inches longer than width of sill rough opening.
2. Cover horizontal sill by aligning flashing edge with inside edge of sill. Adhere to rough opening across sill and up jambs a minimum of 6 inches. Secure flashing tightly into corners by working in along the sill before adhering up the jambs.
3. Fan flashing at bottom corners onto face of wall. Firmly press in place. Mechanically fasten fanned edges.
4. On exterior, apply continuous bead of sealant to wall or backside of window mounting flange across jambs and head. Do not apply sealant across sill.
5. Install window according to manufacturer's instructions.
6. Apply 4-inch wide strips of flashing at jambs overlapping entire mounting flange. Extend jamb flashing 1-inch above top of rough opening and below bottom edge of sill flashing.
7. Apply 4-inch wide strip of flashing as head flashing overlapping the mounting flange. Head flashing should extend beyond outside edges of both jamb flashings.
8. Position weather barrier head flap across head flashing. Adhere using 4-inch wide flashing over the 45-degree seams.
9. Tape head flap in accordance with manufacturer recommendations
10. On interior, install backer rod in joint between frame of window and flashed rough framing. Apply sealant around entire window to create air seal. Apply sealant in accordance with sealant manufacturer's instructions and ASTM C 1193.

End of Section

## SECTION 05 73 00 - METAL RAILINGS

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Furnish all labor, material, equipment, and supervision to provide and install component steel railing system.

#### 1.02 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

#### 1.03 PERFORMANCE REQUIREMENTS

- A. All railings shall be supplied to conform to applicable sections of the following codes:
1. International Building Code
  2. ADAAG
- B. Structural Performance: Provide railings capable of withstanding the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
1. Handrails:
    - a. Uniform load of 50 lbf/ ft. applied in any direction.
    - b. Concentrated load of 200 lbf applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
  2. Top and Intermediate Rails of Guards:
    - a. Uniform load of 50 lbf/ ft. applied in any direction.
    - b. Concentrated load of 200 lbf applied in any direction.
    - c. Uniform and concentrated loads need not be assumed to act concurrently.
- C. Thermal Movements: Provide exterior railings that allow for thermal movements resulting from the following maximum change (range) in ambient and surface temperatures by preventing buckling, opening of joints, overstressing of components, failure of connections, and other detrimental effects. Base engineering calculation on surface temperatures of materials due to both solar heat gain and nighttime-sky heat loss.
1. Temperature Change (Range): 120 deg F, ambient; 180 deg F, material surfaces.
- D. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials. Infill panels constructed of steel shall be treated by an electro coat process.

#### 1.04 SUBMITTALS

- A. Product Data: For the following:
1. Manufacturer's product lines of mechanically connected railings.

2. Grout, anchoring cement, and paint products.
- B. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.
    1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
  - C. Samples for Initial Selection: For products involving selection of color, texture, or design.
  - D. Mill Certificates: Signed by manufacturers of stainless-steel products certifying that products furnished comply with requirements.
  - E. Qualification Data: For professional engineer.
  - F. Product Test Reports: Supplier shall submit calculations and test reports for complete system, including railing and infill panels. Calculations and test reports shall be stamped by a licensed PE. Test reports shall be in accordance with ASTM E 894 and ASTM E 935.

#### 1.05 QUALITY ASSURANCE

- A. Source Limitations: Obtain each type of railing through one source from a single manufacturer.
- B. Mock-up Panel: one section of railing system for verification.
  1. Approximate Size: 60"L x 42"H
  2. Approved mockups may become part of the completed work if undamaged at time of Substantial Completion.
  3. Approval of mockups does not constitute approval of deviations from the contract documents unless such deviations are specifically approved by architect in writing.

#### 1.06 PROJECT CONDITIONS

- A. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

#### 1.07 COORDINATION AND SCHEDULING

- A. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to project site in time for installation.
- B. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not satisfy structural performance requirements.

### PART 2 - PRODUCTS

#### 2.01 DESIGN

- A. Provide component railing as manufactured and assembled by single source manufacturer. Welded railing will not be accepted.

#### 2.02 METAL

- A. General: Provide metals free from surface blemishes where exposed to view in the finished unit. Exposed-to-view surfaces exhibiting pitting, seam marks, roller marks, stains, discolorations, or other imperfections on finished units are not acceptable.
- B. Steel and Iron: Provide steel and iron in the form indicated, complying with the following requirements:
  - 1. Steel Pipe: ASTM A 53; finish, type, and weight class as follows:
    - a. Galvanized finish for exterior installations and where indicated.
    - b. Type F, or Type S, Grade A, standard weight (schedule 40), unless otherwise indicated, or another weight, type, and grade required by structural loads.
  - 2. Steel Plates, Shapes, and Bars: ASTM A 36 (ASTM A 36M).
  - 3. Gray Iron Castings: ASTM A 48, Class 30.
  - 4. Malleable Iron Castings: ASTM A 47, Grade 32510 (ASTM A 47M, Grade 22010).
- C. Brackets, Flanges, and Anchors: Cast or formed metal of the same material and finish as supported rails, unless otherwise indicated.
- D. Provide toekicks and toekick installation and support brackets. Attachments shall be made by bolting.

## 2.02 FASTENERS

- A. Fasteners for Anchoring Railings to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.
- B. Fasteners for Interconnecting Railing Components:
  - 1. Provide structural slip-on fittings for interconnecting railing components and for attaching them to other work, unless exposed fasteners are unavoidable or are the standard fastening method for railings indicated. Systems using adhesive or pop rivet attachment systems will not be accepted.
  - 2. Provide internal/external, reverse knurl, cup point, hex head set screws. Material to be alloy steel with JS 600 zinc plating.
- C. Anchors: Provide concrete adhesive anchors where indicated or necessary.

## 2.03 HANDRAIL FOR ADA RAMPS OR STAIRWAYS (AS REQUIRED)

- A. Ramps that have a drop off of 30 inches or more on the side require guardrail, per above spec. Ramps with a rise greater than 6 inches shall have handrails on both sides.
- B. Stairways shall have handrails on both sides.
- C. Handrail shall be attached to the guardrail sections using brackets.
- D. Handrail shall be installed at a height of 34 – 38 inches above ramp surface or stair tread nosings.
- E. Handrail will be Sch 40 steel, 1 ½ in IPS nominal (1.90 in. OD) and shall have a continuous surface. Where necessary, lengths of the handrail shall be spliced using internal locking splices.



- F. Handrails shall return to a wall, guard or walking surface. If returning to the guard, post return swivel shall be used to connect the end of the handrail to the guardrail post.

#### 2.04 MISCELLANEOUS MATERIALS

- A. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

#### 2.05 FABRICATION

- A. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than that required to support structural loads.
- B. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.
- C. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch, unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.
- D. Form work true to line and level with accurate angles and surfaces.
- E. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.
- F. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.
- G. Connections: Fabricate railings with non-welded connections, unless otherwise indicated.
- H. Non-welded Connections: Connect members with fittings of the structural slip on type which fastens to the exterior of the pipe by means of an internal/external reverse knurl cup point set screw. Reverse knurl is required to ensure that screw does not come loose under vibration. Plain cup point screws will not be accepted.
- I. Form changes in direction as follows:
  - 1. By flush bends or by inserting prefabricated flush-elbow fittings.
- J. Form simple and compound curves by bending members in jigs to produce uniform curvature for each repetitive configuration required; maintain cross section of member throughout entire bend without buckling, twisting, cracking, or otherwise deforming exposed surfaces of components.
- K. Close exposed ends of railing members with prefabricated end fittings.
- L. Provide wall returns at ends of wall-mounted handrails, unless otherwise indicated. Close ends of returns unless clearance between end of rail and wall is 1/4 inch or less.
- M. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings, and anchors to interconnect railing members to other work, unless otherwise indicated. Flanges shall be fastened directly to the post by means of two reverse knurl cup point set screws.
- N. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

## 2.06 FINISHES, GENERAL

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

## 2.07 STEEL FINISHES

- A. Polyester Powder Coating: Electrostatically applied colored polyester powder coating heat cured to chemically bond finish to indicated substrate.
- B. Color: All railing and post material shall be safety yellow. Color for fittings, brackets, flanges, etc. shall be approved by Architect/Engineer.

## PART 3 - EXECUTION

### 3.01 EXAMINATION

- A. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

### 3.02 INSTALLATION, GENERAL

- A. Fit exposed connections together to form tight, hairline joints.
- B. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.
  - 1. Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.
  - 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet.
  - 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.
- C. Corrosion Protection: Coat concealed surfaces of steel that will be in contact with grout, concrete, masonry, wood, or dissimilar metals, with a heavy coat of bituminous paint.
- D. Adjust railings before anchoring to ensure matching alignment at abutting joints.
- E. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

### 3.03 RAILING CONNECTIONS

- A. Non-welded Connections: Use mechanical joints for permanently connecting railing components. Use wood blocks and padding to prevent damage to railing members and fittings.

- B. Expansion Joints: Install expansion joints at locations indicated but not farther apart than required to accommodate thermal movement. Provide slip-joint internal sleeve extending 2 inches beyond joint on either side, fasten internal sleeve securely to 1 side, and locate joint within 6 inches of post.

#### 3.04 ANCHORING RAILING ENDS

- A. Anchor railing ends to concrete and masonry with round flanges connected to railing ends and anchored to wall construction with anchors and bolts.
- B. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and connected to railing ends using non-welded connections.

#### 3.05 ATTACHING HANDRAILS TO WALLS

- A. Attach handrails to wall with wall brackets. Provide brackets with 1-1/2-inch clearance from inside face of handrail and finished wall surface.
- B. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
- C. Secure wall brackets to building construction as indicated, or if not indicated, as follows:
  - 1. For concrete and solid masonry anchorage, use drilled-in expansion shields and hanger or lag bolts.
  - 2. For hollow masonry anchorage, use toggle bolts.
  - 3. Provide blocking between studs in stud wall construction.

#### 3.06 ADJUSTING AND CLEANING

- A. Clean steel by washing thoroughly with clean water and soap and rinsing with clean water.

#### 3.07 PROTECTION

- A. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.
- B. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

End of Section

SECTION 07 13 26 – WATERPROOFING & DAMPPROOFING

PART I GENERAL

1.01 SCOPE:

- A Furnish all labor, materials and equipment, and perform all work to install waterproofing and dampproofing as shown on the drawings and as specified herein.
- B. In general this section shall include the following:
  - 1. Install waterproofing membrane and protection course at all walls below grade prior to backfilling.
  - 2. Install mastic dampproofing on CMU walls behind brick veneer.
  - 3. The Concrete Contractor shall furnish and install moisture barrier under concrete slabs, and waterstops in foundation and floor slabs.
  - 4. The Masonry Contractor shall assist the Concrete Contractor with the installation of waterstops which bridge the intersection of concrete and masonry.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

1.03 SUBMITTALS:

- A Submit manufacturer's specifications and installation instructions for waterproofing membrane, waterstops, and protection board.

1.04 PROJECT CONDITIONS:

- A Provide a suitable area for storage of dampproofing materials and equipment. Store asphalt emulsion containers on end on wood or other clean rigid pad, to prevent adherence of foreign material.
- B Any work or materials damaged during the handling and application of asphalt emulsion shall be restored to original condition or replaced at no additional cost to the Owner.

1.05 GUARANTEE:

- A All areas waterproofed are to be guaranteed during the one (1) year guarantee period. Any water leakage covered herein is to be repaired at the contractor's expense.

PART II PRODUCTS

2.01 MATERIALS:

- A Waterproofing of wall areas below grade and decks above finished space shall be Bituthene System 4000 Waterproofing System as manufactured by Grace Construction Products, Mel-Rol® Waterproofing System as manufactured by W. R. Meadows, Inc. or approved equal.
  - 1. Membrane shall be Bituthene 4000 Waterproof Membrane or approved equal.
    - a. Thickness 1/16 in. (1.5 mm) nominal ASTM D3767—method A
    - b. Flexibility, 180° bend over 1 in. (25 mm) mandrel at -25°F (-32°C)Unaffected ASTM D1970
    - c. Tensile strength, membrane, die C 325 lbs/in.2 min. ASTM D412 modified1
    - d. Tensile strength, film 5,000 lbs/in.2 min. ASTM D882 modified1

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| e. | Elongation, ultimate failure of rubberized asphalt 300% min.         | ASTM D412 Modified         |
| f. | Crack cycling at -25°F (-32°C), Unaffected 100 cycles                | ASTM C836                  |
| g. | Lap adhesion at minimum application temperature: 5 lbs/in. (880 N/m) | ASTM D1876 modified2       |
| h. | Peel strength: 9 lbs/in. (1576 N/m)                                  | ASTM D903 modified3        |
| i. | Puncture resistance, membrane: 50 lbs (222 N) minimum                | ASTM E154                  |
| j. | Resistance to hydrostatic head 210 ft (70 m) of water                | ASTM D5385                 |
| k. | Permeance 0.05 perms maximum method                                  | ASTM E96, section 12—water |
| l. | Water absorption 0.1% maximum  | ASTM D570                  |
2. Surface treatment shall be Bituthene Surface Conditioner.
  3. All waterproofing on walls below grade shall be protected by Bituthene Protection Board.
- B Mastic dampproofing shall be asphalt emulsion type equal to Karnak 200 fibrated, manufactured by Karnak Chemical Corporation, Air-Shield™ LMP by W.R. Meadows, or Hydrocide 700 semi-mastic manufactured by Sonneborn Building Products, Division Contech, Inc.

### PART III EXECUTION

#### 3.01 SURFACE PREPARATION:

- A Surfaces to receive waterproofing shall be clean, dry, and free of voids, loose aggregate scale, and sharp projections.

#### 3.02 INSTALLATION OF WATERPROOFING ON WALLS:

- A Place Z-strips at footings.
- B At deck applications, adhere tape to wall to depth equivalent to the thickness of wearing slab.
- C Install waterproofing sheets as recommended by manufacturer.
- D Tape joints as recommended by manufacturer.
- E Clean and prepare subsurfaces in accordance with waterproofing manufacturers requirements.
- F Cover waterproofing on exterior walls with polystyrene on impaling pins.

#### 3.03 INSTALLATION OF WATERSTOPS:

- A Install in all walls below grade to bridge the gap between the wall and the slabs on grade.
- B All splicing connections shall be made in accordance with manufacturers recommendations.

#### 3.04 INSTALLATION OF DAMPPROOFING:

- A Apply mastic dampproofing to exterior face of exterior masonry wall which are to receive brick veneer, in one full coat over the block.
- B Fill all cracks, crevices, and pores of concrete. Make sure coating is continuous and free from breaks and pinholes.
- C Dampen the dry concrete surfaces and keep surface damp ahead of application.

3.05 APPLICATION OF PARAPET WATERPROOFING SYSTEM:

- A Wash surfaces with pressurized water stream at 3000 psi to remove contaminants and dust and allow to dry prior to applying waterproofing.
- B Apply two coats waterproofing at a rate of 6.4 to 8.3 mils drt. per coat by power sprayer and backrolling allowing coating to dry overnight between coats. Do not reduce coating material. Coating shall achieve a total dry film thickness of 12.8 to 16.6 mils with 10 or less pinholes per square foot.

End of Section

## SECTION 07 21 00 – BUILDING INSULATION

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish and install thermal insulation at all exterior cavity walls and batt insulation and insulation where noted on the drawings.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section	04 20 00	Unit Masonry
Section	05 40 00	Cold Formed Metal Framing and Sheathing
Section	09 29 00	Gypsum Wallboard

#### 5.01 SUBMITALS

- A. Submit product data for all insulation products.

#### 5.02 DELIVERY, STORAGE, AND HANDLING:

- A. Protect insulation materials from physical damage and from deterioration due to moisture, soiling, and other sources. Store inside and in a dry location. Comply with manufacturer's written instructions for handling, storing, and protecting during installation.
- B. Protect foam-plastic board insulation as follows:
1. Do not expose to sunlight except to necessary extent for period of installation and concealment.
  2. Protect against ignition at all times. Do not deliver foam-plastic board materials to Project site before installation time.
  3. Quickly complete installation and concealment of foam-plastic board insulation in each area of construction.

### PART II PRODUCTS

#### 6.01 MATERIAL:

- A. Rigid insulation shall be of thickness indicated in drawings (minimum) AND provide R-Value if indicated in drawings (minimum). If rigid insulation is called for in the drawings, but no thickness or R-Value is indicated, thickness shall be selected by the architect. Provide rigid closed-cell board complying with ASTM C-578 Type IV with the following properties in all locations indicated on the drawings
1. In locations indicated for non-vertical installation (under slab, above roof deck, etc.):
    - a. Compressive Strength: 25 psi minimum
    - b. Flexural Strength: 50lbs/in<sup>2</sup> min (ASTM C 203)
    - c. Water Absorption: max 0.1% by volume (ASTM C 272)
  2. In locations indicated for vertical installation (walls, etc.):
    - a. Compressive Strength: 15 psi minimum
    - b. Flexural Strength: 40lbs/in<sup>2</sup> min (ASTM C 203)
    - c. Water Absorption: max 1.1% by volume (ASTM C 272)

3. In all locations:
  - a. Thermal Resistance: 5 year aged R-values of 5.4 and 5.0 min  $^{\circ}\text{F}\text{-ft}^2\text{-h/Btu}^2/\text{inch}$  at  $40^{\circ}\text{F}$  and  $75^{\circ}\text{F}$  respectively (ASTM C518)
  - b. Water Vapor Permeance: 1.1 perm-inch max
  - c. Dimensional stability: 2% max. linear change (ASTM D2126)
  - d. Flame Spread: 5 (ASTM E84)
  - e. Smoke Developed: 45 to 165 (ASTM E84)
  - f. Size: Lengths and widths as required by project conditions and dimensions.

4. Approved manufacturers include:

- a. DiversiFoam Products
- b. Dow Chemical Company
- c. Owens Corning
- d. Pactiv, Building Products Division
- e. Additional alternate manufactures must be approved by Architect prior to Bidding and provide product equal to or exceeding specified requirements.

B. Perimeter foundation insulation shall be 1-1/2" thick rigid closed-cell board complying with ASTM C-578 Type IV with the following properties:

1. Compressive Strength: 25 psi minimum
2. Flexural Strength: 50lbs/in<sup>2</sup> min (ASTM C 203)
3. Thermal Resistance: 5 year aged R-values of 5.4 and 5.0 min.  $^{\circ}\text{F}\text{-ft}^2\text{-h/Btu}^2/\text{inch}$  at  $40^{\circ}\text{F}$  and  $75^{\circ}\text{F}$  respectively (ASTM C 518).
4. Water Absorption: max. 0.1% by volume (ASTM C 272).
5. Water Vapor Permeance: 1.1 perm-inch max.
6. Dimensional Stability: 2% max. linear change (ASTM D2126).
7. Flame Spread: 5 (ASTM E 84).
8. Smoke Developed: 45 to 165 (ASTM E84)
9. Size: manufacturer's standard lengths and widths.
10. Approved manufacturers include:
  - A. DiversiFoam Products.
  - B. Dow Chemical Company.
  - C. Owens Corning.
  - D. Pctiv, Building Products Division.

6.02 VAPOR RETARDER:

- A. Polyethylene Vapor Retarder: 4-mil film ASTM D 4397 with vapor transmission rating of 0.2 perms where noted on the drawings.

PART III EXECUTION

7.01 GENERAL:

- A. Clean substrates of substances harmful to insulations or vapor retarders, including removing projections capable of puncturing vapor retarders or that interfere with insulation attachment.
- B. Comply with insulation manufacturer's written instructions applicable to products and application indicated.
- C. Install insulation that is undamaged, dry, unsoiled, and has not been exposed at any time to ice or snow.



- D. Extend insulation in thickness indicated to envelop entire area to be insulated. Cut and fit tightly around obstructions, and fill voids with insulation. Remove projections that interfere with placement.
- E. Apply single layer of insulation to produce thickness indicated, unless multiple layers are otherwise shown or required to make up total thickness.

#### 7.02 INSTALLATION OF VAPOR RETARDERS

- A. General: Extend vapor retarder to extremities of areas to be protected from vapor transmission. Secure in place with adhesives or other anchorage system as indicated. Extend vapor retarder to cover miscellaneous voids in insulated substrates, including those filled with loose-fiber insulation.
- B. Before installing vapor retarder, apply urethane sealant to flanges of metal framing including runner tracks, metal studs, and framing around door and window openings. Seal overlapping joints in vapor retarders with vapor-retarder tape according to vapor-retarder manufacturer's written instructions. Seal butt joints with vapor-retarder tape. Locate all joints over framing members or other solid substrates.
- C. Firmly attach vapor retarders to metal framing and solid substrates with vapor-retarder fasteners as recommended by vapor-retarder manufacturer.
- D. Seal joints caused by pipes, conduits, electrical boxes, and similar items penetrating vapor retarders with vapor-retarder tape to create an airtight seal between penetrating objects and vapor retarder.
- E. Repair tears or punctures in vapor retarders immediately before concealment by other work. Cover with vapor-retarder tape or another layer of vapor retarder.

#### 7.03 INSTALLATION OF RIGID INSULATION AT FURRED MASONRY WALLS:

- A. Install wall insulation as follows:
  - 1. Install insulation boards vertically against backup wythe of masonry. Wedge insulation boards tightly between rows of metal furring stripes.
  - 2. Cut insulation by means of saw, knife, or similar sharp tool to fit around obstructions across the cavity such as vents, louvers, pipe, and conduit. Cut insulation to 8" widths and bevel edges to seal tightly at radius corners.
  - 3. Coordinate the installation of insulation with the masonry work. Be sure the dampproofing or waterproofing is in place on face of backup before insulation is installed.

#### 7.04 CLEAN UP:

- A. Remove all debris and unused insulation products from the site.

#### 7.05 PROTECTION:

- A. Protect installed insulation and vapor retarders from damage due to harmful weather exposures, physical abuse, and other causes. Provide temporary coverings or enclosures where insulation is subject to abuse and cannot be concealed and protected by permanent construction immediately after installation.

End of Section

## SECTION 07 53 30 – RUBBER MEMBRANE ROOFING - ADHERED SYSTEM

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish and install a fully adhered rubber membrane roofing system as manufactured by Firestone RubberGard or equal by Carlisle Syntec Systems as specified, where shown on the drawings, including insulation, wood grounds, and wood cleats required to secure roofing in place and miscellaneous items as necessary for a complete warranted installation.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

Section	07 60 00	Flashing and Sheet Metal
Section	07 72 00	Roofing Accessories
Section	07 92 00	Sealants and Caulking

#### 1.03 PERFORMANCE REQUIREMENTS:

- A General: Install sheet membrane roofing and base flashing that are watertight; will not permit the passage of liquid water; and will withstand wind loads, thermally induced movement; and exposure to weather without failure.
- B Material Compatibility: Provide roofing materials that are compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C Fire Rating: Roof Assembly must conform to UL Class A requirements and roof membrane and accessories must be fire rated and bear the FR marking.

#### 1.04 SUBMITTALS:

- A Shop Drawings: Submit indicating roof size, membrane seaming diagram, location and type of penetrations, perimeter and penetration details, base flashings and membrane termination, roof insulation make-up and layout that have been accepted by an authorized manufacturer's representative.
- B Warranty: Submit two copies of Firestone's 20 year warranty for EPDM elastomeric sheet roofing.
- C Submit manufacturer's installation specifications or instructions.
- D Installer Certificates: Signed by roofing system manufacturer certifying that Installer is approved, authorized, or licensed by manufacturer to install specified roofing system.
- E Manufacturer Certificates: Signed by roofing manufacturer certifying that the roofing system complies with requirements specified. Upon request, submit evidence of meeting requirements.
- F Warranty: Sample copy of standard roofing system manufacturer's warranty stating obligations, remedies, limitations, and exclusions of warranty.

#### 1.05 REFERENCES:

- A American society for Testing and Materials (ASTM).
- B Federal Specifications FSHH-I-1972/1 Class 2.

1.06 SYSTEM DESCRIPTION:

A All Roofing, unless otherwise noted, shall be elastomeric sheet roofing fully adhered over rigid insulation.

1.07 QUALITY ASSURANCE:

A Roofing applicator shall be certified in writing by Manufacturer as a licensed applicator.

B A single installer shall perform the work of this Section and shall have completed projects of similar scope and complexity.

C All membrane roofing shall be provided by the same manufacturer and installed by the same Contractor for single source warranty coverage.

1.08 PREINSTALLATION CONFERENCE:

A Before installing roofing system, conduct conference at Project site to review installation requirements and conditions. Provide a minimum of 72 hours notice to all parties required to be present at meeting.

1. Meet with Owner's representative, Architect, Roofing installer, Roofing system manufacturer's representative, deck installer, and installers whose work interfaces with or affects roofing, including installers of roof accessories and roof mounted equipment.
2. Review methods and procedures related to roofing installation, including manufacturer's written instructions.
3. Examine deck substrate conditions and finishes for compliance with requirements, including flatness and fastening.
4. Review loading limitations of deck during and after roofing.
5. Review flashings, special roofing details, roof drainage, roof penetrations, equipment curbs, and condition of other construction that will affect roofing.
6. Review governing regulations and requirements for insurance, certificates, and inspection and testing if applicable.
7. Review temporary protection requirements for roofing system during and after installation.
8. Review roof observation and repair procedures after roofing installation.
9. Document proceeding, including corrective measures or actions required, and furnish copy of record to each participant.

1.09 ENVIRONMENTAL REQUIREMENTS:

A Weather Conditions: Proceed with elastomeric sheet roofing work only when weather conditions comply with manufacturer's recommendations, and will permit materials to be applied and cured in accordance with those recommendations. Do not exceed temperature limitations recommended by roofing manufacturer.

1.10 WARRANTY:

A Manufacturer's Warranty: Submit executed copy of roofing manufacturer's 20 year warranty executed on the signed by an authorized representative of elastomeric sheet roofing system manufacturer,

PART II PRODUCTS

2.01 MATERIALS:

A General: Provide preformed roof insulation boards that comply with requirements and referenced standards, selected from manufacturer's standard sizes and of thicknesses indicated.

B Base layer: Polyisocyanurate Board Insulation: ASTM C 1289, Type II, glass-fiber mat facer on both major surfaces.

1. Insulation available from the following manufacturers may be used if approved by the manufacturer of the roofing membrane proposed:
  - a. AlliedSignal Inc.; Commercial Roofing Systems.
  - b. Apache Products Company.
  - c. Atlas Roofing Corporation.
  - d. Carlisle SynTec Incorporated.
  - e. Celotex Corporation.
  - f. Firestone Building Products Company.
  - g. GAF Materials Corporation.
  - h. GenFlex Roofing Systems.
  - i. Hunter Panels, LLC.
  - j. Johns Manville International, Inc.
  - k. Koppers Industries.
  - l. RMAX.
2. Tapered Insulation: Provide factory-tapered insulation boards fabricated to slope indicated on drawings.
3. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for sloping to drain. Fabricate to slopes indicated.
4. Minimum Total insulation R-Value: As indicated on drawings. If not indicated on drawings, provide minimum R-30.

C Elastomeric Sheet Roofing System Components

1. Manufacturer: Firestone Building Products Co., 250 W. 96<sup>th</sup> St., Indianapolis, IN 46260.
2. Membrane Material: Firestone RubberGard Ethylene Propylene Diene Monomer (EPDM), 60 mil Membrane FR (Fire Retardant).
3. Roof Flashing: Firestone EPDM FormFlash Membrane.
4. Firestone Bonding Adhesive: BA-2004.
5. Firestone Pourable Sealer: S-10.
6. Firestone Water-Block: S-20.
7. Firestone Night Sealant: S-30A.
8. Firestone Fastener Sealer: S-40.
9. Firestone QuickSeam Splice Tape: 100% solids cured butyl base.
10. Firestone QuickSeam Flashing: 5" splice tape/FormFlash laminate.
11. Firestone QuickSeam Batten Cover: 6" splice tape/EPDM laminate.
12. Firestone stainless steel clamping ring.
13. Firestone Batten Strip: 1" x 18 gauge corrosion protected strapping.
14. Firestone Prefabricated Pipe Flashings: Molded EPDM membrane.
15. Firestone Fasteners: Corrosion resistant of types, length, and strength required.
16. Firestone Termination Bar: 1.30" x .10" thick aluminum bar.
17. Firestone Splice Primer: QuickPrime Plus
18. Firestone Termination Bar Fasteners.
19. High density wood fiber crickets shall be 1/2" thick min. by Georgia Pacific or Celotex.
20. Firestone Walkway Pads: 30 inch by 30 inch .30 inch thick.

D Miscellaneous

1. Nailers, Blocking: No. 2 or better, S4S, Douglas Fir-Larch, preservative-treated for rot resistance.

PART III EXECUTION

3.01 DELIVERY, STORAGE AND HANDLING:

- A Deliver roofing materials, insulation and accessories in manufacturer's protective containers with labels intact and legible, and comply with manufacturer's instructions for storage and handling.
- B Handle rolled goods to prevent damage.
- C Store all materials on clean, raised platforms with weather-protective covering.

3.02 INSTALLATION:

- A Verify proper placement of all roof openings, pipes, curbs, sleeves, ducts, vents and drains.
- B Substrate preparation
  - 1. Comply with manufacturer's instructions for preparation of substrate to receive elastomeric sheet roofing. Clean substrate of dust, debris, and other substances detrimental to elastic sheet roofing work.
  - 2. Beginning of installation means acceptance of conditions as satisfactory.
- C Nailers, Blocking
  - 1. Install blocking at the base of roof projections, penetrations and non-roof edge perimeters as detailed.
  - 2. Install treated wood nailers at roof perimeters, at base of roof projections and around specified roof penetration.
    - a. Total nailer height shall match total thickness of insulation being used. Install with 1/8" gap between each length and at changes in direction.
    - b. Firmly fasten nailer to the deck, wall or existing structurally sound and secured nailers at 16" o.c. maximum, batten strips at 12" o.c. maximum, so as to resist a force of 200 lbs. per lineal foot in any direction.
    - c. Taper nailer where applicable to be flush at point of contact with membrane in either the vertical or horizontal applications.
- D Roof Insulation
  - 1. Loosely lay roof insulation with end joints staggered. Joints shall be 1/4" or less in width. Neatly cut and fit insulation around roof penetrations and projections. Install only dry insulation and only as much insulation as can be covered the same day with membrane and completed.
  - 2. Install insulation with long joints of insulation in a continuous straight line with end joints staggered between rows, abutting edges and ends between boards. Fill gaps exceeding 1/4 inch with insulation.
  - 3. Anchor roof insulation in accordance with system manufacturer's requirements for fastener type, placement and density.
  - 4. Install cover boards over insulation with long joints in continuous straight lines with end joints staggered between rows. Loosely butt cover boards together and fasten to roof deck according to roofing system manufacturer's written instructions.
- E Installation Instructions - Fully Adhered Roofing
  - 1. Install elastomeric sheet roofing in accordance with manufacturer's current printed instructions.

2. Loosely lay sheet membrane over roof insulation and allow the membrane to relax 30 minutes minimum before bonding, splicing or attaching.
3. After making sure the sheet is in its final position, evenly fold sheet back on itself after it is in its final position so as to expose the underside. Apply bonding adhesives evenly to both the substrate and the membrane. Apply in sequence to allow equal drying time; allow to dry until tacky, not to stick or string by touch of a dry finger. Starting at the fold, slowly roll the coated membrane into the coated substrate evenly, so as to prevent wrinkles. Compress with stiff push broom to assure full contact
4. Repeat application procedure to other half of sheet.
5. Position the Lap Edge of adjoining sheets to be spliced by overlapping membrane 5 inches. Apply QuickSeam Splice Tape to the bottom sheet after cleaning and priming. Immediately roll the splice tape into place to insure full contact.
6. Roll back top sheet, peel the paper backing off the splice tape by pulling against the weight of the bottom sheet at approximately a 45 degree angle to the tape and parallel with the roof surface. Allow the sheet to fall freely onto the exposed splice tape. Broom the entire surface of the splice as the paper is being removed.
7. Roll the splice to assure full contact.
8. Secure membrane at all locations where the membrane terminates or goes through an angle change greater than 2 inches in 12 inches (i.e. Roof edges, curbs, interior walls, etc.), except for round pipe penetrations less than 18 inches in diameter and square penetrations less than 4 inches square.
9. Install reinforced perimeter fastening strip into the Structural Substrate
10. Complete splice between flashing and sheet roofing before bonding the flashing to vertical surface. Flash all penetrations passing through the sheet membrane.
11. Broom flashing immediately after installation to assure full contact with substrate.
12. Install walkway pads in locations indicated. Adhere walkway pads to substrate with seam tape according to the manufacturer's written instructions.

### 3.03 CLEANING:

- A Remove trash and debris resulting from roofing work at end of each day's work.

### 3.04 MANUFACTURER'S FIELD SERVICE:

- A Upon completion of the roofing system, an authorized Firestone representative will make an inspection of the installation for final acceptance. Manufacturer's representative will issue a written report of inspection findings to the Architect with a copy to the Roofing Consultant.
- B The Contractor shall provide a minimum of 72 hours advance notice to the Architect and the Roofing Consultant before the Manufacturer's representative's visit.

### 3.05 PROTECTION AND REPAIR:

- A Protect sheet membrane roofing from damage and wear during remainder of construction period. When remaining construction will not affect or endanger roofing, inspect roofing for deterioration and damage, describing its nature and extent in a written report, with copies to the Architect and Roof Consultant.

- B Correct deficiencies in or remove roofing that does not comply with requirements, repair substrates, reinstall roofing, and repair sheet flashings to a condition free of damage and deterioration at the time of Substantial Completion and according to warranty requirements.

End of Section

## SECTION 07 62 00 – FLASHING AND SHEET METAL

### PART I GENERAL

#### 1.01 SCOPE:

- A. Provide all labor, equipment, and materials to fabricate and install all sheet metal indicated on the drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1 General Requirements, apply to the work under this section.

Section 04 20 00 Unit Masonry  
Section 06 10 00 Carpentry Section  
Section 07 72 00 Roof Accessories  
Section 07 92 00 Sealants and Caulking

#### 1.03 REFERENCES:

- A. American Society for Testing and Materials (ASTM)
  - 1. A653-00 Standard Specification for Steel Sheet, Zinc-Coated (galvanized) or Zinc Iron Alloy-Coated (galvannealed) by the Hot-Dip Process.
  - 2. A792-99 Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy Coated by the Hot-Dip Process.
  - 3. B209-00 Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
  - 4. B221-00 Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.
- B. Warnock Hersey International, Inc., Middleton, WI (WH)
- C. Factory Mutual Research Corporation (FMRC)
- D. Underwriters Laboratories (UL)
- E. Sheet Metal and Air Conditioning Contractors National Association (SMACNA)
  - 1. 2012 Edition Architectural Sheet Metal Manual, 7 h edition
- F. National Roofing Contractors Association (NRCA)
  - 1. Roofing and Waterproofing Manual, 5 th Edition

#### 1.04 SUBMITTALS:

- A. Submit under provisions of Section 013300 - Submittals.
- B. Product Data
- C. Provide manufacturer's specification data sheets for each product in accordance with Section 013300.
- D. Metal material characteristics and installation recommendations.
- E. Submit color chart prior to material ordering and/or fabrication so that equivalent colors to those



specified can be approved.

- F. Provide approval letters from metal manufacturer for use of their metal within this particular roofing system type.
- G. Submit two (2) samples, illustrating typical metal edge, coping, gutters, fascia extenders for material and finish.
- H. Provide 6" square sample of specified sheet materials for Architect approval.
- I. Shop Drawings
  - 1. For manufactured and shop fabricated gravel stops, fascia, scuppers, and all other sheet metal fabrications.
  - 2. Shop drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashing, termination's, and installation details.
  - 2. Indicate type, gauge and finish of metal.
- J. Certification
  - 1. Submit roof manufacturer's certification that metal fasteners furnished are acceptable to roof manufacturer.
  - 3. Submit roof manufacturer's certification that metal furnished is acceptable to roofing manufacturer as a component of roofing system and is eligible for roof manufacturer's system warranty.

1.05 QUALITY ASSURANCE:

- A. Engage an experienced roofing contractor specializing in sheet metal flashing work with a minimum of five (5) years experience.
- B. Successful contractor is required to maintain a full-time supervisor/foreman who is on the job-site at all times during installation of the new roof perimeter flashing. Foreman must have a minimum of five (5) years experience with the installation of similar system to that specified.
- C. Successful contractor must obtain all components of roof system from a single manufacturer including any roll good materials, if required. Any secondary products that are required, which cannot be supplied by the specified manufacturer, must be recommended and approved in writing by the primary manufacturer prior to bidding.
- D. If required, fabricator/installer shall submit work experience and evidence of adequate financial responsibility. The owners representative reserves the right to inspect fabrication facilities in determining qualifications.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials in manufacturer's original, unopened containers or packages with labels intact and legible.
- B. Stack pre-formed and pre-finished material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

1.07 JOB CONDITIONS:

A. Determine that work of other trades will not hamper or conflict with necessary fabrication and storage requirements for pre-formed metal edge system.

1.08 DESIGN AND PERFORMANCE CRITERIA:

A. Thermal expansion and contraction:

1. Completed metal edge flashing system shall be capable of withstanding expansion and contraction of components caused by changes in temperature without buckling, producing excess stress on structure, anchors or fasteners, or reducing performance ability.

1.09 WARRANTIES:

A. Owner shall receive one (1) warranty from manufacturer of roofing materials covering all of the following criteria. Multiple warranties are not acceptable.

1. Pre-finished metal material shall require a written 20-year non-prorated warranty covering fade, chalking and film integrity. The material shall not show a color change greater than 5 NBS color units per ASTM D-2244 or chalking excess of 8 units per ASTM D-659. If either occurs material shall be replaced per warranty, at no cost to the Owner.
2. Changes: Changes or alterations in the edge metal system without prior written consent from the manufacturer shall render the system unacceptable for warranty(ies).
3. Warranty shall commence on date of substantial completion or final payment, whichever is agreed by contract.
4. The Contractor shall provide the Owner with a notarized written warranty assuring that all sheet metal work including caulking and fasteners to be watertight and secure for a period of two years from the date of final acceptance of the building. Warranty shall include all materials and workmanship required to repair any leaks that develop, and make good any damage to other work caused by such leaks or the repairs thereof.
5. Installing roofing contractor shall be responsible for the installation of the edge metal system in general accordance with the membrane manufacturer's recommendations.
6. Installing contractor shall certify that the edge metal system has been installed per the manufacturer's printed details and specifications.
7. One manufacturer shall provide a single warranty for all accessory metal for flashings, metal edges and copings, along with the warranty for metal roof areas, membrane roof areas, and any transitions between two different material types.

PART II PRODUCTS

2.01 MATERIALS:

A. Sheet Steel: Prepainted, Metallic-Coated Steel Sheet: Steel sheet metallic coated by the hot-dip process and prepainted by the coil-coating process to comply with ASTM A 755/A 755M.

1. Exposed base flashing metal material:
  - a. Aluminum-zinc alloy (galvalume) coated steel, ASTM A792, coating designation AZ-50, in thickness of .0217 nom. /24 gauge or .0336 nom. 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
2. Unexposed base flashing metal material:
  - a. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0299 nom. / 22 gauge; 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.

3. Minimum gauge of steel or thickness of Aluminum to be specified in accordance with Architectural Sheet Metal Manual, Sheet Metal and Air Conditioning Contractor's National Association, Inc. recommendations.

4. Exposed surfaces for coated panels:160526Job# 07 62 00.4

a. Steel Finishes: fluorocarbon finish. Epoxy primer baked both sides, .2-.25 mils thickness as approved by finish coat manufacturer.

Weathering finish as referred by National Coil Coaters Association (NCCA).

Property Test Method Fluorocarbon\*

Pencil	ASTM D-3363	HB-H	
Hardness	NCAA II-2		
Bend	ASTM D-4145	O-T	NCAA II-19
Cross-Hatch	ASTM D-3359		
Adhesion	no loss of adhesion		
Gloss	ASTM D-523	25+/-5%	(60° angle)
Reverse Impact	ASTM D-2794	no cracking or loss of adhesion	
Nominal Thickness	ASTM D-1005		
primer	0.2 mils		
topcoat	0.8 mils		
TOTAL	1.0 mils		

\*Subject to minimum quantity requirements

b. Color shall be as specified

B. Aluminum Sheet: ASTM B 209 (ASTM B 209M), Alloy 3003, 3004, 3105, or 5005, Temper suitable for forming and structural performance required, but not less than H14, .032 inch thickness unless otherwise noted, finished as follows:

1. Mill Finish: One-side

2. High-Performance Organic Finish: AA-C12C42R1x (Chemical Finish: cleaned with inhibited chemicals; Chemical Finish: acid-chromate-fluoride-phosphate conversion coating; Organic Coating: as specified below). Prepare, pretreat, and apply coating to exposed metal surfaces to comply with coating and resin manufacturers' written instructions.

a. Fluoropolymer 2-Coat System: Manufacturer's standard 2-coat, thermocured system consisting of specially formulated inhibitive primer and fluoropolymer color topcoat containing not less than 70 percent polyvinylidene fluoride resin by weight; complying with AAMA 2605.

2.02 RELATED MATERIALS:

A. Metal Primer: Zinc chromate type.

B. Plastic Cement: ASTM D 4586

C. Sealant: ASTM C 920, elastomeric sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim and remain watertight.

D. Underlayment: ASTM D2178, No15 asphalt saturated roofing felt.

E. Slip Sheet: Rosin sized building paper.

F. Fasteners:

1. Corrosion resistant screw fastener as recommended by metal manufacturer. Finish exposed fasteners same as flashing metal.160526Job# 07 62 00.5
2. Fastening shall conform to Factory Mutual 1-45 requirements or as stated on section details, whichever is more stringent.

#### 2.03 THROUGH WALL FLASHING:

A. Fabric thru-wall flashing shall be Copper Fabric Flashing with 3 oz. per square foot copper sheet asphalt- and pressure- laminated on both sides with a treated glass fabric. Provide Sandell's Copper Fabric Thru-Wall Flashing as manufactured by Hohmann & Barnard Inc. or Multi-Flash 500 as manufactured by York Manufacturing or Copper Fabric as manufactured by Advanced Building Products Inc.

1. Flashing shall be embedded in the mortar joint of CMU backup walls or attached to metal stud walls with metal termination bar.
2. Joints in Flashing shall be made by lapping a minimum of 4 inches and coating surfaces with Sandell Asphalt Trowel Mastic.

B. Provide 1/8 in thick by 1 inch type 304 stainless steel termination bar at attachment of through wall flashing to metal stud walls. Attach termination bar to framing at 16 inches on center with self taping screws.

1. Acceptable products:

Type T1 as manufactured by Hohmann& Barnard Inc.  
Termination bar as manufactured by Heckmann Building Products  
Termination bar as manufactured by Sandell Manufacturing  
Termination bar as manufactured by Wire Bond  
Equal products of other manufacturers approved prior to bidding.

C. Sealant for top of termination bar shall be a multicomponent non-sagging urethane sealant complying with ASTM C920 for type M, Grade NS, class 25, Uses A, G, M, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include DAP, Pecora, Sonneborn, and Tremco.

1. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.

#### 2.04 BASE AND COUNTER FLASHING

A. Base and Counter Flashing associated with roof to wall intersections shall be fabricated in accordance with Figure 4-7A SMACNA 5<sup>th</sup> ed.

1. Separate pieces of base flashing are installed as each course of shingles is applied. The

upper edge of each piece of flashing should extend 2 inches above each course of shingles. The lower edge should be ½ inch above the butts of the singles forming the next course. Flashing must extend up the wall and onto the roof a minimum of 4 inches. Flashing pieces are nailed to the roof sheathing above the top of each shingle course

2. Counter flashing is installed in a reglet left by the mason or cut by the Contractor. Wedges or tension formig shapes are used to hold the counter flashing in place and the reglet is filled with a compatable sealant. The length of each piece of counter flashing will vary with the slope of the roof but no step should be more than 8 inches high. The width will vary but should always be wide enough to cover 4 inches of the base flashing.

### PART III EXECUTION

#### 3.01 COORDINATION:

- A. Coordinate the installation of sheet metal work with the work of other trades, e.g. thru-wall flashing and counterflashing with installation of masonry work.

#### 3.02 PROTECTION:

- A. Dissimilar metals shall not be allowed to come in contact with each other. Isolate any dissimilar metals, masonry or concrete, from metals using bituminous paint, tape, or slip sheet. Use gasketed fasteners where required to prevent corrosive actions.

#### 3.03 GENERAL:

- A. Fastening of metal to walls and wood blocking shall comply with SMACNA Architectural Sheet Metal Manual, Factory Mutual I-60 wind uplift specifications and/or manufacturer's recommendations whichever is of the highest standard.
- B. All accessories or other items essential to the completeness of sheet metal installation, whether specifically indicated or not, shall be provided and of the same material as item to which applied.
- C. Allow sufficient clearances for expansion and contraction of linear metal components. Secure metal using fasteners as required by the system. No exposed face fastening shall be accepted.

#### 3.04 INSPECTION:

- A. Verify curbs are solidly set and nailing strips located.
- B. Beginning of installation means acceptance of existing conditions.
- C. Field measure site conditions prior to fabricating work.
- D. Edge metal installation shall not disrupt other trades. Verify that substrate is dry, clean and free of foreign matter.

#### 3.05 MANUFACTURED SHEET METAL SYSTEMS:

- A. Installing Contractor shall be responsible for determining if the edge metal systems are in general conformance with roof manufacturer's recommendations.
- B. Furnish and install manufactured systems in strict accordance with manufacturer's printed instructions.

- C. Provide all factory-fabricated accessories including, but not limited to, extenders, miters, joint covers, etc.

### 3.06 SOLDERING:

- A. Clean and roughen edges to be soldered. Apply non-corrosive flux precoat to the surfaces to be joined with solder alloy for a distance of 1-1/2" back from edge of metal. Remove flux residue with clean water. Assemble the parts and solder, using regular non-corrosive rosin flux.
- B. Soldering shall be used for sealing only and joints that must withstand mechanical stresses shall be riveted or screwed in addition to soldering.
- C. Solder shall be 50-50 tin lead type.

### 3.07 SHOP FABRICATED SHEET METAL:

- A. Installing Contractor shall be responsible for determining if the sheet metal systems are in general conformance with roof manufacturer's recommendations.
- B. Metal work shall be shop fabricated to configurations and forms in accordance with recognized sheet metal practices.
- C. Hem exposed edges.
- D. Angle bottom edges of exposed vertical surfaces to form drip.
- E. All corners for sheet metal shall be lapped with adjoining pieces fastened and set in sealant.
- F. Joints for any gravel stop fascia system, coping cap shall be formed with a 3/8" opening between sections. The opening shall be backed by an internal drainage plate formed to the profile of fascia piece.
- G. Install sheet metal to comply with Architectural Sheet Metal manual, Sheet Metal and Air Conditioning Contractor's National Associations, Inc.

### 3.08 FABRIC THRU-WALL FLASHING:

- A. Install thru-wall flashing continuous near base of all exterior walls, just below drip openings in face brick wythe, and elsewhere as shown on the drawings. Flashing shall be laid in a slurry of fresh mortar and topped with a fresh full bed of mortar. Flashing shall start flush with outside face of wall, cross the cavity on mortar bed and extend up on the face of the inner wythe a minimum of 6" and be turned back into concrete block mortar joint or attached to the wall with termination bar and sealant.
- B. Head and Sill Flashing:  
  
The flashing shall start flush with the outside of the wall or lintel angle, then carried through or up the wall as indicated. Flashing shall extend 6" beyond each side of the opening and be turned up at the sides forming a pan. All corners shall be folded, not cut.
- C. Other Areas:  
  
All membrane flashing at other locations shall be installed in accordance with manufacturer's recommendations.
- D. Joining of Material:

Joint shall be made by lapping a minimum of 4" and coating the contacting surfaces with Mastic recommended by the manufacturer.

End of Section

## SECTION 07 92 00 – SEALANTS AND CAULKING

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, tools, equipment and services required to install joint sealants for the following locations:
1. Joints in exterior vertical surfaces and non-traffic horizontal surfaces as indicated below:
    - a. Perimeter joints between wall materials and frames of doors and windows.
    - b. Joints between different materials.
    - c. Other joints as indicated on the drawings.
    - d. Openings around pipes projecting through exterior walls.
  2. Joints in exterior horizontal traffic bearing surfaces as indicated below:
    - a. Control and expansion joints in concrete paving.
  3. Interior joints in vertical and vertical surfaces as indicated below:
    - a. Joints between different materials.
    - b. Joints between plumbing fixtures and adjacent materials.
    - c. Joints around pipes projecting through interior walls.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
- B Caulking in connection with ductwork is specified in Division 23.

#### 1.03 SUBMITTALS:

- A Submit manufacturer's product and application data on products specified.
- B Submit color charts on products requiring color selection.
- C Product test reports.

#### 1.04 QUALITY ASSURANCE:

- A Engage an experienced installer who has completed joint sealant applications similar in material, design, and extent to that indicated for the project that have resulted in construction with a record of successful in-service performance.

#### 1.05 ENVIRONMENTAL CONDITIONS:

- A Do not proceed with installation of joint sealants under the following conditions:
1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
  2. When joint substrates are wet.
  3. Where joint widths are less than allowed by joint sealant manufacturer for application indicated.
  4. Until contaminant capable of interfering with their adhesion are removed from joint substrates.



## PART II PRODUCTS

### 2.01 GENERAL:

- A Provide joint sealants, joint fillers, and other related materials that are compatible with one another and with joint substrates under the conditions of service and application as demonstrated by the manufacturer based on testing and field experience.
- B Match colors indicated by reference.

### 2.02 MATERIALS:

- A Sealant for caulking of control joints in concrete slabs shall be a two-part, Jet-Fuel-Resistant, non-sag, Polyurethane Rubber Sealant for Concrete: Pourable, chemically curing elastomeric formulation complying with the following requirements relative to formulation and with ASTM C 920 for Type, Grade, Class, and Uses indicated.
  - 1. Urethane formulation: Type M, Class 25, Uses T, M, and O as applicable to joint substrates.
  - 2. Grade P for joints in horizontal paved surfaces.
  - 3. Grade NS for vertical and other joints where installation of a Grade P (self-leveling) sealant would result in sealant flowing out of joint.
- B Sealant for all exterior caulking except as noted, and at cabinets shall be a multicomponent non-sagging urethane sealant complying with ASTM C920 for type M, Grade NS, class 25, Uses A, G, M, and O as applicable to joint substrates. Provide products with the capability, when tested for adhesion and cohesion under maximum cyclic movement per ASTM C719, to withstand the specified percentage change in the joint width existing at the time of installation and remain in compliance with other requirements of ASTM C920 for uses indicated. Acceptable manufacturers include DAP, Pecora, Sonneborn, and Tremco.
  - 1. Additional Movement Capability: 50 percent movement in extension and 50 percent in compression for a total of 100 percent movement.
- C Sealant for interior use unless otherwise specified shall be a paintable type equal to DAP Acrylic Latex Caulk, Pecora AC-20 Acrylic Latex, or Tremco Acrylic Latex Caulk.
- D Primer shall be the type recommended by the sealant manufacturer and shall be supplied by the manufacturer of the sealant used.
- E Backup material and joint fillers shall be non-staining, compatible with sealant and primer used, and of a resilient nature. Raveled strands of non-staining rope fiber or cotton wicking may be used as filler in deep joints but the filler backing up the sealant shall be rod shaped foam neoprene, foam polyethylene, or hollow vinyl extrusions. Filler material impregnated with oil, bitumen, or similar substances shall not be used in any case.
- F Bond breakers shall be polyethylene tape, pressure sensitive masking tape, or equal, as recommended by the sealant manufacturer.
- G Preformed Foam Sealants: Manufacturer's standard preformed, precompressed, impregnated open cell foam sealant manufactured from high density urethane foam impregnated with a nondrying water repellent agent: factory produced in precompressed sizes and in roll or stick form to fit joint widths indicated and to develop watertight and airtight seal when compressed to the degree specified by the manufacturer, and complying with the following requirements:
  - 1. Permanently mildew-resistant non-migratory, non-staining, and compatible with joint substrates and other joint sealants.
  - 2. Impregnating Agent: Chemically stabilized acrylic.

3. Density: Manufacturer's standard.
4. Backing: None
5. Product shall be Colorseal as manufactured by Emseal Joint Systems, Westborough, MA. or equal product of Willseal or Tremco Illbruck.

## 2.03 JOINT SEALANT BACKING:

- A General: Provide sealant backings of material and type that are non-staining; are compatible with joint substrates, sealants, primers and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B Plastic Foam Joint Fillers: Preformed, compressible, resilient, non-staining, non-waxing, non-extruding strips of flexible plastic foam of material indicated below and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance
- C Closed-cell polyethylene foam, non-absorbent to liquid water and gas, non-outgassing in unruptured state.
- D Elastomeric Tubing Joint Fillers: Neoprene, butyl EPDM, or silicone tubing complying with ASTM D 1056, non-absorbent to water and gas, capable of remaining resilient at temperatures down to -26° F (-32° C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth, and otherwise contribute to optimum sealant performance.
- E Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing sealant from adhering to rigid, inflexible joint filler materials or joint surfaces at back of joint where such adhesion would result in sealant failure. Provide self-adhesive tape where applicable.

## PART III EXECUTION

### 3.01 EXAMINATION:

- A Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

### 3.02 PREPARATION:

- A Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
  2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
  3. Remove laitance and form release agents from concrete.
  4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.

- B Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.
- C Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

### 3.03 INSTALLATION OF JOINT SEALANTS:

- A General: Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.
- B Sealant Installation Standard: Comply with recommendations of ASTM C1193 for use of joint sealants as applicable to materials, applications, and conditions indicated.
- C Install joint filler of type indicated to provide support of sealants during application and at position required to produce the cross-sectional shapes and depths of installed sealants relative to joint widths that allow optimum sealant movement capability.
  - 1. Do not leave gaps between ends of joint fillers.
  - 2. Do not stretch, twist, puncture, or tear joint fillers.
  - 3. Remove absorbent joint fillers that have become wet prior to sealant application and replace with dry material.
- D Installation of Sealants: Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint widths that allow optimum sealant movement capability. Install sealants at the time sealant backings are installed.
- E Tooling of Non-sag Sealants: Immediately after sealant application and prior to time skinning or curing begins, tool sealants to form smooth, uniform beads of configuration indicated, to eliminate air pockets, and to ensure contact and adhesion of sealant with sides of joint. Remove excess sealants from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.
  - 1. Provide concave joint configuration per Figure 5A in ASTM C 1193, unless otherwise indicated.
- F Installation of Preformed Foam Sealants: Install each length of sealant immediately after removing protective wrapping, taking care not to pull or stretch material, and to comply with sealant manufacturer's directions for installation methods, materials, and tools that produce seal continuity at ends, turns, and intersections of joints. For applications at low ambient temperatures where expansion of sealant requires acceleration to produce seal, apply heat to sealant in conformation with sealant manufacturer's recommendations.

### 3.04 CLEANING:

- A Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

### 3.05 PROTECTION:

- A Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

End of Section

## SECTION 08 11 13 – HOLLOW METAL DOORS AND FRAMES

### PART I GENERAL

#### 1.01 WORK INCLUDED:

- A Furnish and install all exterior and interior hollow metal doors, steel doorframes and frames for fixed glass windows, and all necessary incidental work in connection therewith.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 079200 Sealants and Caulking  
Section 087100 Finish Hardware  
Section 088000 Glazing  
Section 099100 Painting

#### 1.03 SUBMITTALS:

- A Submit schedules and shop drawings of hollow metal doors and frames to the Architect for approval before any work is fabricated.

### PART II PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS:

- A Doors and frames shall be products as specified, manufactured by Steelcraft Manufacturing Company, Cincinnati, Ohio; or equal products of the following manufacturers:

Mesker Brothers, St. Louis, Mo.  
Metal Products, Inc., Corbin, Kentucky  
Curries Corporation, Mason City, Iowa

#### 2.02 MATERIALS:

- A Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, Commercial Steel (CS), Type B; suitable for exposed applications.
- B Metallic-Coated Steel Sheet: ASTM A 653/A 653M, Commercial Steel (CS), Type B; with minimum G60 (Z180) or A60 (ZF180) metallic coating.
- C Frame Anchors: ASTM A 591/A 591M, Commercial Steel (CS), 40Z (12G) coating designation; mill phosphatized.
1. For anchors built into exterior walls, steel sheet complying with ASTM A 1008/A 1008M or ASTM A 1011/A 1011M, hot-dip galvanized according to ASTM A 153/A 153M, Class B.
- D Inserts, Bolts, and Fasteners: Hot-dip galvanized according to ASTM A 153/A 153M.

#### 2.03 DOORS:

- A Doors shall be full flush construction 1-3/4" thick, made of cold, 16 gauge, cold rolled steel. Doors shall be Type B-16. Doors shall be reinforced, stiffened, sound deadened and insulated with impregnated kraft honeycomb core completely filling the inside of the doors and laminated to both inside faces of the panels.

1. All doors shall have mechanical edge seam or be fully welded and ground smooth if joint is in center of door edge.
  2. Hinge and lock edge shall have 1/8" in 2" bevel.
  3. Top and bottom #14 gauge cold, rolled steel reinforcing channels shall be spot welded within the door.
  4. Top edges of exterior doors shall be finished with flush metal closure.
  5. Hinge reinforcing shall be 8-gauge steel.
  6. Lock reinforcing shall be #16 gauge.
  7. Closer reinforcing shall be #12 gauge.
  8. Adequate reinforcing shall be provided for other hardware as required.
  9. Mortise, drill and tap for hardware, except that doors be drilled and tapped for surface-mounted hardware in the field.
- B Glass light openings shall be provided with removable metal moldings secured in place with oval head countersunk screws.
- C Glass in fire rated doors shall be 1/4" wire glass. Glass in non-label doors shall be 1/4" thick tempered clear.

#### 2.04 FRAMES:

- A Frames shall be flush frames with 2" wide faces, formed of #16 gauge steel. Interior frames shall be fabricated from cold rolled steel. Exterior frames shall be fabricated from metallic coated steel sheet. Frames shall be set up and welded and doorframes shall be provided with temporary spreaders at bottom. Mitered corners shall have reinforcements with integral tabs for secure and easy interlocking of jambs to head. Strike jambs shall be supplied with three factory installed rubber bumpers. Mullions at pairs of doors shall be removable type.
1. Frames shall have 8 gauge steel hinge reinforcements and be mortised for hinges specified.
  2. Strike reinforcements shall be #16 gauge.
  3. Provide metal plaster guards for all mortise cutouts. Reinforcements for surface closers shall be #12 gauge.
  4. Adequate reinforcing shall be provided for other hardware as required.
  5. Mortise, drill and tap for hardware, except that frames shall be drilled and tapped for surface-mounted hardware in the field.
- B Frames shall be furnished with a minimum of six wall anchors and two adjustable base anchors of manufacturer's standard design at masonry walls and a minimum of six wall anchors (2 base) at stud walls. Anchors for labeled frames shall be UL approved type.
- C Steelcraft unitized weatherstripping will be acceptable in lieu of weatherstripping specified for exterior doors in Finish Hardware Section herein.

#### 2.05 LOCATION OF HARDWARE:

- A Finishing hardware is specified to be furnished in "Finish Hardware" section under Division 8. Doors and frames shall be prepared for hardware from templates of the hardware to be furnished.
- B Unless otherwise specifically indicated, hardware shall be located as follows:
1. Knob locks, handle sets, and exit bolt locks; 36" from finish floor to centerline of strike.
  2. Deadlocks: 42" from finish floor to centerline of strike.
  3. Door Pulls and Single Push Bars: 42" from finish floor to centerline of grip or to centerline of push bar.
  4. Push Plates: 42" from finish floor to centerline of strike.

5. Hinges: Top hinge 9-3/4" from head of frame to centerline of hinge; bottom hinge 10-3/8" from finished floor to centerline of hinge; intermediate hinges equally spaced from top and bottom hinges. Locate top and bottom hinges at toilet stall doors 6" from top and bottom of door.

2.06 DOOR CLEARANCE:

- A Doors shall have 1/8" clearance at top, 3/32" clearance at sides, and 5/8" clearance above finished floor at the bottom, unless noted on the drawings to be undercut.

2.07 FINISH:

- A Doors and frames shall be cleaned, bonderized, and finished with one coat of baked-on prime paint.

PART III EXECUTION

3.01 EXAMINATION:

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of standard steel doors and frames.
  1. Examine roughing-in for embedded and built-in anchors to verify actual locations of standard steel frame connections before frame installation.
  2. Delete first subparagraph below if not required.
  3. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of work.
  4. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 PREPARATION:

- A Remove welded-in shipping spreaders installed at factory.
- B Prior to installation and with installation spreaders in place, adjust and securely brace standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
  1. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
  2. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
  3. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
  4. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a perpendicular line from head to floor.
- C Drill and tap doors and frames to receive nontemplated mortised and surface-mounted door hardware.

3.03 INSTALLATION:

- A General: Provide doors and frames of sizes, thicknesses, and designs indicated. Install standard steel doors and frames plumb, rigid, properly aligned, and securely fastened in place with all clearances accurately maintained; comply with Drawings and manufacturer's written instructions.
- B Standard Steel Frames: Install standard steel frames for doors and other openings, of size and profile indicated. Comply with SDI 105.
1. Set frames accurately in position; plumbed, aligned, and braced securely until permanent anchors are set. After wall construction is complete, remove temporary braces, leaving surfaces smooth and undamaged.
    - a. At fire-protection-rated openings, install frames according to NFPA 80.
    - b. Where frames are fabricated in sections due to shipping or handling limitations, field splice at approved locations by welding face joint continuously; grind, fill, dress, and make splice smooth, flush, and invisible on exposed faces.
    - c. Install frames with removable glazing stops located on secure side of opening.
    - d. Install door silencers in frames before grouting.
    - e. Remove temporary braces necessary for installation only after frames have been properly set and secured.
    - f. Check plumb, squareness, and twist of frames as walls are constructed. Shim as necessary to comply with installation tolerances.
    - g. Apply bituminous coating to backs of frames that are filled with mortar, grout, and plaster containing antifreezing agents.
  2. Floor Anchors: Provide floor anchors for each jamb and mullion that extends to floor and secure with postinstalled expansion anchors.
    - a. Floor anchors may be set with powder-actuated fasteners instead of postinstalled expansion anchors if so indicated and approved on Shop Drawings.
  3. Metal-Stud Partitions: Solidly pack mineral-fiber insulation behind frames.
  4. Masonry Walls: Coordinate installation of frames to allow for solidly filling space between frames and masonry with mortar as specified in Division 4 Section "Unit Masonry Assemblies."
  5. Concrete Walls: Solidly fill space between frames and concrete with grout. Install grout in lifts and take precautions, including bracing frames, to ensure that frames are not deformed or damaged by grout forces.
  6. In-Place Concrete or Masonry Construction: Secure frames in place with postinstalled expansion anchors. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  7. In-Place Gypsum Board Partitions: Secure frames in place with postinstalled expansion anchors through floor anchors at each jamb. Countersink anchors, and fill and make smooth, flush, and invisible on exposed faces.
  8. Ceiling Struts: Extend struts vertically from top of frame at each jamb to supporting construction above, unless frame is anchored to masonry or to other structural support at each jamb. Bend top of struts to provide flush contact for securing to supporting construction above. Provide adjustable wedged or bolted anchorage to frame jamb



members.

9. Installation Tolerances: Adjust standard steel door frames for squareness, alignment, twist, and plumb to the following tolerances:
    - a. Squareness: Plus or minus 1/16 inch (1.6 mm), measured at door rabbet on a line 90 degrees from jamb perpendicular to frame head.
    - b. Alignment: Plus or minus 1/16 inch (1.6 mm), measured at jambs on a horizontal line parallel to plane of wall.
    - c. Twist: Plus or minus 1/16 inch (1.6 mm), measured at opposite face corners of jambs on parallel lines, and perpendicular to plane of wall.
    - d. Plumbness: Plus or minus 1/16 inch (1.6 mm), measured at jambs at floor.
- C Standard Steel Doors: Fit hollow-metal doors accurately in frames, within clearances specified below. Shim as necessary.
1. Non-Fire-Rated Standard Steel Doors:
    - a. Jambs and Head: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
    - b. Between Edges of Pairs of Doors: 1/8 inch (3 mm) plus or minus 1/16 inch (1.6 mm).
    - c. Between Bottom of Door and Top of Threshold: Maximum 3/8 inch (9.5 mm).
    - d. Between Bottom of Door and Top of Finish Floor (No Threshold): Maximum 3/4 inch (19 mm).
  2. Fire-Rated Doors: Install doors with clearances according to NFPA 80.
- D Smoke-Control Doors: Install doors according to NFPA 105.
- E Where labeled fire doors are called for on the drawings, the doors and frames shall meet the requirements of the Underwriters' Laboratories and the National Fire Protection Association and shall bear UL label.
- 3.04 ADJUSTING AND CLEANING:
- A Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including standard steel doors or frames that are warped, bowed, or otherwise unacceptable.
  - B Clean grout and other bonding material off standard steel doors and frames immediately after installation.
  - C Prime-Coat Touchup: Immediately after erection, sand smooth rusted or damaged areas of prime coat and apply touchup of compatible air-drying primer.
  - D Galvannealed Surfaces: Clean abraded areas and repair with galvanizing repair paint according to manufacturer's written instructions.

End of Section

## SECTION 08 71 00 - FINISH HARDWARE

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, tools, equipment, and supervision as required to properly and completely equip all doors as shown on the drawings and specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, supplemental Conditions and Division 1, General Requirements, apply to the work under this section.

Section	08 11 13	Hollow Metal Doors and Frames
Section	08 14 16	Wood Doors
Division	26	Electrical

#### 1.03 QUALITY ASSURANCE:

- A Obtain each type of Hardware (i.e. locks) from a single manufacturer.
- B "Supplier" refers to a recognized architectural hardware supplier, with warehouse facilities, furnishing hardware for not less than 2 years in the project's vicinity. Supplier must be or employ a full time experienced Architectural Hardware Consultant (AHC – Certified by the Door and Hardware Institute) who, at reasonable times during the course of the work, is available for consultation with the Owner, Architect and Contractor about the project's requirements.

#### 1.04 SUBMITTALS:

- A Submit hardware schedule in manner indicated below. Coordinate hardware with doors, frames, and related work to insure proper size, thickness, hand, function and finish of hardware.
- B Final Hardware Schedule: Based on finish hardware, organize a schedule into "hardware sets" containing all items required for each door or opening. Include the following information:
1. Type, style, function, size, finish and manufacturer of each hardware item.
  2. Explanation of abbreviations, symbols, codes, etc. contained in schedule.
  3. Fastening and other pertinent information.
  4. Location of hardware set cross-referenced to drawings.
  5. Mounting locations for hardware.
  6. Door frame size and material.
  7. Keying information.
- C Submit schedule at earliest possible date since acceptance of hardware schedule must precede fabrication of other work (i.e. hollow metal frames) critical to construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to a coordinated review of hardware schedule.
- D Submit separate keying schedule indication implementation of the Owner's final keying instructions.
- E Furnish templates to fabricators of doors, frames, and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of each other's work, to confirm that adequate provisions are made for proper location and installation of hardware.
- F No hardware shall be ordered until hardware schedule has been approved by the Architect.

#### 1.05 PACKING AND MARKING:

- A All hardware shall have the required screws, bolts, and other fasteners necessary for its' installation packed in the same package as the hardware. Each package shall be legibly and adequately labeled to indicate the part of the work for which it is intended.
- B Hardware shall include such adjusting tools and instructions as furnished by the manufacturer as standard practice. Upon completion of the work, the Contractor shall turn over to the Owner or his representative all such tools, instructions and emergency keys.

PART II PRODUCTS

2.01 GENERAL:

- A Coordinate finish hardware work with work of other trades as required.
- B Cooperate with Finish Hardware supplier in scheduling dates for submittals and delivery of templates and finish hardware.

2.02 MATERIALS:

- A Catalog numbers used in the schedule are as follows:
 

Butts	- Hager Hinge Co.
Locksets	- Yale Security
Closers	- Yale Security
Push, Pull, Kick Plates, Stops, Misc.	- Hager Hinge Co.
Thresholds, Weatherstrip, Drip Caps	- National Guard Products
Overhead Stop & Holders	- Glynn Johnson
- B Labeled Doors: Hardware for labeled fire doors shall be UL listed and shall be labeled where required by NFPA standards.
- C Maintenance Requirements: Furnish a complete set of specialized tools and instructions for maintenance, adjustment, removal and replacement.

2.03 FINISH:

- A Finish to be Satin Chrome, US26D for all items unless otherwise scheduled. Closers to be sprayed Aluminum to match remainder of hardware.
- B Push, pull and kick plates and overhead holders shall be Satin Stainless Steel, US32D.
- C Thresholds and drip caps to have clear anodized finish.

2.04 KEYING:

- A All locks shall be master keyed to match owner's existing key system. Furnish six (6) master keys and four (4) keys per lock. Furnish a construction master key system for use during building construction. Remove construction keying at completion of project. Furnish twelve (12) construction master keys.

2.05 BUTTS:

- A Butts, unless scheduled otherwise, shall be BB1279, 4.5" x 4.5" for doors not more than 36" wide and 5" x 4.5" for doors over 36" wide.
- B Provide two (2) pair butts for doors over 7'2" high.
- C Provide non-removable pins for all out swinging exterior doors.

2.06 DOOR STOPS:

- A Except where overhead door holders are scheduled, provide 236W Series stop for each door leaf. Substitute type 241F Series of the proper height where wall stop cannot be installed.

2.07 DOOR MUTES:

- A Mutes for hollow metal doorframes shall be GJ-64. Three mutes required for single swinging doors and two for pairs of doors. Omit for exterior openings.

2.08 CLOSERS:

- A Where closers are scheduled, provide types as specified for exterior and interior openings. Size shall be as recommended by the manufacturer.
- B Provide brackets for closers on exterior out swinging doors and for other doors as required.
- C Provide hold-open arms for all exterior doors and where scheduled for other doors.
- D Provide regular arm or parallel arm as required to mount closers in rooms away from public areas.

2.09 LOCKSETS:

- A Provide types as specified with design as specified at all locations. Cylindrical locksets shall be lever handle with free wheeling levers when lockset is in locked mode.

2.10 KICKPLATES:

- A Provide kick plates 8" high, unless noted otherwise, 2" less than nominal door width for single doors and 1" less than nominal door width for pairs of doors. Kick plates shall be 0.050" thick and beveled on all edges.

PART III EXECUTION:

3.01 INSTALLATION:

- A Locations of hardware shall be in accordance with the recommendations of the National Builders Hardware Association for detailed locations.
- B Install hardware in accurate conformity with the manufacturer's templates.
- C Push and Pulls: Pull plates shall be through-bolted with bolt heads concealed behind push plated.
- D Lock trim shall be as listed in schedule, or equivalent of other approved manufacturers. Dummy trim levers and roses shall be identical to those supplies with locksets. All locksets shall be beveled 1/8" in 2".

3.02 ADJUSTMENT AND CLEANING:

- A Check and adjust each operating item to ensure proper functioning of each unit. Replace units which cannot be adjusted to operate properly.
- B Clean adjacent surfaces soiled by hardware installation.
- C Whenever hardware installation is completed more than one month prior to acceptance or occupancy of building or space, during the week prior to acceptance or occupancy, make final check and adjustment of all items. Clean operating items and restore proper function and finish of hardware and doors. Adjust door control devices to compensate for permanent heating and ventilating conditions.

- D During final adjustment of hardware, instruct Owner's personnel in proper adjustment and maintenance procedures for hardware operations and finished.

End of Section

## SECTION 09 29 00 - GYPSUM WALLBOARD

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials and equipment, and perform all work to install Gypsum Wallboard exposed ceilings, furr-downs and wallboard, including all miscellaneous trim and accessories as required for a complete installation.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements apply to the work under this section.

Section	09 22 16	Metal Support Systems
Section	07 92 00	Caulking and Sealants
Section	09 91 00	Painting

#### 1.03 SUBMITTALS:

- A. Product Data: For each type of product indicated.
- B. Shop Drawings: Show locations, fabrication, and installation of control and expansion joints including plans, elevations, sections, component details and attachments to other units of Work.
- C. Textured Finish Samples: Manufacturer's standard size for each textured finish indicated and on same backing indicated for Work.

#### 1.04 QUALITY ASSURANCE:

- A. Fire-Test-Response Characteristics: For gypsum board assemblies with fire-resistance ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E119 by independent testing and inspecting agency acceptable to authorities having jurisdiction. Fire-Resistance-Rated Assemblies are indicated on drawings by design designations from UL's "Fire Resistance Directory.
- B. Sound Transmission Characteristics: For gypsum board assemblies with STC ratings, provide materials and construction identical to those tested in assembly indicated according to ASTM E 90 and classified according to ASTM E 413 by a qualified independent testing agency.
  - 1. STC-Rated Assemblies: Indicated by design designations from GA-600, "Fire Resistance Design Manual."

#### 1.05 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials in original packages, containers, or bundles bearing brand name and identification of manufacturer or supplier.
- B. Store materials inside under cover and keep them dry and protected against damage from weather, direct sunlight, surface contamination, corrosion, construction traffic, and other causes. Stack gypsum panels flat to prevent sagging.

#### 1.06 PROJECT CONDITIONS:

- A. Environmental Limitations: Comply with ASTM C 840 requirements or gypsum board manufacturer's written recommendations, whichever are more stringent.

### PART II PRODUCTS

2.01 MANUFACTURERS:

- A. Materials shall be products of United States Gypsum Company as listed or equal products of CertainTeed Gypsum, Georgia-Pacific, Lafarge North America, National Gypsum Company, or equal product of other manufacturers approved prior to bidding, except as specifically noted otherwise.

2.02 GYP SUM BOARD AND ACCESSORIES:

- A. Fire rated Gypsum Board shall be fire-rated 5/8" thick, Type "X" Gypsum panels, unless otherwise noted on the drawings. Non Fire-rated wallboard shall be 5/8" thick Gypsum panels unless otherwise noted. All wallboard shall be 4'-0" wide and most economical lengths to suit building conditions. Ceilings shall receive 5/8" Gypsum panels unless otherwise notes.
- B. Abuse resistant Gypsum Board shall be similar and equal to 5/8 inch thick Fiberock® abuse resistant panels as manufactured by United States Gypsum Company as listed or equal products of Georgia-Pacific, Lafarge North America, Gold Bond Building Products, the Flintkote Company, Bostwick, or Allied Structural Industries, except as specifically noted otherwise
- C. Accessories:
1. Cornerbeads for all external corners shall be USG Dur-A-Bead No. 103 (1-1/4" x 1-1/4").
  2. Metal trim for edges of wallboard abutting masonry, plaster or metal wall surfaces shall be USG No. 200-A.
  3. Control Joint Trim shall be zinc control joint USG No. 093.
- D. Materials for exposed joint treatment shall be USG Perf-A-Tape Dura-bond Compound Taping, Dura-bond 90 Joint Compound, and USG Ready-mixed Joint Compound Topping.

2.03 ACOUSTICAL SEALANT

- A. Provide nonsag, paintable, nonstaining, latex sealant complying with ASTM C 834 that effectively reduces airborne sound transmission through perimeter joints and openings in building construction as demonstrated by testing representative assemblies according to ASTM E 90: Subject to compliance with requirements, acceptable include:
1. Pecora Corp.; AC-20 FTR Acoustical and Insulation Sealant.
  2. United States Gypsum Co.; SHEETROCK Acoustical Sealant.
  3. Additional alternate products must be approved by Architect prior to bidding.

2.04 AUXILIARY MATERIALS::

- A. Isolation strip at exterior walls: Asphalt-Saturated Organic Felt: ASTM D 226, Type I (No. 15 asphalt felt), nonperforated.
- B. Spray-Applied Skim Coat Primer-Surfacer:
1. Approved Product: "Sheetrock Brand Primer-Surfacer" by United States Gypsum Co. Alternate products must be approved by Architect prior to bidding.
  2. Provide spray-applied dual-purpose acrylic latex-based coating, in lieu of skim coat of joint compound for Level 5 gypsum board finish at the following locations:
    - a. Areas where Gloss Paint finish is noted on the drawings.
    - b. Glass-Mat, Mold & Mildew Resistant Interior Wall and Ceiling Panels where glass mat facing is exposed.
    - c. Other locations as shown on the Drawings

3. Contractor's option to use this product at other areas requiring Level 5 gypsum board finish.

### PART III EXECUTION

#### 3.01 INSTALLATION - GENERAL:

- A. The installation of Gypsum board shall conform to applicable provisions of Gypsum Board Application and Finishing Standards: ASTM C 840 and GA-216, the recommended specifications of the Gypsum board manufacturer and to underwriter's laboratory. Refer to UL Assembly installation requirements at fire-rated partitions.
- B. At all fire-rated partitions the wallboard shall extend to the roof deck above. At all non-rated partitions the wallboard shall extend to a minimum of 6 inches above the ceiling.
- C. Where fixtures or accessories are recessed into rated partitions, take caution and do work necessary to maintain the fire rating of the partition.
- D. Apply W/R sealant to all cut or exposed edges of W/R panels prior to installing.
- E. Furr out around Columns, and thicken partitions at electrical panels, alarm panels, columns, piping ductwork and other items as required.
- F. Install sound attenuation blankets before installing gypsum panels, unless blankets are readily installed after panels have been installed on one side.
- G. Install ceiling board panels across framing to minimize the number of abutting end joints and to avoid abutting end joints in the central area of each ceiling. Stagger abutting end joints of adjacent panels not less than one framing member.
- H. Install gypsum panels with face side out. Butt panels together for a light contact at edges and ends with not more than 1/16 inch of open space between panels. Do not force into place.
- I. Locate edge and end joints over supports, except in ceiling applications where intermediate supports or gypsum board back-blocking is provided behind end joints. Do not place tapered edges against cut edges or ends. Stagger vertical joints on opposite sides of partitions. Do not make joints other than control joints at corners of framed openings.
- J. Attach gypsum panels to steel studs so leading edge or end of each panel is attached to open (unsupported) edges of stud flanges first.
- K. Attach gypsum panels to framing provided at openings and cutouts.
- L. Do not attach gypsum panels across the flat grain of wide-dimension lumber, including floor joists and headers. Float gypsum panels over these members using resilient channels, or provide control joints to counteract wood shrinkage.
- M. Form control and expansion joints with space between edges of adjoining gypsum panels.
- N. Fit gypsum panels around ducts, pipes, and conduits.
- O. Where partitions intersect open concrete coffers, concrete joists, and other structural members projecting below underside of floor/roof slabs and decks, cut gypsum panels to fit profile formed by coffers, joists, and other structural members; allow 1/4 to 3/8-inch-wide joints to install sealant.
- P. Isolate perimeter of non-load-bearing gypsum board partitions at structural abutments, except floors. Provide 1/4 to 1/2-inch-wide spaces at these locations, and trim edges with U-bead edge trim where edges of gypsum panels are exposed. Seal joints between edges and abutting structural surfaces with acoustical sealant.



- Q. Floating Construction: Where feasible, including where recommended in writing by manufacturer, install gypsum panels over wood framing, with floating internal corner construction.
- R. STC-Rated Assemblies: Seal construction at perimeters, behind control and expansion joints, and at openings and penetrations with a continuous bead of acoustical sealant. Install acoustical sealant at both faces of partitions at perimeters and through penetrations. Comply with ASTM C 919 and manufacturer's written recommendations for locating edge trim and closing off sound-flanking paths around or through gypsum board assemblies, including sealing partitions above acoustical ceilings.
- S. Space fasteners in gypsum panels according to referenced gypsum board application and finishing standard and manufacturer's written recommendations.
- T. Apply Gypsum panels parallel to studs, perpendicular to resilient channels. Position all edges over studs. Fit ends and edges closely, but not forced together. Stagger joints on opposite sides of partition. Fasten panels to studs with 1" Type S Bugle Head Screws 8" on center at vertical joints, in field, and to door head and ceiling runners.
- U. Power drive at least 3/8" from edges and ends of gypsum panels to provide uniform 1/32" dimple.

### 3.02 PANEL APPLICATION METHODS:

#### A. Single-Layer Application:

1. On ceilings, apply gypsum panels before wall/partition board application to the greatest extent possible and at right angles to framing, unless otherwise indicated.
2. On partitions/walls, apply gypsum panels perpendicular to framing, unless otherwise indicated or required by fire-resistance-rated assembly, and minimize end joints.
3. Stagger abutting end joints not less than one framing member in alternate courses of board.
4. At stairwells and other high walls, install panels horizontally, unless otherwise indicated or required by fire-resistance-rated assembly.
5. On Z-furring members, apply gypsum panels vertically (parallel to framing) with no end joints. Locate edge joints over furring members.
6. Fastening Methods: Apply gypsum panels to supports with steel drill screws. For exterior applications, use corrosion-resistant screws.

#### B. Curved Partitions:

1. Install panels horizontally and unbroken, to extent possible, across curved surface plus 12-inch (min.) long straight sections at ends of curve which continue tangent to curve.
2. Wet gypsum panels on surfaces that will become compressed where curve radius prevents using dry panels. Comply with gypsum board manufacturer's written recommendations for curve radii, wetting methods, stacking panels after wetting, and other preparations that precede installing wetted gypsum panels.
3. On convex sides of partitions, begin installation at one end of curved surface and fasten gypsum panels to studs as they are wrapped around curve. On concave side, start fastening panels to stud at center of curve and work outward to panel ends. Fasten panels to framing with screws spaced 12 inches o.c. max.
4. For double-layer construction, fasten base layer to studs with screws 16 inches o.c. (max.) Center gypsum board face layer over joints in base layer, and fasten to studs with screws spaced 12 inches o.c. (max.)
5. Allow wetted gypsum panels to dry before applying joint treatment.

### 3.03 INSTALLING TRIM ACCESSORIES:

- A. General: For trim with back flanges intended for fasteners, attach to framing with same fasteners used for panels. Otherwise, attach trim according to manufacturer's written instructions.

- B. Control Joints: Install control joints according to ASTM C 840 and in specific locations approved by Architect for visual effect. Provide gypsum board backing at control installed in fire rated partitions in accordance with manufacturer's recommendations and as required to maintain the rating specified. Install control joints in the following locations if not specifically located on the drawings:
1. In partition or furring runs at 30 feet on center maximum.
  2. In ceilings where dimensions exceed 30 feet in either direction maximum.
  3. In ceilings at ridge lines or at change of slope.
  4. In exterior gypsum board soffits that exceed 30 feet in either direction maximum.
  5. Where wings of "L", "U", and "T" shaped ceiling areas are joined.
  6. Expansion or control joints that occur throughout the building itself.
  7. Less-than-ceiling height door and window frames should have control joints extending to the ceiling from both corners. Ceiling height door and window frames may be used as control joints.
  8. Install backer rod and sealant behind control joints in wall noted on the drawings to contain sound insulation or to include resilient channels in the wall assembly.
- C. Cornerbeads shall be installed at all exterior corners attached with screws or 9/16" rosin-coated staples 9" o.c. Cornerbeads shall be in single lengths except where corner exceeds standard stock lengths. Clinch-on cornerbeads shall not be allowed.
- D. Casing beads shall be installed where gypsum board abutts masonry walls.

#### 3.04 FINISHING GYPSUM BOARD ASSEMBLIES:

- A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for decoration. Promptly remove residual joint compound from adjacent surfaces.
- B. Prefill open joints, rounded or beveled edges, and damaged surface areas.
- C. Apply joint tape over gypsum board joints, except those with trim having flanges not intended for tape.
- D. In sanding jointing compound, care shall be taken not to sand exposed face of gypsum board and raise a knap on the paper covering.
- E. Gypsum Board Finish Levels: Finish panels to levels indicated below, according to ASTM C 840, for locations indicated:
1. Level 1: Embed tape at joints. **Use this finish level in ceiling plenum areas not exposed to view, concealed areas, and elsewhere as indicated.**
  2. Level 2: Embed tape and apply separate first coat of joint compound to tape, fasteners and trim flanges. **Use this finish level where panels are substrate for tile and elsewhere as indicated.**
  3. Level 3: Embed tape and apply separate first and fill coats of joint compound to tape, fasteners, and trim flanges. **Use this finish level where indicated.**
  4. Level 4: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges. **Use this finish level at panel surfaces that will be exposed to view or covered with flexible wall coverings unless otherwise indicated.**
  5. Level 5: Embed tape and apply separate first, fill, and finish coats of joint compound to tape, fasteners, and trim flanges, and apply skim coat of joint compound over entire

surface. **Use this finish level at panel surfaces to be painted with semi-gloss or gloss paint.**

### 3.05 SPRAY APPLIED SKIM COAT PRIMER SURFACER APPLICATION

#### A. Preparation:

1. General: Remove hardware and hardware accessories, plates, machined surfaces, light fixtures, and similar items already installed that are not to be coated. If removal is impractical or impossible because of size or weight of item, provide surface-applied protection before surface preparation and coating.
2. After completing coating operations in each area, reinstall items removed using workers skilled in trades involved.

#### B. Cleaning: Before applying coatings or other surface treatments, clean substrates of substances that could impair bond of coating systems. Remove oil and grease before cleaning.

1. Schedule cleaning and coating application so dust and other contaminants from cleaning operations will not fall on wet, newly coated surfaces.
2. Surface Preparation: Clean and prepare surfaces to be coated according to the manufacturer's written instructions for the particular substrate conditions, and as specified.

#### C. Gypsum Board Preparation:

1. Treat joints and fastener heads in accordance with U.S. Gypsum instructions for a minimum Level 4 wallboard finish.
2. Fill and smooth scratches and scuffs in gypsum board surfaces.
3. Allow gypsum board joint treatment and fillers to thoroughly dry before application.
4. Install sealant in joints. Refer to Section 07 92 00 (07920).

#### D. Material Preparation: Carefully mix and prepare materials according to the manufacturer's written instructions.

#### E. Application:

1. General: Apply finish to exposed surfaces indicated.
2. Primer-Surfacer Application: Mix and apply finish to gypsum panels indicated to receive finish according to finish manufacturer's directions. Using power spray equipment acceptable to finish manufacturer, produce a uniform thickness, free of starved spots, pin-holes, or other evidence of thin application or of application patterns, and free of excessive globules.
3. Prevent spray-applied finishes from coming into contact with surfaces not indicated to receive texture finish by covering them with masking agents, polyethylene film, or other means. If despite these precautions, finishes contact these surfaces, immediately remove droppings and overspray as recommended by finish manufacturer to prevent damage.
4. Color to be White.
5. Minimum Coating Thickness: Apply each material at not less than the manufacturer's recommended spreading rate. Provide total cured material thickness indicated or as recommended by the manufacturer.

### 3.06 PROTECTION:

- #### A.
- During Gypsum panel application and joint finishing, temperatures within the buildings shall be maintained within the range of 55°F to 70°F. Adequate ventilation shall be provided to carry off excess moisture.

- B. All materials shall be delivered to the buildings in their original unopened packages and stored in an enclosed shelter providing protection from damage and exposure to the elements. Damaged or deteriorated materials shall be removed from the premises.

3.08 CLEANUP:

- A. Upon completion of work, remove all drywall debris and scrap materials from the premises and site.

End of Section

## SECTION 09 62 20 – RESILIENT ATHLETIC FLOORING

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision to provide and install multipurpose gymnasium sports flooring where indicated on the drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 PROJECT CONDITIONS:

- A The building shall be dry and enclosed with the permanent HVAC system installed and operational. Maintain 70° F. minimum temperature in room for 48 hours prior to installation, during installation, and 48 hours after installation. Maintain a minimum temperature of 55° F. thereafter.
- B The installer shall be familiar with the existing subfloor conditions.
- C All work which will cause damage, dirt, dust or interruption to the install shall be completed one week prior.
- D The installation area shall be closed to all traffic and activity for a period to be set by the flooring contractor.

#### 1.04 QUALITY ASSURANCE:

- A Installation shall be by experienced and skilled mechanics, in accordance with the flooring manufacturer's latest printed instructions.
- B Coordinate the requirements of floor adhesives and concrete finishing to assure compatibility between flooring adhesive and finish of concrete slab.

#### 1.05 SUBMITTALS:

- A Submit product data, certificates, and maintenance data in accordance with Section 013300. Submit the following:
  - 1. Product data: For each type of product specified.
  - 2. Samples for Selection: In manufacturer's standard size for each pattern of floor covering specified, showing full range of variations expected in color and pattern.
  - 3. Maintenance Data: For sheet vinyl floor coverings to include in maintenance manuals specified in Division 1.

#### 1.06 WARRANTY:

- A As provided by the Manufacturer on flooring and accessories for a period of two (2) years.

## PART II PRODUCTS

### 2.01 MATERIALS:

A Resilient flooring shall be Taraflex Sport M flooring, a product of:

G2I, Inc.  
3715 Northcrest Rd, Suite 23  
Atlanta, GA 30340-2830  
770-455-7072  
800-727-7505 (toll free)  
770-455-4577 (fax)

Taraflex flooring is shipped in rolls, roughly 4'-11" x 65'-6" x 0.28".

B Accessories:

1. Indentation Resistant System: Gerfloor Taraflex BleacherBlok System  
Location: Under stacking and extended position of bleachers

C Base shall be Thermoset vulcanized Rubber Base manufactured from 100% virgin synthetic rubber as manufactured by Johnsonite, Flexco Roppe, or approved substitute. Provide 1/8" gauge set-on straight base 4 inches high at carpeted floors unless noted otherwise on the drawings. Provide 1/8" gauge set-on cove type, 4 inches high at all other floor surfaces where rubber base is scheduled. Provide base in 120 foot rolls. Colors to be selected by the Architect.

D Adhesive for installing resilient flooring shall be types specified by the flooring manufacturer. Adhesive for installing vinyl base shall be in accordance with manufacturer's written instructions.

E Provide and install preformed base corners at all inside and outside corners.

## PART III EXECUTION

### 3.01 INSPECTION:

A The Flooring Contractor shall inspect floor substrate to receive vinyl flooring prior to beginning work and shall bring any deficiencies, which would prevent him from producing an acceptable installation to the attention of the Architect and the General Contractor. He shall not proceed until the deficiencies are corrected. In no case shall the correction of deficiencies in the subfloor, required for successful tile installation, be cause for additional charges to the Owner. In any event, start of vinyl tile work shall be construed by the Architect as acceptance by the Contractor, of the substrate for proper installation.

### 3.02 PREPARATION OF SURFACES:

A Sweep or brush all surfaces clean of dust and foreign material and be sure that all surface irregularities have been corrected before resilient material is installed. Fill all voids to assure a smooth and solid anchorage of the tile.

### 3.03 INSTALLATION:

A Lay vinyl tiles so as to insure good contact, with close even joints and with all finished surfaces in a true plane, smooth, and with veining in tile all laid in the same direction. Tile joints shall be continuous in one direction only and shall alternate at the mid-point of the adjacent tile in the other direction. Tiles shall be laid square with axis of room with widths of tiles at all sides as nearly even as possible, in no case less than 1/2 tile.

- B It is intended that all sub-floors on which vinyl work is laid shall be smooth and level. The Contractor shall, however, provide approved "underlayment", recommended and guaranteed by tile manufacturer for specific purpose, for filling small cracks and irregularities, as job conditions require.
- C Lay all vinyl flooring strictly as per manufacturer's printed specifications for particular material and type of tile.
- D Install vinyl plastic edging strip with rounded or tapered edge where resilient floor terminates at points higher than contiguous finished flooring.
- E Install feature strips where tile pattern offsets.
- F Install rubber base around the base of all fixed base cabinets.
- G Install edge trim in accordance with manufacturer's directions.

3.04 CLEANING AND PROTECTION:

- A Perform the following operations immediately after installing resilient products:
  - 1. Remove and replace all damaged, defective, scratched, and discolored tile.
  - 2. Remove adhesive and other surface blemishes using cleaner recommended by the resilient product manufacturers.
  - 3. Sweep or vacuum floor thoroughly.
  - 4. Do not wash floor until after time period recommended by flooring manufacturer.
  - 5. Damp-mop floor to remove marks and soil.
  - 6. After time recommended by the manufacturer, apply protective floor polish to floor surfaces that are free from soil, visible adhesive, and surface blemishes. Coordinate selection of floor polish with Owner's maintenance service.
- B Cover installed flooring with undyed, untreated building paper until inspection for final completion.
- C Not more than 4 days before date scheduled for final inspection, clean flooring according to manufacturer's recommendations. Strip protective floor polish that was applied after completing installation only if required to restore polish finish and if recommended by flooring manufacturer. After cleaning, reapply polish to floor surfaces to restore protective floor finish and buff according to flooring manufacturer's written recommendations

End of Section

## SECTION 09 65 19 – RESILIENT FLOORING AND BASE

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision to provide and install vinyl flooring and rubber base in areas where indicated on the drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 PROJECT CONDITIONS:

- A Maintain 70° F. minimum temperature in room for 48 hours prior to installation, during installation, and 48 hours after installation. Maintain a minimum temperature of 55° F. thereafter.

#### 1.04 QUALITY ASSURANCE:

- A Comply with the provisions of the current editions of the following codes, specifications, and standards, except where more stringent requirements are shown or specified.

1. ASTM F – 1869 Test Method for Measuring Vapor Emission Rate of Concrete Subfloors Using Anhydrous Calcium Chloride.

- B Coordinate the requirements of floor adhesives and concrete finishing to assure compatibility between flooring adhesive and finish of concrete slab.

1. Employ at Contractor's expense a testing laboratory to perform moisture testing on concrete slabs scheduled to receive resilient flooring at a rate of one test per 2000 sq.ft. prior to installation of finish flooring.
2. Floors to receive resilient flooring shall limit moisture vapor emission to not more than 3 pounds per 1,000 sq.ft. per 24 hours, in compliance with RMA Moisture Test Unit.

- C Installation shall be by experienced and skilled mechanics, in accordance with the flooring manufacturer's latest printed instructions.

- D Coordinate the requirements of floor adhesives and concrete finishing to assure compatibility between flooring adhesive and finish of concrete slab.

#### 1.05 SUBMITTALS:

- A Submit product data, certificates, and maintenance data in accordance with Section 01300. Submit the following:

1. Product data: For each type of product specified.
2. Samples for Selection: In manufacturer's standard size for each pattern of floor covering specified, showing full range of variations expected in color and pattern.
3. Maintenance Data: For sheet vinyl floor coverings to include in maintenance manuals specified in Division 1.

#### 1.06 GUARANTEE:

- A Furnish to the Architect a written guarantee that all work required by this section will be free from defects of materials and workmanship for a period of one year from date of acceptance of the work by the Architect.



## PART II PRODUCTS

### 2.01 MATERIALS:

- A Vinyl composition flooring shall be as indicated on the drawings.
1. If not indicated on drawings, "VCT"/"tile" flooring shall be 12" x 12" x 1/8" Armstrong Standard Excelon Vinyl Composition Tile or equal by Mannington, Azrock, Shaw or Kentile. Pattern and color must be approved by Architect prior to bidding.
  2. If not indicated on drawings, "LVP"/"VCP"/"plank" flooring shall be 48" x 4.5" Armstrong Luxury Vinyl Planks or equal by Mannington, Mohawk or Shaw. Pattern and color must be approved by Architect prior to bidding.
- B Cove Base shall be as indicated on the drawings.
1. If not indicated on drawings, provide thermoset vulcanized Rubber Base manufactured from 100% virgin synthetic rubber as manufactured by Johnsonite, Flexco Roppe, or alternate manufacturers approved by Architect prior to Bidding. Provide 1/8" gauge set-on straight base 4 inches high at carpeted floors. Provide 1/8" gauge set-on cove type, 4 inches high at all other floor surfaces where rubber base is indicated. Provide base in 120 foot rolls. Colors to be selected by the Architect.
- C Rubber tile shall be 12"x12"x1/8" tile as shown on the drawings.
1. If not scheduled on the drawings, rubber tile shall be Class: I-B (homogeneous rubber tile, through mottled) Rubber Floor Tile: ASTM F 1344 as manufactured by: Roppe Corporation , R.C.A. Rubber Company (The); Musson, R. C. Rubber Co.; Mondo Rubber International, Inc.; Burke Mercer Flooring Products; or approved equal.
- D Adhesive for installing resilient flooring shall be types specified by the flooring manufacturer. Adhesive for installing base shall be in accordance with manufacturer's written instructions.
- E Tapered edging strips for vinyl flooring termination shall be 1/8" thick by 1" wide, vinyl with tapered or rounded edge.
- F 1" feature strips shall be provided at changes in floor pattern.
- G Provide and install preformed base corners at all inside and outside corners.
- H Unless otherwise indicated on the drawings stair treads shall be covered with type 415 rubber heavy duty diamond treads with adjustable nose as manufactured by Flexco or approved equal.

## PART III EXECUTION

### 3.01 INSPECTION:

- A The Flooring Contractor shall inspect floor substrate to receive vinyl flooring prior to beginning work and shall bring any deficiencies, which would prevent him from producing an acceptable installation to the attention of the Architect and the General Contractor. He shall not proceed until the deficiencies are corrected. In no case shall the correction of deficiencies in the subfloor, required for successful installation, be cause for additional charges to the Owner. In any event, start of flooring work shall be construed by the Architect as acceptance by the Contractor, of the substrate for proper installation.

### 3.02 PREPARATION OF SURFACES:

- A. Prepare substrates according to manufacturer's written instructions to ensure adhesion of resilient products.

- B. Concrete Substrates: Prepare according to ASTM F 710.
- C. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
- D. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.
- E. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
- F. Moisture Testing: Perform tests specified or as recommended by the manufacturer if more stringent controls are required. Submit test results to Architect for review. Proceed with installation only after substrates pass testing.
- G. Scrub concrete subfloor with a rotary buffer with a 100 -150 grit abrasive screen over a 1" white nylon maintenance pad.
- H. Sweep or brush all surfaces clean of dust and foreign material and be sure that all surface irregularities have been corrected before resilient material is installed. Fill all voids to assure a smooth and solid anchorage of the flooring.

### 3.03 INSTALLATION:

- B Lay vinyl flooring so as to insure good contact, with close even joints and with all finished surfaces in a true plane, smooth, and with veining in tile/plank all laid in the same direction.
- C Joints shall be arranged as shown in the drawings.
  1. If not indicated on drawings, joints for any "VCT"/"tile" shall be laid continuous in both directions. Tiles shall be laid square with axis of room with widths of tiles at all sides as nearly even as possible, in no case less than 1/2 tile.
  2. If not indicated on drawings, joints for any "VCP"/"plank" shall be laid continuous on the long side of the planks and staggered in a randomly selected offset in an increment of 12" with no adjacent short joints aligning. Architect shall select general orthogonal direction of the long axis. Planks shall be laid square with axis of room with widths of planks on both "sides" of room/pattern as even as possible and in no case less than 1/2 a plank in the short dimension. Install with no less than four linear inches in the long dimension on both "ends" of room/pattern.
- D It is intended that all sub-floors on which vinyl work is laid shall be smooth and level. The Contractor shall, however, provide approved "underlayment", recommended and guaranteed by flooring manufacturer for specific purpose, for filling small cracks and irregularities, as job conditions require.
- E Lay all vinyl flooring strictly as per manufacturer's printed specifications for particular material and type of tile and/or plank.
- F Install vinyl plastic edging strip with rounded or tapered edge where resilient floor terminates at points higher than contiguous finished flooring.
- G Install feature strips where floor pattern offsets.
- H Install rubber base around the base of all fixed base cabinets.
- I Install edge trim in accordance with manufacturer's directions.

### 3.03 CLEANING AND PROTECTION:

- J Perform the following operations immediately after installing resilient products:
1. Remove and replace all damaged, defective, scratched, and discolored tile and/or plank.
  2. Remove adhesive and other surface blemishes using cleaner recommended by the resilient product manufacturers.
  3. Sweep or vacuum floor thoroughly.
  4. Do not wash floor until after time period recommended by flooring manufacturer.
  5. Damp-mop floor to remove marks and soil.
  6. After time recommended by the manufacturer, apply protective floor polish to floor surfaces that are free from soil, visible adhesive, and surface blemishes. Coordinate selection of floor polish with Owner's maintenance service.
- K Cover installed flooring with undyed, untreated building paper until inspection for final completion.
- L Not more than 4 days before date scheduled for final inspection, clean flooring according to manufacturer's recommendations. Strip protective floor polish that was applied after completing installation only if required to restore polish finish and if recommended by flooring manufacturer. After cleaning, reapply polish to floor surfaces to restore protective floor finish and buff according to flooring manufacturer's written recommendations

End of Section

## SECTION 09 91 00 - PAINTING

### PART I GENERAL

#### 1.01 SCOPE:

- A. Painting is required on all new and existing surfaces unless otherwise scheduled and/or as noted on the drawings and herein as specified.
- B. The term "paint" as used herein is all inclusive, meaning emulsions, enamels, oil paints, sealers, stains, varnishes, polyvinyl emulsions, latex emulsions and similar coatings.
- C. Before any paint material has been delivered to the job, submit a complete list of materials proposed for use, identifying each type of material by manufacturer's brand name, and no material shall be delivered to the job until the Architect's approval has been secured in writing. Approval will be of brands and quality, but not for results obtained.
- D. Painting will not be required on non-ferrous metal, putty, or glazing compound, masonry with integral color, or on factory finished items including prefinished, equipment and galvanized wirework, except as may be specifically required elsewhere in the specifications.
- E. Surface preparation, priming, and finish coats specified in this Section are in addition to shop priming and surface treatment specified in other Sections.
- F. Conditions of Surfaces: It shall be the responsibility of each subcontractor to carefully inspect and examine surfaces or areas prepared to receive his work. Should he consider such surfaces or areas not proper or satisfactory for the installation or application of his work, he shall notify the Contractor in writing with copy to the Architect. Should he proceed before proper corrections have been made, it shall be at his own risk and any subsequent corrections that may be ordered or required shall be at his expense.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.
- B. See Section 092900 Gypsum Wallboard for finish requirements for prime coat on Paperless Gyp. Bd.

#### 1.03 DEFINITIONS:

- A. Flat: lusterless or matte finish with gloss range below 15 when measured at 85-degree meter.
- B. Eggshell: low-sheen finish with gloss range 5 to 20 when measured at 60-degree meter.
- C. Semi gloss: medium-sheen finish with gloss range 30 to 65 when measured at 60-degree meter.
- D. Full gloss: high-sheen finish with gloss range more than 65 when measured at 60-degree meter.

#### 1.04 SUBMITTALS:

- A. Submit manufacturer's data including label analysis and instructions for handling, storing, and applying each material proposed for use. Include block fillers and primers.
- B. Provide certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOCs).
- C. Where substitutions are approved, submit manufacturer's color charts for color selection.
- D. Provide samples of each color and material to be applied, with texture to simulate actual conditions, on representative samples of the actual substrate if required by the Architect.

#### 1.05 QUALITY ASSURANCE:

- A. Applicator Qualifications: Engage an experienced applicator who has completed painting system applications similar in material and extent to that indicated for this Project with a record of successful in-service performance.
- B. Obtain primers, block fillers and undercoat paint for each system from same manuf. as finish coats.
- C. Provide primers compatible with finish system in strict accordance with manufacturer's recommendations. Upon request, furnish data for characteristics of finish materials to ensure compatible prime coats are used.
- D. Notify the Architect of problems anticipated using the materials specified.
- E. Provide the manufacturer's best quality paint material for each coating type specified. Paint material containers not displaying manufacturer's product identification will not be acceptable.
- F. Proprietary names used to designate colors or materials are not intended to imply that products named are required, or to exclude equal products of other manufacturers.
- G. No claim by the Contractor concerning the unsuitability of any material specified or his inability to produce satisfactory results therewith will be considered unless such claim is made in writing to the Architect before the Contract is signed.
- H. The Architect will select one room or surface to represent surfaces and condition for each type of coating and substrate to be painted, demonstrating finished colors textures. Final acceptance of colors will be given based on job-applied samples. After finishes are accepted, the Architect will use the room or surface to evaluate coating systems of a similar nature.

1.06 DELIVERY, STORAGE, AND HANDLING:

- A. Deliver materials to the Project Site in manufacturer's original, unopened packages and containers bearing manufacturer's name and label, and the following information:
  - 1. Product name or title of material.
  - 2. Product description (generic classification or binder type).
  - 3. Manufacturer's stock number and date of manufacture.
  - 4. Contents by volume, for pigment and vehicle constituents.
  - 5. Thinning instructions.
  - 6. Application instructions.
  - 7. Color name and number.
  - 8. VOC content.
- B. Store materials not in use in tightly covered containers in a well ventilated area at a minimum ambient temperature of 45° F. Maintain containers used in storage in a clean condition, free of foreign materials and residue.
- C. Protect from freezing. Keep storage area neat and orderly. Remove oily rags and waste daily. Take necessary measures to ensure that workers and work areas are protected from fire and health hazards resulting from handling, mixing, and application.

1.07 EXTRA MATERIALS:

- A. Furnish extra paint materials from the same production run as the materials applied in the quantities described below. Package paint materials in unopened, factory- sealed containers for storage and identify with labels describing contents. Deliver extra materials to owner at close of Project.
- B. Furnish Owner with additional 5 percent, but not less than 1 gal of each material & color applied.

1.08 JOB CONDITIONS:

- A. Apply water-based paints only when temperature of surfaces to be painted and surrounding air temperatures are 50° F -90° F.

- B. Apply solvent-thinned paints only when temperature of surfaces to be painted and surrounding air temperatures are 45° F -95° F.
- C. Do not apply paint in snow, rain, fog or mist, or when relative humidity exceeds 85%, at temperatures less than 5° F (3° C) above the dewpoint, or to damp or wet surfaces.
- D. Painting may be continued during inclement weather if areas and surfaces to be painted are enclosed and heated within temperature limits specified by paint manufacturer during application and drying periods.

PART II PRODUCTS

2.01 MANUFACTURERS:

- A. Products: Subject to compliance with requirements, provide one of the products in the paint schedules.
- B. Manufacturer's Names: The following manufacturers are referred to in the paint schedules by use of shortened versions of their names, which are shown in parentheses:
  - 1. PPG Industries, Inc. (PPG).
  - 2. Sherwin Williams (SW).
  - 4. Comex Group (CW).

2.02 PAINT:

- A. Paint shall be ready-mixed, except that tinting and thinning may be done at the job. The paint shall be suitable for spraying when thinned by not more than 12 percent by volume of thinner. All paint materials shall be delivered in original unopened containers with labels intact and legible.
- B. Provide block fillers, primers, undercoats, and finish-coat materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
- C. Provide manufacturer's best-quality paint material of the various coating types specified. Paint- material containers not displaying manufacturer's product identification will not be acceptable.
- D. Use of manufacturer's proprietary product names to designate colors or materials is not intended to imply that products named are required to be used to the exclusion of equivalent products of other manufacturers. Furnish manufacturer's material data and certificates of performance for proposed substitutions.
- E. Colors: Match colors indicated by reference to manufacturer's color designations.

2.03 COLORS AND SPECIMENS FOR APPROVAL:

- A. Colors and finishes shall be as indicated on the drawings. If not scheduled on the drawings, colors shall be as selected by the Architect. Before any work is done, the Architect will furnish the Contractor with a set of color cards and a schedule showing where the various colors shall go. The Contractor shall then prepare samples at the job as required until the colors and textures are satisfactory. Wood used to display stains shall be the same kind on which the stain is to be used.
- B. The Contractor, if requested by the Architect, shall finish one complete room, space, or item, for each color scheme or finish required, showing selected colors, finished texture, materials and workmanship. After approval, these sample rooms or items shall serve as standard for similar work throughout the building.

2.04 GERMICIDAL DETERGENT: (Use if mold and mildew has been found)

- A. Approved Manufacturers:
  - 1. "X-14 Professional Instant Mildew Stain Remover" - WD-40 Company (888-324-7596)
  - 2. "Tilex Mold & Mildew Remover" - Clorox Co. (800-227-1860)

3. "Tilex Mildew Root Penetrator and Remover" - Clorox Co. (800-227-1860)

PART III EXECUTION

3.01 EXAMINATION:

- A. Examine substrates, areas, and conditions, with the Applicator present, under which painting will be performed for compliance with paint application requirements.
- B. Do not begin to apply paint until unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
- C. Start of painting will be construed as the Applicator's acceptance of surfaces and conditions within a particular area.

3.02 GENERAL REQUIREMENTS:

- A. Maintain temperature of rooms where varnish or enamel is being applied at 70 degrees or more, and at 50 degrees or more during other interior painting. Do exterior painting only when temperature is 50 degrees or higher, and in dry weather.
- B. Apply all materials under adequate illumination, evenly spread and smoothly flowed on without runs or sags. Only skilled workmen shall be employed.
- C. Vary tints of succeeding coats slightly to permit identification of coats.
- D. If any paint is applied to damp material or improperly prepared surfaces; the Contractor shall use such corrective measures as determined by the Architect.
- E. Protect all adjacent work and materials by suitable covering, or other methods, during progress of the work. Upon completion, remove all paint spots from floors, glass and other surfaces.
- F. Store and mix paint materials only in spaces designated and assigned for the purpose. Do not permit paint or oil soaked rags or waste to accumulate. Exercise strict precautions at all times against fire.
- G. Covering shall be complete. When color, stain, dirt, or undercoats show through the final coat of paint, apply additional coats until the finish is of uniform color and appearance and coverage is complete.
- H. Paste wood filler, when set, shall be wiped across the grain, then with the grain, to secure a clean surface.
- I. Enamel, varnish, or oil finish applied to wood or metal shall be sanded between coats with fine sandpaper to produce an even, smooth finish.
- J. Before painting, remove hardware, accessories, plates, lighting fixtures and similar items, or provide ample protection for such items. Upon completion of each space, replace above items. Remove doors, if necessary, to paint bottom edge. Use only skilled workmen for removing and connecting above items.
- K. Paint all interior wood.
- L. Paint all new metal structure exposed in interior of building.
- M. When painting existing surfaces or new work cut into existing surfaces, new paint coverage shall extend corner to corner and floor to ceiling covering the entire plane of the surface in question.

3.03 PREPARATION OF SURFACES:

- A. Wood surfaces shall be sandpapered to a smooth and even surface and dusted off. After priming or stain coat has been applied, thoroughly fill nail or other holes and cracks with plastic wood or putty; for natural finish work, filler (if required) shall be colored to match wood.

- B. On metal surfaces, remove grease, rust, scale and dust, and touch up any abraded place on items that have been shop coated. Where steel or iron has a heavy coating of scale, it shall be removed by wire-brushing or sandblasting as necessary to produce satisfactory painting surface.
- C. Chemically treat galvanized metal surfaces with a compound for this purpose, in accordance with the manufacturer's directions for use, before applying the first coat of paint.
- D. Concrete block surfaces: Wire brush to remove loose materials.
- E. Exposed concrete: Wire brush to remove loose mortar. Patch and repair surfaces for uniform texture.
- F. Clean concrete floors to be painted with a 5 percent solution of muriatic acid or other etching cleaner. Flush the floor with clean water to remove acid, neutralize with ammonia, rinse, allow to dry, and vacuum before painting.
- G. Backpriming: All concealed surfaces of painted wood shall be backprimed. Spot prime all ends of trim.
- H. Touch up bare areas of shop-applied prime coats that have been damaged. Wire-brush, clean with solvents recommended by paint manufacturer, and touch up with the same primer as the shop coat.
- I. Clean galvanized surfaces with non-petroleum-based solvents so surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock by mechanical methods.
- J. On previously painted surfaces and PVC columns, all loose, powdery or peeling paint, wax, grease, and other foreign matter shall be removed prior to application of new paint. Cracks and other surface imperfections shall be repaired. Glossy surfaces shall be dulled by sanding and then wiped clean with a damp cloth. Rinse surfaces thoroughly to remove all detergent residues.
- K. Between coats of polyurethane prime coat rub with steel wool and allow overnight drying.
- L. Mold and Mildew Removal: If mold or mildew is observed on surfaces to be painted, notify the Architect for direction. If in the opinion of the Architect, the mold is remediable, remove contamination and neutralize surfaces as recommended in writing by manufacturer of selected product. If in the opinion of the Architect, the mold is not remediable, request direction before proceeding.

### 3.04 PROTECTION:

- A. Protect work of other trades, whether being painted or not, against damage by painting. Correct damage by cleaning, repairing or replacing, and repainting, as approved by the Architect.
- B. Provide "Wet Paint" signs to protect newly painted finishes. Remove temporary protective wrappings provided by others to protect their work after completing painting operations.
- C. At completion of construction activities of other trades, touch and restore damaged or defaced painted surfaces.

### 3.05 CLEANING:

- A. At the end of each workday, remove empty cans, rags, rubbish, and other discarded paint materials from the site.
- B. After completing painting, clean glass and paint-spattered surfaces. Remove spattered paint by washing and scraping. Be careful not to scratch or damage adjacent finished surfaces.

### 3.06 SCHEDULE OF PAINTING:

#### GENERAL:

1. All items listed in the following paint schedule may not apply to this project.
2. Numbers of coats listed in this schedule are minimum. If coverage is not complete and uniform, additional coats must be added until the finished surface is satisfactory and accepted by the Architect.
3. Omit primer on metal surfaces that have been shop primed and touch-up painted.



4. If undercoats, stains, or other conditions show through final coat of paint, apply additional coats until paint film is uniform finish, color, and appearance. Give special attention to ensure edges, corners, crevices, welds, and exposed fasteners receive a dry film thickness equivalent to that of flat surfaces.
5. Allow sufficient time between successive coats to permit proper drying. Do not recoat surfaces until paint has dried to where it feels firm, does not deform or feel sticky under moderate thumb pressure, and where application of another coat of paint does not cause the undercoat to lift or lose adhesion.
6. Where graphics are shown on the drawings they shall be applied in two (2) coats of Latex Enamel with two (2) coats of clear acrylic applied over finished graphics. Graphics shall be applied by an approved professional sign painter.
7. Electric Panel Boxes: Two (2) coats Rustoleum over prime coat.
8. Exposed Pipe, Pipe Hangers, Sprinkler Pipe, Sprinkler Pipe Hangers, Supports etc.: Two (2) coats satin enamel over metal primer.
9. Exposed Ductwork: Two (2) coats satin enamel over one (1) coat metal primer for galvanized.
10. Specific finishes listed in the finish schedule on the drawings take precedence over the finishes listed below. Luster levels indicated or scheduled on drawings shall take precedence over those specified below. If they differ, provide like product below in luster indicated on drawings.

**B. EXTERIOR:**

1. Metal: Provide the following finish system over miscellaneous ferrous metal, structural, hollow metal doors and frames, louvers:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a rust-inhibitive primer:

Primer: Rust-inhibitive metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.3 mils:

PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.

SW: DTM Acrylic Primer/Finish, B66W1 (OR) Kem Kromik Universal Metal Primer, B50Z (Alkyd).

CW: C309 Ultra Teach DTM Universal Water-Based Metal Primer

First and Second Coats: Semi gloss, exterior, acrylic-latex enamel applied at spreading rate recommended by manuf. to achieve total dry film thickness of not less than 2.6 mils.

PPG: 78 Line Sun-Proof Semi-Gloss House and Trim Paint.

SW: A100 Exterior Acrylic Gloss A8 Series or Metalatex Exterior Semi-gloss Coating, B42-100.

CW: C218 Ultra Tech Exterior 100% Acrylic Semi-Gloss Coating

2. Non-Ferrous Metal: Galvanized. (Acid etch galvanized surfaces that have not weathered at least six months prior to beginning painting operations). Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a galvanized metal primer.

Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

ICI: 4020 Devflex DTM; Flat Int./Ext. Waterborne Primer /Finish.

PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.

SW: DTM Acrylic Primer/Finish, B66W1.

CW: C309 Ultra Teach DTM Universal Water-Based Metal Primer

First and Second Coats: Semi gloss, exterior, acrylic-latex enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

PPG: 78 Line Sun-Proof Semi-Gloss Acrylic Latex House and Trim Paint.

SW: A100 Exterior Acrylic Gloss A8 Series (OR) Metalatex Exterior Semi-gloss Coating, B42-100.  
CW: C218 Ultra Tech Exterior 100% Acrylic Semi-Gloss Coating

3. Aluminum surfaces in contact with masonry or steel to have a coat of zinc chromate.

C. INTERIOR:

1. Concrete Masonry Units: provide the following finish systems over interior concrete masonry block units:

Low-Luster, Acrylic-Enamel Finish: Two (2) finish coats over a block filler.

Block Filler: High-performance, latex-based, block filler applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 5.0 mils.

PPG: 6-7 Speedhide Interior/Exterior Masonry Latex Block Filler.  
SW: Preprite Block Filler, B25W25.  
CW: 3250 Hi-Build Block Filler

First and Second Coats: Low-Luster (eggshell or stain), acrylic-latex, interior enamel applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 2.8 mils.

PPG: 88-110 Satinhide Interior Enamel Wall & Trim LO-Lustre Semi-Gloss Latex.  
SW: ProMar 200 Latex Eg-Shel Enamel, B20W2200 Series.  
CW: UltraTech C106 Interior Eggshell Enamel

2. Epoxy Painted Concrete Masonry Units: provide the following finish systems over interior concrete masonry block units:

Semi-gloss Polyamid Epoxy Finish: Two (2) finish coats over a block filler.

Block Filler: Heavy Duty Acrylic block filler applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 12mils.

PPG: 16-90 Pit-Glaze Heavy Duty Acrylic Block filler  
SW: Heavy Duty Block Filler, B42W46.  
CW: 3250 Hi-Build Block Filler

First and Second Coats: Semi-Gloss Polyamide Epoxy applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 5 mils.

PPG: 97 Line Aquapon Polyamide Epoxy Semi-Gloss Coating.  
SW: Tile Clad H.S. Epoxy, B62Z-100 Series (Eg-Shel) or B70-200 Semi-gloss.  
CW: 1300 Clean Coat Aqua Epoxy

3. Gypsum Board: provide the following finish systems over interior gypsum board surfaces:

Flat Acrylic Finish: Two (2) finish coats over a primer. (Walls scheduled to receive wall fabric shall receive one coat of Latex Primer – Tint Primer to match wall fabric).

Primer: Latex – based, interior primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

PPG: 17-10 Quick-Drying Interior Latex Primer-Sealer.  
SW: PrepRite 200 Latex Wall Primer, B28W200.  
CW: UltraTech C152 Interior Latex Primer-Sealer

First and Second Coats: Flat, acrylic-latex based, interior paint applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.5 mils.

PPG: 80 Line Wallhide Interior Wall Flat Latex Paint.  
SW: ProMar 400 Latex Flat Wall Paint, B30W400.  
CW: UltraTech C115 Interior Latex Flat

4. Painted Interior Wood Surfaces: Provide the following paint finish systems over new, interior wood surfaces.

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a wood undercoater. (Omit undercoater on previously painted surfaces.)

Undercoat: Alkyd – or acrylic-latex based, interior wood undercoater, as recommended by the manufacturer for this substrate, applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

PPG: 6-755 Speedhide Interior Water-Based Undercoater.

SW: PrepRite ProBlock Latex Primer/Sealer, B51W20.

CW: Ultra Tech C152 Interior Latex Primer-Sealer

First and Second Coats: Semi gloss, acrylic-latex, interior enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

CW: UltraTech C119 Interior Latex Semi-Gloss Enamel

5. Painted Ferrous Metal (Hollow Metal doors and frames, electrical panel boxes etc.): Provide the following finish over interior metal work.

Semi gloss Acrylic-Enamel Finish: One finish coat over an enamel undercoater and a primer. (Omit primer on shop primed items)

Primer: Quick-drying rust-inhibitive, alkyd-based or epoxy-metal primer, as recommended by manufacturer for this substrate, applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of not less than 1.5 mils.

PPG: 6-208 Speedhide Interior/Exterior Rust Inhibitive Steel Primer.

SW: Kem Kromik Universal Metal Primer, B50Z Series.

CW: UltraTech C305 Alkyd Rust Inhibitive Primer

Undercoater: Alkyd, interior enamel undercoat or semi gloss, acrylic-latex, interior enamel as recommended by the manufacturer for this substrate, applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 1.3 mils.

PPG: 6-6 Speedhide Interior Quick-Drying Enamel Undercoater.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

CW: UltraTech C119 Interior Latex Semi-Gloss Enamel

Finish Coat: Semi gloss, acrylic-latex, interior enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 1.3 mils.

PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

CW: UltraTech C119 Interior Latex Semi-Gloss Enamel

6. Non-Ferrous Metal: Galvanized. Provide the following finish systems over exterior zinc-coated (galvanized) metal surfaces:

Semi gloss, Acrylic-Enamel Finish: Two (2) finish coats over a galvanized metal primer.

Primer: Galvanized metal primer applied at spreading rate recommended by the manufacturer to achieve a total dry film thickness of not less than 1.2 mils.

PPG: 90-709 Pitt-Tech One Pack Interior/Exterior Primer/Finish DTM Industrial Enamel.

SW: DTM Acrylic Primer/Finish, B66W1.

CW: UltraTech C309 Universal Water-Based Metal Primer

First and Second Coats: Semi gloss, acrylic-latex enamel applied at spreading rate recommended by manufacturer to achieve total dry film thickness of not less than 2.6 mils.

PPG: 88-110 Satinhide Interior Enamel Wall and Trim Lo-Lustre Semi-Gloss Latex.

SW: ProMar 200 Latex Semi-gloss Enamel, B31-2200.

CW: UltraTech C119 Interior Latex Semi-Gloss Enamel

7. Metal Decking, Bar Joists, exposed metal structure (non-galvanized): Provide the following finish systems over shop primed metal surfaces:

Flat Waterborne Acrylic Dry Fall Finish: Two (2) coats applied at spreading rate recommended by manufacturer to achieve a total dry film thickness of 4 mils.

PPG: Spedhide Latex dry Fog Flat Spray Paint, 6-715

SW: Waterborne Acrylic Dryfall, Flat, B42W1

CW: UltraTech C157 Interior Latex Flat Dryfall

CW: UltraTech C309 Universal Water-Based Metal Primer

CW: UltraTech C119 Interior Latex Semi-Gloss

8. Aluminum surfaces in contact with masonry or steel to have a coat of zinc chromate.

3.07 MECHANICAL AND ELECTRICAL ITEMS:

- A. All equipment such as pumps, tanks, air units, compressors, cabinets, etc., that have had their paint defaced, scarred or skinned shall be touched up with machinery enamel.

PPG: Lavax Machinery Enamel, 23- Line.

SW: Steel Spec Fast Dry Alkyd Enamel, B55W811.

CW: UltraTech C248 Exterior Alkyd Semi-Gloss Enamel

- B. All uncovered pipe hangers, tank stands, equipment support stands and brackets, uncovered portions of tank, and other mechanical apparatus, including factory finished items, shall be painted as scheduled above for painted ferrous metal.
- C. All hot water, cold water, steam, condensation, circulating water lines for heating and cooling, drains gas piping, electrical conduit, junction boxes and similar items exposed shall be painted as scheduled above for painted ferrous metal, galvanized metal or Aluminum Metal-lite, as appropriate for the substitute.
- D. All electrical panel boxes, box covers, conduit junction boxes, brackets and accessories except those in electrical rooms shall have field finish paint, as scheduled above for ferrous metal over prime finish, or factory finish.
- E. Exposed Ductwork: As scheduled above for galvanized metal. Interior of ducts exposed to view shall be painted flat black for the first two (2) feet beyond grill or diffuser.

End of Section

## SECTION 104400 - FIRE EXTINGUISHERS

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish and install fire extinguishers and cabinets, as shown on drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A Submit manufacturer's data for fire extinguishers and cabinets including mounting recommendations.

#### 1.04 QUALITY ASSURANCE:

- A Fire extinguishers shall be UL listed with UL listing mark for type, rating and classification of extinguisher.

### PART II PRODUCTS

#### 2.01 MATERIALS:

- A. Fire extinguishers shall be J. L. Industries Cosmic Series E, Model 10, Dry Chemical Extinguisher or approved equal of Elkhart, Casco, Larsen, Allenco, Badger-Powhatter, and Ansul.
- B. Extinguisher cabinet shall be model 1526 with clear bubble, 1-1/2 inch square edge trim, powder coated steel frame cabinet. Cabinet shall have zinc plated handle and roller catch. Provide Mark Bracket MB846 for attachment of extinguisher inside cabinet.
- C. Fire extinguisher cabinets located in fire rated walls shall be provided with FX fire rated tub option.
- D. Fire extinguishers indicated in the drawings for mounting within a Kitchen shall be J. L. Industries Saturn Series, Class K, Wet Chemical Extinguisher or approved equal of Elkhart, Casco, Larsen, Allenco, Badger-Powhatter, and Ansul.

### PART III EXECUTION

#### 3.01 INSTALLATION:

- A Examine walls and partitions for thickness and framing for cabinets to verify cabinet depth and mounting prior to cabinet installation.
- B Follow manufacturer's printed instructions for installation.
- C Install in locations and at mounting heights located, or if not indicated, at heights to comply with applicable regulations of governing authorities.
- D Install fire extinguisher cabinets in fire rated walls in accordance with manufacturer's instructions for maintaining fire rating of wall assembly.

End of Section

## SECTION 11 66 23 - BASKETBALL BACKSTOPS

### PART I GENERAL

#### 1.01 SCOPE:

- A Furnish all labor, materials, equipment and supervision necessary to provide and install folding basketball backstops at each end and sides of the Gymnasium as shown on the drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A. Product Data: For each type of product indicated.
  - 1. If applicable, include assembly, disassembly, and storage instructions for removable equipment.
  - 2. Motors: Show nameplate data, ratings, characteristics, and mounting arrangements.
- B. Samples for Verification: For the following products:
  - 1. Basketball Net: Full size.
  - 2. Pad Fabric: Not less than 3 inches (76 mm) square, with specified treatments applied. Mark face of material.
- B. Operation and Maintenance Data: For gymnasium equipment to include in emergency, operation, and maintenance manuals.
- C. Warranty: Special warranty specified in this Section.

#### 1.04 QUALITY ASSURANCE:

- A Backstops and goals shall be supplied and installed only by a company regularly engaged in the production and installation of commercial athletic equipment.
- B. Source Limitations: Obtain each type of gymnasium equipment through one source from a single manufacturer.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

#### 1.05 GUARANTEE:

- A Provide Manufacturers Standard Guarantee in addition to the standard One-Year Guarantee.

1.06 COORDINATION:

- A. Coordinate installation of floor inserts with structural floors and finish flooring installation and with court layout and game lines and markers on finish flooring.
- B. Coordinate layout and installation of overhead-supported gymnasium equipment and suspension system components with other construction including light fixtures, HVAC equipment, fire-suppression-system components, and partition assemblies.

PART II PRODUCTS

2.01 INDOOR BACKSTOPS:

- A. Backstop at stage end of gymnasium shall be No. 917 "Center Strut" Ceiling Suspended Forward Folding Backstop with No. 900-506 Height Adjustment System as manufactured by Porter Athletic Equipment Company or approved equal. Backstop at other end of gymnasium shall be No. 926 "Center Strut" Ceiling Suspended Stationary Backstop with No. 900-506 Height Adjustment System as manufactured by Porter Athletic Equipment Company or approved equal.
  - 1. Vertical front drop frame assembly "Center-Strut" shall consist of a main, center mast of 6-5/8" O.D. heavy wall structural steel tube with diagonal side sway braces of 2-3/8" O.D. structural pipe. Top horizontal mast, hinge spreader to be of heavy 4" structural channel to form a rigid, back to back triangular design. Goal shall mount directly through bank and into a heavy structural steel weldment "Center-Strut" which shall be clamped to the vertical 6-5/8" O.D. center support to eliminate any strain on bank should a player hang on the front mounted goal (conforms to the NCAA latest rules.)
  - 2. "Center-Strut" shall be suspended by special adjustable hangers to provide for precise plumbing of frame during installation. Support hangers shall be offset 2" behind center line of "Center-Strut" to properly weight lock unit in playing position without the use of ropes, latches or springs.
  - 3. Backstop to operate with a 1-7/8" O.D. front brace assembly with folding knee joint. Knee joint to be adjustable for ease of installation and field adjustment. Knee joint locks backboard in playing position and is easily disengaged by upward force of hoist cable.
  - 4. Backstop shall be supported from 3-1/2" O.D. pipe anchored to roof framing members by means of heavy formed steel support fittings. Superstructure pipes to be reinforced with special bridging or bracing when framing centers exceed spans of 14'-0". Provide all necessary framing, braces and fasteners to connect backstop to building structure.
  - 5. All metal parts shall be painted one (1) coat of flat black enamel (if special painting or colors are required, specify final painting by painting contractor.)
  - 6. Folding backstops shall be equipped with No. 797 "Saf-strap" backstop safety lock.
  - 7. Folding backstops shall be equipped with No. 707 3/4 hp. Remote control electric winch and No. 791 key switch.
    - A. Winch shall be worm gear type, designed to hold backstop at any position when raising or lowering. Winch housing, base, cable drum and bracket are machined from high strength aluminum alloy. The worm is machined from high strain tempered steel bar. All surfaces of the worm shaft are ground and the worm teeth and seal surfaces are polished after grinding for the utmost in efficiency and sealing capabilities. Worm shaft shall turn in sealed, precision thrust-bearings.

The shaft shall also be sealed by an additional seal on the outside of the sealed bearings.

- B. The worm gear shall be machined from high strength forged bronze alloy for exceptional wear ability and long life characteristics.
- C. The worm and gear set to run in an oil bath within main shaft housing which is completely sealed by the worm shaft seal, and by a double lip seal around the polished cable drum shaft where it enters the housing. This unit is filled with oil at the factory and sealed, for maintenance-free service.
- D. Winch to be operated mechanically by means of a 3/4 hp (13 amp) capacitor type 60 cycle, 115 volt, single phase electric motor with automatic thermal overload protection manufactured to NEMA specifications. The motor shall drive the winch by means of a connecting v-belt and sprockets. The motor shall be controlled by a special dual keyed, flush wall mounted momentary key switch which cannot be instantly reversed, providing a safety provision so as not to damage motor or winch. Switch assembly shall be furnished with a 4-1/2" square stainless steel cover plate for mounting in a masonry wall box by the electrical contractor.
- E. Drum shall be mechanically interconnected to a special rotary counting Up-Down limit switch assembly which shall be mounted and pre-wired to motor as an integral part of the winch. Limit switch shall be furnished in a special, extruded aluminum housing with continuous slots for adjusting 20 amp. Micro switches (2) to precisely limit the up and down operation of the winch. Winch shall be pre-wired with a 6'-0" lg. Neoprene covered cable with twist-lock grounded type plug attached. Matching flange type receptacle shall be mounted in 4" square box cover.
- F. Under no-load conditions, RPM of drum is 11.5, RPM of motor is 1725.
- G. Hoisting capacity of winch is 1,600 pounds.

- B Backstop structures shall conform to current FIBA/NCAA/NFSHSA rules and regulations at the time of installation.
- C Backstops shall be "Pro-Strut" No. 00 204-000 Rectangular Glass Backboard as manufactured by Porter Athletic Equipment or approved equal. Backstops shall be provided with No. 00229 padding kit.
- D Basketball Goals shall be No. 00243-300 Super flex goal as manufactured by Porter Athletic Equipment or approved equal with woven nylon net.

#### 2.02 VOLLEYBALL NET STANDARDS SLEEVES:

- A Volleyball net standard sleeves shall be No. 00870-100 3-1/2 inch diameter Floor Anchor or approved equal - Furnish 2 complete sets of sleeves and covers.

### PART III EXECUTION

#### 3.01 INSTALLATION:

- A Install in accordance with manufacturer's recommendations. Provide all necessary accessory fasteners, brackets and hardware necessary for a complete installation.



A. Touch up any paint scarred during installation and repair any damaged insulation.

End of Section

## SECTION 126600 – TELESCOPING BLEACHERS

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, materials, equipment and supervision necessary to provide and install power operated with all attached, telescoping bleachers where indicated on the Drawings and as specified herein.

#### 1.02 RELATED DOCUMENTS

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1 General Requirements apply to the work under this section.

#### 1.03 DEFINITIONS:

- A. Telescoping bleachers are operable systems of multiple-tiered benches or chairs on interconnected, folding platforms that close, without being dismantled, into a nested stack for storing or moving.

#### 1.04 PERFORMANCE REQUIREMENTS

- A. Structural Performance Characteristics: Engineer, fabricate, and install telescoping stands to withstand the design loads specified in NFPA 102, "Standard for Assembly Seating, Tents, and Membrane Structures," Chapter 5, "Folding and Telescopic Seating," without exceeding the allowable design working stresses of the materials involved, including anchors and connections. Apply each load to produce the maximum stress in each respective component of each telescoping stand unit.
- B. The following loading shall be compared to the loading specified by the reference cited above and where the two differ, the more stringent loading criteria shall govern unless specifically noted otherwise. Telescopic seating shall be designed to support, in addition to its own weight, and the weight of added accessories, a uniformly distributed live load of not less than 100 lbs. per sq. ft. of gross horizontal projection.
  - 1. Seatboards and footrest shall be designed for a live load of not less than 120 lbs. per linear foot.
  - 2. A sway force applied to seats shall be 24 lbs. per linear ft. parallel to the seats and 10 lbs. per linear ft. perpendicular to the leads. Sway forces shall not be considered simultaneously applied.
- C. Railings, posts and sockets designed to withstand the following forces applied separately:
  - 1. Handrails shall be designed and constructed for:
    - a. A concentrated load of 200 lbs. applied at any point in any direction.
    - b. A uniform load of 50 lbs. per ft. applied in any direction. The concentrated and uniform loading conditions shall not be required to be applied simultaneously.
    - c. The concentrated and uniform loading conditions shall not be required to be applied simultaneously.
  - 2. Guards shall be designed and constructed for:
    - a. A concentrated load of 200 lbs. applied at any point and in any direction along the top railing member and

- b. A uniform load of 50 lbs. per ft. applied horizontally at the required guardrail height and simultaneous uniform load of 100 lbs. per ft. applied vertically downward at the top of the guardrail. The concentrated and uniform loading conditions shall not be required to be applied simultaneously.
- c. American Institute of Steel Construction (AISC) American Iron and Steel Institute (AISI) and Aluminum Association (AA) design criteria shall be the basis for calculation of member sizes and connections.
- d. Wood members shall be designed in accordance with National Forest Products Association, (NFOPA), and National Design Specification for Wood Construction.

#### 1.05 SUBMITTALS

- A. General: Submit each item in this Article according to the Conditions of the Contract and Division 1 Specification Sections.
  - 1. Product Data for each type of telescoping stand specified, including details of construction relative to materials, dimensions of individual components, profiles, and finishes.
    - a. Shop Drawings showing fabrication and installation of telescoping stands including plans, elevations, sections, details of components, and attachments to other units of Work.
      - i. For installed products indicated to comply with certain design loadings, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
    - b. Wiring diagrams from manufacturer for electrically operated units.
    - c. Samples for verification of the following items, in the size indicated below. Prepare Samples from the same material to be used for the Work. Where finishes involve normal color and texture variations, include Sample sets showing the full range of variations expected.
      - i. Painted Steel: 6 inch- (150 mm) square sample of painted steel sheet.
      - ii. Molded-Plastic Benches: One end cap in each color indicated.
    - d. Qualification data for firms and persons specified in the "Quality Assurance" Article to demonstrate their capabilities and experience. Include lists of completed projects with project names and addresses, names and addresses of architects and owners, and other information specified.
    - e. Maintenance data for telescoping stands, including detailed instructions for operation and annual inspection requirements of authorities having jurisdiction, to include in the operation and maintenance manual specified in Division 1.

#### 1.06 QUALITY ASSURANCE

- A. NFPA Standard: Comply with requirements of NFPA 102, "Standard for Assembly Seating, Tents, and Membrane Structures," Chapter 5, "Folding and Telescopic Seating," except where more stringent requirements are indicated or imposed by authorities having jurisdiction.
- B. Manufacturer Qualifications: Manufacturer shall be a company specializing in the manufacture of telescopic seating who has a minimum 10 year history of successful installations similar to those specified herein.

- C. Installer Qualifications: Engage an experienced Installer trained and certified by the manufacturer to perform work of this Section who has specialized in installing types of telescoping stands similar to those required for this Project.
- D. Professional Engineer Qualifications: A professional engineer who is legally authorized to practice in the jurisdiction where Project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of telescoping stands that are similar to that indicated for this Project in material, design, and extent.
- E. Engineering Responsibility: Engineer telescoping stands by qualified professional engineer legally authorized to practice in jurisdiction where Project is located.
- F. Welding Standards: Comply with applicable provisions of AWS D1.1 "Structural Welding Code--Steel" and AWS D1.3 "Structural Welding Code--Sheet Steel."
- G. Engage certified welders that have satisfactorily passed AWS qualification tests for welding processes involved and, if pertinent, have undergone recertification.

#### 1.07 WARRANTY

- A. The manufacturer shall warranty all work performed under these specification to be free of defects in materials and workmanship for a period of one year from the date of Substantial Completion.

#### 1.08 PROJECT CONDITIONS

- A. Field Measurements: Check actual dimensions of construction affecting telescoping stands by accurate field measurements before fabrication and show recorded measurements on Shop Drawings. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

### PART II PRODUCTS

#### 2.01 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated in the Work include, but are not limited to, the following:
  1. Basis of Design: Universal Interkal, Inc. Bench Seating with Sculpture Seat Modules  
 Universal Interkal, Inc.  
 5981 East Cork St.  
 Kalamazoo, MI 49003  
 269-349-1521
  2. Irwin Model 4500 Telescoping Seating System as manufactured by:  
 Irwin Seating Company; Folding Bleacher Company Subsidiary.  
 P.O. Box 320  
 Altamont, IL 62411  
 618-483-6157
  3. Kodiak 2400 Series Spectator Seating as manufactured by:  
 Kodiak Industries Ltd.  
 1865 Burrows Ave.  
 Winnipeg, MB Canada  
 204-224-3221

2.02 SUPPLY AND INSTALL

- A. 3 Rows high. Length as indicated on the drawings.
  - 1. Mounting: Wall Attached
  - 2. Operation: Manual
  - 3. Rise per row: 11-12 inches
  - 4. Row spacing: 24"

2.03 MATERIALS

- A. Plywood Deck: Provide manufacturer's standard APA grade trademarked plywood deck.
- B. Structural Steel Shapes, Plates, and Bars: ASTM A 36 (ASTM A 36M), except where higher strength steel is indicated or standard with manufacturer.
- C. Commercial-Quality Uncoated Steel Sheet: ASTM A 366 (ASTM A 366M) cold-rolled steel sheet, or ASTM A 569 (ASTM A 569M) hot-rolled steel sheet, stretcher leveled.
- D. Structural-Quality Uncoated Steel Sheet: ASTM A 570 (ASTM A 570M) hot-rolled steel sheet, or ASTM A 611 cold-rolled steel sheet, stretcher leveled.
- E. High-Strength Uncoated Steel Sheet: ASTM A 607 hot- or cold-rolled steel sheet, stretcher leveled.
- F. Galvanized Steel Sheet: ASTM A 653, G60 (ASTM A 653M, Z180) coating designation, phosphatized, stretcher leveled.
- G. Steel Tubing: ASTM A 500, cold formed; or ASTM A 501, hot formed.
- H. Extruded Aluminum: ASTM B 221 (ASTM B 221M), alloy as standard for manufacturer.
- I. Polyethylene Plastic: ASTM D 1248, Type III, Class B; molded, color-pigmented, textured, impact-resistant, structural formulation.
- J. Fasteners: Vibration proof, of size and material standard with manufacturer.

2.04 COMPONENTS

- A. General: Provide manufacturer's standard telescoping stands fabricated to comply with requirements indicated. Smoothly round corners, edges, and exposed fasteners to eliminate snagging and pinching hazards. Form exposed sheet metal with flat, flush surfaces, true to line and level, and without cracking and grain separation. Perform welding by operators and processes complying with AWS requirements.

Bleacher table based on Irwin Telescoping Bleachers.

of Rows	10" Rise 25 cm	12" Rise 30 cm	22" Spacing 56 cm	24" Spacing 61 cm	26" Spacing 65 cm	31" Spacing 79 cm	32" Spacing 81 cm	33" Spacing 84 cm
3	3' 1/4" (93 cm)	3' 6" (107 cm)	5' 1" (155 cm)	5' 3" (160 cm)	5' 5" (165 cm)	6' 5" (196 cm)	6' 6" (198 cm)	6' 7" (201 cm)
	3' 10 1/4" (119 cm)	4' 6" (137 cm)	6' 11" (211 cm)	7' 3" (221 cm)	7' 7" (231 cm)	9' 0" (274 cm)	9' 2" (279 cm)	9' 4" (284 cm)
5	4' 8 1/4"	5' 6"	8' 9"	9' 3"	9' 9"	11' 7"	11' 10"	12' 1"

of Rows	10" Rise 25 cm	12" Rise 30 cm	22" Spacing 56 cm	24" Spacing 61 cm	26" Spacing 65 cm	31" Spacing 79 cm	32" Spacing 81 cm	33" Spacing 84 cm
	(144 cm)	(168 cm)	(267 cm)	(282 cm)	(297 cm)	(353 cm)	(361 cm)	(368 cm)
6	5' 6 1/4" (170 cm)	6' 6" (198 cm)	10' 7" (322 cm)	11' 3" (343 cm)	11' 11" (363 cm)	14' 2" (432 cm)	14' 6" (442 cm)	14' 10" (452 cm)
	6' 4 1/4" (195 cm)	7' 6" (229 cm)	12' 5" (378 cm)	13' 3" (404 cm)	14' 1" (429 cm)	16' 9" (511 cm)	17' 2" (523 cm)	17' 7" (536 cm)
8	7' 2 1/4" (220 cm)	8' 6" (259 cm)	14' 3" (434 cm)	15' 3" (465 cm)	16' 3" (495 cm)	19' 4" (589 cm)	19' 10" (605 cm)	20' 4" (620 cm)
	8' 0 1/4" (246 cm)	9' 6" (290 cm)	16' 1" (490 cm)	17' 3" (526 cm)	18' 5" (561 cm)	21' 11" (668 cm)	22' 6" (686 cm)	23' 1" (704 cm)
10	8' 10 1/4" (271 cm)	10' 6" (320 cm)	17' 11" (546 cm)	19' 3" (587 cm)	20' 7" (627 cm)	24' 6" (747 cm)	25' 2" (767 cm)	25' 10" (787 cm)
	9' 8 1/4" (297 cm)	11' 6" (351 cm)	19' 9" (602 cm)	21' 3" (648 cm)	22' 9" (693 cm)	27' 1" (826 cm)	27' 10" (848 cm)	28' 7" (871 cm)
12	10' 6 1/4" (322 cm)	12' 6" (381 cm)	21' 7" (658 cm)	23' 3" (709 cm)	24' 11" (759 cm)	29' 8" (904 cm)	30' 6" (930 cm)	31' 4" (955 cm)
	11' 4 1/4" (347 cm)	13' 6" (411 cm)	23' 5" (714 cm)	25' 3" (770 cm)	27' 1" (825 cm)	32' 3" (983 cm)	33' 2" (1011 cm)	34' 1" (1039 cm)
14	12' 2 1/4" (373 cm)	14' 6" (442 cm)	25' 3" (770 cm)	27' 3" (841 cm)	29' 3" (891 cm)	34' 10" (1062 cm)	35' 10" (1092 cm)	36' 10" (1123 cm)
	13' 0 1/4" (398 cm)	15' 6" (472 cm)	27' 1" (825 cm)	29' 3" (891 cm)	31' 5" (957 cm)	37' 5" (1140 cm)	38' 6" (1173 cm)	39' 7" (1207 cm)
16	13' 10 1/4" (424 cm)	16' 6" (753 cm)	28' 11" (881 cm)	31' 3" (952 cm)	33' 7" (1023 cm)	40' 0" (1219 cm)	41' 2" (1255 cm)	42' 4" (1290 cm)
	14' 8 1/4" (449 cm)	17' 6" (533 cm)	30' 9" (937 cm)	33' 3" (1013 cm)	35' 9" (1089 cm)	42' 7" (1298 cm)	43' 10" (1336 cm)	45' 1" (1374 cm)
18	15' 6 1/4" (474 cm)	18' 6" (564 cm)	32' 7" (993 cm)	35' 3" (1074 cm)	37' 11" (1155 cm)	45' 2" (1377 cm)	46' 6" (1417 cm)	47' 10" (1458 cm)
	16' 4 1/4" (500 cm)	19' 6" (594 cm)	34' 5" (1049 cm)	37' 3" (1135 cm)	40' 1" (1221 cm)	47' 9" (1455 cm)	49' 2" (1499 cm)	50' 7" (1542 cm)
20	17' 2 1/4" (525 cm)	20' 6" (625 cm)	36' 3" (1105 cm)	39' 3" (1196 cm)	42' 3" (1287 cm)	50' 4" (1534 cm)	51' 10" (1580 cm)	53' 4" (1626 cm)
	18' 0 1/4" (551 cm)	21' 6" (655 cm)	38' 1" (1161 cm)	41' 3" (1257 cm)	44' 5" (1353 cm)	52' 11" (1613 cm)	54' 6" (1662 cm)	56' 1" (1709 cm)
22	18' 10 1/4" (476 cm)	22' 6" (686 cm)	39' 11" (1217 cm)	43' 3" (1318 cm)	46' 7" (1419 cm)	55' 6" (1692 cm)	57' 2" (1743 cm)	58' 10" (1793 cm)
	19' 8 1/4" (601 cm)	23' 6" (716 cm)	41' 9" (1272 cm)	45' 3" (1379 cm)	48' 9" (1485 cm)	58' 1" (1770 cm)	59' 10" (1824 cm)	61' 7" (1877 cm)
24	20' 6 1/4" (627 cm)	24' 6" (747 cm)	43' 7" (1328 cm)	47' 3" (1440 cm)	50' 11" (1551 cm)	60' 8" (1849 cm)	62' 6" (1905 cm)	64' 4" (1961 cm)
	21' 4 1/4" (652 cm)	25' 6" (777 cm)	45' 5" (1385 cm)	49' 3" (1501 cm)	53' 1" (1617 cm)	63' 3" (1928 cm)	65' 2" (1986 cm)	67' 1" (2045 cm)

**MINIMUM CLOSED DEPTHS**

3' 3" For 22", 24", or 26" Spacing

The closed depth will be increased by portable, forward fold, or freestanding units, higher rows, non-friction power, columns or

- B. **Bench Seats and Skirts:** Provide seats with uniform heights of not less than 16 inches (406.4 mm) or more than 18 inches (457.2 mm), as standard with manufacturer.
1. **Material:** Polyethylene plastic in color selected by Architect from manufacturer's full range of colors.
  2. **Profile:** Contoured seat surface with enclosed back, cantilevered to the rear to provide toe space beneath seat.
  3. **Depth:** 12 inches (304.8 mm).
- C. **Cutouts for wheelchair accessible seating at first tier locations indicated.** Provide front rails attached to front of second tier at rear of wheelchair accessible seating area. Provide full-width front closure panel at cutout that matches decking construction and finish and extends from underside of second tier to 1-1/2 inches (38.1 mm) from finished floor.
- D. **Risers:** Fabricate risers from steel sheet with painted or galvanized finish, as standard with manufacturer.
- E. **Footrests:** Fabricate fully closed footrests from plywood, as standard with manufacturer.
- F. **Understructure:** Fabricate understructure from structural steel members of size, spacing, and form required to support design loads.
1. **Cantilever bench seat supports to produce toe space uninterrupted by vertical bracing.**
- G. **Support Column Wheels:** Provide manufacturer's nonmarring, soft, rubber-face wheel assembly under each support column. Include wheels of size, number, and design required to support stands and to achieve smooth operation without damage to flooring surface, but not less than 4 per column or less than 3-1/2 inches (88.9 mm) in diameter and 1 inch (25.4 mm) wide.
- H. **Aisles:** Fabricate stands with the following aisle configuration, at locations and of widths indicated:
1. **Footrest-Level Configuration:** Interrupt seats to provide aisle walking surfaces at footrest level.
- I. **Row Spacing:** Fabricate units with row spacing of 24 inches (609.6 mm); unless otherwise indicated.
- J. **Row Rise:** Fabricate units with row rise of between 11 and 12 inches (292.1 and 295.3 mm); as standard with manufacturer.
- K. **Operation:** Provide telescoping stands incorporating manufacturer's standard system of seating and understructure members that permit opening and closing of adjacent rows, allow individual and collective rows to be locked open for use, and close with vertical faces of upper skirts in the same vertical plane.
1. **Manual Operation:** Provide manual operation of stands by portable operator handles that attach to center of stand units and allow 1 or 2 operators to work from upright position.
- L. **Types of Telescoping Stands:** Provide assemblies of the following types, fabricated in lengths and number of rows indicated:
1. **Wall-Attached Type:** Construct stands to provide for permanent attachment of rear of understructure to wall construction.

- M. Accessories: Provide the following accessories of manufacturer's standard design and construction at locations indicated or required to comply with referenced code standard:
1. Nonslip abrasive tread surfaces at vertical aisles.
  2. Intermediate aisle steps, fully enclosed, at each vertical aisle.
  3. Removable aisle handrails located at centerline of each vertical aisle and discontinuous with gaps or breaks at intervals not exceeding 5 rows. Equip handrails with an intermediate horizontal handrail below the top rail.
  4. End railings of telescoping, self-storing type.
  5. Rear fillers including supports for closing openings between top row and rear wall of adjoining construction.
  6. Gap fillers for closing openings between stand units or between stand units and adjoining construction.
  7. End panels covering exposed ends of stands in stored position.
  8. Removable scorer's table that attaches to mounting sockets provided as part of telescoping stands.
  9. Row letters at each row end.

#### 2.05 STEEL FINISHES:

- A. Surface Preparation: Solvent-clean surfaces to comply with SSPC-SP 1 to remove dirt, oil, grease, and other contaminants that could impair paint bond. Remove mill scale and rust, if present, from uncoated steel complying with SSPC-SP 5 (White Metal Blast Cleaning) or SSPC-SP 8 (Pickling).
- B. Rust-Inhibitive Finish: Immediately after cleaning and pretreating, apply manufacturer's standard rust-inhibitive finish to exposed and concealed metal surfaces including understructure, except where other types of finishes are indicated.
1. Epoxy Finish: Manufacturer's standard epoxy-resin-based finish consisting of prime coat and topcoat.

#### 2.06 WOOD FINISHES:

- A. Painted Plywood: Manufacturer's standard wear-resistant finish in manufacturer's standard color

### PART III EXECUTION

#### 3.01 EXAMINATION:

- A. Examine areas where telescoping stands are to be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of telescoping stands. Do not proceed with installation until unsatisfactory conditions have been corrected.

#### 3.02 INSTALLATION

- A. Install telescoping stands to comply with manufacturer's instructions and Shop Drawings. Provide accessories indicated and anchors, fasteners, inserts, and other items required for installing and attaching units to adjoining construction.



3.03 ADJUSTING AND CLEANING:

- A. On completion of installation, including work of other trades, lubricate, test, and adjust each telescoping stand unit to operate easily and to comply with manufacturer's specifications.
- B. Clean installed telescoping stands on exposed and semiexposed surfaces. Touch up shop-applied finishes to restore damaged or soiled areas.

3.04 DEMONSTRATION:

- A. Engage a factory-authorized service representative to demonstrate and train Owner's maintenance personnel as specified below.
  - 1. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - 2. Train Owner's maintenance personnel on procedures and schedules related to operation, troubleshooting, servicing, inspection, and maintenance.
  - 3. Review data in the operation and maintenance manuals. Refer to Division 1 Section "Contract Closeout."
  - 4. Schedule training with Owner, through Architect, with at least 7 days' advance notice.

3.05 PROTECTION:

- A. Provide final protection and maintain conditions, in a manner acceptable to manufacturer and Installer, that ensure telescoping stands are without damage or deterioration at the time of Substantial Completion.

End of Section

## SECTION 21 13 13 – WET-PIPE SPRINKLER SYSTEMS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Pipes, fittings, and specialties.
  - 2. Sprinklers.

#### 1.3 DEFINITIONS

- A. Standard-Pressure Sprinkler Piping: Wet-pipe sprinkler system piping designed to operate at working pressure of 175 psig maximum.

#### 1.4 SYSTEM DESCRIPTIONS

- A. Wet-Pipe Sprinkler System: Automatic sprinklers are attached to piping containing water and that is connected to water supply through alarm valve. Water discharges immediately from sprinklers when they are opened. Sprinklers open when heat melts fusible link or destroys frangible device. Hose connections are included if indicated.

#### 1.5 PERFORMANCE REQUIREMENTS

- A. Standard-Pressure Piping System Component: Listed for 175-psig minimum working pressure.
- B. Sprinkler system design shall be approved by authorities having jurisdiction.
  - 1. Margin of Safety for Available Water Flow and Pressure: 10 percent, including losses through water-service piping, valves, and backflow preventers.
  - 2. Sprinkler Occupancy Hazard Classifications:
    - a. See Plans
  - 3. Minimum Density for Automatic-Sprinkler Piping Design:
    - a. See Plans
  - 4. Maximum Protection Area per Sprinkler:
    - a. All Areas: According to NFPA 13 recommendations unless otherwise indicated.
  - 5. Total Combined Hose-Stream Demand Requirement: According to NFPA 13 unless otherwise indicated:
    - a. See Plans

## 1.6 SUBMITTALS

- A. Product Data: For each type of product indicated. Include rated capacities, operating characteristics, electrical characteristics, and furnished specialties and accessories.
- B. Shop Drawings: For wet-pipe sprinkler systems. Include plans, elevations, sections, details, and attachments to other work.
  - 1. Wiring Diagrams: For power, signal, and control wiring.
- C. Coordination Drawings: Sprinkler systems, drawn to scale, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
  - 1. Domestic water piping.
  - 2. Natural gas piping.
  - 3. HVAC hydronic piping.
  - 4. Items penetrating finished ceiling include the following:
    - a. Lighting fixtures.
    - b. Air outlets and inlets.
- D. Qualification Data: For qualified Installer.
- E. Approved Sprinkler Piping Drawings: Working plans, prepared according to NFPA 13, that have been approved by authorities having jurisdiction, including hydraulic calculations if applicable.
- F. Welding certificates.
- G. Field Test Reports and Certificates: Indicate and interpret test results for compliance with performance requirements and as described in NFPA 13. Include "Contractor's Material and Test Certificate for Aboveground Piping."
- H. Field quality-control reports.
- I. Operation and Maintenance Data: For sprinkler specialties to include in emergency, operation, and maintenance manuals.

## 1.7 QUALITY ASSURANCE

- A. Installer Qualifications:
  - 1. Installer's responsibilities include designing, fabricating, and installing sprinkler systems and providing professional engineering services needed to assume engineering responsibility. Base calculations on results of fire-hydrant flow test.
    - a. Engineering Responsibility: Preparation of working plans, calculations, and field test reports by a qualified professional engineer.
- B. Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.
- C. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.

D. NFPA Standards: Sprinkler system equipment, specialties, accessories, installation, and testing shall comply with the following:

1. NFPA 13, "Installation of Sprinkler Systems."

#### 1.8 PROJECT CONDITIONS

A. Interruption of Existing Sprinkler Service: Do not interrupt sprinkler service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary sprinkler service according to requirements indicated:

1. Notify Owner no fewer than two days in advance of proposed interruption of sprinkler service.
2. Do not proceed with interruption of sprinkler service without Owner's written permission.

#### 1.9 COORDINATION

A. Coordinate layout and installation of sprinklers with other construction that penetrates ceilings, including light fixtures, HVAC equipment, and partition assemblies.

#### 1.10 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

1. Sprinkler Cabinets: Finished, wall-mounted, steel cabinet with hinged cover, and with space for minimum of six spare sprinklers plus sprinkler wrench. Include number of sprinklers required by NFPA 13 and sprinkler wrench. Include separate cabinet with sprinklers and wrench for each type of sprinkler used on Project.

### PART 2 - PRODUCTS

#### 2.1 PIPING MATERIALS

A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, and fitting materials, and for joining methods for specific services, service locations, and pipe sizes.

#### 2.2 STEEL PIPE AND FITTINGS

A. Standard Weight, Black-Steel Pipe: ASTM A 53/A 53M, Type E, Grade B. Pipe ends may be factory or field formed to match joining method.

B. Black-Steel Pipe Nipples: ASTM A 733, made of ASTM A 53/A 53M, standard-weight, seamless steel pipe with threaded ends.

C. Uncoated, Steel Couplings: ASTM A 865, threaded.

D. Uncoated, Gray-Iron Threaded Fittings: ASME B16.4, Class 125, standard pattern.

- E. Malleable- or Ductile-Iron Unions: UL 860.
- F. Cast-Iron Flanges: ASME 16.1, Class 125.
- G. Steel Flanges and Flanged Fittings: ASME B16.5, Class 150.
- H. Steel Welding Fittings: ASTM A 234/A 234M and ASME B16.9.
- I. Grooved-Joint, Steel-Pipe Appurtenances:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Anvil International, Inc.
    - b. Tyco Fire & Building Products LP.
    - c. Victaulic Company.
  - 2. Pressure Rating: 175 psig minimum.
  - 3. Uncoated, Grooved-End Fittings for Steel Piping: ASTM A 47/A 47M, malleable-iron casting or ASTM A 536, ductile-iron casting; with dimensions matching steel pipe.
  - 4. Grooved-End-Pipe Couplings for Steel Piping: AWWA C606 and UL 213, rigid pattern, unless otherwise indicated, for steel-pipe dimensions. Include ferrous housing sections, EPDM-rubber gasket, and bolts and nuts.
- J. Steel Pressure-Seal Fittings: UL 213, FM-approved, 175-psig pressure rating with steel housing, rubber O-rings, and pipe stop; for use with fitting manufacturers' pressure-seal tools.
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
    - a. Victaulic Company.

## 2.3 PIPING JOINING MATERIALS

- A. Brazing Filler Metals: AWS A5.8/A5.8M, BCuP Series, copper-phosphorus alloys for general-duty brazing unless otherwise indicated.
- B. Welding Filler Metals: Comply with AWS D10.12M/D10.12 for welding materials appropriate for wall thickness and chemical analysis of steel pipe being welded.

## 2.4 LISTED FIRE-PROTECTION VALVES

- A. General Requirements:
  - 1. Valves shall be UL listed or FM approved.
  - 2. Minimum Pressure Rating for Standard-Pressure Piping: 175 psig.
- B. Ball Valves:
  - 1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - 2. Basis-of-Design Product: Subject to compliance with requirements, provide product indicated on Drawings or comparable product by one of the following:

- a. Anvil International, Inc.
  - b. Victaulic Company.
3. Standard: UL 1091 except with ball instead of disc.
  4. Valves NPS 1-1/2 and Smaller: Bronze body with threaded ends.
  5. Valves NPS 2 and NPS 2-1/2: Bronze body with threaded ends.

## 2.5 SPECIALTY VALVES

### A. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating:
  - a. Standard-Pressure Piping Specialty Valves: 175 psig minimum.
3. Body Material: Cast or ductile iron.
4. Size: Same as connected piping.
5. End Connections: Flanged or grooved.

## 2.6 SPRINKLER SPECIALTY PIPE FITTINGS

### A. Branch Outlet Fittings:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
  - a. Anvil International, Inc.
  - b. Shurjoint Piping Products.
  - c. Tyco Fire & Building Products LP.
2. Standard: UL 213.
3. Pressure Rating: 175 psig minimum.
4. Body Material: Ductile-iron housing with EPDM seals and bolts and nuts.
5. Type: Mechanical-T and -cross fittings.
6. Configurations: Snap-on and strapless, ductile-iron housing with branch outlets.
7. Size: Of dimension to fit onto sprinkler main and with outlet connections as required to match connected branch piping.
8. Branch Outlets: Grooved, plain-end pipe, or threaded.

## 2.7 SPRINKLERS

- ### A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
1. Reliable Automatic Sprinkler Co., Inc.
  2. Tyco Fire & Building Products LP.
  3. Viking Corporation.
- ### B. General Requirements:

1. Standard: UL's "Fire Protection Equipment Directory" listing or "Approval Guide," published by FM Global, listing.
2. Pressure Rating for Automatic Sprinklers: 175 psig minimum.

C. Automatic Sprinklers with Heat-Responsive Element:

1. Early-Suppression, Fast-Response Applications: UL 1767.
2. Nonresidential Applications: UL 199.
3. Characteristics: Nominal 1/2-inch orifice with Discharge Coefficient K of 5.6, and for "Ordinary" temperature classification rating unless otherwise indicated or required by application.

D. Sprinkler Finishes:

1. Chrome plated.
2. Bronze.

## 2.8 MANUAL CONTROL STATIONS

- A. Description: UL listed or FM approved, hydraulic operation, with union, NPS 1/2 pipe nipple, and bronze ball valve. Include metal enclosure labeled "MANUAL CONTROL STATION" with operating instructions and cover held closed by breakable strut to prevent accidental opening.

## 2.9 CONTROL PANELS

- A. Description: Single-area, two-area, or single-area cross-zoned control panel as indicated, including NEMA ICS 6, Type 1 enclosure, detector, alarm, and solenoid-valve circuitry for operation of deluge valves. Panels contain power supply; battery charger; standby batteries; field-wiring terminal strip; electrically supervised solenoid valves and polarized fire-alarm bell; lamp test facility; single-pole, double-throw auxiliary alarm contacts; and rectifier.

1. Panels: UL listed and FM approved when used with thermal detectors and Class A detector circuit wiring. Electrical characteristics are 120-V ac, 60 Hz, with 24-V dc rechargeable batteries.
2. Manual Control Stations: Electric operation, metal enclosure, labeled "MANUAL CONTROL STATION" with operating instructions and cover held closed by breakable strut to prevent accidental opening.
3. Manual Control Stations: Hydraulic operation, with union, NPS 1/2 pipe nipple, and bronze ball valve. Include metal enclosure labeled "MANUAL CONTROL STATION" with operating instructions and cover held closed by breakable strut to prevent accidental opening.

## PART 3 - EXECUTION

### 3.1 PREPARATION

- A. Perform fire-hydrant flow test according to NFPA 13 and NFPA 291. Use results for system design calculations required in "Quality Assurance" Article.
- B. Report test results promptly and in writing.

### 3.2 WATER-SUPPLY CONNECTIONS

- A. Connect sprinkler piping to building's interior water-distribution piping. Comply with requirements for interior piping in Section 221116 "Domestic Water Piping."

### 3.3 PIPING INSTALLATION

- A. Locations and Arrangements: Drawing plans, schematics, and diagrams indicate general location and arrangement of piping. Install piping as indicated, as far as practical.
  - 1. Deviations from approved working plans for piping require written approval from authorities having jurisdiction. File written approval with Architect before deviating from approved working plans.
- B. Piping Standard: Comply with requirements for installation of sprinkler piping in NFPA 13.
- C. Install seismic restraints on piping. Comply with requirements for seismic-restraint device materials and installation in NFPA 13.
- D. Use listed fittings to make changes in direction, branch takeoffs from mains, and reductions in pipe sizes.
- E. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- F. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- G. Install automatic (ball drip) drain valve at each check valve for fire-department connection, to drain piping between fire-department connection and check valve. Install drain piping to and spill over floor drain or to outside building.
- H. Install alarm devices in piping systems.
- I. Install hangers and supports for sprinkler system piping according to NFPA 13. Comply with requirements for hanger materials in NFPA 13.
- J. Fill sprinkler system piping with water.

### 3.4 JOINT CONSTRUCTION

- A. Install couplings, flanges, flanged fittings, unions, nipples, and transition and special fittings that have finish and pressure ratings same as or higher than system's pressure rating for aboveground applications unless otherwise indicated.
- B. Install unions adjacent to each valve in pipes NPS 2 and smaller.
- C. Install flanges, flange adapters, or couplings for grooved-end piping on valves, apparatus, and equipment having NPS 2-1/2 and larger end connections.
- D. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe.
- E. Remove scale, slag, dirt, and debris from inside and outside of pipes, tubes, and fittings before assembly.



- F. Threaded Joints: Thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Join pipe fittings and valves as follows:
  - 1. Apply appropriate tape or thread compound to external pipe threads.
  - 2. Damaged Threads: Do not use pipe or pipe fittings with threads that are corroded or damaged.
- G. Steel-Piping, Pressure-Sealed Joints: Join lightwall steel pipe and steel pressure-seal fittings with tools recommended by fitting manufacturer.
- H. Welded Joints: Construct joints according to AWS D10.12M/D10.12, using qualified processes and welding operators according to "Quality Assurance" Article.
  - 1. Shop weld pipe joints where welded piping is indicated. Do not use welded joints for galvanized-steel pipe.
- I. Steel-Piping, Cut-Grooved Joints: Cut square-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe joints.
- J. Steel-Piping, Roll-Grooved Joints: Roll rounded-edge groove in end of pipe according to AWWA C606. Assemble coupling with housing, gasket, lubricant, and bolts. Join steel pipe and grooved-end fittings according to AWWA C606 for steel-pipe grooved joints.

### 3.5 SPRINKLER INSTALLATION

- A. Install sprinklers in suspended ceilings in center of acoustical ceiling panels.
- B. Install sprinklers into flexible, sprinkler hose fittings and install hose into bracket on ceiling grid.

### 3.6 IDENTIFICATION

- A. Install labeling and pipe markers on piping according to requirements in NFPA 13.

### 3.7 FIELD QUALITY CONTROL

- A. Perform tests and inspections.
- B. Tests and Inspections:
  - 1. Leak Test: After installation, charge systems and test for leaks. Repair leaks and retest until no leaks exist.
  - 2. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
  - 3. Flush, test, and inspect sprinkler systems according to NFPA 13, "Systems Acceptance" Chapter.
  - 4. Energize circuits to electrical equipment and devices.
  - 5. Coordinate with fire-alarm tests. Operate as required.
  - 6. Coordinate with fire-pump tests. Operate as required.
  - 7. Verify that equipment hose threads are same as local fire-department equipment.

- C. Sprinkler piping system will be considered defective if it does not pass tests and inspections.
- D. Prepare test and inspection reports.

### 3.8 CLEANING

- A. Clean dirt and debris from sprinklers.
- B. Remove and replace sprinklers with paint other than factory finish.

### 3.9 PIPING SCHEDULE

- A. Sprinkler specialty fittings may be used, downstream of control valves, instead of specified fittings.
- B. Standard-pressure, wet-pipe sprinkler system, NPS 2 and smaller, shall be the following:
  - 1. Standard-weight, black-steel pipe with threaded ends; uncoated, gray-iron threaded fittings; and threaded joints.
  - 2. Standard-weight, black-steel pipe with roll or cut-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
  - 3. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.
- C. Standard-pressure, wet-pipe sprinkler system, NPS 2-1/2 to NPS 4, shall be the following:
  - 1. Standard-weight, black-steel pipe with roll or cut-grooved ends; uncoated, grooved-end fittings for steel piping; grooved-end-pipe couplings for steel piping; and grooved joints.
  - 2. Standard-weight, black-steel pipe with plain ends; steel welding fittings; and welded joints.

### 3.10 SPRINKLER SCHEDULE

- A. Use sprinkler types in subparagraphs below for the following applications:
  - 1. Rooms without Ceilings: Upright sprinklers.
  - 2. Rooms with Suspended Ceilings: Pendent sprinklers.
- B. Provide sprinkler types in subparagraphs below with finishes indicated.
  - 1. Upright and pendent Sprinklers: Chrome plated in finished spaces exposed to view; rough bronze in unfinished spaces not exposed to view

END OF SECTION 211313

## SECTION 221413 - FACILITY STORM DRAINAGE PIPING

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. Section Includes:
  - 1. Pipe, tube, and fittings.
  - 2. Specialty pipe fittings.
  - 3. Encasement for underground metal piping.

#### 1.3 PERFORMANCE REQUIREMENTS

- A. Components and installation shall be capable of withstanding the following minimum working pressure unless otherwise indicated:
  - 1. Storm Drainage Piping: 10-foot head of water (30 kPa).

#### 1.4 QUALITY ASSURANCE

- A. Piping materials shall bear label, stamp, or other markings of specified testing agency.

### PART 2 - PRODUCTS

#### 2.1 PIPING MATERIALS

- A. Comply with requirements in "Piping Schedule" Article for applications of pipe, tube, fitting materials, and joining methods for specific services, service locations, and pipe sizes.

#### 2.2 HUBLESS, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 888 or CISPI 301.
- B. CISPI, Hubless-Piping Couplings:
  - 1. Manufacturers: Subject to compliance with requirements:
    - a. ANACO-Husky.
    - b. Dallas Specialty & Mfg. Co.
    - c. Ferco Inc.

- d. Matco-Norca, Inc.
  - e. MIFAB, Inc.
  - f. Mission Rubber Company; a division of MCP Industries, Inc.
  - g. Stant.
  - h. Tyler Pipe.
2. Standards: ASTM C 1277 and CISPI 310.
  3. Description: Stainless-steel corrugated shield with stainless-steel bands and tightening devices; and ASTM C 564, rubber sleeve with integral, center pipe stop.
- C. Cast-Iron, Hubless-Piping Couplings:
1. Manufacturers: Subject to compliance with requirements,:
    - a. MG Piping Products Company.
    - b. Others.
  2. Standard: ASTM C 1277.
  3. Description: Two-piece ASTM A 48/A 48M, cast-iron housing; stainless-steel bolts and nuts; and ASTM C 564, rubber sleeve with integral, center pipe stop.

## 2.3 PIPING INSTALLATION

- A. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations from layout are approved on coordination drawings.
- B. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.
- C. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.
- D. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.
- E. Install piping to permit valve servicing.
- F. Install piping at indicated slopes.
- G. Install piping free of sags and bends.
- H. Install fittings for changes in direction and branch connections.
- I. Install piping to allow application of insulation.
- J. Install seismic restraints on piping. Comply with requirements for seismic-restraint devices specified in Section 220548 "Vibration and Seismic Controls for Plumbing Piping and Equipment."
- K. Make changes in direction for storm drainage piping using appropriate branches, bends, and long-sweep bends. Do not change direction of flow more than 90 degrees. Use proper size of

standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

- L. Lay buried building storm drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.
- M. Install storm drainage piping at the following minimum slopes unless otherwise indicated:
  - 1. Building Storm Drain: 2 percent downward in direction of flow for piping NPS 3 (DN 80) and smaller; 1 percent downward in direction of flow for piping NPS 4 (DN 100) and larger.
  - 2. Horizontal Storm-Drainage Piping: 2 percent downward in direction of flow.
- N. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."
  - 1. Install encasement on underground piping according to ASTM A 674 or AWWA C105.

## 2.4 JOINT CONSTRUCTION

- A. Hubless, Cast-Iron Soil Piping Coupled Joints: Join according to CISPI 310 and CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for hubless-piping coupling joints.

## 2.5 HANGER AND SUPPORT INSTALLATION

- A. Comply with requirements for pipe hanger and support devices.
  - 1. Install carbon-steel pipe hangers for horizontal piping in noncorrosive environments.
  - 2. Individual, Straight, Horizontal Piping Runs:
    - a. 100 Feet (30 m) and Less: MSS Type 1, adjustable, steel clevis hangers.
- B. Support horizontal piping and tubing within 12 inches (300 mm) of each fitting and coupling.
- C. Support vertical piping and tubing at base and at each floor.
- D. Rod diameter may be reduced one size for double-rod hangers, with 3/8-inch (10-mm) minimum rods.
- E. Install hangers for cast-iron soil piping with the following maximum horizontal spacing and minimum rod diameters:
  - 1. NPS 3 (DN 80): 60 inches (1500 mm) with 1/2-inch (13-mm) rod.
  - 2. NPS 4 and NPS 5 (DN 100 and DN 125): 60 inches (1500 mm) with 5/8-inch (16-mm) rod.
  - 3. NPS 6 and NPS 8 (DN 150 and DN 200): 60 inches (1500 mm) with 3/4-inch (19-mm) rod.
- F. Install supports for vertical cast-iron soil piping every 15 feet (4.5 m).

## 2.6 CONNECTIONS

- A. Drawings indicate general arrangement of piping, fittings, and specialties.
- B. Connect interior storm drainage piping to exterior storm drainage piping. Use transition fitting to join dissimilar piping materials.

## 2.7 FIELD QUALITY CONTROL

- A. Test storm drainage piping according to procedures of authorities having jurisdiction or, in absence of published procedures, as follows:
  - 1. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired. If testing is performed in segments, submit separate report for each test, complete with diagram of portion of piping tested.
  - 2. Leave uncovered and unconcealed new, altered, extended, or replaced storm drainage piping until it has been tested and approved. Expose work that was covered or concealed before it was tested.
  - 3. Test Procedure: Test storm drainage piping on completion of roughing-in. Close openings in piping system and fill with water to point of overflow, but not less than 10-foot head of water (30 kPa). From 15 minutes before inspection starts until completion of inspection, water level must not drop. Inspect joints for leaks.
  - 4. Repair leaks and defects with new materials and retest piping, or portion thereof, until satisfactory results are obtained.
  - 5. Prepare reports for tests and required corrective action.

## 2.8 CLEANING

- A. Clean interior of piping. Remove dirt and debris as work progresses.
- B. Protect drains during remainder of construction period to avoid clogging with dirt and debris and to prevent damage from traffic and construction work.
- C. Place plugs in ends of uncompleted piping at end of day and when work stops.

## 2.9 PIPING SCHEDULE

- A. Flanges and unions may be used on aboveground pressure piping unless otherwise indicated.
- B. Aboveground storm drainage piping NPS 6 (DN 150) and smaller shall be the following:
  - 1. Hubless, cast-iron soil pipe and fittings; hubless-piping couplings; and coupled joints.

END OF SECTION 221413

## SECTION 230593 - TESTING, ADJUSTING, AND BALANCING FOR HVAC

### PART 1 - GENERAL

#### 1.1 SUMMARY

- A. Section Includes:
  - 1. Balancing Air Systems:
    - a. Constant-volume air systems.

#### 1.2 DEFINITIONS

- A. AABC: Associated Air Balance Council.
- B. NEBB: National Environmental Balancing Bureau.
- C. TAB: Testing, adjusting, and balancing.
- D. TABB: Testing, Adjusting, and Balancing Bureau.
- E. TAB Specialist: An entity engaged to perform TAB Work.

#### 1.3 ACTION SUBMITTALS

- A. Certified TAB reports.
- B. Sample report forms.
- C. Instrument calibration reports, to include the following:
  - 1. Instrument type and make.
  - 2. Serial number.
  - 3. Application.
  - 4. Dates of use.
  - 5. Dates of calibration.

#### 1.4 QUALITY ASSURANCE

- A. TAB Contractor Qualifications: Engage a TAB entity certified by AABC or NEBB.
- B. Instrumentation Type, Quantity, Accuracy, and Calibration: As described in ASHRAE 111, Section 5, "Instrumentation."
- C. ASHRAE Compliance: Applicable requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."

- D. ASHRAE/IESNA Compliance: Applicable requirements in ASHRAE/IESNA 90.1, Section 6.7.2.3 - "System Balancing."

## PART 2 - PRODUCTS (Not Applicable)

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine the Contract Documents to become familiar with Project requirements and to discover conditions in systems' designs that may preclude proper TAB of systems and equipment.
- B. Examine the approved submittals for HVAC systems and equipment.
- C. Examine design data including HVAC system descriptions, statements of design assumptions for environmental conditions and systems' output, and statements of philosophies and assumptions about HVAC system and equipment controls.
- D. Examine equipment performance data including fan and pump curves.
  - 1. Relate performance data to Project conditions and requirements, including system effects that can create undesired or unpredicted conditions that cause reduced capacities in all or part of a system.
  - 2. Calculate system-effect factors to reduce performance ratings of HVAC equipment when installed under conditions different from the conditions used to rate equipment performance. To calculate system effects for air systems, use tables and charts found in AMCA 201, "Fans and Systems," or in SMACNA's "HVAC Systems - Duct Design." Compare results with the design data and installed conditions.
- E. Examine system and equipment installations and verify that field quality-control testing, cleaning, and adjusting specified in individual Sections have been performed.
- F. Examine test reports specified in individual system and equipment Sections.
- G. Examine HVAC equipment and filters and verify that bearings are greased, belts are aligned and tight, and equipment with functioning controls is ready for operation.
- H. Examine terminal units, such as variable-air-volume boxes, and verify that they are accessible and their controls are connected and functioning.
- I. Examine operating safety interlocks and controls on HVAC equipment.
- J. Report deficiencies discovered before and during performance of TAB procedures. Observe and record system reactions to changes in conditions. Record default set points if different from indicated values.

### 3.2 PREPARATION

- A. Prepare a TAB plan that includes strategies and step-by-step procedures.
- B. Complete system-readiness checks and prepare reports. Verify the following:



1. Permanent electrical-power wiring is complete.
2. Automatic temperature-control systems are operational.
3. Equipment and duct access doors are securely closed.
4. Balance, smoke, and fire dampers are open.
5. Windows and doors can be closed so indicated conditions for system operations can be met.

### 3.3 GENERAL PROCEDURES FOR TESTING AND BALANCING

- A. Perform testing and balancing procedures on each system according to the procedures contained in AABC's "National Standards for Total System Balance", ASHRAE 111, NEBB's "Procedural Standards for Testing, Adjusting, and Balancing of Environmental Systems" or SMACNA's "HVAC Systems - Testing, Adjusting, and Balancing" and in this Section.
  1. Comply with requirements in ASHRAE 62.1, Section 7.2.2 - "Air Balancing."
- B. Cut insulation, ducts, pipes, and equipment cabinets for installation of test probes to the minimum extent necessary for TAB procedures.
  1. After testing and balancing, patch probe holes in ducts with same material and thickness as used to construct ducts.
- C. Mark equipment and balancing devices, including damper-control positions, valve position indicators, fan-speed-control levers, and similar controls and devices, with paint or other suitable, permanent identification material to show final settings.
- D. Take and report testing and balancing measurements in inch-pound (IP) units.

### 3.4 PROCEDURES FOR CONSTANT-VOLUME AIR SYSTEMS

- A. Adjust fans to deliver total indicated airflows within the maximum allowable fan speed listed by fan manufacturer.
  1. Measure total airflow.
    - a. Where sufficient space in ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow.
  2. Measure fan static pressures as follows to determine actual static pressure:
    - a. Measure outlet static pressure as far downstream from the fan as practical and upstream from restrictions in ducts such as elbows and transitions.
    - b. Measure static pressure directly at the fan outlet or through the flexible connection.
    - c. Measure inlet static pressure of single-inlet fans in the inlet duct as near the fan as possible, upstream from the flexible connection, and downstream from duct restrictions.
    - d. Measure inlet static pressure of double-inlet fans through the wall of the plenum that houses the fan.
  3. Measure static pressure across each component that makes up an air-handling unit, rooftop unit, and other air-handling and -treating equipment.

- a. Report the cleanliness status of filters and the time static pressures are measured.
  - 4. Measure static pressures entering and leaving other devices, such as sound traps, heat-recovery equipment, and air washers, under final balanced conditions.
  - 5. Review Record Documents to determine variations in design static pressures versus actual static pressures. Calculate actual system-effect factors. Recommend adjustments to accommodate actual conditions.
  - 6. Do not make fan-speed adjustments that result in motor overload. Consult equipment manufacturers about fan-speed safety factors. Modulate dampers and measure fan-motor amperage to ensure that no overload will occur. Measure amperage in full-cooling, full-heating, economizer, and any other operating mode to determine the maximum required brake horsepower.
- B. Adjust volume dampers for main duct, submain ducts, and major branch ducts to indicated airflows within specified tolerances.
- 1. Measure airflow of submain and branch ducts.
    - a. Where sufficient space in submain and branch ducts is unavailable for Pitot-tube traverse measurements, measure airflow at terminal outlets and inlets and calculate the total airflow for that zone.
  - 2. Measure static pressure at a point downstream from the balancing damper, and adjust volume dampers until the proper static pressure is achieved.
  - 3. Remeasure each submain and branch duct after all have been adjusted. Continue to adjust submain and branch ducts to indicated airflows within specified tolerances.
- C. Measure air outlets and inlets without making adjustments.
- 1. Measure terminal outlets using a direct-reading hood or outlet manufacturer's written instructions and calculating factors.
- D. Adjust air outlets and inlets for each space to indicated airflows within specified tolerances of indicated values. Make adjustments using branch volume dampers rather than extractors and the dampers at air terminals.
- 1. Adjust each outlet in same room or space to within specified tolerances of indicated quantities without generating noise levels above the limitations prescribed by the Contract Documents.
  - 2. Adjust patterns of adjustable outlets for proper distribution without drafts.

### 3.5 FINAL REPORT

- A. General: Prepare a certified written report; tabulate and divide the report into separate sections for tested systems and balanced systems.
  - 1. Include a certification sheet at the front of the report's binder, signed and sealed by the certified testing and balancing engineer.
  - 2. Include a list of instruments used for procedures, along with proof of calibration.
- B. Final Report Contents: In addition to certified field-report data, include the following:
  - 1. Pump curves.
  - 2. Fan curves.

3. Manufacturers' test data.
4. Field test reports prepared by system and equipment installers.
5. Other information relative to equipment performance; do not include Shop Drawings and product data.

C. General Report Data: In addition to form titles and entries, include the following data:

1. Title page.
2. Name and address of the TAB contractor.
3. Project name.
4. Project location.
5. Architect's name and address.
6. Engineer's name and address.
7. Contractor's name and address.
8. Report date.
9. Signature of TAB supervisor who certifies the report.
10. Table of Contents with the total number of pages defined for each section of the report. Number each page in the report.
11. Summary of contents including the following:
  - a. Indicated versus final performance.
  - b. Notable characteristics of systems.
  - c. Description of system operation sequence if it varies from the Contract Documents.
12. Nomenclature sheets for each item of equipment.
13. Data for terminal units, including manufacturer's name, type, size, and fittings.
14. Notes to explain why certain final data in the body of reports vary from indicated values.
15. Test conditions for fans and pump performance forms including the following:
  - a. Settings for outdoor-, return-, and exhaust-air dampers.
  - b. Conditions of filters.
  - c. Cooling coil, wet- and dry-bulb conditions.
  - d. Face and bypass damper settings at coils.
  - e. Fan drive settings including settings and percentage of maximum pitch diameter.
  - f. Inlet vane settings for variable-air-volume systems.
  - g. Settings for supply-air, static-pressure controller.
  - h. Other system operating conditions that affect performance.

D. System Diagrams: Include schematic layouts of air and hydronic distribution systems. Present each system with single-line diagram and include the following:

1. Quantities of outdoor, supply, return, and exhaust airflows.
2. Water and steam flow rates.
3. Duct, outlet, and inlet sizes.
4. Pipe and valve sizes and locations.
5. Terminal units.
6. Balancing stations.
7. Position of balancing devices.

E. Air-Handling-Unit Test Reports: For air-handling units with coils, include the following:

1. Unit Data:
  - a. Unit identification.

- b. Location.
  - c. Make and type.
  - d. Model number and unit size.
  - e. Manufacturer's serial number.
  - f. Unit arrangement and class.
  - g. Discharge arrangement.
  - h. Sheave make, size in inches (mm), and bore.
  - i. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).
  - j. Number, make, and size of belts.
  - k. Number, type, and size of filters.
2. Motor Data:
- a. Motor make, and frame type and size.
  - b. Horsepower and rpm.
  - c. Volts, phase, and hertz.
  - d. Full-load amperage and service factor.
  - e. Sheave make, size in inches (mm), and bore.
  - f. Center-to-center dimensions of sheave, and amount of adjustments in inches (mm).
3. Test Data (Indicated and Actual Values):
- a. Total air flow rate in cfm (L/s).
  - b. Total system static pressure in inches wg (Pa).
  - c. Fan rpm.
  - d. Discharge static pressure in inches wg (Pa).
  - e. Filter static-pressure differential in inches wg (Pa).
  - f. Preheat-coil static-pressure differential in inches wg (Pa).
  - g. Cooling-coil static-pressure differential in inches wg (Pa).
  - h. Heating-coil static-pressure differential in inches wg (Pa).
  - i. Outdoor airflow in cfm (L/s).
  - j. Return airflow in cfm (L/s).
  - k. Outdoor-air damper position.
  - l. Return-air damper position.
  - m. Vortex damper position.

END OF SECTION 230593

## SECTION 237413 - PACKAGED, OUTDOOR, CENTRAL-STATION AIR-HANDLING UNITS

### PART 1 - GENERAL

#### 1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

#### 1.2 SUMMARY

- A. This Section includes packaged, outdoor, central-station air-handling units (rooftop units) with the following components and accessories:
  - 1. Direct-expansion cooling.
  - 2. Hot-gas reheat.
  - 3. Gas furnace.
  - 4. Economizer outdoor- and return-air damper section.
  - 5. Integral, space temperature controls.
  - 6. Roof curbs.

#### 1.3 DEFINITIONS

- A. DDC: Direct-digital controls.
- B. ECM: Electrically commutated motor.
- C. Outdoor-Air Refrigerant Coil: Refrigerant coil in the outdoor-air stream to reject heat during cooling operations and to absorb heat during heating operations. "Outdoor air" is defined as the air outside the building or taken from outdoors and not previously circulated through the system.
- D. Outdoor-Air Refrigerant-Coil Fan: The outdoor-air refrigerant-coil fan in RTUs. "Outdoor air" is defined as the air outside the building or taken from outdoors and not previously circulated through the system.
- E. RTU: Rooftop unit. As used in this Section, this abbreviation means packaged, outdoor, central-station air-handling units. This abbreviation is used regardless of whether the unit is mounted on the roof or on a concrete base on ground.
- F. Supply-Air Fan: The fan providing supply air to conditioned space. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.
- G. Supply-Air Refrigerant Coil: Refrigerant coil in the supply-air stream to absorb heat (provide cooling) during cooling operations and to reject heat (provide heating) during heating operations. "Supply air" is defined as the air entering a space from air-conditioning, heating, or ventilating apparatus.
- H. VVT: Variable-air volume and temperature.

#### 1.4 ACTION SUBMITTALS

- A. Shop Drawings: Detail equipment assemblies and indicate dimensions, weights, loads, required clearances, method of field assembly, components, and location and size of each field connection.
  - 1. Wiring Diagrams: Power, signal, and control wiring.

#### 1.5 CLOSEOUT SUBMITTALS

- A. Operation and Maintenance Data: For RTUs to include in emergency, operation, and maintenance manuals.

#### 1.6 QUALITY ASSURANCE

- A. ARI Compliance:
  - 1. Comply with ARI 203/110 and ARI 303/110 for testing and rating energy efficiencies for RTUs.
  - 2. Comply with ARI 270 for testing and rating sound performance for RTUs.

#### 1.7 WARRANTY

- A. Special Warranty: Manufacturer's standard form in which manufacturer agrees to replace components of RTUs that fail in materials or workmanship within specified warranty period.
  - 1. Warranty Period for Compressors: Manufacturer's standard, but not less than five years from date of Substantial Completion.
  - 2. Warranty Period for Gas Furnace Heat Exchangers: Manufacturer's standard, but not less than 10 years from date of Substantial Completion.

### PART 2 - PRODUCTS

#### 2.1 MANUFACTURERS

- A. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
- B. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
- C. Basis-of-Design Product: Subject to compliance with requirements, provide a comparable product by one of the following:
  - 1. AAON, Inc.
  - 2. Addison Products Company.
  - 3. Carrier Corporation.
  - 4. Lennox Industries Inc.
  - 5. Daikin
  - 6. Trane; American Standard Companies, Inc.

7. JCI/YORK International Corporation.

2.2 CASING

- A. General Fabrication Requirements for Casings: Formed and reinforced double-wall insulated panels, fabricated to allow removal for access to internal parts and components, with joints between sections sealed.

2.3 FANS

- A. Belt-Driven Supply-Air Fans: Double width, forward curved, centrifugal; with permanently lubricated, single-speed motor installed on an adjustable fan base resiliently mounted in the casing. Aluminum or painted-steel wheels, and galvanized- or painted-steel fan scrolls.

2.4 COILS

A. Supply-Air Refrigerant Coil:

1. Aluminum-plate fin and seamless copper tube in steel casing with equalizing-type vertical distributor.
2. Polymer strip shall prevent all copper coil from contacting steel coil frame or condensate pan.
3. Coil Split: Interlaced.
4. Condensate Drain Pan: Stainless steel formed with pitch and drain connections.

B. Hot-Gas Reheat Refrigerant Coil:

1. Aluminum-plate fin and seamless copper tube in steel casing with equalizing-type vertical distributor.
2. Polymer strip shall prevent all copper coil from contacting steel coil frame or condensate pan.

2.5 GAS FURNACE

- A. Description: Factory assembled, piped, and wired; complying with ANSI Z21.47 and NFPA 54.

1. CSA Approval: Designed and certified by and bearing label of CSA.

B. Burners: Stainless steel.

1. Fuel: Natural gas.
2. Ignition: Electronically controlled electric spark or hot-surface igniter with flame sensor.

C. Heat-Exchanger and Drain Pan: Stainless steel.

D. Venting: Gravity vented.

2.6 CONTROLS

A. Basic Unit Controls:

1. Control-voltage transformer.
2. Wall-mounted thermostat or sensor with the following features:
  - a. Heat-cool-off switch.
  - b. Fan on-auto switch.
  - c. Fan-speed switch.
  - d. [Manual] [Automatic] changeover.
  - e. Adjustable deadband.
  - f. [Concealed] [Exposed] set point.
  - g. [Concealed] [Exposed] indication.
  - h. [Degree F] [Degree C] indication.
  - i. Unoccupied-period-override push button.
  - j. Data entry and access port to input temperature[and humidity] set points, occupied and unoccupied periods, and output room temperature[and humidity], supply-air temperature, operating mode, and status.
3. Wall-mounted humidistat or sensor with the following features:
  - a. Exposed set point.
  - b. Exposed indication.

## 2.7 ACCESSORIES

## 2.8 ROOF CURBS

- A. Materials: Galvanized steel with corrosion-protection coating, watertight gaskets, and factory-installed wood nailer; complying with NRCA standards.
  1. Curb Insulation and Adhesive: Comply with NFPA 90A or NFPA 90B.
    - a. Materials: ASTM C 1071, Type I or II.
    - b. Thickness: 1 inch (25 mm).
- B. Curb Height: 14 inches (355 mm).

## PART 3 - EXECUTION

### 3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of RTUs.
- B. Examine roughing-in for RTUs to verify actual locations of piping and duct connections before equipment installation.
- C. Examine roofs for suitable conditions where RTUs will be installed.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.



### 3.2 CONNECTIONS

- A. Install condensate drain, minimum connection size, with trap and indirect connection to nearest roof drain or area drain.
- B. Install piping adjacent to RTUs to allow service and maintenance.
  - 1. Connect gas piping to burner, full size of gas train inlet, and connect with union and shutoff valve with sufficient clearance for burner removal and service.

### 3.3 CLEANING AND ADJUSTING

- A. After completing system installation and testing, adjusting, and balancing RTU and air-distribution systems, clean filter housings and install new filters.

END OF SECTION 237413

## SECTION 26 01 00 – OPERATION AND MAINTENANCE OF ELECTRICAL SYSTEMS

### PART I GENERAL

#### 1.01 SECTION INCLUDES:

- A. Scope of Work: The contractor shall furnish all plant, labor, materials, equipment and services necessary for and reasonably incidental to the complete installation of all electrical work as shown on the drawings and as specified herein.
- B. Related Work: General Provisions of the Contract, General and Supplementary Conditions, and Division 1 Specification Sections, General Requirements, apply to this section.
- C. If the project involves any renovation work the contractor shall visit the site and familiarize themselves with the work and any hidden conditions before bidding. Any questions which arise from this site visit shall be addressed before bids are received. Any conditions not addressed will be the responsibility of the contractor.

#### 1.02 INTERFERENCES:

- A. Because electrical Drawings are generally diagrammatic in nature, minor adjustments to illustrated requirements may be required to avoid interference between electrical Work and construction furnished by other trades.
- B. Plan and coordinate Work; furnish raceway offsets, fittings, and boxes; adjust fixture and equipment locations; and provide associated supports, all as needed to avoid interferences.
- C. Take field measurements to verify dimensions provided on Drawings.
- D. If an interference can not be avoided, obtain approval before proceeding with affected Work.

#### 1.03 GENERAL ITEMS:

- A. The drawings indicate the extent and general arrangement of the electrical system. Details of proposed departures due to unforeseen conditions or other causes shall be submitted to the Architect for approval before proceeding. If the conduit is shown above ground on the riser diagram it is to be installed overhead. ,
- B. Equipment and materials to be furnished under this specification shall be the standard products of manufacturer's latest standard, shall be new and unused, and bear the Underwriter's Seal of Approval.
- C. All work of the installation to be done by skilled workmen in a workmanlike manner, following the best modern practices. The work shall present a neat and workmanlike appearance when completed.
- D. Manufacturers, catalog numbers, etc., used in these specifications or shown on the drawings are to denote design, workmanship and quality desired.
- E. In the case that there are discrepancies in some part of the drawings and/or specifications, then the contractor shall ask the engineer for clarification. If no clarifications are requested then the contractor shall provide and install the largest and the more expensive option depicted on the drawings and in the specifications.

- F. Inspections and or correspondence by the Engineer required due to failure by the Contractor to obtain inspections and approval from the Public Authorities having jurisdiction are beyond the scope of Construction Contract Administration for the Engineer. As additional services, the Contractor will be billed a minimum fee of Five Hundred Dollars (\$500.00) per occurrence plus the Engineer's time at the Engineer's standard hourly rate for the personnel required to perform these functions.

1.04 APPLICABLE STANDARDS AND CODES:

- A. Be governed by these specifications and by the current rules and regulations as listed in Division 1 General Conditions, Applicable Codes.

1.05 EXISTING SERVICE CONTINUITY:

- A. Maintain full capacity power service continuity when connection or modification is made to electrical systems.
- B. When modification or connection cannot be made without interruption of power, coordinate schedule of outage and obtain approval prior to interruption of power.

1.06 PRINCIPAL FEATURES:

- A. A complete system of conduit and conductors to supply electrical energy to and throughout the building.
- B. Branch circuit panels, wiring devices.
- C. Emergency lighting and battery units.
- D. Lighting fixtures and lamps.
- E. Wiring in connection with mechanical equipment. Power and controls.
- F. Fire alarm system.
- G. PA System.

1.07 SUBSTITUTIONS:

- A. A ten day prior approval is required for any lighting fixture substitutions. If current catalog information is not provided for the substitutions the substitutions will not be accepted. The following manufacturer's are pre-approved:
  - 1. Lithonia.
  - 2. Cooper/Metalux.
  - 3. Columbia.
  - 4. Daybright/Thomas.

See specification sections 00800 and 01300 for additional information concerning substitutions and substitution procedures.

1.08 SHOP DRAWINGS:

- A. Furnish eight (8) copies of shop drawings for approval of the following.
- B. Panelboards.

- C. Interior/Exterior lighting fixtures.
- D. Exit signs.
- E. Dry-type transformers.
- F. Fire Alarm System.

1.09 TEMPORARY WIRING:

- A. As soon as practicable, install temporary wiring and lighting throughout the building. There shall be one pigtail lampholder for each 150 square feet of floor space or fraction thereof and in addition, install a plug receptacle for each room having 200 square feet or more. There shall be one light in each room of 50 square feet and larger. Each pigtail outlet shall be equipped with a 100 watt lamp and replacement made immediately upon burnout or theft. In corridors, locate lights, as per above on 25 feet center; install temporary panelboards with not more than ten (10) outlets, light, or receptacles on a circuit. Temporary wire shall consist of plastic type non-metallic sheathed cable having a ground wire to which all the receptacle ground poles shall be constructed.

1.10 WORK IN CONNECTION WITH MOTORS:

- A. Check rotation and connect for proper rotation. Check overload heater element furnished with starters against nameplate rating of motor and code, call attention to improper sizes to mechanical contractor and Architect. Connect all motors with short length of flexible conduit as manufactured by American Brass Company. Use proper type connector with this type conduit. Connect all motor and controls completely, neatly, orderly and properly tagged for proper operation of system involved.

1.11 WORK IN CONNECTION WITH THE MECHANICAL EQUIPMENT:

- A. Furnish and install all conduit and wiring necessary for the line voltage power supply for the plumbing, heating, ventilating, air condition facilities.
- B. Furnish and install all wiring and conduit for HVAC controls. See division 15000 and Mechanical plans for controls requirements.
- C. Conductors shall be installed in the conduit for line voltage wiring and connections made.
- D. Furnish and install all disconnect switches required by the National Electrical Code and/or as called for on the drawings. See Mechanical drawings for control types, locations, and quantities..
- E. Stencil the name of the equipment being controlled on the cover of all starters and disconnect switches when located remotely from motors. Stencils to be 3/4-inches high in black letters on white background.

1.12 SERVICE TO EQUIPMENT:

- A. Check service required by equipment prior to making final connection. Call differences to attention of engineer. Verify all equipment voltage, ampacity, and phase requirements with Mechanical Contractor before HVAC equipment has been ordered. Notify Mechanical and Electrical Engineers of any discrepancies. Check equipment for proper protective devices such

as fuses, circuit breakers, and safety disconnects to allow proper operation of equipment and prevent burnout. Assist Owners in initial operation of equipment and make necessary adjustment for proper operation. Any additional costs due to voltage, ampacity, or phase discrepancies, not brought to the attention of the engineer, before ordering equipment, will be paid for by the Electrical and Mechanical Contractors.

1.13 ARCHITECTURAL DRAWINGS:

- A. Refer to architectural drawings for details such as finishes, dimensions, materials, etc. Refer to drawings for door locations, door swings, ceiling material type, partitions, location, cabinet and counters, making proper allowances therefore. Refer to equipment plans for exact location of electrical connections.

1.14 INITIAL OPERATION OF EQUIPMENT:

- A. Give all equipment furnished in the contract an operational test prior to final acceptance. Assist the Owner in the initial operation when the Owner operates the building and equipment. Instruct the Owner's personnel in the proper operation and maintenance of all the equipment furnished under this section of the specifications.

1.15 RECORD DRAWINGS:

- A. Furnish record drawings showing the changes and modifications that occurred during the construction period. These drawings shall be on tracing paper to allow reproduction.
- B. The job supervisor shall maintain a set of prints of the job office to be used to illustrate and note the job changes as they occur. This set of prints shall then be used as a reference to prepare the reproducible drawings record drawings. At the contractor's option, a "sepia" or translucent print may be made from the contract drawings at the contractor's expense and the modifications made thereon. Secure approval of the type of translucent print used prior to having them made.

1.16 TYPICAL MOUNTING HEIGHTS:

- A. For all exposed elements of electrical work such as lighting fixtures, panelboards, wiring devices, switches, fire alarm, sound equipment, clock equipment, etc., mounted in walls and finished spaces will have the mounting heights may be supplied in detail by the Architect. When provided, these heights are to be used in all cases except where mounting heights are noted for a specific device, fixture or panel on the electrical drawings. Schedule will be prepared when shop drawings and brochures have been submitted so that the dimensions of particular pieces of equipment can be evaluated in relation to ceiling height and other clearances.

1.17 FIRE-RATED WALL PENETRATIONS:

- B. Where conduit penetrates fire-rated walls, the space between the penetration item and the fire barrier wall shall be properly protected. The space adjoining the conduit penetration shall be filled with a material capable of maintaining the fire-rating of the fire barrier, or it shall be protected by an approved device designed for this specific purpose. Where penetrating sleeves are used, the sleeves shall be solidly set in this fire barrier wall, and the space between the conduit and the sleeve shall be filled with a material capable of maintaining the fire resistance of the fire-rated wall. Only UL assemblies will be accepted.

1.18 GUARANTEE:

- A. Guarantee all work to be free from defects of material and workmanship for a period one year after date of final acceptance. Repair and/or replace all defective material or equipment and any

work damaged thereby and make any other adjustments necessary without additional cost to the Owner.

## PART II PRODUCTS

### 2.01 EQUIPMENT TOUCH-UP PAINT:

- A. Types and brands recommended by manufacturers of factory furnished components.

## PART III EXECUTION

### 3.01 INSTALLATION:

- A. To maximum extent practicable, install equipment to facilitate servicing, maintenance, and replacement of equipment.
- B. Connect equipment so that disconnection can be made in a convenient manner which minimizes interference with other construction.

### 3.02 TOUCH-UP PAINTING:

- A. Repair damage to factory-applied paint finishes with touch-up paint.
- B. Use touch-up paint and methods of preparation and application recommended by manufacturer of components to be repaired.

End of Section

SECTION 26 05 19 – 600 VOLT CONDUCTORS

PART 1 DESCRIPTION

1.01 DESCRIPTION:

- A. Furnish and install conductors through the raceway system and distribution of electrical energy for the lighting, and power, and control needs.

PART 2 MATERIAL

2.01 MATERIAL:

- A. Use stranded conductors for sizes No. 8 and larger and solid conductors for No. 10 and 12. Minimum size shall be No. 12 AWG. Insulate conductors with Type “THHN/THWN” insulation unless specifically indicated otherwise on the drawings. Rating shall be 600-volts, AC.
- B. Connectors for conductors size No. 10 and 12 shall be approved type insulated twist-on wire nuts. Use hydraulic compression type connectors for conductors No. 8 and larger.
- C. All conductors are to be copper. No aluminum conductors allowed.
- D. The secondary service, feeders and branch circuits shall be color coded as follows:

<u>PHASE</u>	<u>208/120V</u>	<u>480/277V</u>
A	Black	Brown
B	Red	Orange
C	Blue	Yellow
Neutral	White	Natural Gray
Ground	Green	Green

PART 3 INSTALLATION

3.01 INSTALLATION:

- A. Conform to manufacturer’s recommendations and latest standard practice of industry. Color code all conductor for phase, neutral and ground reference.

End of Section

## SECTION 26 05 33 – CONDUIT

### PART 1 DESCRIPTION

#### 1.01 DESCRIPTION:

- A. Furnish and install a system of raceways and boxes for installation of conductors for distribution of power, controls and communication needs throughout building. All wiring shall be in conduit. No "open wiring" will be accepted. Conduit shall be concealed except where specifically called for to be exposed, such as in mechanical/electrical equipment rooms.

### PART 2 MATERIALS:

#### 2.01 MATERIALS:

##### A. RACEWAYS:

1. Rigid galvanized steel or intermediate metal (IMC) shall be used for all conduits in or below floor slabs. Conduit exposed on exterior of building shall be rigid steel.
2. Elsewhere, electric metallic tubing (EMT) with steel compression fittings shall be used. Minimum conduit size 1/2" unless noted otherwise.
3. Conduit underground on exterior of building shall be Schedule 40 Polyvinyl Chloride with rigid galvanized steel conduit stub-ups through slabs.

- B. BUSHINGS: Bushings for conduit 2" in size and smaller shall be plastic. Conduit size 2-1/2" and larger shall be OZ Company type "B" Appleton Co. Efcor Series No. 55 or approved equal with metal ring and insulator as an integral part of bushing.

- C. MANUFACTURER: Conduit shall be as manufactured by Pittsburgh, National, Republic Steel Companies, General Electric Company or approved equal.

- D. FLEXIBLE CONDUIT: Flexible metal conduit shall be used for final connections for all motors, transformers, unit heaters, lighting fixtures, and other permanently connected equipment. Maximum length of flexible conduit shall be 24" except for connection of light fixtures, which may have a length of up to 72". The flexible conduit shall be constructed of hot-dipped galvanized, interlocked spirally wound steel strip. All connectors shall be galvanized and shall be listed for connection to the conduit and boxes. Provide a ground conductor in each length of flexible conduit. Flexible conduit used in mechanical rooms, kitchen areas, and damp or wet locations shall be liquid tight. Other than the uses listed above, the use of flexible conduit will not be permitted. The use of "MC" will not be considered.

### PART 3 INSTALLATION

#### 3.01 INSTALLATION:

- A. Conduits shall be continuous from outlet to outlet and from outlet to panel or pull box. Connect conduit in building construction except as indicated. Secure conduit to all boxes and bushings with double locknuts so that system will be electrically continuous.

- B. Where conduits stub into the bottom of the main switchboard, or communication conduits that enter from the exterior of the building, provide Raychem mylar "RDSS" sealing boots around the power cables and/or communication cables. These seals must be installed after the final cable terminations have been completed.

- C. Install all conduit in a workmanlike manner with bends made using tools specifically designed for purpose to prevent kinks and flattened areas. Where electric metallic tubing is connected to an



outlet box or panel, terminate tubing in an approved type connector and couple together with approved type connectors in order to insure adequate bonding.

- D. Where conduit is installed above ceilings, secure it in place by attachment to building structural framing system with appropriate clamps manufactured for purpose of making conduit attachment.
- E. Where conduit penetrates a fire-rated wall, provide a suitable seal to close openings. All fire penetrations must be a U.L. listed assembly.
- F. Minimum conduit size is ½" unless stated otherwise.

End of Section

## SECTION 26 05 35 – BOXES

### PART 1 DESCRIPTION

#### 1.01 DESCRIPTION:

- A. Furnish outlet boxes for lighting fixtures, wall receptacles, switches and other boxes as required. Also, pull boxes and junction boxes shall be furnished as required. Use cast aluminum boxes in unfinished areas.

### PART 2 MATERIALS

#### 2.01 MATERIALS:

##### A. CEILING BOXES:

1. Ceiling outlet boxes shall be 4-inch octagon and 2-1/8 inch deep. Provide extension rings where additional volume is required. All ceiling outlet boxes shall have fixture stud of no-bolt, self-locking type installed if required to hang fixture specified at that outlet.
2. Where ceiling outlets occur in reinforced concrete, provide rings with removable back plate and fixture stud specifically designed for this purpose.

##### B. WALL BOXES:

1. Light wall switch boxes shall be a minimum size of 4" high by 2-1/8" wide by 2-1/8" deep. Where more than one gang occurs, 4" square boxes or additional larger boxes shall be used with device ring attached. Boxes in masonry shall be 4" high and 2-1/2" deep with the number of gangs necessary. An example of the masonry box shall be Raco Co. No. 692 for 3-gang, No. 693 for 4-gang, etc.
2. Plug receptacle boxes and telephone boxes shall be 4" square by 1-1/2" deep with a 4" square device cover, either one or two-gang as required. Covers shall be square cut, with a depth to accommodate the wall finish material with a minimum raised cut of 1/2".
3. Provide special sized boxes where called for on the drawings.

##### C. MANUFACTURER:

1. Boxes and fittings shall be Appleton, Steel City, Raco, Crouse-Hinds or equal.

#### 2.02 FABRICATION:

- A. Pull and junction boxes shall be galvanized or sherardized sheet metal or code thickness with lapped and welded joints and with 3/4" flange. They shall be rigidly supported on ceiling or wall. Conduit runs entering a box shall not be considered as adequate support.

### PART 3 INSTALLATION

#### 3.01 INSTALLATION:

- A. Install pull and/or junction boxes in conduit lines wherever necessary to avoid excessive length of runs or number of bends in run. No run shall exceed 100 feet without a pull box.
- B. Pull and junction boxes shall be accessible and sized in accordance with provisions of Article No. 370-18 of latest edition of National Electrical Code.
- C. Pull and junction boxes shall be installed so that cover shall be accessible at all times.

End of Section

## SECTION 26 27 26 – WIRING DEVICES

### PART 1 DESCRIPTION

#### 1.01 DESCRIPTION:

- A. Furnish and install wall switches, plug receptacles, etc. as specified hereafter and shown on the drawings. Devices offered as a substitute to those specified will be carefully checked to see that quality such as grounding continuity, retention force for insertion devices, are equal to those specified.

### PART 2 MATERIALS

#### 2.01 MATERIALS:

- A. The plug receptacles shall have a minimum rating of 20 amperes for the voltage service applied. An example of the quality of device required is the Hubbell Co. No. 5362-GRY. Provide Erico Model RLC device leveler for each receptacle. Provide GFCI type receptacles where shown or required by Code. Provide AFCI breakers in all bedroom circuits and where called for on the drawings. All 120 VAC receptacles in all commercial kitchen areas shall be GFCI type.
- B. Wall switches shall be 20-ampere, minimum capacity and single pole, 3-way or 4-way as required. Other variations of the devices shall be as called for on the drawings. Where pilot lights are required, they shall be separately ganged.
- C. Special colors may be required by the Architect and request for color variation must be made well in advance of product procurement. For the basis of the specification, it shall be assumed that the switch device handles and plug receptacle bodies are Gray.
- D. Coverplates: Stainless steel coverplates shall be used in unfinished areas. Gray nylon in finished areas. No plastic coverplates will be accepted.
- E. The manufacturer shall be Hubbell, General Electric, Bryant, P & S, Leviton or approved equal. All devices shall be specification grade.

### PART 3 INSTALLATION

#### 3.01 INSTALLATION:

- A. Installation of devices shall be in accord with the manufacturer's recommendations. Grounding devices such as jumper straps between the device grounding pole and the junction box, or the connection of a grounding conductor will be required at each plug receptacle. Where metal conduit serves the outlet box, a device using a "UL" approved grounding arrangement making use of the contact between the yoke and the device box is approved for use.

End of Section

## SECTION 26 28 13 – SAFETY SWITCHES

### PART 1 DESCRIPTION

#### 1.01 DESCRIPTION:

- A. Furnish and install fuse safety switches and/or disconnect switches as called for on the drawings and as may be otherwise required by the Codes.

### PART 2 MATERIALS

#### 2.01 MATERIALS:

- A. Safety switches shall be fused or non-fused as shown on the drawings. Safety switches shall be heavy-duty, horsepower rated, quick-make, quick-break with arc shields with enclosed construction. All fuses shall be furnished.

### PART 3 INSTALLATION

#### 3.01 INSTALLATION:

- A. Install where called for on the drawings and/or as required by the National Electrical Code, including any Mechanical equipment.
- B. Where disconnect or safety switches are called for away from walls, suitable support shall be provided to allow the switch to be in a position of approximately 4-1/2 feet above floor. Where necessary, provide a steel frame attached to the floor or overhead structural system or both. Switches may be mounted on equipment where specific approval is realized from the supplier of the equipment, so as not to interfere with normal and ready maintenance of the equipment.
- C. Install fuses in switch as required by nameplate of equipment being served.
- D. Provide NEMA 3R type for exterior use. NEMA 1 type for interior use.

End of Section

## SECTION 26 51 00 - INTERIOR LIGHTING

### PART I GENERAL

#### 1.01 SECTION INCLUDES:

- A. Section specifies luminaries and associated ballasts and lamps used in interior spaces.

#### 1.02 QUALITY ASSURANCE:

- A. UL Labeling or Listing: Furnish luminaries bearing UL label.
- B. Ballast Certification: Certified Ballast Manufacturers certification by Electrical Testing Laboratories, Inc. is required for ballasts and LED drivers.

#### 1.03 SUBMITTALS:

- A. Submit Product Data for each type of luminaire indicating:
  - 1. Dimensions and weight.
  - 2. Operating voltage and fixture wattage.
  - 3. Type and number of lamps or lumen output for LED sources.
  - 4. Type of ballast or driver.
  - 5. Photometric data.
  - 6. Identify each Product Data sheet with fixture type designation shown on drawings.

#### 1.04 WARRANTY:

- A. Guarantee and replace at no additional expense, ballasts which fail in normal service or generate noise in excess of the published sound rating within a 1 year period following final acceptance or use as described below.
  - 1. Upon written notification, specific areas may be occupied for installation of production machinery or other purposes prior to final acceptance of entire Project.
  - 2. In that circumstance, install necessary lamps and place luminaries in operation.
  - 3. Replace failed or burned out lamps in these areas until Project acceptance has occurred.
  - 4. LED fixtures shall have a 5 year lamp and driver warranty. This includes labor and material costs for warranty replacement or repair of fixtures.

### PART II EMERGENCY LIGHTING

#### 2.01 GENERAL

##### A. SECTION INCLUDES:

- 1. Section specifies fully automatic, nicad storage battery operated, self-contained, emergency lighting units.

#### 2.02 QUALITY ASSURANCE:

- A. UL Labeling or Listing: Furnish units bearing UL label.

#### 2.03 SUBMITTALS:

- A. Submit Product Data for each type of emergency light indicating:
  - 1. Dimensions and weight.
  - 2. Battery type, voltage, and quantity per unit.
  - 3. Operating voltage.

4. Type and number of lamps.
  5. Type of ballast.
  6. Photometric data.
  7. Identify each Product Data sheet with fixture type designation.
- B. Submit typewritten inventory, with full descriptive data, of lamps required for the Project and 4 copies of manufacturer's recommended maintenance instructions covering each unit.

2.04 WARRANTY:

- A. Guarantee and replace at no additional expense units which fails in normal service or when tested within a 1 year period following final acceptance or use as described below.
1. Upon written notification specific areas may be occupied for erection of production machinery or other purposes prior to final acceptance of entire Project.
  2. In that circumstance, install necessary lamps and place luminaries in operation.
  3. Additional lamping will not be required in occupied areas prior to Project acceptance unless lamp failures or burnouts occur.
- B. Guarantee and replace without charge, ballasts which fail in normal service, when tested or generates abnormal or objectionable noise within a 2-year period following final acceptance or use as previously described.

PART III EXIT LIGHT

3.01 Section Includes:

- A. Section specifies fully automatic, nicad battery back-up, exit lights and exit/emergency combination lights.

3.02 Quality Assurance:

- A. UL Labeling or Listing: Furnish units bearing UL Label.

3.03 SUBMITTALS:

- A. Submit Product Data for each type of exit light indicating:
- B. Dimensions and weight.
- C. Battery type, voltage, and quantity per unit.
- D. Operating voltage.
- E. Type and number of lamps.
- F. Type of ballast.
- G. Photometric data.
- H. Identify each Product Data sheet with fixture type designation.

3.04 WARRANTY:

- A. Guarantee and replace at no additional expense units which fails in normal service or when tested within a 1 year period following final acceptance or use as described below.

1. Upon written notification specific areas may be occupied for erection of production machinery or other purposes prior to final acceptance of entire Project.
  2. In that circumstance, install necessary lamps and place luminaries in operation.
  3. Additional lamping will not be required in occupied areas prior to Project acceptance unless lamp failures or burnouts occur.
- B. Guarantee and replace without charge, ballasts which fail in normal service, when tested or generates abnormal or objectionable noise within a 2-year period following final acceptance or use as previously described.

3.05 MATERIALS:

- A. Exposed metal or plastic elements shall be matte white enamel finish. Letters shall be red.
- B. Each unit shall contain LED's with energy consumption of 6.5 watts. Input voltage shall be rated 120/277-volts.
- C. The equipment shall be similar and equal to Lithonia Co. LHQM Series, with nicad battery backup. The unit mounted on a lay-in type ceiling shall be supported by use of a Caddy Co. acoustical "Tee Bar" box hanger, Catalog No. 512 or similar product.

3.06 INSTALLATION:

- A. Conform to the manufacturer's recommendations.

PART IV PRODUCTS

4.01 EQUIPMENT:

- A. Luminaries: Luminaire types with manufacturer's identification and lamp data are scheduled on "Luminaire Schedule" located on Drawings.
- B. Recessed Luminaries: Recessed luminaries are identified in "Luminaire Schedule" by manufacturer's general type or style designation only. Provide recessed luminaries that are fully coordinated mechanically and dimensionally with ceiling system in which they are installed.
- C. Ballasts:
1. General: Specific ballast type per luminaire is included on "Luminaire Schedule" located on Drawings.
  2. Hazardous Materials: Do not provide ballasts containing "Askarel" or other toxic/hazardous materials.
  3. Fluorescent Ballasts: High power factor, UL "Class P", with manufacturer's best sound rating for lamp current and primary voltage required.
    - a. Secure ballast to fixture housing by means of screws.
    - b. Total Harmonic Distortion (THD) not to exceed 20% for electronic ballasts or 30% for magnetic ballasts.
  4. Special Requirements: Low temperature, dimming, flashing, or other special operating modes are stated on "Luminaire Schedule" located on Drawings.
- D. Lamps: Full complement of new 130volt lamps of correct wattage, shape, color and rating, as designated on "Luminaire Schedule" located on Drawings. Provide lamps manufactured by one of the following:
1. General Electric Company.
  2. North American Philips Lighting Corporation.
  3. Osram Sylvania, Inc.

## PART V

### 5.01 INSTALLATION:

- A. General: Install luminaries securely in precise alignment with axes, level and plumb using supports as specified in Section 260529 and in accordance with manufacturer's recommendations. Eliminate light leaks from enclosed luminaries.
- B. Recessed Luminaries:
1. Support:
    - a. Tile Ceilings: Where installed in suspended acoustical tile ceilings using inverted T-bars with lay-in tiles, weight of luminaire may be imposed directly on T-bars.
    - b. Gypsum Board and Plaster Ceilings: Support luminaries with 3/8 inch diameter threaded hanger rods secured to main ceiling suspension structure or supplementary horizontal steel members as required and secured to luminaire housing, using two nuts at each end of rod.
  2. Connection: Connect each luminaire to conduit system by means of "Greenfield" type flexible conduit and fittings.
  3. Install flexible conduit connections in lengths of no more than 6 feet and no less than 4 feet.
- C. LED Pendant Luminaries Supports:
1. Furred Ceilings: Where installed below furred ceiling and with concealed wiring, use factory-finished stems and canopies which match luminaire.
    - a. Secure stems used in wiring to fixture stud in outlet box supported from building structure.
    - b. For stems not used in wiring, use 3/8-inch diameter hanger rods secured to main ceiling suspension structure or supplementary horizontal steel members as required, and extending through ceiling into canopy.
    - c. Do not exceed 48-inch stem spacing.
  2. Exposed Construction:
    - a. Where support is used in wiring to luminaire, use a universal joint type conduit fitting at top and bottom of 1/2-inch rigid conduit stem and a ball joint box connector fitting at luminaire channel.
    - b. For supports not used in wiring, install 3/8-inch diameter hanger rods with swivel connections at top and bottom.
    - c. Do not exceed 48-inch support spacing.
- D. Grounding: Connect each luminaire housing to equipment grounding conductor by means of a crimped spade-type terminal connector secured to housing with a self-tapping screw or housing grounding lug.
- E. Lamps: Clean luminaire prior to lamp installation. Install lamps and energize lighting system to check for proper operation. Perform corrections to lighting system.
1. Do not install lamps before two weeks prior to date established for final acceptance or use.
  2. Do not utilize permanent lighting system for construction purposes.

### 5.02 EQUIPMENT:

- A. General: UL 924. Fully automatic, self-contained, portable emergency lighting units. Types with manufacturer's identification are scheduled on "Luminaire Schedule" located on Drawings.
- B. Housing: Minimum 20 gauge steel housing with manufacturer's standard finish and hardware for fastening to a mounting bracket.



- C. Batteries: 6 volt, nickel cadmium, plastic encased storage battery.
- D. Battery Charger: Automatic, temperature compensated, pulse type battery charger with reverse polarity and short circuit protection.
- E. Controls:
  - 1. Sealed transfer relay.
  - 2. Automatic protection against battery deep discharge.
  - 3. "ON-Off" switch mounted on housing with an indicating light to show when charger is operating at high rate, a second light to indicate when battery is fully charged, and a test button to momentarily break AC supply to test lamps.
- F. Lamps: Number, type, and wattage of lamps are shown on "Luminarie Schedule" located on Drawings.
- G. Accessories: Steel mounting bracket, adjustable luminarie brackets on non-fluorescent units, and a junction box for conduit connections.
- H. LED emergency battery packs. 1100 lumen battery packs minimum. PS-1100 or equal.

5.03 INSTALLATION:

- A. Mounting: Mount units 8 feet above finished floor in unfinished areas and 1 foot below ceiling to top of housing in finished areas. in accordance with manufacturer's recommendations.
- B. Connection: Connect each unit to conduit system by means of "Greenfield" type flexible conduit. Install flexible conduit in lengths a maximum of 3 feet and a minimum of 1 foot.
- C. Grounding: Connect each unit housing to equipment grounding conductor by means of a crimped spade-type terminal connector secured to housing with a self-tapping screw.
- D. Lamps: Clean luminaries prior to lamp installation. Install lamps and check unit for proper operation.

End of Section

## SECTION 310530 – GEOSYNTHETICS:

### 1 PART I GENERAL

#### 1.01 SCOPE:

- A. Section Includes - Furnishing, testing, and installing structural geogrid reinforcement.

Work consists of:

1. Furnishing and testing structural geogrid reinforcement as shown on the construction drawings.
2. Storing, cutting, and placing structural geogrid reinforcement as specified herein and as shown on the construction drawings.
3. Providing supplier representatives for pre-construction meeting with Contractor and Engineer.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

Section 312000 Earth Moving  
Section 311000 Site Preparation

#### 1.03 REFERENCES:

- A. American Society for Testing and Materials (ASTM)

1. D1388-96 - Standard Test Method for Stiffness of Fabrics, Option A
2. D4355-92 - Standard Test Method for Deterioration of Geotextiles from Exposure to Ultraviolet Light and Water (Xenon-Arc Type Apparatus)
3. D4716-95 - Test Method for Constant Head Hydraulic Transmissivity (In-Plane Flow) of Geotextiles and Geotextile Related Products
4. D4759-92 - Practice for Determining the Specification Conformance of Geosynthetics
5. D5262-97 - Standard Test Method for Evaluating Unconfined Tensile Creep Behavior of Geosynthetics
6. D5818-95 - Practice for Obtaining Samples of Geosynthetics from a Test Section for Assessment of Installation Damage
7. D6637-01 – Standard Test Method for Determining Tensile Properties of Geogrids by the Single or Multi-rib Tensile Method

- B. Geosynthetic Research Institute (GRI)

1. GG2-87 - Standard Test Method for Geogrid Junction Strength
2. GG4-91 - Determination of the Long-Term Design Strength of Geogrids
3. GG5-91 - Standard Test Method for “Geogrid Pullout”

4. GG8 - Determination of the Number Average Molecular Weight of Poly(Ethylene Terephthalate) (PET) Yarns Based on a Relative Viscosity Value
- C. U.S. Federal Highway Administration (U.S. FHWA)
1. FHWA NHI-00-043 - Mechanically Stabilized Earth Walls and Reinforced Soil Slope Design and Construction Guidelines (Demonstration Project 82)
  2. FHWA NHI-00-044 - Corrosion/Degradation of Soil Reinforcements for Mechanically Stabilized Earth Walls and Reinforced Soil Slopes
- D. U.S. Environmental Protection Agency (U.S. EPA)
1. EPA 9090 - Compatibility Test for Wastes and Membrane Liners
- E. U.S. Army Corps of Engineers (U.S. COE)
1. Draft Specification for Grid Aperture Stability by In-Plane Rotation

#### 1.04 DEFINITIONS

- A. Structural Geogrid - A structural geogrid is formed by a regular network of integrally connected tensile elements with apertures of sufficient size to allow interlocking with surrounding soil, rock, or earth and function primarily as reinforcement.

#### 1.05 SUBMITTALS

- A. Geotextile materials will not be considered as an alternate to geogrid materials. Geotextile may be used to provide separation, filtration, or drainage; however, no structural contribution will be attributed to the geotextile.
- B. Alternate geogrid materials shall not be used unless submitted to the Engineer and approved in writing by the Engineer at least 7 days prior to the proposal letting. The Engineer shall have absolute authority to reject or accept alternate materials based on the requirements of this Section and the Engineer's judgment. Polyester geogrids, whether coated or uncoated, will not be approved for use in calcareous, alkaline or highly acidic environments including lime-treated or cement-treated soils, crushed limerock, or soils potentially exposed to leachate from cement, lime, or de-icing salts. In no case shall polyester geogrids be used in soils with a pH >9. In order to be considered, submittal packages for alternate geogrid materials must include:
1. A list of 10 comparable projects that are similar in terms of size and application, are located in the United States where the results of using the specific alternate geogrid materials can be verified after a minimum of 3 years of service life.
    - a. A sample of alternate geogrid material and certified specification sheets.
    - b. Recommended installation instructions.
    - c. An explanation of engineering techniques used and sample design drawings and calculations prepared and sealed by a Professional Engineer licensed in the State.
    - d. Additional information as required by the Engineer.
- C. The Contractor shall submit 6 sets of detailed design calculations, construction drawings, and shop drawings for approval at least 30 days prior to the beginning of construction. The calculations and drawings shall be prepared and sealed by a Professional Engineer, licensed in the State. Upon approval, the Engineer will make available 2 sets of the drawings to the Contractor. The Contractor shall obtain the approved drawings prior to commencing construction.

D. Submit geogrid product samples approximately 4 inches by 7 inches or larger and consisting of at least 4 entire apertures.

E. Submit Manufacturer's installation instructions and general recommendations.

1.06 QUALITY ASSURANCE:

A. Qualifications - The Engineer's approval of the system and the supplier will be based upon the following considerations:

1. The geogrid reinforcement has been reviewed and approved for use.
2. The supplier has a large enough operation and the necessary experience to supply and support the construction on a timely basis.
3. Past experience in the design and construction of at least 10 projects of a similar magnitude of the proposed system can be documented.

B. The design shall be signed by a registered Professional Engineer who shall demonstrate a minimum Errors and Omissions insurance coverage of \$2,000,000 by furnishing the Engineer with a current certificate of insurance.

C. Pre-Construction Conference - Prior to the installation of the geogrid, the Contractor shall arrange a meeting at the site with the geogrid material supplier and, where applicable, the geogrid installer. The Owner and the Engineer shall be notified at least 3 days in advance of the time of the meeting. The representative of the geogrid supplier shall be available on an "as-needed" basis during construction.

1.07 DELIVERY, STORAGE, AND HANDLING:

A. Storage and Protection

1. Prevent excessive mud, wet concrete, epoxy, or other deleterious materials from coming in contact with and affixing to the geogrid materials.
2. Store at temperatures above -20° F (-29° C).
3. Rolled materials may be laid flat or stood on end.

2 PART II PRODUCTS

2.01 UNIT PRICES:

A. The Contractor shall include on his Form of Proposal the following unit price:

1. Unit Price per square yard of geogrid delivered and installed in foundation excavation.

2.02 ALLOWANCES:

A. The Contractor shall include in his Proposal the following Allowance.

1. Allowance for providing and placing 2,250 sq. yards of geogrid at the unit price quoted on the form of proposal

2.03 MATERIALS:

A. Acceptable Products:

1. BX1100 as manufactured by the Tensar Corporation, Morrow, GA or their designated representative.

2.04 MATERIALS:

A. The geogrid, shall meet the following minimum average physical property requirements:

<b>LOAD CAPACITY</b>		
<b>PROPERTY</b>	<b>METHOD</b>	
Tensile Strength*		
2% Strain, lbs/ft*	ASTM D6637*	450
5% Strain, lbs/ft*	ASTM D6637*	920
<b>INTEGRITY OF PRODUCT STRUCTURE</b>		
<b>PROPERTY</b>	<b>METHOD</b>	
Junction Efficiency, % of Ult. Tensile Strength	GRI-GG2-87 @ 10%/min	93
Flexural Stiffness* mg-cm	ASTM D1388, Option A	250,000
Aperture Stability**	Corps of Engineers	3.2

1. Unless noted otherwise, values shown are for the cross machine direction and represent minimum average roll values with the exception that Flexural Stiffness, which is determined in the machine direction and represents typical values. The tensile strength at 2 percent and 5 percent strain shall be determined with this test conducted without artificially deforming test materials under load before measuring such resistance or employing an artificial “secant” or “offset” tangent basis of measurement so as to overstate tensile properties.

\*Bending resistance values determined in the machine direction using specimen dimensions of 864 millimeters in length by 1 aperture in width.

\*\*Resistance to in-plane rotation movement measured by applying a 20 kg-cm moment to the central junction of a 9-inch by 9-inch specimen restrained at its perimeter and measured in units of kg-cm/deg.

3 PART III EXECUTION:

3.01 EXAMINATION:

A. The Contractor shall check the geogrid upon delivery to verify that the proper material has been received. The geogrid shall be inspected by the Contractor to be free of flaws or damage occurring during manufacturing, shipping, or handling.

3.02 PREPARATION:

A. The subgrade soil shall be prepared as indicated on the construction drawings or as directed by the Engineer. Foundation soil shall be excavated to the lines and grades as shown on the drawings or as directed by the Engineer. Overexcavated areas shall be filled with compacted backfill material.

3.03 INSTALLATION:

A. Geogrid shall be laid at the proper elevation and orientation as shown on the construction drawings or as directed by the Engineer. Where percent coverage and truncation options are shown on the plans, alternate layers of uniaxial primary geogrid reinforcement shall be placed in a staggered pattern such that the layer above is placed with the centerline of the geogrid in alignment with the centerline of the open space below. The maximum horizontal spacing between geogrids where percent coverage design alternates are employed shall be 4 to 6 inches. Correct

orientation (roll direction) of the geogrid shall be verified by the Contractor. Geogrid may be temporarily secured in place with staples, pins, sand bags, or backfill as required by fill properties, fill placement procedures, or weather conditions, or as directed by the Engineer.

- B. Geogrid soil reinforcement shall be connected/spliced when required to provide continuity of tensile resistance. Geogrids manufactured using polyolefins (e.g. HDPE and PP) shall be connected with a mechanical polymer bar. Geogrids manufactured of polyester shall be connected by sewing with Kevlar sewing thread perpendicular to the direction of loading at the ends of the materials.
- C. Overlap connections may be used if the Contractor provides the Engineer independent test documentation which demonstrates that the load/deformation characteristics of the overlap of geogrid materials is equal to or exceeds those of the geogrid. The minimum overlap shall be 5 feet.

3.04 FILL PLACEMENT OVER GEOGRID:

- A. Backfill material shall be placed in lifts and compacted as directed under Section 02300. Backfill shall be placed, spread, and compacted in such a manner that minimizes the development of wrinkles in and/or movement of the geogrid.
- B. Tracked construction equipment shall not be operated directly on the geogrid. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over the geogrid. Turning of tracked vehicles should be kept to a minimum to prevent tracks from displacing the fill and damaging the geogrid. Rubber-tired equipment may pass over polyolefin geogrid reinforcement at slow speeds, less than 10 mph. Sudden braking and sharp turning shall be avoided. Rubber-tired equipment shall not pass over polyester geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of rubber-tired equipment over polyester geogrid reinforcement.

3.05 REPAIR:

- A. Any geogrid damaged during installation shall be replaced by the Contractor at no additional cost to the Owner.
- B. Coated geogrids shall not be used if the coating is torn, shedding, cracked, punctured, flawed or cut, unless a repair procedure is carried out as approved by the Engineer. The repair procedure shall include placing a suitable patch over the defective area or applying a coating solution identical to the original coating.

3.06 PROTECTION:

- A. Follow the Manufacturer's recommendations regarding protection from exposure to sunlight.

End of Section

## SECTION 31 10 00 – SITE PREPARATION

### PART I GENERAL

#### 1.01 SCOPE:

- A Work shall include, but not be limited to: Protection of existing trees to remain, removal of trees and other vegetation scheduled to be removed, topsoil stripping, clearing, grubbing, and removal of above and below grade improvements.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

Section 31 20 00 Earthwork

#### 1.03 PROJECT CONDITIONS:

- A Traffic: Conduct site clearing operations to ensure minimum interference with roads, streets, walks, or other occupied or used facilities without permission from authorities having jurisdiction.
- B Protection of Existing Improvements:
1. Provide protections necessary to prevent damage to existing improvements indicated to remain.
  2. Protect improvements on adjoining properties and on the Owner's property.
  3. Restore damaged improvements to their original condition, as acceptable to property owners and other parties having jurisdiction
- C Protection of Existing Trees and Vegetation:
1. Protect existing trees and other vegetation indicated to remain in place, against unnecessary cutting, breaking or skinning of roots, skinning or bruising of bark, smothering or trees by stockpiling construction materials or excavated materials within drip line, excess foot or vehicular traffic, or parking of vehicles within the drip line. Provide temporary guards to protect trees and vegetation to be left standing.
  2. Water trees and other vegetation to remain within the limits of the contract work as required to maintain their health during the course of construction operations.
  3. Provide protection for roots over 1-1/2" in diameter which are cut during construction operations. Coat the cut faces with an emulsified asphalt, or other acceptable coating, formulated for use on damaged plant tissues. Temporarily cover exposed roots with wet burlap to prevent roots from drying out. Cover with earth as soon as possible.
  4. Repair or replace trees and vegetation indicated to remain which are damaged by construction operations, in a manner acceptable to the Engineer. Employ a licensed arborist to repair damages to trees and shrubs. Replace trees which cannot be repaired and restored to full growth status, as determined by the arborist.
- D Salvageable Improvements: Carefully remove items indicated to be salvaged, and store on the Owner's premises where indicated or directed.

### PART II PRODUCTS

NOT USED

### PART III EXECUTION

#### 3.01 SITE CLEARING:

A General:

1. Remove trees, shrubs, grass, and other vegetation, improvements, or obstructions as required to permit installation of new construction. Remove similar items elsewhere on the site or premises unless specifically indicated to remain. Removal includes digging out and off-site disposing of roots and stumps.
2. Carefully and cleanly cut minor roots and branches of trees indicated to be left standing, where such roots and branches obstruct new construction.

B Topsoil:

1. Topsoil is defined as friable clay loam surface soil found in depth of not less than 4 inches. Satisfactory topsoil is reasonably free of subsoil, clay lumps, stones, and other objects over 2 inches in diameter, and without weeds, roots, and other objectionable material.
2. Strip topsoil to whatever depths encountered in a manner to prevent intermingling with underlying subsoil or other objectionable material.
3. Remove heavy growths of grass from areas before stripping.
4. Where existing trees are indicated to remain, leave existing topsoil in place within drip lines to prevent damage to root system.
5. Stockpile topsoil in storage piles in areas shown, or where otherwise directed. Construct storage piles to freely drain surface water. Cover storage piles if required to prevent windblown dust.

C Clearing and Grubbing:

1. Clear site of trees, shrubs and other vegetation, except for those specifically indicated to be left standing.
2. Completely remove stumps, roots, and other debris protruding through the ground surface.
3. Use only hand methods for grubbing inside the drip lines of trees indicated to be left standing.
4. Fill depressions caused by clearing and grubbing operations with satisfactory soil material, unless further excavation or earthwork is indicated.
5. Place fill material in horizontal layers not exceeding 6 inches loose depth, and thoroughly compact to a density equal to adjacent original ground.

D Removal of Improvements:

1. Remove above-ground and below-grade improvements as indicated and as necessary to facilitate new construction.
2. Abandonment or removal of certain underground pipe or conduits may be shown on mechanical or electrical drawings, and is included under work of related Division 15 and 16 Sections. Removal of abandoned underground piping or conduit interfering with construction is included in this Section.

3.02 DISPOSAL OF WASTE MATERIALS:

A Burning is not permitted on the Owner's property.

B Remove waste materials and unsuitable or excess topsoil from Owner's property and dispose of legally.

End of Section



SECTION 31 20 00 - EARTHWORK

PART I GENERAL

1.01 SCOPE:

- A Do all excavating, filling, backfilling, grading, and all necessary incidental work in connection therewith, required to install all work shown and specified under the Contract.
- B Work shall include, but not be limited to: Soils Engineer monitoring, topsoiling and fine grading of areas to be seeded; topsoiling and fine grading of planting areas; excavating and grading for building drives and walks, controlled filling and porous fill.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

Section	00 31 32	Subsurface Investigation
Section	01 40 00	Quality Control
Division	22	Plumbing
Division	26	Electrical
Division	33	Utilities

- B The Subsurface Investigation Report is the basis for the design. The Contractor shall make note and comply with suggestions incorporated in the included Soils Engineering Reports relative to cut, fill, compaction, borrow material, removal of unsatisfactory material, maintenance of site drainage or other soils-related conditions.

1.03 EXAMINATION OF THE SITE:

- A Bidders upon work under this section, before submitting bids, shall visit and carefully examine the site so as to familiarize themselves with the existing conditions, including amount of topsoil available, and the difficulties that will affect the execution of the work. The submission of a bid will be construed as evidence that such an examination has been made.
- B The Owner has secured a source for earth borrow materials and a location for placement of removed unsuitable soil materials at no cost for materials. The Contractor shall be responsible for costs associated with loading, unloading, hauling and placement of materials obtained from this source or placed at this location. Additionally, the Contractor shall be responsible for leaving borrow and dump areas in acceptable condition to facilitate drainage, prevent erosion and restore grass cover.

1.04 DETERMINATION OF FOUNDATION BEARING CAPACITY BY GEOTECHNICAL ENGINEER:

- A Foundation bearing capacity shall be determined on the basis of scientific analysis utilizing investigations, tests, or studies conducted or provided by the soils testing engineer.
- B Documentation of foundation bearing capacity shall be submitted to the Structural Engineer of record. Submittal shall identify the project, contain the name, address and registration number of the designated engineer and shall indicate type and frequency of tests performed as well as their location within the project.

1.05 SUBMITTALS:

- A Submit one copy of permits and notices obtained from authority having jurisdiction before commencing work.

- B Obtain and submit certification of adequacy of site grading and filling from Testing Laboratory, signed and sealed by the Geotechnical Engineer of record, registered in the state in which the work is performed, stating that work is in accordance with Contract Documents, and that soils are capable of supporting the structure to be constructed under the Contract.
- C If bench marks and other permanent reference points are displaced, obtain and submit certification, signed and sealed by a licensed surveyor, of proper re-establishment of bench marks and reference points.
- D The Contractor shall submit samples of approximately 50 pounds each of the fill materials he proposes to use to testing agency approved by the Owner at least ten (10) days prior to its use. The testing agency shall test such samples, classify them as specified by U.S. Bureau of Public Roads, and determine the moisture-density in pounds per cubic foot of oven-dried weight.

1.06 PROJECT CONDITIONS:

- A The Subsurface Investigation Report is the basis for the design. The Contractor shall make note and comply with suggestions incorporated in the included Soils Engineering Reports relative to cut, fill, compaction, borrow material, removal of unsatisfactory material, maintenance of site drainage or other soils-related conditions. Any conflicts or contradictions between the Subsurface Investigation Report and any portion of this specification, the conflict shall be brought to the attention of the Engineer and clarified prior to proceeding with the work of this section.
- B Additional test borings and other investigatory operations may be undertaken by Contractor at the Contractor's option. However, no change in Contract Amount will be made for such operations.
- C Notify Owner's representative when excavations have reached required elevations. If it is determined that bearing materials are unsuitable, continue excavations until suitable bearing is encountered. Contract Amount may be adjusted by an appropriate Contract modification.
- D Locate and, where indicated to remain, protect and support existing utilities. If uncharted or incorrectly charted items are encountered, immediately notify utility company and cooperate with utility company's directives. Cooperate with Owner and utility companies in order to keep services and facilities in operation. Repair any damages caused by Work to the satisfaction of the affected utility company.
- E If utility service must be interrupted, give 72-hour notice to Owner's representative, and obtain written approval prior to such interruption.
- F Provide barricades and warning lights for open excavations. Operate warning lights as and when recommended by authorities having jurisdiction. Remove such protective items when no longer required.
- G Protect structures, utilities, sidewalks, paving, and other facilities from damage due to settlement, lateral movement, undermining, washout, and other hazards resulting from earthwork operations.
- H Root systems of trees to remain are to be protected from damage or drying out; cover exposed roots with burlap.

PART II PRODUCTS

2.01 UNIT PRICES:

- A The Contractor shall include on his Bid Form, any Unit Prices described in Section 01 21 00.

2.02 ALLOWANCES:

- A The Contractor shall include in his Base Bid, any Allowances described in Section 01 21 00.

2.03 DRAINAGE FABRIC:

A Non-woven geotextile, specifically manufactured as a drainage geotextile; made from polyolefins, polyesters, or polyamides; and with the following minimum properties determined according to ASTM D 4759 and referenced standard test methods:

1. Grab Tensile Strength: 110 lbf (490 N); ASTM D 4632.
2. Tear Strength: 40 lbf (178 N); ASTM D 4533.
3. Puncture Resistance: 50 lbf (222 N); ASTM D 4833.
4. Water Flow Rate: 150 gpm per sq. ft. (100 L/s per sq. m); ASTM D 4491.
5. Apparent Opening Size: No. 50 (0.3 mm); ASTM D 4751.

2.04 BURIED WARNING AND IDENTIFICATION TAPE:

A. Polyethylene plastic and metallic core or metallic-faced, acid and alkali-resistant, polyethylene plastic warning tape manufactured specifically for warning and identification of buried utility lines. Provide tape on rolls, 3 inch minimum width, color coded as specified below for the intended utility with warning and identification imprinted in bold black letters continuously over the entire tape length. Warning and identification to read "CAUTION BURIED (intended service) LINE BELOW" or similar wording. Color and printing shall be permanent, unaffected by moisture or soil.

Warning Tape Color Codes:

Red	Electric
Yellow	Gas, Oil, Dangerous Materials
Orange	Telephone and Other Communications
Blue	Water Systems
Green	Sewer Systems
White	Steam Systems

B. Warning Tape for Metallic Piping: Acid and Alkali-resistant polyethylene plastic tape conforming to the width, color, and printing requirements specified above. Minimum thickness of tape shall be 0.003 inch. Tape shall have a minimum strength of 1500 psi lengthwise, and 1250 psi crosswise, with a maximum 350 percent elongation.

2.05 BACKFILL MATERIAL:

A Backfill material shall be a type that can be compacted to the densities specified under the conditions existing at the site at the time it is placed.

B Stone for compacted backfill under slabs shall be evenly graded mixture of crushed stone or crushed or uncrushed gravel, with one hundred percent (100%) passing a 1-1/2" sieve and not more than five percent (5%) passing a No. 4 sieve.

C Earth for compacted backfill and engineered fill shall consist of clean granular soils, clay soils, or shale soils having a plasticity index of less than 30 and a minimum density of 90 pounds per cubic foot when compacted to one hundred percent (100%) of its maximum dry density per standard proctor test. (ASTM D698) Material shall be free of vegetation, roots, rocks larger than 2" in any dimension, debris and other deleterious materials. Residual soil excavated at the site may be used for backfill if it meets the specification requirements. The moisture content of the fill soils should be maintained within +3 and -3 percentage points of optimum moisture content determined from the standard Proctor compaction test.

D Cohesive soils that have become hard and lumpy or that have been piled and become dry shall be broken up and properly conditioned for optimum moisture content immediately before using as backfill. However, in no case shall earth backfill be wetted or puddled in place.

E Backfill at retaining walls (if any) shall be ASTM #57 or #67 stone.

2.06 ENGINEERED FILL:

- A All fill in areas to be occupied by the building(s) and paving, including an area 10 feet outside the perimeters thereof, and any areas noted on the site plan as "Future Expansion" shall be controlled (engineered) fill and the compaction shall be tested by an Agency as specified in Section 01 40 00 Quality Control. Controlled fill in areas of buildings shall be compacted in thin lifts to at least 98% of maximum dry density within 3% of optimum moisture content in accordance with ASTM Specification D-698 (standard proctor). Fill in areas of asphalt paving shall be compacted in thin lifts to at least 98% of maximum dry density within 3% of optimum moisture content in accordance with ASTM Specification D 698. The upper 12 inches of fill beneath pavements and upper 24 inches beneath footings and grade slabs shall be compacted to 100%.
- B Where rock is excavated to 24 inches below footings, the footing excavations shall be refilled from top of rock to bottom of footings with controlled compacted fill.

2.07 TOPSOIL:

- A Shall be natural, fertile, agricultural soil, capable of sustaining vigorous plant growth. It shall be of uniform friable clay loam composition throughout, without admixture of subsoil. Soil shall be free of stones, lumps, live plants and their roots, sticks and other extraneous matter. The soil shall not be contaminated with substances harmful to the growth of plants and humans. It shall have a pH range of 5.0 to 7.0, and contain not less than five percent (5%) organic matter. The topsoil shall be free of noxious weeds, grasses or other foreign vegetation which would cause maintenance problems for the Owner after the contract is complete. Contractor shall assume full responsibility for control of noxious species introduced by the addition of soil infested with such species for a period of one year from Provisional Acceptance of the Work.

2.08 UNDERCUT AT FOUNDATIONS:

- A Undercut and backfill with compacted stone at foundations shall be performed if directed by the Engineer, based on the results of in place testing of earth at foundation sub-grades. In areas where unsuitable soils are encountered at or near foundation level, the foundation shall be undercut to a depth and width of two times the foundation bearing level or to competent bearing soils. The trench shall be backfilled with compacted stone to the level of foundation bearing.

2.09 CLASSIFICATION OF EXCAVATED MATERIALS:

- A Materials to be excavated shall be classified as topsoil suitable for fine grading and planting beds, soil suitable for use in engineered fill, soil unsuitable for use in engineered fill, and rock.
- B It is understood that full compensation has been included in the Base Bid amount for all excavation work, including the furnishing and installing of all filling and backfilling materials required, except (1) the removal of rock (2) excavating and backfilling of areas of unsuitable soil (3) changes in the work made after award of the contract and (4) work required because of differing site conditions as defined hereinafter.

2.10 CLASSIFICATION OF EXCAVATED MATERIALS:

- A Materials to be excavated shall be unclassified. Excavating shall include the removal of all materials encountered, both natural and artificial.
- B It is understood that full compensation has been included in the Base Bid amount for all excavation work, including the furnishing and installing of all filling and backfilling materials required, the removal of rock and excavating and backfilling of areas of unsuitable soil except work required because of differing site conditions as defined hereinafter.

2.11 GROUNDWATER IN EXCAVATIONS:

A It is anticipated that ground water will be encountered in the course of the work. The Contractor shall coordinate his work so that any ground water is controlled and directed to existing or newly constructed storm drainage structures. Measures such as temporary trenching and pumping should be anticipated and shall not be given consideration as differing site conditions.

2.12 DIFFERING SITE CONDITIONS:

A The Contractor shall promptly, and before such conditions are disturbed, notify the Engineer in writing of sinkholes or caves encountered in excavations.

B The Engineer and the Soil Engineer will promptly investigate the conditions, and if they find such conditions do materially so differ and cause an increase or decrease in the Contractor's cost of, or the time required for performance of any part of the work under this Contract, whether or not changed as a result of such conditions, an equitable adjustment shall be made and the Contract modified in writing accordingly by a change order.

C No claim of the Contractor under this clause shall be allowed unless the Contractor has given the notice required in Subparagraph A above; provided, however, the time prescribed therefore may be extended by the Owner.

D No claim by the Contractor for an equitable adjustment hereunder shall be allowed if asserted after final payment under the Contract.

PART III EXECUTION

3.01 ROCK EXCAVATION:

A Material to be excavated is assumed to be earth and other materials that can be removed by power shovel, power spade, backhoe, bulldozer, or other equipment normal to excavation work, but not requiring the use of explosives or drills. If rock, as herein defined, is encountered within the limits of excavation, the "Contract Price" will be adjusted. When the rock is encountered, the Contractor shall immediately notify the Engineer and shall not proceed further until instructions are given and measurements made for the purpose of establishing volume of rock excavation.

B Rock: Rock material in beds, ledges, unstratified masses, and conglomerate deposits and boulders of rock material exceeding 1 cu.yd. for bulk excavation or 3/4 cu.yd. for footing, trench, and pit excavation that cannot be removed by rock excavating equipment equivalent to the following in size and performance ratings, without systematic drilling, ram hammering, ripping, or blasting (when permitted):

1. Excavation of Footings, Trenches, and Pits: Late-model, track-mounted hydraulic excavator equivalent to Caterpillar Model No. 3201; equipped with a 24 inch wide, short-tip-radius rock bucket; rated at not less than 120 hp flywheel power with bucket-curling force of not less than 25,000 lbf and stick-crowd force of not less than 18,700 lbf; measured according to SAE J-1179.
2. Bulk Excavation: Late-model, track-mounted loader equivalent to Caterpillar Model No. 973; rated at not less than 210 hp flywheel power and developing a minimum of 45,000 lbf breakout force; measured according to SAE J-732.

C Quantities of excavated rock shall be based on "in-place" volumes. Rock shall be stripped for measurement before excavating, and no rock excavated or loosened before measurement will be allowed or paid for as rock. Measurement and payment therefore, shall be by the number of cubic yards required to bring the excavation to the required surface or grade shown on the Drawings. The Owner may adjust the grades should excessive rock be encountered.

D Before placing concrete or masonry or rock surfaces, the surfaces shall be leveled off, or shelved, to a slope not exceeding one inch per foot.

- E Payment for rock excavation, as defined above, shall be at the agreed unit price per cubic yard. (Computations will be made in a vertical plane from the lowest point rock is excavated).
- F If the use of explosives is required or desired by the Contractor, Contractor shall present written evidence of appropriate insurance, have written permission from the Engineer and all authorities having jurisdiction prior to bringing explosives onto job site or using in the work and shall implement all precautionary measures deemed necessary by all authorities having jurisdiction.
- G If rock is encountered, it shall be excavated to the following limits:
1. Two feet outside of concrete work for which forms are required, except footings.
  2. One foot outside the perimeter of footings and two feet below bottom of footings.
  3. One foot below concrete floor slabs on grade.
  4. In all pipe trenches, 6" below invert elevation of pipe and 2 feet wider than the inside diameter of the pipe, but not less than three feet trench width. Contractor shall notify officials prior to detonation of explosives or beginning noisy drilling operations.
  5. In all other excavated areas: 2 feet below finished grade.

### 3.02 EXCAVATIONS:

- A Excavation shall be to depth and of form and size required for installation of work shown on the drawings. Excavations for foundation walls shall be large enough to provide sufficient working space to permit the proper placing and inspection of forms, waterproofing, sleeves, and similar items, and the installation of foundation drains where such drains are shown. Excavation for slabs on grade shall be deep enough to allow for placing porous fill of depths specified under the slabs.
- B Excavation for wall and column footings shall be to firm undisturbed earth or engineered earth fill, sides square and bottoms level. Changes in level of wall footings shall be made by stepping and not by sloping. Trenches, if excavated properly, may be used to maintain the concrete for all footings without the use of forms.
- C Excavations in earth for footings, slabs, walks, and other structures shall not be made to full depths required when freezing temperatures or rain may be expected. Concrete footings shall be placed immediately after excavation is completed. Freezing or water damaged excavations shall be carried deeper as required and backfilled as necessary at no additional cost to the Owner. The Soils Engineer shall observe all footing excavations immediately prior to placing reinforcing steel or concrete.
- D After excavating and rough grading the building areas, and areas to be paved which are in cut, to the required subgrade elevations, and after topsoil has been removed from building areas and areas to be paved which are to receive engineered fill, these areas shall be proof-rolled by the Contractor in the presence of the Soils Engineer using a fully-loaded dump truck or similar pneumatic-tired equipment. Any areas exhibiting significant deflection, in the opinion of the Soil Engineer, shall be stabilized as directed prior to placing any fill. If areas exhibiting deflection cannot be stabilized by compaction, the unsuitable soil shall be undercut as directed by the Soil Engineer and replaced with engineered fill.
- E Any existing underground pipes or electrical conduits that are in service encountered during the excavation shall be temporarily supported and maintained until permanent support has been restored, or until other disposition has been made as directed by the Engineer. Existing underground pipes encountered that have been abandoned or are to be abandoned shall be removed to a point outside the construction excavation and plugged.
- F All non-engineered fill shall be removed in the area of the new construction and replaced with engineered fill. All footing excavations shall be examined and approved by a senior engineering technician working under the direct supervision of a Geotechnical engineer immediately prior to placing reinforcing steel or concrete. Modifications shall be made to the excavation if the Soils Engineer determines that the excavation is not in compliance with the drawings or specifications.

- G In cut areas, excavation shall extend below any deleterious materials or unsatisfactory soil as specified.
- H Cut shall not be carried deeper than necessary to reach required elevations. Fill shall be clean earth as specified for backfilling. Fill shall be placed evenly over the entire area to be filled, in layers. Each layer shall be thoroughly compacted to sufficient density to prevent unsightly settlement.
- J. Foundation Bearing Materials Testing: The Soils Engineer shall observe all footing excavations immediately **prior to placing reinforcing steel or concrete.**
1. For foundations bearing on residual (natural) soils, the bearing materials shall be probed with a minimum 1/2 inch diameter steel probe rod to detect weaker materials. Weaker materials detected by probing shall be tested with dynamic cone penetrometer to verify the design bearing capacity. Test frequency shall be one cone penetrometer test per four individual foundations and per 100 linear feet of strip foundations.
  2. For foundations bearing on fill (under the present contract) soils, the bearing materials shall be probed with a minimum 1/2 inch diameter steel probe rod to detect weaker materials. Weaker materials detected by probing shall be tested with a nuclear density gauge to verify the in-place percent compaction conforms to the applicable compaction criteria. Test frequency shall be one nuclear density test per four individual foundations and per 100 linear feet of strip foundations.

### 3.03 UNSUITABLE SOIL:

- A In building or paving areas where unsuitable soil conditions are encountered which cannot be stabilized by compaction, or where in the opinion of the Soil Engineer attempting stabilization by compaction would be unsuccessful, the unsuitable soil shall be excavated and removed from the site and the area backfilled with engineered fill specified hereinafter.
- B Quantities of excavated unsuitable soil shall be based on "in-place" volumes. Quantities of unsuitable soil removed shall be determined from measurements made by the Contractor in the presence of the Soils Engineer. Measurements shall be made by cross sectioning and determining depth of cut with a surveyor's level at periodic intervals, or by other methods mutually agreed upon by the Contractor and the Owner. When unsuitable soil is encountered the contractor shall notify the Engineer and not proceed further until instructions are given. Payment for unsuitable soil, as defined above, shall be made at the agreed unit price per cubic yard.

### 3.04 PAYMENT FOR EXCAVATION OF ROCK OR UNSUITABLE SOIL:

- A If rock or unsuitable soil is encountered, a change order will be issued to adjust the Contract Amount after all general excavation in building and paving area is complete.

### 3.05 PROTECTION OF EXISTING WORK AND LANDSCAPE FEATURES:

- A Excavating, filling, backfilling and grading shall be performed in such a manner and by such methods that will not damage existing structures, existing underground piping, existing overhead wiring, existing trees (unless noted to be removed), and other landscaping planting.
- B Protect, maintain and restore benchmarks, monuments, and other reference points affected by this work. If bench marks, monuments or other permanent reference points are displaced or destroyed, points shall be re-established and markers reset under supervision of a licensed surveyor who shall furnish Engineer with certification of his work.

### 3.06 PROTECTION OF EXCAVATION:

- A Excavation and grading operations shall be performed in a manner that will ensure positive and rapid surface run off of water away from the building area at all times.
- B Banks, slopes and adjacent structures shall be fully protected against harmful sluffing and erosion, by the use of shoring or other temporary construction, if necessary. The excavations shall be kept free of water by temporary dams or drains, pumping or other adequate means, until backfilling is completed.

### 3.07 STABILITY OF EXCAVATION

- A. General: Comply with local codes, ordinances, and requirements of agencies having jurisdiction.
- B. Slope sides of excavations to comply with local codes, ordinances, and requirements of agencies having jurisdiction. Shore and brace where sloping is not possible because of space restrictions or stability of material excavated. Maintain sides and slopes of excavations in safe condition until completion of backfilling.
- C. Shoring and Bracing: Provide materials for shoring and bracing, such as sheet piling, uprights, stringers, and cross braces, in good serviceable condition. Maintain shoring and bracing in excavations regardless of time period excavations will be open. Extend shoring and bracing as excavation progresses.
- D. Provide permanent steel sheet piling or pressure-creosoted timber sheet piling wherever subsequent removal of sheet piling might permit lateral movement of soil under adjacent structures. Cut off tops a minimum of 2'-6" below final grade and leave permanently in place.

### 3.08 BACKFILLING:

- A Excavation below the finished grade shall be backfilled after removing forms, shoring and similar temporary work and after waterproofing, piping, and other underground work has been installed, inspected and approved. Any caving of excavations or any backfill placed before inspections are completed shall be removed as the Engineer or Engineer may deem necessary.
- B Material and compaction of backfill for excavations in controlled fill shall conform to requirements specified for controlled fill.
- C Backfill material for use in areas to be seeded or planted shall be clean earth, free from large stones or rock fragments, large roots and debris, but may contain loam or similar organic matter. Backfill in these areas shall be compacted to a density that will prevent unsightly settlement after the finished grading is completed.
- D All backfill, not otherwise specified, shall be deposited in layers not over 10" loose thickness and each layer shall be compacted by light compaction equipment as it is placed.
- E Install porous backfill under concrete slabs on grade. Porous backfill thickness shall be not less than 4" under slabs. Where rock is excavated to 12 inches below concrete floor slabs on grade excavations shall be refilled from top of rock to bottom of slab with porous backfill.
- F Finish grade shall slope away from the structure on all sides.
- G After all turf, topsoil, roots, debris and other objectionable materials that would cause interference with the compaction of the fill have been removed, the area to be filled shall be scarified and broken to a depth of 8 inches. A thin layer, 3 inches thick, of the specified fill material shall be spread on the scarified base and the whole compacted as specified.
- H The fill shall be formed of successive horizontal layers of 6 to 8 inches loose depth deposited in windows and machine spread. Each layer shall be compacted to the percentage of maximum density at optimum moisture content specified by means of sheeps-foot rollers, or other approved



mechanical compacting machines. Where the fill is inaccessible to tamping rollers, it shall be consolidated and compacted by mechanical hand tampers.

- I During the fill operation, field compaction tests by means of the Ottawa Sand and Cone Method, ASTM D1556, or other acceptable method, shall be made as often as deemed necessary by the selected testing agency to determine the percent compaction of any completed layer. There shall be taken not less than one compaction test for every 900 square feet for each foot depth to fill. There shall be a representative of the testing agency present on site at all times when engineered fill is being placed. If such test shows failure to meet the required compaction due to insufficient moisture, too much moisture, insufficient rolling or other causes, the Contractor shall remedy the condition by bringing the material to optimum moisture content or by continued rolling and re-compaction. In no case shall the Contractor be permitted to continue filling if the underlying layers fail to meet compaction requirements.
- J The Contractor shall maintain drainage and dryness so that there will be no undue saturation of the fill while the work is in progress. If an area becomes saturated, the Contractor shall remove all soft materials, scarify and re-compact to the required density.
- K Fill in areas other than those where controlled fill is specified shall be earth fill compacted to a density of approximately ninety-five percent (95%) standard proctor to prevent harmful or unsightly settlement of the finished grade, but need not be tested for specific percentage of compaction.
- L Additional fill dirt shall be taken from on-site or off-site locations as agreed to by the Engineer. Any such borrow areas shall be smoothed and left finished with topsoil, fertilizer and seeded as specified.

### 3.09 ROUGH GRADING:

- A Do all grading inside building to bring subgrade to proper level at underside of floor slab.
- B Do all grading outside the building required to bring the site to the finished grades indicated on the drawings. Subgrade in areas to be seeded and planted shall be brought to within 5" of finished grades.
- C Sub-grades under walks and paved areas shall be brought to proper elevations at bottom of surfacing material to within two-tenths of one foot, plus or minus, of the required grades and profiles.
- D Grades not otherwise shown shall be uniform levels or slopes between points where elevations are given, or between such points and existing finished grades.

### 3.10 EXCAVATION FOR UTILITY TRENCHES:

- A Excavate trenches to indicated gradients, lines, depths, and elevations.
  - 1. In the absence of a local code requirement or standard detail, beyond building perimeter, excavate trenches to allow installation of top of pipe below frost line.
- B Excavate trenches to uniform widths to provide a working clearance on each side of pipe. Excavate trench walls vertically from trench bottom to 12 inches higher than top of pipe, unless otherwise indicated.
  - 1. Clearance: As indicated in standard detail or 12" minimum on each side of pipe if no detail is available.
- C Trench Bottoms: Excavate and shape trench bottoms to provide uniform bearing and support of pipes. Shape subgrade to provide continuous support for bells, joints, and barrels of pipes. Remove projecting stones and sharp objects along trench subgrade.

1. For ductile or cast iron pipe, hand-excavate trench bottoms and support pipe and conduit on an undisturbed subgrade.
2. For PVC or other flexible pipe provide 6" bedding layer of #57 stone.
3. For all pipe, excavate trenches 6" deeper than elevation required in rock or other unyielding bearing material to allow for #57 stone bedding layer. Provide specified stone.

### 3.11 UTILITY TRENCH BACKFILL:

- A Place and compact bedding course on trench bottoms where indicated as fill area on plans. Shape bedding course to provide continuous support for bells, joints, and barrels of pipes and for joints, fittings, and bodies of conduits.
- B Backfill trenches excavated under footings and within 18 inches of bottom of footings with concrete to elevation of bottom of footings.
- C Provide 4-inch-thick, concrete-base slab support for piping or conduit less than 30 inches below surface of roadways. After installing and testing, completely encase piping or conduit in a minimum of 4 inches of concrete before backfilling or placing roadway sub-base.
- D For typical site installation of ductile or cast iron pipe, place and compact initial backfill of sub-base material, free of particles larger than 1 inch, to a height of 12 inches over the utility pipe or conduit. Carefully compact material under pipe haunches and bring backfill evenly up on both sides and along the full length of utility piping to avoid damage or displacement of utility system. For PVC or other flexible pipe, backfill with #57 stone (or to plans specifications if differs) to 6" above top of pipe to provide complete stone envelope. Backfill to subgrade with #57 stone in all paved areas.
- E Coordinate backfilling with utilities testing.
- F Fill voids with approved backfill materials while shoring and bracing, and as sheeting is removed.
- G Place and compact final backfill of satisfactory soil material to final sub grade.
- H Install warning tape directly above utilities, 12 inches below finished grade, except 6 inches below subgrade under pavements and slabs.

### 3.12 FINE GRADING:

- A All areas where existing grass lawn cover is damaged or disturbed by construction operations. Areas indicated on the site plan to be grass shall be surfaced with topsoil not less than 5" thick after compacting. If the quantity of topsoil existing on the site is insufficient for these purposes, or if the existing topsoil does not conform to the requirements specified above for topsoil, additional topsoil shall be brought to the job or the existing topsoil shall be amended as required to provide the specified quantity and quality of topsoil.
- B After the rough grading and other construction operations have been completed to the point where these areas will not be disturbed by subsequent work, the subgrade shall be cleaned free from waste materials of all kinds, large rocks, and other objectionable material; scarified and pulverized to a depth of 4"; graded to remove remaining surface irregularities; and then covered with the topsoil which was previously removed and stockpiled.
- C If the previously stockpiled topsoil is not sufficient to cover the areas as specified, the Contractor shall furnish additional topsoil obtained from other sources. Topsoil obtained from other sources shall be clean, friable loam free from objectionable weed seeds.
- D Finished grades shall slope away from the building in all cases and shall contain no sinks or dams. Hand trim and rake topsoil to finished grades and leave ready for seeding or planting.

3.13 DISPOSAL OR SURPLUS MATERIAL AND VEGETATION:

- A Surplus dirt and rock not required for site improvements shall be removed from the site at the Contractor's expense and to a place of his choosing but only after the Engineer has determined it cannot be used on the site. The Owner shall be given the opportunity to keep surplus dirt on site to use as he sees fit. Only after the Owner has stated that they do not wish to retain surplus dirt shall it be removed from the site.
- B All vegetation, roots, trees, etc., are to be hauled away from the site and disposed of by the Contractor and at his expense.
- C Placement of any materials listed in Paragraphs A & B above on any off-site location shall be done only after prior approval of the Owner of the land involved and it shall be the full responsibility of the Contractor and Owner of such land to agree on location, distribution and condition in which such materials are left.

End of Section

## 31 25 00 - EROSION AND SEDIMENTATION CONTROL

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Work shall include, but not be limited to temporary and permanent erosion control systems and slope protection systems.

#### 1.02 RELATED DOCUMENTS

- A. Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.
- B. Additional requirements and information necessary to complete the Work of this Section may be found in other Documents, including but not limited to the project Storm Water Pollution Prevention Plan (SWPPP).

#### 1.02 SUBMITTALS

- A. Environmental Permit Requirements: Show compliance with all requirements of the Tennessee General NPDES Permit (TNR 100000) for Storm Water Discharges Associated with Construction Activity (CGP) and the project Storm Water Pollution Prevention Plan (SWPPP). Provide Engineer and the local Tennessee Department of Environment and Conservation (TDEC) Environmental Field Office (EFO) with copies of all required paperwork during and at the conclusion of the project. The Contractor is responsible for all maintenance, inspections, record keeping, and reporting.

#### 1.03 QUALITY ASSURANCE

- A. Personnel Qualifications: Inspections by the Contractor will be performed by personnel certified in the TDEC Level 1 Erosion Control Course.
- B. Performance: Protect adjacent properties and water resources from erosion and sediment damage throughout Work. Ensure compliance with applicable Federal, State, and local regulations related to erosion and sedimentation control.

### PART 2 - PRODUCTS

#### 2.01 MATERIALS

- A. All materials used for sediment and erosion control measures shall conform to the recommendations of the TDEC Erosion and Sediment Control Handbook, latest edition or the requirements of the local governing code agency; whichever is more stringent.
- B. See drawings for specific structural erosion control measures. The measures shown on the plans are a minimum. Contractor is to add, adjust and maintain structural controls as required to keep silt and dust from leaving the construction site.

### PART 3 - EXECUTION

#### 3.01 PREPARATION

- A. Examine the Storm Water Pollution Prevention Plan (SWPPP) and the Site Erosion and Sedimentation Control Drawings.
- B. Notify Engineer of deficiencies or changes in the SWPPP or Drawings required by current site conditions. Revisions of the Documents will be made as determined by the Engineer.

### 3.02 EROSION CONTROL AND SLOPE PROTECTION IMPLEMENTATION

- A. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to undisturbed areas and to adjacent properties and walkways, according to the Site Erosion and Sedimentation Control Drawings as well as the CGP and the SWPPP.
  - 1. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross tree- or plant- protection zones.
  - 2. Inspect, repair, and maintain erosion and sedimentation control measures during construction until permanent vegetation has been established.
  - 3. Clean, repair, and restore adjoining properties and roads affected by erosion and sedimentation from the project site during the course of the project.
  - 4. After final stabilization of the site, remove erosion and sedimentation controls and restore and stabilize areas disturbed during removal.
- B. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- C. Contractor shall limit where practical surface area of erodible earth material exposed by clearing and grubbing, excavation, borrow and embankment operations. Contractor shall provide immediate permanent or temporary pollution control measures.
- D. Provide permanent erosion control measures at earliest practical time to minimize requirement for temporary erosion controls. Permanently seed and mulch cut slopes as excavation proceeds.
- E. Maintain temporary erosion control systems installed by Contractor to control siltation at all times throughout Work. Provide maintenance or additional Work within 48 hours of notification by Engineer or other governing entities.
- F. Seed and mulch slopes that may be easily eroded. Application of temporary or permanent stabilization must be initiated within 14 days (7 days for slopes greater than 35%) to disturbed areas of a site where construction activities have temporarily or permanently ceased.

End of Section

## SECTION 31 31 16 – TERMITE CONTROL

### PART I GENERAL:

#### 1.01 SCOPE:

- A Furnish all labor, materials, tools, equipment, supervision, coordination, services, etc., required for complete execution of soil treatment for termite control as specified herein.

#### 1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions, and Division 1, General Requirements, apply to the work under this section.

#### 1.03 SUBMITTALS:

- A. Product Data: Submit general information, MSDS and EPA-Registered Label for all products.
- B. Product Certificates: For termite control products, signed by product manufacturer.
- C. Qualification Data: For Installer of termite control products.
- D. Soil Treatment Application Report: After application of termiticide is completed, submit report for Owner's record information, including the following:
  - 1. Date and time of application.
  - 2. Moisture content of soil before application.
  - 3. Brand name and manufacturer of termiticide.
  - 4. Quantity of undiluted termiticide used.
  - 5. Dilutions, methods, volumes, and rates of application used.
  - 6. Areas of application.
  - 7. Water source for application.

#### 1.04 QUALITY ASSURANCE:

- A. Installer Qualifications: A specialist who is licensed according to regulations of authorities having jurisdiction to apply termite control treatment and products in jurisdiction where Project is located, and who employs workers trained and approved by bait-station system manufacturer to install manufacturer's products.
- B. Regulatory Requirements: Formulate and apply termiticides according to the EPA-Registered Label.
- C. Source Limitations: Obtain termite control products from a single manufacturer for each product.

#### 1.05 PROJECT CONDITIONS:

- A. Environmental Limitations: To ensure penetration, do not treat soil that is water saturated or frozen. Do not treat soil while precipitation is occurring. Comply with requirements of the EPA-Registered Label and requirements of authorities having jurisdiction.

#### 1.06 COORDINATION:

- A. Coordinate soil treatment application with excavating, filling, grading, and concreting operations. Treat soil under footings, grade beams, and ground-supported slabs before construction.
- B. Apply borate treatment after framing, sheathing, and exterior weather protection is completed but before electrical and mechanical systems are installed.

1.07 WARRANTY:

A. Special Warranty: Manufacturer's standard form, signed by Applicator and Contractor certifying that termite control work, consisting of applied soil termiticide treatment, will prevent infestation of subterranean termites. If subterranean termite activity or damage is discovered during warranty period, re-treat soil and repair or replace damage caused by termite infestation.

1. Warranty Period: **Five** years from date of Substantial Completion.

1.08 MAINTENANCE SERVICE:

A. Continuing Service: Beginning at Substantial Completion, provide 12 months' continuing service including monitoring, inspection, and re-treatment for occurrences of termite activity. Provide a standard continuing service agreement. State services, obligations, conditions, and terms for agreement period; and terms for future renewal options.

PART II PRODUCTS

2.01 MANUFACTURERS:

A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Termiticides:

- a. Aventis Environmental Science USA LP; Termidor.
- b. Bayer Corporation; Premise 75 / Centerfire 75 WSP.
- c. Dow AgroSciences LLC; Dursban TC orEquity.
- d. FMC Corporation, Agricultural Products Group; Talstar, Prevail FT, Torpedo.
- e. Syngenta; Demon TC.

2.02 SOIL TREATMENT:

A. Termiticide: Provide an EPA-registered termiticide complying with requirements of authorities having jurisdiction, in an aqueous solution formulated to prevent termite infestation. Provide quantity required for application at the label volume and rate for the maximum termiticide concentration allowed for each specific use, according to product's EPA-Registered Label.

PART III EXECUTION

3.01 GENERAL:

A Perform application only after excavation, filling and grading operations are completed except as otherwise required in construction operations.

B Do not perform soil treatment to frozen or excessively wet soil, or during inclement weather.

3.02 EXAMINATION:

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for moisture content of soil, interfaces with earthwork, slab and foundation work, landscaping, and other conditions affecting performance of termite control.

1. Proceed with application only after unsatisfactory conditions have been corrected.

3.03 PREPARATION:

A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's written instructions for preparation before beginning application of termite control

treatment. Remove all extraneous sources of wood cellulose and other edible materials such as wood debris, tree stumps and roots, stakes, formwork, and construction waste wood from soil within and around foundations.

- B. Soil Treatment Preparation: Remove foreign matter and impermeable soil materials that could decrease treatment effectiveness on areas to be treated. Loosen, rake, and level soil to be treated except previously compacted areas under slabs and footings. Termiticides may be applied before placing compacted fill under slabs if recommended in writing by termiticide manufacturer.
  - 1. Fit filling hose connected to water source at the site with a backflow preventer, complying with requirements of authorities having jurisdiction.

### 3.04 APPLICATION, GENERAL:

- A. General: Comply with the most stringent requirements of authorities having jurisdiction and with manufacturer's EPA-Registered Label for products.

### 3.05 APPLYING SOIL TREATMENT:

- A. Application: Mix soil treatment termiticide solution to a uniform consistency. Provide quantity required for application at the label volume and rate for the maximum specified concentration of termiticide, according to manufacturer's EPA-Registered Label, to the following so that a continuous horizontal and vertical termiticidal barrier or treated zone is established around and under building construction. Distribute treatment evenly.
  - 1. Slabs-on-Grade and Basement Slabs: Under ground-supported slab construction, including footings, building slabs, and attached slabs as an overall treatment. Treat soil materials before concrete footings and slabs are placed.
  - 2. Foundations: Adjacent soil including soil along the entire inside perimeter of foundation walls, along both sides of interior partition walls, around plumbing pipes and electric conduit penetrating the slab, and around interior column footers, piers, and chimney bases; also along the entire outside perimeter, from grade to bottom of footing. Avoid soil washout around footings.
  - 3. Masonry: Treat voids.
  - 4. Penetrations: At expansion joints, control joints, and areas where slabs will be penetrated.
- B. Avoid disturbance of treated soil after application. Keep off treated areas until completely dry.
- C. Protect termiticide solution, dispersed in treated soils and fills, from being diluted until ground-supported slabs are installed. Use waterproof barrier according to EPA-Registered Label instructions.
- D. Post warning signs in areas of application.
- E. Reapply soil treatment solution to areas disturbed by subsequent excavation, grading, landscaping, or other construction activities following application. End of Section



## SECTION 32 12 18 – HOT-MIXED ASPHALT PAVING REPAIR

### PART I GENERAL

#### 1.01 SCOPE:

- A. Furnish all labor, material, equipment and services, including inspection, to install bituminous paving where shown on the drawings.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification sections, apply to this section.

Section	31 20 00	Earthwork
Section	03 30 00	Concrete

#### 1.03 SUBMITTALS:

- A. General: Submit the following in accordance with Conditions of the Contract and Division 1 Specification sections.
- B. Material Certificates signed by material producer and Contractor, certifying that each material item complies with or exceeds specified requirements.

#### 1.04 QUALITY ASSURANCE:

- A. Comply with City Highway Department standards for work in relation to city streets.
- B. Demonstrate drainage of finished paving to Engineer through the application of sprayed water to verify complete drainage and the absence of “bird baths”.

### PART II PRODUCTS

#### 2.01 MATERIALS:

- A. General: Use locally available materials and gradations that exhibit a satisfactory record of previous installations.
- B. Asphalt Cement: ASTM D 3381 for viscosity-graded material; ASTM D 946 for penetration-graded material.
- C. Tack Coat: ASTM D 977 or AASHTO M 140 emulsified asphalt as required. ASTM D 2397 or AASHTO M 208 cationic emulsified asphalt as required, slow setting, diluted in water, of suitable grade and consistency for application.
- D. Joint Sealant: ASTM D 6690 or AASHTO M 324, Type I hot-applied, single-component, polymer-modified bituminous sealant.
- E. Asphalt Binder Course: meet the specifications of TDOT, Section 307, Bituminous Plant Mix Base. The aggregates for the mixture shall meet the requirements for grading B Modified.
- F. Finishing Course:
  - 1. Hot-mix bituminous paving finish course shall meet the provisions of Section 411 (Grading E) of Tennessee Highway Department Specifications, 2006 Edition.
  - 2. Bitumen content shall be adequate to produce durable, water repellent surfaces, but not so great as to create undesirable bleeding.

## PART III EXECUTION

### 2.01 SITE CONDITIONS:

- A. Construct hot-mixed asphalt surface course when atmospheric temperature is above 40° F (4° C) and when base is dry. Base course may be placed when air temperature is above 30° F (minus 1° C) and rising.
  - 1. Tack Coat: Minimum surface temperature of 60 deg F (15.6 deg C).
- B. Grade Control: Establish and maintain required lines and elevations.
- C. Pavement-Marking Paint: Proceed with pavement marking only on clean, dry surfaces and at a minimum ambient or surface temperature of [40 deg F (4.4 deg C) for oil-based materials] [55 deg F (12.8 deg C) for water-based materials], and not exceeding 95 deg F (35 deg C).

### 3.02 SURFACE PREPARATION

- A. General: Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces. Ensure that prepared subgrade is ready to receive paving.
- B. Repairs: Remove paved areas that are defective or contaminated with foreign materials
  - 1. Pothole patching: Saw cut perimeter of patch and excavate existing pavement section to sound base. Excavate rectangular or trapezoidal patches, extending 12 inches (300 mm) into adjacent sound pavement, unless otherwise indicated. Cut excavation faces vertically. Remove excavated material. Recompact existing unbound-aggregate base course to form new subgrade.
- C. Immediately before placing asphalt materials, remove loose and deleterious material from substrate surfaces by power-brooming. Ensure that prepared subgrade is ready to receive paving.

### 3.03 MATERIALS PLACEMENT:

- A. Exercise care in applying bituminous materials to avoid smearing of adjoining concrete surfaces. Remove and clean damaged surfaces.
- B. Repairs:
  - 1. Patching: Partially fill excavated pavements with hot-mix asphalt base mix and, while still hot, compact. Cover asphalt base course with compacted, hot-mix surface layer finished flush with adjacent surfaces.
  - 2. Crack and Joint Filling: Remove existing joint filler material from cracks or joints to a minimum depth of 1/4 inch (6 mm) unless indicated otherwise on drawings.
    - a. Clean cracks and joints in existing hot-mix asphalt pavement.
    - b. Use emulsified-asphalt slurry to seal cracks and joints less than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.
    - c. Use hot-applied joint sealant to seal cracks and joints more than 1/4 inch (6 mm) wide. Fill flush with surface of existing pavement and remove excess.
- C. Placing Mix:
  - 1. General: Machine place hot-mixed asphalt mixture on prepared surface, spread uniformly and strike off. Spread mixture at minimum temperature of 225° F (107° C). Place areas

inaccessible to equipment by hand. Place each course to required grade, cross-section, and compacted thickness.

- a. Begin applying mix along centerline of crown for crowned sections and on high side of one-way slopes unless otherwise indicated.
  - b. Regulate paver machine speed to obtain smooth, continuous surface free of pulls and tears in asphalt-paving mat.
2. Finish Course: Finish course shall be installed to a compacted minimum thickness as noted on the drawings but not less than 1-1/2".
  3. Paver Placing: Place in strips not less than 10 feet side, unless otherwise acceptable to the Engineer. After first strip has been placed and rolled, place succeeding strips and extend rolling to overlap previous strips. Complete base course for a section before placing surface course.
  4. Immediately correct surface irregularities in finish course behind paver. Remove excess material forming high spots with shovel or lute.
  5. Joints: Make joints between old and new pavements, or between successive days work, to ensure continuous bond between adjoining work. Construct joints to have same texture, density, and smoothness as other sections of hot-mixed asphalt course.
- D. Joints: Ensure a continuous bond between adjoining paving sections. Construct joints free of depressions, with same texture and smoothness as other sections of hot-mix asphalt course.
1. Clean contact surfaces and apply tack coat to joints.
  2. Offset longitudinal joints, in successive courses, a minimum of 6 inches (150 mm).
  3. Offset transverse joints, in successive courses, a minimum of 24 inches (600 mm).
  4. Construct transverse joints at each point where paver ends a day's work and resumes work at a subsequent time. Construct these joints using either "bulkhead" or "papered" method according to AI MS-22, for both "Ending a Lane" and "Resumption of Paving Operations.
  5. Compact joints as soon as hot-mix asphalt will bear roller weight without excessive displacement.
  6. Compact asphalt at joints to a density within 2 percent of specified course density.
- E. Curbs: Construct concrete curbs over compacted binder course surfaces unless indicated otherwise on drawings.
- F. Rolling:
1. General: Begin rolling when mixture will bear roller weight without excessive displacement.
  2. Compact mixture with hot hand tampers or vibrating plate compactors in areas in accessible to rollers.
  3. Breakdown Rolling: Accomplish breakdown or initial rolling immediately following rolling of joints and outside edge. Check surface after breakdown rolling and repair displaced areas by loosening and filling, if required, with hot material.
  4. Second Rolling: Follow breakdown rolling as soon as possible, while mixture is hot. Continue second rolling until mixture has been evenly compacted.
  5. Finish Rolling: Perform finish rolling while mixture is still warm enough for removal of roller marks. Continue rolling until roller marks are eliminated and course has attained a minimum of 92 percent laboratory density, maximum theoretical density as determined by ASTM D 2041, but not less than 90 percent nor greater than 96 percent.

6. Patching: Remove and replace paving areas mixed with foreign materials and defective areas. Cut out such areas and fill with fresh, hot-mixed asphalt. Compact by rolling to specified surface density and smoothness.
7. Protection: After final rolling, do not permit vehicular traffic on pavement until it has cooled and hardened.
8. Erect barricades to protect paving from traffic until mixture has cooled enough not to become marked.

#### 3.04 TRAFFIC AND LANE MARKINGS:

- A. Cleaning: Sweep and clean surface to eliminate loose material and dust.
- B. Do not apply traffic and lane marking paint until layout and placement have been verified with the Engineer.
- C. Apply paint with mechanical equipment to produce uniform, straight edges. Apply at manufacturer's recommended rates to provide minimum 12 to 15 mils dry thickness. Lot striping shall be painted with 4" wide stripes.
  1. Color: White (Blue for Handicapped Parking Symbols)

#### 3.05 PRECAST CONCRETE WHEEL STOPS:

- A. Secure wheel stops to pavement with galvanized steel dowels.

#### 3.06 FIELD QUALITY CONTROL:

- A. Testing: If the Engineer suspects that the paving does not conform to the thicknesses specified he may require up to six (6) test cores be taken in locations of his determination. If test cores indicate non-compliance with the specifications, the areas in nonconformance shall be replaced. If the initial tests indicate non-compliance with the specifications, additional test cores will be required. The number and location of tests to be as directed by the Engineer. Patch all test core locations.
- B. Thickness: In-place compacted thickness tested in accordance with ASTM D 3549 will not be acceptable if exceeding following allowable variations:
  1. Binder Course: Plus or minus 1/2-inch.
  2. Finish Course: Plus or minus 1/4-inch.
- C. Surface Smoothness: Test finished surface of each hot-mixed asphalt course for smoothness, using 10-foot straightedge applied parallel with and at right angles to centerline of paved area. Surfaces will not be acceptable if exceeding the following tolerances for smoothness:
  1. Base Course Surface: 1/4-inch.
  2. Wearing Course Surface: 3/16-inch.
  3. Crowned Surfaces: Test with crowned template centered and at right angle to crown. Maximum allowable variance from template is 1/4-inch.
  4. Check surface areas at intervals as directed by the Engineer.
- D. Conformance with Grades and Drainage: Compare paved surfaces to grades as shown on the Construction Documents. Surface shall conform with slopes indicated on the documents and shall be free draining with no impounded areas. Provide tape measure and construction level to verify slopes questioned by Engineer. Provide water hose and water supply for drainage testing.

End of Section

## SECTION 32 13 13 - CONCRETE PAVING

### PART 1 - GENERAL

#### 1.01 SUMMARY

- A. Section Includes
  - 1. Concrete Paving.
  - 2. Concrete Curbs.
- B. RELATED SECTIONS
  - 1. Section 312000 - Earthwork

#### 1.02 SUBMITTALS

- A. Submit product data for the following:
  - 1. Fiber reinforcement.
  - 2. Expansion joint filler.
  - 3. Curing compound.
  - 4. Joint sealant.
  - 5. High-range water-reducing admixture.
- B. Design Mixtures: For each concrete paving mixture. Include alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments.
- C. Submit fiber reinforcement manufacturer's batching and mixing instructions.
- D. Submit certificate prepared by the concrete supplier stating that the approved fiber reinforcement materials were added in the proper proportions to each batch of concrete. Submit batch delivery ticket indicating fiber reinforcement quantity.
- E. Submit under provisions of Section 01300.

#### 1.03 QUALITY ASSURANCE

- A. Ready-Mix-Concrete Manufacturer Qualifications: A firm experienced in manufacturing ready-mixed concrete products and that complies with ASTM C 94/C 94M requirements for production facilities and equipment.
- B. ACI Publications: Comply with ACI 301 (ACI 301M) unless otherwise indicated.

### PART 2 – PRODUCTS

#### 2.01 ACCEPTABLE MANUFACTURERS

- A. For each product, one of the listed manufacturers.
- B. Fiber Reinforcement:
  - 1. Forta Corporation.
  - 2. Fibermesh Company.
  - 3. Durafiber Group.
- C. Curing Compound:

1. Sonneborn Building Products.
  2. Euclid Chemical Co.
  3. W.R. Meadows.
  4. L&M Construction Chemicals.
  5. W.R. Grace Construction Products.
- D. Joint Sealant:
1. Sonneborn Building Products.
  2. Pecora Corporation.
  3. Tremco.
- E. High-Range Water-Reducing Admixture:
1. Master Builders.
  2. Euclid Chemical Co.
  3. Sika Chemical Company.
  4. Chem-Masters Corp.
  5. W.R. Grace Construction Products.
- F. No substitutions, except under provisions of Section 01600.

## 2.02 STEEL REINFORCEMENT

- A. Plain-Steel Welded Wire Reinforcement: ASTM A 185/A 185M – 6x6, fabricated from as-drawn steel wire into flat sheets.
- B. Deformed-Steel Welded Wire Reinforcement: ASTM A 497/A 497M, flat sheet.
- C. Reinforcing Bars: ASTM A 615/A 615M, Grade 60 (Grade 420); deformed.
- D. Plain-Steel Wire: ASTM A 82/A 82M, as drawn.
- E. Deformed-Steel Wire: ASTM A 496/A 496M.
- F. Dowel Bars: ASTM A 615/A 615M, Grade 60 (Grade 420) plain-steel bars; zinc coated (galvanized) after fabrication according to ASTM A 767/A 767M, Class I coating. Cut bars true to length with ends square and free of burrs.
- G. Bar Supports: Bolsters, chairs, spacers, and other devices for spacing, supporting, and fastening reinforcing bars, welded wire reinforcement, and dowels in place. Manufacture bar supports according to CRSI's "Manual of Standard Practice" from steel wire, plastic, or precast concrete of greater compressive strength than concrete specified.

## 2.03 CONCRETE MATERIALS

- A. Cementitious Material: Use the following cementitious materials, of same type, brand, and source throughout Project:
  1. Portland Cement: ASTM C 150, gray portland cement.
    - a. Fly Ash: ASTM C 618.
    - b. Ground Granulated Blast-Furnace Slag: ASTM C 989, Grade 100 or 120.
  2. Blended Hydraulic Cement: ASTM C 595.
- B. Normal-Weight Aggregates: ASTM C 33 uniformly graded. Provide aggregates from a single source.

- C. Water: Potable and complying with ASTM C 94/C 94M.
- D. Air-Entraining Admixture: ASTM C 260.
- E. Chemical Admixtures: Admixtures certified by manufacturer to be compatible with other admixtures and to contain not more than 0.1 percent water-soluble chloride ions by mass of cementitious material.

#### 2.04 FIBER REINFORCEMENT

- A. Synthetic Fiber: Monofilament or fibrillated polypropylene fibers engineered and designed for use in concrete paving, complying with ASTM C 1116/C 1116M, Type III.

#### 2.05 CURING MATERIAL

- A. Absorptive Cover: AASHTO M 182, Class 3, burlap cloth made from jute or kenaf, weighing approximately 9 oz./sq. yd. (305 g/sq. m) dry or cotton mats.
- B. Moisture-Retaining Cover: ASTM C 171, polyethylene film or white burlap-polyethylene sheet.
- C. Water: Potable.
- D. Evaporation Retarder: Waterborne, monomolecular, film forming, manufactured for application to fresh concrete.
- E. Clear, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class B, dissipating.
- F. White, Waterborne, Membrane-Forming Curing Compound: ASTM C 309, Type 2, Class B, dissipating.

#### 2.06 RELATED MATERIALS

- A. Joint Fillers: ASTM D 1751, asphalt-saturated cellulosic fiber or ASTM D 1752 – limestone color.
- B. Slip-Resistive Aggregate Finish: Factory-graded, packaged, rustproof, nonglazing, abrasive aggregate of fused aluminum-oxide granules or crushed emery aggregate containing not less than 50 percent aluminum oxide and not less than 20 percent ferric oxide; unaffected by freezing, moisture, and cleaning materials.

#### 2.07 CONCRETE MIXTURES

- A. Prepare design mixtures, proportioned according to ACI 301 (ACI 301M), with the following properties:
  1. Compressive Strength (28 Days): 4000 psi (27.6 MPa).
  2. Cement Content: 560 lbs. per cu. yd. minimum
  3. Coarse Aggregate: 1 ½" maximum size.
  4. Slump Limit: 4 inches (100 mm).
  5. Air Content: 5 percent.
- B. Chemical Admixtures: Use admixtures according to manufacturer's written instructions.
- C. Synthetic Fiber: Uniformly disperse in concrete mixture at manufacturer's recommended rate, but not less than [1.5 lb/cu. yd.

#### 2.08 CONCRETE MIXING

- A. Ready-Mixed Concrete: Measure, batch, and mix concrete materials and concrete according to

ASTM C 94/C 94M[ and ASTM C 1116/C 1116M]. Furnish batch certificates for each batch discharged and used in the Work.

#### 2.09 SOURCE QUALITY CONTROL

- A. Testing will be performed under provisions of Section 01400.
- B. Test concrete for:
  - 1. Compressive strength.
  - 2. Slump.
  - 3. Air content.
- C. Perform number of tests and follow testing procedures in accordance with ASTM C94.

#### 2.10 MACHINE-FORMED CURBS

- A. Curb: Profile to match Stephens-Canfield Mold T-2, or as per county highway department.

### PART 3 - EXECUTION

#### 3.01 EXAMINATION AND PREPARATION

- A. Ensure compacted subgrade is proper to support paving.
- B. Ensure gradients and elevations of subgrade are correct.
- C. Proof roll prepared subgrade to check for unstable areas and areas requiring additional compaction.
- D. Do not begin paving work until deficient subgrade areas have been corrected and are ready to receive paving.
- E. Remove loose material from compacted subbase surface immediately before placing concrete.
- F. Dampen subgrade with water prior to concreting to minimize absorption of water from fresh concrete.
- G. Do not place concrete over standing water, or muddy or soft spots.

#### 3.02 EDGE FORMS AND SCREED CONSTRUCTION

- A. Construct to maintain tolerances and prevent movement from pressure of concrete or impact of finishing equipment.
- B. Set forms to required grades and lines, within following tolerances:
  - 1. Top of forms not more than 1/8" in 10 ft.
  - 2. Vertical face not more than 1/4" in 10 ft.
- C. Set, brace, and secure edge forms, bulkheads, and intermediate screed guides to required lines, grades, and elevations. Install forms to allow continuous progress of work and so forms can remain in place at least 24 hours after concrete placement.
- D. Clean forms after each use and coat with form-release agent to ensure separation from concrete without damage.

#### 3.03 SETTING REINFORCEMENT



- A. Place reinforcement at mid-height of slabs. Interrupt reinforcement at expansion joints.
- B. Comply with CRSI's "Manual of Standard Practice" for fabricating, placing, and supporting reinforcement.

### 3.04 JOINTS

- A. Provide expansion or isolation joints between pavement and building, curb, and other fixed objects.
  - 1. Provide other expansion joints as shown on the drawings.
  - 2. Provide thickened edge each side of joint. Provide joint filler full depth of slab; place top 1/2" below finished surface.
  - 3. Where indicated as doweled joint, omit thickened edge and provide 3/4" dowels, 14" long, 12" o.c. Lubricate one half of length and provide dowel expansion cap.
- B. Provide longitudinal construction joints at edges of paving lines as shown on the drawings.
  - 1. Where indicated as tied joint, provide butt joint formed bulkhead with No. 4 tie bars, 30" long, 30" o.c.
  - 2. Provide keyway joints at other locations.
- C. Provide transverse construction joints at end of placement and at locations where placement is stopped for a period of more than 1/2 hour, other than at expansion joints.
  - 1. Where joints occur at planned control joint locations, provide butt joint formed bulkhead with 3/4" dowels, 14" long, at 12" o.c. Lubricate one half of length.
  - 2. At other locations, provide keyway joint with No. 4 tie bars, 30" long, 30" o.c.
- D. Provide control, or contraction, joints to section concrete into areas shown on the drawings.
  - 1. Joints may, at Contractor's option, be formed by hand, or sawed.
- E. After initial floating, tool edges of paving, gutters, curbs and joints in concrete with an edging tool to a 3/8" radius. Repeat tools of edges after applying surface finishes. Eliminate edging-tool marks on concrete surfaces.
- F. Clean joints more than 1/4" wide and fill with sealant.

### 3.05 CONCRETE PLACEMENT

- A. Moisten subbase to provide a uniform dampened condition at time concrete is placed.
- B. Comply with ACI requirements for measuring, mixing, transporting, placing, and consolidating concrete.
- C. Deposit and spread concrete in a continuous operation between transverse joints. Do not push or drag concrete into place or use vibrators to move concrete into place.
- D. Screed paving surface with a straightedge and strike off.
- E. Commence initial floating using bull floats or darbies to impart an open-textured and uniform surface plane before excess moisture or bleed water appears on the surface. Do not further disturb concrete surfaces before beginning finishing operations or spreading surface treatments.
- F. Place machine formed curbs over pavement aggregate base by automatic machine.
- H. Provide expansion joints in cast-in-place curbs at same locations as joints in adjacent walk.

### 3.06 FLOAT FINISHING

- A. General: Do not add water to concrete surfaces during finishing operations.
- B. Float Finish: Begin the second floating operation when bleed-water sheen has disappeared and concrete surface has stiffened sufficiently to permit operations. Float surface with power-driven floats or by hand floating if area is small or inaccessible to power units. Finish surfaces to true planes. Cut down high spots and fill low spots. Refloat surface immediately to uniform granular texture.
  - 1. Medium-to-Fine-Textured Broom Finish: Draw a soft-bristle broom across float-finished concrete surface perpendicular to line of traffic to provide a uniform, fine-line texture.
- C. Slip-Resistive Aggregate Finish: Before final floating, spread slip-resistive aggregate finish on paving surface according to manufacturer's written instructions.
  - 1. Cure concrete with curing compound recommended by slip-resistive aggregate manufacturer. Apply curing compound immediately after final finishing.
  - 2. After curing, lightly work surface with a steel wire brush or abrasive stone and water to expose nonslip aggregate.
- D. Trowel top and face of curb. Provide a final fine brush finish to top and face of curb with brush strokes parallel to line of curb.

### 3.07 CONCRETE PROTECTION AND CURING

- A. General: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures.
- B. Comply with ACI 306.1 for cold-weather protection.
- C. Evaporation Retarder: Apply evaporation retarder to concrete surfaces if hot, dry, or windy conditions cause moisture loss approaching 0.2 lb/sq. ft. x h (1 kg/sq. m x h) before and during finishing operations. Apply according to manufacturer's written instructions after placing, screeding, and bull floating or darbying concrete but before float finishing.
- D. Begin curing after finishing concrete but not before free water has disappeared from concrete surface.
- E. Curing Methods: Cure concrete by moisture curing, moisture-retaining-cover curing, curing compound or a combination of these.
- F. Exclude all foot traffic from pavement for at least 3 days and exclude truck traffic for at least 14 days after placement or as necessary to maintain integrity of finish.

### 3.08 PAVING TOLERANCES

- A. Comply with tolerances in ACI 117 and as follows:
  - 1. Elevation: 3/4 inch.
  - 2. Thickness: Plus 3/8 inch, minus 1/4 inch.
  - 3. Surface: Gap below 10-foot-long, unlevelled straightedge not to exceed 1/2 inch.
  - 4. Joint Spacing: 3 inches.
  - 5. Contraction Joint Depth: Plus 1/4 inch, no minus.
  - 6. Joint Width: Plus 1/8 inch, no minus.

### 3.09 REPAIRS AND PROTECTION

- A. Remove and replace concrete paving that is broken, damaged, or defective or that does not comply with requirements in this Section. Remove work in complete sections from joint to joint unless otherwise approved by project manager.
- B. Protect concrete paving from damage. Exclude traffic from paving for at least 14 days after placement. When construction traffic is permitted, maintain paving as clean as possible by removing surface stains and spillage of materials as they occur.
- C. Maintain concrete paving free of stains, discoloration, dirt, and other foreign material. Sweep paving not more than two days before date scheduled for Substantial Completion inspections.

End of Section

## SECTION 32 92 00 – SEEDING

### PART I GENERAL

#### 1.01 SCOPE:

- A. The work covered by this Section consists of furnishing all labor, equipment and materials required to place seed, commercial fertilizer, agricultural limestone and mulch material, including seed bed preparation, harrowing, compacting and other placement operations on graded earthen areas as described herein and shown on the Drawings. In general, seeding operations shall be conducted on all barren areas not covered by structures or pavement; all cleared or grubbed areas which remain as finish grade surfaces; and on all existing turf areas which are disturbed by construction operations and which are to remain as finish grade surfaces.
- B. The General Contractor shall be responsible for placing all topsoil on the site to within finish grade. The Landscape Contractor shall be responsible for finish grading, seeding and other operations as herein specified.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 QUALITY ASSURANCE:

- A. Prior to seeding, the Contractor shall furnish to the Engineer labels or certified laboratory reports showing the analysis and germination of the seed to be furnished. Acceptance of the seed test reports shall not relieve the Contractor of any responsibility or liability for furnishing seed meeting the requirements of this Section.

#### 1.04 PROJECT CONDITIONS:

- A. Protect existing utilities, paving and other facilities from damage caused by seeding operations.
- B. Perform seeding work only after grading and other work affecting ground surface has been completed.
- C. Restrict traffic from lawn areas until grass is established.
- D. Provide hose and lawn watering equipment as required.

#### 1.05 WARRANTY:

- A. Provide a uniform stand of grass until the end of the Warranty Period, which is a period of one year from Acceptance of Work by the Owner. Any areas which are designated by the Engineer as being unacceptable shall be re-seeded as specified herein until an acceptable stand of grass is established.

### PART II PRODUCTS

#### 2.01 SEED:

- A. Seed shall be delivered in new bags or bags that are sound and labels in accordance with the U.S. Department of Agriculture Federal Seed act.
- B. All seed shall be from the last crop available at the time of purchase and shall not be moldy, wet or otherwise damaged in transit or storage.

- C. Seed shall bear growers analysis testing to a 95% minimum purity and 90% minimum germination.
- D. Species, rate of seeding, fertilization and other requirement are shown in the seed requirements table:

**SEED REQUIREMENTS TABLE**  
(Rate per 1000 sq. ft.)

<u>Area</u>	<u>Seed Type</u>	<u>Seed Quantity</u>	<u>Fertilizer</u>	<u>Fertilizer Quantity</u>
Lawn Areas	Kentucky 31 Fescue	5 lbs.	10-10-10	40 lbs.

2.02 FERTILIZER:

- A. Container bags shall have the name and address of manufacturer, brand, name weight and chemical composition. Containers shall insure proper protection in handling, transporting and storing the fertilizer.

2.03 LIMING:

- A. Limestone shall be a pulverize limestone having a carbonate content of not less than 85% by weight. The limestone shall be crushed so that at least 85% of the material passes a No. 10 mesh screen and 50% passes No. 40 mesh screen. Apply at a rate of 135 lbs. per 1000 sq. ft.

2.04 MULCH:

- A. Mulch shall be one of the following used at the specified rate:

1. Wood Cellulose Fiber 1,500 lbs. per acre
2. Straw 4,000 lbs. per acre

2.05 WATER:

- A. Free of substance harmful to seed growth. Furnished by Contractor. Hoses or other methods of watering furnished by Contractor.

2.06 EROSION CONTROL BLANKET:

- A. Wood excelsior blanket reinforced with a photo-degradable plastic grid similar and equal to Curlex Excelsior blanket by the American Excelsior Company or approved equal.

**PART III EXECUTION**

3.01 SEED BED PREPARATION:

- A. Before fertilizing and seeding, the surfaces shall be trimmed and worked to true line free from variation, bumps, ridges and depressions, and all foreign materials including roots, rocks and debris removed.
- B. The soil surface to be seeded shall be thoroughly cultivated to a minimum depth of 4 inches with a weighted disk, tiller or other equipment.
- C. If the prepared surface becomes eroded, compacted, or wet due to rain or other occurrence, the surface shall be re-cultivated prior to seeding.
- D. Ground preparation operations shall be preformed only when the ground is in a tillable and workable condition, as determined by the Engineer.

E. Allowance for settlement shall be made.

3.02 FERTILIZER AND LIMING:

- A. Following seed bed preparation, fertilizer and lime shall be incorporated at the rates specified herein in the top 2 inches of the soil by disking or other measure.
- B. Fertilizer need not be incorporated in the soil when hydro-seeding is used in seeding operations.

3.03 SEEDING:

- A. Examine finish surfaces, grades, topsoil quality and depth. Do not start seeding work until unsatisfactory conditions are corrected.
- B. Seed of the specified group shall be sown as soon as the seed bed preparation is complete. Do not seed during windy conditions.
- C. Seeds shall be uniformly sown by approved mechanical method, preferably a broadcast type spreader. Hydro-seeding is an acceptable method of distribution of seed and fertilizer.
- D. Immediately after sowing by mechanical means, the seed shall be lightly with soil covered by a cultipacker or roller.

3.04 MULCHING:

- A. All seeded areas shall be uniformly mulched in a continuous blanket immediately after seeding. Approximately twenty five percent (25%) of the ground surface shall be visible through the mulch blanket. Mulches shall be applied at the rates as specified herein.

3.05 WATERING:

- A. Contractor shall be responsible for watering the seeded areas until a satisfactory stand of grass is obtained. Watering shall be done with sprinklers in such a manner as not to cause excessive runoff or erosion.

3.06 INSTALLATION OF EROSION CONTROL BLANKET:

- A. Install erosion control blanket on all slopes steeper than 3 run to 1 rise. Install blanket after seed has been placed. Apply blankets vertically to slopes butt ends and sides. Fasten

3.07 HYDROSEEDING:

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.
  - 1. Mix Slurry with non-asphaltic tackifier.
  - 2. Apply slurry uniformly to all areas to be seeded in a 1-step process. Apply mulch at the minimum rate of 1500lb per acre (16.5 kg per 100 sq. m) dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.08 MAINTENANCE:

- A. Contractor shall submit typewritten instructions (prior to acceptance) recommending procedures to be established by the Owner for the maintenance of lawns for one full year.
- B. Maintain seeded lawn areas, including watering, spot weeding, mowing, applications of herbicides, fungicides, insecticides, and re-seeding until a full, uniform stand of grass free of

weeds, undesirable grass species, disease and insects is achieved and accepted by the Engineer.

1. Water daily to maintain adequate surface soil moisture for proper seed germination. Continue daily watering for not less than thirty (30) days. Thereafter apply 1/2" of water twice weekly until acceptance.
  2. Repair, rework and re-seed all areas that have washed out, are eroded, or do not catch.
  3. Mow lawn areas as soon as lawn top growth reaches a 3" height. Cut back to 2" in height. Repeat mowing as required to maintain specified height.
- C. Maintain seeded banks, ditches, medians and fields to the extent of establishment only. Re-grade and re-seed washed out or eroded areas as required until a suitable cover is established.

3.09 SUBSTANTIAL COMPLETION:

- A. An inspection of the seeded lawns will be made by the Engineer upon request for Application of Substantial Completion by the Contractor
- B. Seeded areas will be acceptable provided all requirements, including maintenance have been complied with, and a healthy, uniform close stand of specified grass is established free of weeds, undesirable grass species, disease and insects.
- C. No individual lawn areas shall have bare spots or unacceptable cover totaling more than two percent (2%) of the individual areas, in areas requested to be inspected.

3.10 CLEANING:

- A. Perform cleaning during installation of the work and upon completion of the work. Remove from site all excess materials, debris, and equipment. Repair damage resulting from seeding operations.

End of Section

## SECTION 329250 - TEMPORARY SEEDING

### PART I GENERAL

#### 1.01 SCOPE:

- A. The work covered by this Section consists of furnishing all labor, equipment and materials required to place seed, commercial fertilizer, and mulch material for temporary grass cover of disturbed soil areas of site. In general, seeding operations shall be conducted on all barren areas not covered by pavement or stone working pad; all cleared or grubbed areas which remain as finish grade surfaces; and on all existing turf areas which are disturbed by construction operations an which are to remain as finish grade surfaces.
- B. The Earthwork Contractor shall be responsible for placing all seeding and other operations as herein specified.

#### 1.02 RELATED DOCUMENTS:

- A. Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

#### 1.03 PROJECT CONDITIONS:

- A. Protect existing utilities, paving and other facilities from damage caused by seeding operations.
- B. Perform seeding work only after grading and other work affecting ground surface has been completed to a point where rough grades are established and will remain during building construction.
- C. Restrict traffic from lawn areas until grass is established.
- D. Provide hose and lawn watering equipment as required.

### PART II PRODUCTS

#### 2.01 SEED:

- A. Seed mix shall be 40% Kentucky 31 Fescue and 60% Annual Rye Grass.
- B. Seed shall be delivered in new bags or bags that are sound and labeled in accordance with the U.S. Department of Agriculture Federal Seed Act.
- C. All seed shall be from the last crop available at the time of purchase and shall not be moldy, wet or otherwise damaged in transit or storage.
- D. Seed shall bear growers analysis testing to a 95% minimum purity and 90% minimum germination.
- E. Species, rate of seeding, fertilization and other requirement are shown in the seed requirements table:



## SEED REQUIREMENTS TABLE

<u>Area</u>	<u>Seed Type</u>	<u>Seed rate per 1000 sq. ft.</u>	<u>Fertilizer</u>	<u>Fertilizer rate per 1000 sq. ft.</u>
Exposed soil Areas	Kentucky 31 Fescue and Rye Grass mix	5 lbs.	10-10-10 lbs.	5 lbs.

### 2.02 FERTILIZER:

- A. Commercial fertilizer shall be ready mixed material and shall be 10-10-10.
- B. Container bags shall have the name and address of manufacturer, brand, name weight and chemical composition. Containers shall insure proper protection in handling, transporting and storing the fertilizer.

### 2.03 MULCH:

- A. Mulch shall be one of the following used at the specified rate:

- 1. Wood Cellulose Fiber      750 lbs. per acre
- 2. Straw                              1500 lbs. per acre

### 2.04 WATER:

- A. Free of substance harmful to seed growth. Furnished by Contractor. Hoses or other methods of watering furnished by Contractor.

## PART III EXECUTION

### 3.01 PREPARATION OF SUBGRADE (if not prepared by General Contractor)

- A. The subsoil shall be graded and uniformly compacted so that it will be parallel but below the proposed finished grade. All subgrade material heavily compacted by construction traffic shall be loosened to a depth of 4 inches.

### 3.02 FERTILIZER:

- A. Following seed bed preparation, fertilizer shall be incorporated at the rates specified herein in the top 2 inches of the soil by disking or other measure.

### 3.03 SEEDING:

- A. Seed of the specified group shall be sown as soon as the seed bed preparation is complete. Do not seed during windy conditions.
- B. Seeds shall be uniformly sown by approved mechanical method, preferably a broadcast type spreader or by hydro seeding. Hydro-seeding is the preferred method of distribution of seed and fertilizer.
- C. Immediately after sowing by mechanical means, the seed shall be covered with mulch.

3.04 MULCHING:

- A. All seeded areas shall be uniformly mulched in a continuous blanket immediately after seeding. Approximately 25% of the ground surface shall be visible through the mulch blanket. Mulches shall be applied at the rates as specified herein.

3.05 WATERING:

- A. Contractor shall be responsible for watering the seeded areas until a satisfactory stand of grass is obtained. Watering shall be done with sprinklers in such a manner as not to cause excessive runoff or erosion.

3.06 HYDROSEEDING:

- A. Hydroseeding: Mix specified seed, fertilizer, and fiber mulch in water, using equipment specifically designed for hydroseed application. Continue mixing until uniformly blended into homogenous slurry suitable for hydraulic application.

1. Mix Slurry with nonasphaltic tackifier.
2. Apply slurry uniformly to all areas to be seeded in a 1-step process. Apply mulch at the minimum rate of 1200lb per acre (16.5 kg per 100 sq. m) dry weight but not less than the rate required to obtain specified seed-sowing rate.

3.07 MAINTENANCE:

- A. Maintain seeded banks, ditches, medians and fields to the extent of establishment only. Re-grade and re-seed washed out or eroded areas as required until a suitable cover is established and for 90 days after substantial completion of the project.

End of Section

SECTION 32 93 00 – LANDSCAPING

1 PART I GENERAL

1.01 SCOPE:

- A This section includes furnishing all materials, equipment, and labor necessary for placement of topsoil in all planting areas including backfilling of curbs, walks, and around building, soil treatment; planting of trees, shrubs and vines; protection, maintenance, guarantee and replacement of plants. All existing landscaping to remain shall have weeds removed and shall be mulched.
- B Before commencing any work required by this section, the Landscape Contractor shall ascertain the location of all utilities, subsurface drainage and underground construction so that proper precautions may be taken not to disturb or damage any subsurface improvements. This Contractor will be held responsible for making, at his own expense, all repairs to damaged utilities resulting from the work hereunder.

1.02 RELATED DOCUMENTS:

- A Applicable provisions of the General Conditions, Supplementary Conditions and Division 1, General Requirements, apply to the work under this section.

Section 32 92 00 Seeding

1.03 QUALITY ASSURANCE:

- A. Installer Qualifications: A qualified landscape Installer whose work has resulted in successful establishment of plants.
  - 1. Professional Membership: Installer shall be a member in good standing of either the Professional Landcare Network or the American Nursery and Landscape Association.
  - 2. Experience: Five years' experience in landscape installation in addition to requirements in Division 01 Section "Quality Requirements."
  - 3. Installer's Field Supervision: Require Installer to maintain an experienced full-time supervisor on Project site when work is in progress.
  - 4. Personnel Certifications: Installer's field supervisor shall have certification in one of the following categories from the Professional Landcare Network:
    - a. Certified Landscape Technician - Exterior, with installation specialty area(s), designated CLT-Exterior.
    - b. Certified Ornamental Landscape Professional, designated COLP.
- B General: Ship landscape materials with certificates of inspection required by governing authorities. Comply with regulations applicable to landscape materials.
- C Do not make substitutions. If specified landscape material is not obtainable, submit proof of non-availability from a minimum of six suppliers to the Designer, together with proposal for use of equivalent material.
- D Analysis and Standards: Deliver packaged materials in containers showing weight, analysis, and name of manufacturer. Protect materials from deterioration during delivery, and while stored at the site. For other materials, provide analysis by recognized laboratory made in accordance with methods established by the Association of Official Agriculture Chemists, wherever applicable.
- E Topsoil: Before delivery of topsoil, furnish Designer with written statement giving location of properties which topsoil is to be obtained. Submit laboratory proof of minimum 5% organic matter content in topsoil.
- F Trees, Shrubs and Plants: Provide trees, shrubs and plants of quantity, size, genus, species and variety shown and scheduled for landscape work complying with the requirements of ANSI Z60.1

“American Standard for Nursery Stock”, and American Association of Nurserymen Standards for Nursery Stock, current edition. Such standards will be considered as MINIMUM ACCEPTABLE and Contractor will be expected to provide plants which can be considered to have a quality which is higher than minimum acceptable.

- G Inspection: The designer may inspect trees and shrubs either at place of growth or at site before planting, for compliance with requirements for genus, species, variety, size and quality. Designer retains the right to further inspect trees and shrubs for size and condition of root ball, insects, injuries and latent defects and to reject unsatisfactory or defective material at any time during progress of work. Rejected material must be immediately removed from the project site.

#### 1.04 SUBMITTALS:

- A Certification: Submit certificates of inspection as required by governmental agencies. Submit manufacturer’s certified analysis for soil amendments and fertilizers.
- B Planting Schedule: submit proposed planting schedule, indicating dates for each type of landscape work during normal seasons for such work in area of site. Correlate with specified maintenance periods to provide maintenance from date of substantial completion. Once accepted, revise dates only as approved in writing, after documentation of reasons for delays.
- C Maintenance Instruction: Submit typewritten instructions recommending procedures to be established by Owner for maintenance of landscape work for one full year. Submit prior to expiration of required maintenance period.

#### 1.05 DELIVERY, STORAGE, AND HANDLING:

- A All plants shall be packed, transported and handled with the care necessary to insure protection from injury. Plants shall be handled by their root zones only. They must not be dropped, thrown or otherwise roughly handled. All broken or damaged root balls, damaged containers or injured plants shall be rejected.
- B Plants in transport shall be fastened and secured in a manner that does not damage plant. Plants shall be protected from freezing, overheating, or excessive transpiration. All plants must be transported in a closed or tarp-covered vehicle or an open vehicle traveling less than 35 miles per hour. Anti-desiccant is permitted if used according to manufacturer’s direction. The use of such a product does not constitute protection from heat, cold or wind.
- C Interim Storage: Plants not installed immediately upon their arrival at the site shall be stored in the proper manner as follows:
  1. Balled and burlapped plants must be heeled in a trench which allows contact of roots to soil or mulch. Bare roots must be covered with a layer of mulch.
  2. All plants shall be protected from wind and excessive sun by the use of moist burlap or other such barrier. Roots shall never be exposed to freezing, excessive heat or harsh winds.
  3. Bare-root, balled and burlapped, and container plants shall be watered daily in hot weather and frequently during cold weather. Machine balled plants shall be kept moist but never waterlogged.

#### 1.06 PROJECT CONDITIONS:

- A 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.
- B Utilities: Determine the locations of underground and overhead utilities and perform work in a manner to avoid possible damage. Repair to utilities, if damaged, shall be the responsibility of the Contractor at his expense.
- C Report of Unfavorable Conditions: The Contractor shall notify the Designer of adverse soil drainage conditions, discrepancies in sub-grade elevations, or other situations unfavorable for Landscape

installation. He shall do no additional work, except at his own risk, in such an area until the problem has been reviewed by the Designer and resumption of work is authorized.

- D Report of Obstructions to Work: In the event that plants have been inadvertently located in the plan too close to a utility or other obstruction, the Contractor shall notify the Designer in order for relocations of plant material to be determined.
- E Protection of Site from Damage: The Contractor shall provide at his own expense, protection against trespassing and damage to seeded areas, planted areas and other construction areas until the Provisional Acceptance. He shall provide barricades, temporary fencing, signs, written warning or policing as may be required to protect such areas.
- F Protection and Replacement of Existing site Features: It shall be the Contractor's responsibility to locate and protect all existing above and below ground utilities. The Contractor shall be responsible for the protection of crowns, trunks and roots of existing trees, shrubs, lawns, paved areas, structures and other existing landscaped areas that are to remain.
  - 1. Existing trees which may be subject to construction damage shall be boxed, fenced or otherwise protected before any work is started. Boxing or other protection will be removed at the end of construction. Do not locate heavy equipment or stockpiles within the drip-line of existing plants, or on lawns.
- G Water: Water shall be clean, clear water free from objectionable or harmful chemical qualities or organisms. Contractor shall verify location of water on the site and shall make arrangements and furnish equipment to convey water to planted areas.

#### 1.07 GUARANTEE AND MAINTENANCE:

- A All plant material and other landscape work including lawns shall be guaranteed by the Contractor for a period of one year beginning on the date of Provisional Acceptance. Plant materials including trees, shrubs, grassed areas and perennials shall have acceptable appearance, be alive and healthy and exhibit vigorous normal growth. Upon notice by the Designer, the contractor shall replace, without cost to the Owner, and as soon as weather conditions permit, all unacceptable plants.
  - 1. Replacements shall match adjacent specimens of the same species and shall conform to the standards for plant materials specified. All replaced material shall immediately be removed from the site and all necessary repairs to plants, grades, lawn areas, paving, and other areas damaged during replacement shall be made at no cost to the Owner.
  - 2. When Work is provisionally accepted in parts, the guarantee period extends from each Provisional Acceptance date to the terminal date of the last Guarantee Period. Thus, all Guarantee Periods terminate at the same time.
  - 3. If the replacement is not acceptable during or at the end of the Guarantee Period, the Owner may elect either subsequent replacement or credit. Replacements shall have a similar one-year Guarantee from the date of replacement.
  - 4. Guarantee applies to losses other than those due to Acts of God, vandalism, or Owner neglect, as determined by the Owner.
- B Maintenance Period: Contractor shall provide all maintenance (including watering) for the landscape work (including grassing) during construction and for one year after Provisional Acceptance of the Work.

#### 1.08 INSPECTIONS:

- A Interim Inspections: Inspections will be made during the progress of the work to check compliance with the plans and specifications during construction.
- B Punch List Inspection: When work has been substantially completed, contractor shall notify the Designer that work is ready for Punch List Inspection. The Designer, within reasonable time, will check work and prepare Punch List stating observed deficiencies of work which need correction prior to Provisional Acceptance Inspection. Punch List is for Contractor's convenience and shall not relieve

him of any obligations of Contract. All items on the punch list shall have been attended to, prior to Provisional Acceptance Inspection(s).

- C Inspection for Provisional Acceptance of Work: Shall occur upon completion of final recommendations submitted by the Designer after the Punch List Inspection. Contractor shall notify the Designer 7 days in advance of anticipated date of the Provisional Acceptance Inspection. At this inspection all requirements on the Contract Documents must be satisfactorily completed. If work is unacceptable and additional inspection is required, Contractor shall reimburse Owner for additional expenses charged by the Designer for re-inspection and Owner shall deduct such amount from payment to Contractor
- D Inspection for Final Approval: To occur at end of Guarantee Period. At the end of the Guarantee period, the Designer will make a final inspection. Upon completion of all repairs or renewals which may appear at that time to be necessary, the Designer shall certify in writing to the Owner the Final Acceptance of the project.

## 2PART II PRODUCTS

### 2.01 SOIL:

- A Topsoil: Shall be natural, fertile, agricultural soil, capable of sustaining vigorous plant growth. It shall be of uniform friable clay loam composition throughout, without admixture of subsoil. Soil shall be free of stones, lumps, live plants and their roots, sticks and other extraneous matter. The soil shall not be contaminated with substances harmful to the growth of plants and humans. It shall have a pH range of 5.0 to 7.0, and contain not less than five percent (5%) organic matter. The topsoil shall be free of noxious weeds, grasses or other foreign vegetation which would cause maintenance problems for the Owner after the contract is complete. Contractor shall assume full responsibility for control of noxious species introduced by the addition of soil infested with such species for a period of one year from Provisional Acceptance of the Work.
- B Backfill soil: Shall consist of topsoil mixed with amendments as specified in the detail drawings.
- C Any stored topsoil remaining after all work is in place shall be disposed of by the Contractor.

### 2.02 SOIL AMENDMENTS:

- A Lime: Natural limestone containing not less than eight five percent (85%) of total carbonates, ground so that not less than ninety percent (90%) passes a 10-mesh sieve and not less than fifty percent (50%) passes a 100-mesh sieve. Provide lime in the form of dolomitic limestone meeting the specified requirements. Do not apply lime in areas where acid-loving plants are installed.
- B Organic Amendments: Shall consist of finely milled black Michigan Peat or other organic compost approved by the Designer. See graphic details for application rate and method.
- C Superphosphate: Soluble mixture of treated minerals, 20% available phosphoric acid.
- D Sand: Clean, washed sand, free of toxic materials. Manufactured limestone sand is not acceptable. See graphic details for application rate and method.
- E Commercial Fertilizer: complete fertilizer of neutral character, with some elements derived from organic sources and containing following percentages of available plant nutrients:
  - 1. For trees and shrubs, provide fertilizer with not less than 10% total nitrogen, 10% available phosphoric acid and 10% soluble potash and including trace elements. The use of a slow release product is recommended. Apply per manufacturer's recommendations.

### 2.03 MULCHES:

- A Mulch shall be shredded hardwood bark unless otherwise specified on the materials list. Mulches shall be free from matured seed, noxious weeds, egg cases, harmful insects, or any species or

chemical detrimental to the development of plants and humans. contractor shall assume full responsibility for control of noxious weeds introduced on the site in the mulch for a period of one year after Provisional Acceptance of the Work. Mulches shall exhibit uniform texture, color and particle size. Submit sample for approval prior to placing mulch.

2.04 MATERIALS FOR PLANT SUPPORT AND PROTECTION:

- A Plants to be staked and acceptable methods of staking are described herein. Tree stakes and guy stakes shall be pressure treated pine with minimum uniform cross-section of 2 x 2 inches nominal dimension, capable of withstanding above ground and underground conditions until Final Acceptance. Metal tree anchors manufactured specifically for this purpose may be used.
- B Lumber lengths shall be as specified herein. Guy wires shall be of 12 gauge or comparable strength, malleable, galvanized annealed wire.
- C Wires shall not come in contact with plant, but shall be covered with rubber hosing at point of contact. Hosing shall be two-ply, 1/2 inch minimum diameter reinforced rubber hose or approved comparable, non-injurious product of a length sufficient to properly protect trunk.
- D Commercial tree wrapping product shall be of bituminous impregnated tape, heavy crepe paper, or other approved material 4 to 12 inches wide. Twine shall be not less than 2-ply jute twine or comparable non-metallic material of neat, inconspicuous appearance. Contractor shall submit samples of above materials for approval t Designer.
- E Weed Barrier Fabric: Provide black polypropylene sheet 28 mils thick, grab tensile strength per ASTM D-4632; 179LB (machine direction) 108 lbs (cross machine direction)

2.05 PLANT MATERIALS:

- A Plant List: A complete list of plants, including a schedule of quantities, sizes and other requirements, is shown on the drawings.
- B Quality: Plants shall have a habit of growth that is normal for the species and shall be sound, healthy and free from disease, insect pests, mechanical injuries, defects, disfiguring knots, abrasions of the bark, and sunscald injuries. Plants shall stand straight and plumb in their natural position and shall be heavily and well branched in the manner of any high quality specimen of its species. During the appropriate season, plants shall exhibit healthy and full foliage. All plants shall be nursery grown from stock that has proven hardy to the location of this project. Plants shall have been growing under similar climactic conditions as the location of this project.
- C Nomenclature: The names of plants required shall conform generally with names accepted in nursery trade, but authority in case of dispute shall be Standardized Plant Names, Second Edition, American Joint Committee on Horticultural Nomenclature, 1942, J. Horace McFarland Company, Harrisburg, Pennsylvania.
- D Measurement: Plant size, grading standards and methods of measurement shall conform to those of the American Standard For Nursery Stock, American Association of Nurserymen, 230 Southern Building Washington, D.C., 20005, 1980 unless otherwise specified. All plants shall be an approximate average between the minimum and maximum dimensions cited on the plant list including: stem height, caliper, average spread of foliage, root spread and minimum number of stems. A plant shall be measured before pruning as it stands in its natural position. Height and spread specified refer to the main body of the plant and not t the distance from tip to tip of branches or roots.
- E. Sod: Provide strongly rooted sod not less than 2 years old, free of weeds and undesirable native grasses and machine cut to pad thickness of 3/4" (+/- 1/4"), excluding top growth and thatch. Provide only sod capable of vigorous growth and development when planted (viable, not dormant).
- F. Provide sod of uniform pad sizes with maximum 5% deviation in either length or width. Broken pads or pads with uneven ends will not be acceptable. Sod pads incapable of supporting their own weight when suspended vertically with a firm grasp on upper 10% of pad will be rejected.

1. Provide sod as shown on the drawings.
2. Turfgrass Species: Sod of grass species as specified, with not less than 95% germination, not less than 85 percent pure seed, and not more than 0.5% weed seed:

### 3PART III EXECUTION:

#### 3.01 FINISH GRADING:

- A All areas where existing grass lawn cover is damaged or disturbed by construction operations areas indicated on the site plan to be grass shall be surfaced with topsoil not less than 5" thick after compacting
- B If the previously stockpiled topsoil is not sufficient to cover the areas as specified, the Contractor shall furnish additional topsoil obtained from other sources. Topsoil obtained from other sources shall be clean, friable loam free from objectionable weed seeds.
- C Finished grades shall slope away from the building in all cases and shall contain no sinks or dams. Hand trim and rake topsoil to finished grades and leave ready for seeding or planting.
- D Minimum permitted slope on site shall be 1.5% to insure positive drainage.

#### 3.02 PREPARATION FOR PLANTING:

- A Layout and Staking: Layout individual tree and shrub locations and areas for mass plantings. Stake locations and outline areas and secure Designer's acceptance before start of planting work. Make minor adjustments as may be requested. Contractor shall immediately notify Designer if structural changes in paving or other site construction are different from the plans and would cause a change in the location of any plants.
- B Planting Pit and Bed Preparation: No plant pits shall be dug or prepared until their location is approved by the Designer. Holes for shrubs and trees shall be dug as shown on the planting details.
1. Topsoil for backfilling shall be kept separate from excavated subsoil. Excess subsoil from planting areas shall be kept separate from excavated subsoil. Excess subsoil from planting areas shall be removed from the site unless otherwise directed.
  2. All existing sod remaining in areas shown to be planted, shall be sprayed, stripped and removed from the site. Following manufacturer's recommendations, especially with regard to temperature, rainfall, etc. Spray sod with Round-up or comparable systemic herbicide at least seven days prior to beginning work. If Bermuda grass is present, make at least two such applications in appropriate season prior to stripping sod. Upon beginning work, strip all sod to a depth of at least 2" and remove sod from site unless otherwise directed by the Owner.
  3. Shrub masses may be planted in beds rather than individual holes. Beds shall be evenly tilled to a depth of six inches. Organic matter, fertilizers and herbicides shall be evenly incorporated into those six inches. The soil shall then be raked smooth to an even grade allowing for adequate surface drainage prior to being covered with mulch as indicated on the details. Install weed barrier fabric over soil prior to planting shrubs. Make an "X" cut in the fabric at each plant location and fold back the tabs to allow the shrub to be planted. After planting and before mulch is spread, fold tabs of cut back into place.
  4. All plant beds shall be treated with Ronstar-G or comparable pre-emergent herbicide on the bare soil prior to placing mulch and on top of the mulch after it is in place. Apply per manufacturer's instructions.
- C Root and Ball Preparation: All plant material root balls shall receive the following treatment:
1. Prior to planting, container grown material shall have containers removed. If root bound, container plants shall have their exterior root mass sliced vertically three times or appropriately loosened in an acceptable manner.
  2. Any non-decomposable twine or containers shall be removed from any plant prior to backfilling. Non-decomposable burlap must be either removed from the root ball after



placement in the hole or rolled under the root ball as far as possible from the surface. Any damaged roots shall be pruned back according to acceptable horticultural practices.

3. The Contractor shall be responsible for the removal and control of any weeds growing in the soil or any container grown or balled and burlapped plants which are used on this project.

### 3.03 SETTING PLANTS:

- A Backfill in bottom of pit shall be lightly tamped or settled by watering prior to setting plants. Each plant shall be placed in the center of the planting hole in a vertically plumb position. Plants shall be rotated to obtain the best visual appearance and proper relationship to nearby buildings or adjacent plants. Sufficient backfill should be placed in the bottom of the hole so that the plant sits at the same grade or no more than two inches above the grade that it rested in the field. The roots of bare root plants, pruned appropriately, shall be spread out to their approximate natural position over a cone or mound of soil formed in the center of the planting pit. Balled and burlapped plants shall be set straight in the hole while still in their wrapped ball.
- B Backfilling and Backfill Content: Backfill shall consist of topsoil plus peat moss at a ratio of 3:1, respectively. The plant pit shall be backfilled in layers around the roots or ball. Each layer shall be carefully worked around loose roots and lightly settled in place in such a manner as to avoid injury to the roots or ball and to avoid disturbing the position of the plant. When approximately two-thirds of the plant hole has been backfilled: 1) the balled and burlapped plants shall have the top third of the burlap cut away or folded back, 2) All plant pits shall be filled with water and allowed to settle. After water has settled, backfill with specified topsoil mixture and tamp lightly to grade.
- C Watering: Immediately after planting, the entire planting pit area and root mass shall be soaked with contaminant free water again and any erosion caused by watering repaired. All plants shall be watered by the Contractor as required during the maintenance period.
- D Mulching: After the water has been absorbed and any settlement has been brought to grade, a 2-3 inch layer of mulch shall be spread around the base of the plant. As pictured on the planting details, construct a 4 inch saucer of mulch around the plant pit.
- E Pruning: The bruised or broken parts of large or fleshy roots be cut off smooth before planting. The tops of deciduous plants shall be pruned wither immediately before or after planting. This shall consist of removing 1/4 to 1/3 of the top or thinning out and/or heading back the stems and top branches, and shall be done so that the plant retains its natural form. All pruning shall be done in accordance with standard horticultural practices. Only the proper sharp, clean tools shall be used. The top leader of any tree shall never be pruned unless previously approved by the Designer. All cuts shall be made close to the trunk or branch except when heading back. When heading back, cuts shall be made just above a viable bud. Evergreen plants shall not be pruned except to remove dead or broken branches unless otherwise indicated in the drawings. All cut surfaces one inch or more in diameter shall be painted with a standard non-toxic tree wound dressing.
- F Staking: All trees over 6' in height and up to 2" caliper shall be staked in the following manner:
  1. Use 2 parallel stakes driven 18" into firm soil about 1 foot beyond planting hole. The height of the stakes shall be two-thirds that of the tree after being driven into the ground.
  2. The tree is then supported by wires attached to both stakes and looped around trees. Rubber hosing should be used to protect trees.
- G Guying: All trees over a 2" caliper shall be guyed in the following manner:
  1. Stakes are driven into the ground 18" - 30" at a 45 degree angle away from the tree trunk and notched to hold the wire secure. The distance from the tree trunk to the stake is approximately the same as the height of the tree.
  2. The wire is then fastened two-thirds of the way up the trunk by a loose rubber-hose-covered loop. The other end is fastened to the stake.
  3. Tighten wire by twisting wire with a small stick or install turnbuckles if necessary.

H Bed Preparation (Annuals and Groundcovers): The soil for planting beds shall consist of a minimum of 4 inches of topsoil and peat moss in the ratio of 3:1, respectively. Beds shall be evenly tilled, raked to a level grade, and then mulched prior to planting.

1. Plant Preparation: Plants shall be thoroughly soaked with water before planting. Care should be taken to handle plants by their roots. All containerized plants shall have their containers removed and their soil/root mass loosened.
2. Setting Plants: Place plants at even spacing according to the plantings details. Bulbs, tubers, or other below ground root structures shall be placed at a proper depth according to standard horticultural practices.
3. Watering: Immediately after planting, plants shall be thoroughly watered with a diffusing type applicator such as a sprinkler. Water shall be uncontaminated. Contractor shall be responsible for watering until the end of the maintenance period.

3.04 SODDING:

- A. Lay sod within 24 hours of harvesting. Do not lay sod if dormant or if ground is frozen or muddy.
- B. Lay sod to form a solid mass with tightly fitted joints. Butt ends and sides of sod; do not stretch or overlap. Stagger sod strips or pads to offset joints in adjacent courses. Avoid damage to subgrade or sod during installation. Tamp and roll lightly to ensure contact with subgrade, eliminate air pockets, and form a smooth surface. Work sifted soil or fine sand into minor cracks between pieces of sod; remove excess to avoid smothering sod and adjacent grass.
  1. Lay sod across angle of slopes exceeding 1:3.
  2. Anchor sod on slopes exceeding 1:6 with wood pegs or steel staples spaced as recommended by sod manufacturer but not less than 2 anchors per sod strip to prevent slippage.
  3. Saturate sod with fine water spray within two hours of planting. During first week, water daily or more frequently as necessary to maintain moist soil to a minimum depth of 1-1/2 inches (38 mm) below sod.

3.05 MAINTENANCE:

- A Begin maintenance immediately after planting.
- B Maintain trees, shrubs, and other plants until after final acceptance but in no case less than the following period: 60 days after substantial completion of planting.
- C Maintain trees, shrubs, and other plants by pruning, cultivating and weeding as required for healthy growth. Restore planting saucers. Tighten and repair stake and or vertical position as required. Restore or replace damaged wrappings. Spray as required to keep trees and shrubs free of insects and disease.

3.06 CLEAN UP:

- A Clean Up and Restoration of Damaged Areas: During planting, excess and waste materials shall be continuously and promptly removed, lawn areas and paved surfaces kept clear and all reasonable precautions shall be taken to avoid damage to existing structures, plants and grass. Prior to Acceptance of Work, all damaged areas must be restored with the same quality of work as required in these specifications. All debris, waste material, excess soil etc. shall be removed. Walks and paved areas shall be hosed down and scrubbed clean, and the entire site made neat. Contractor shall provide barricades, signage, etc. as is prudently necessary to prevent pedestrian or vehicular accidents which could occur as a result of the Contract work.

End of Section

## SECTION 33 41 00 – STORMWATER COLLECTION SYSTEM

### PART I GENERAL

#### 1.01 SCOPE:

- A. Extent of storm sewer collection system work is shown on drawings. Storm Sewer collection system work includes, but is not limited to, the following:
1. Pipe and fittings.
  2. Non-pressure transition couplings.
  3. Cleanouts.
  4. Drains.
  5. Manholes.
  6. Channel drainage systems.
  7. Catch basins.
  8. Stormwater inlets.
  9. Pipe outlets.

#### 1.02 RELATED DOCUMENTS:

- A. Drawings and general provisions of Contract, including General and Supplementary Conditions and other Division 1 Specification Sections, apply to work of this section.

#### 1.03 QUALITY ASSURANCE:

- A. Installer: A firm specializing and experienced in sewer collection system work for not less than two (2) years.
- B. Comply with the requirements of applicable Division 2 sections for excavation and backfilling required in connection with exterior water service piping.

#### 1.04 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Shop Drawings:
1. Manholes: Include plans, elevations, sections, details, frames, and covers.
  2. Catch basins and stormwater inlets. Include plans, elevations, sections, details, frames, covers, and grates.

#### 1.05 DELIVERY, STORAGE, AND HANDLING

- A. Do not store plastic manholes, pipe, and fittings in direct sunlight.
- B. Protect pipe, pipe fittings, and seals from dirt and damage.
- C. Handle manholes according to manufacturer's written rigging instructions.
- D. Handle catch basins and stormwater inlets according to manufacturer's written rigging instructions.

#### 1.06 PROJECT CONDITIONS

- A. Interruption of Existing Storm Drainage Service: Do not interrupt service to facilities occupied by Owner or others unless permitted under the following conditions and then only after arranging to provide temporary service according to requirements indicated:

1. Notify Engineer no fewer than two days in advance of proposed interruption of service.
2. Do not proceed with interruption of service without Engineer's written permission.

## PART II PRODUCTS

### 2.01 HUB-AND-SPIGOT, CAST-IRON SOIL PIPE AND FITTINGS

- A. Pipe and Fittings: ASTM A 74, Service class.
- B. Gaskets: ASTM C 564, rubber.

### 2.02 STEEL PIPE AND FITTINGS

- A. Corrugated-Steel Pipe and Fittings: ASTM A 760/A 760M, Type I with fittings of similar form and construction as pipe.
  1. Standard-Joint Bands: Corrugated steel.
  2. Coating: Zinc.

### 2.03 PVC PIPE AND FITTINGS

- A. PVC Type PSM Sewer Piping:
  1. Pipe: ASTM D 3034, SDR 35, PVC Type PSM sewer pipe with bell-and-spigot ends for gasketed joints.
  2. Fittings: ASTM D 3034, PVC with bell ends.
  3. Gaskets: ASTM F 477, elastomeric seals.

### 2.04 CONCRETE PIPE AND FITTINGS

- A. Reinforced-Concrete Sewer Pipe and Fittings: ASTM C 76.
  1. Tongue-and-groove ends and gasketed joints with ASTM C 443
  2. Class III.

### 2.05 NONPRESSURE TRANSITION COUPLINGS

- A. Comply with ASTM C 1173, elastomeric, sleeve-type, reducing or transition coupling, for joining underground non-pressure piping. Include ends of same sizes as piping to be joined, and corrosion-resistant-metal tension band and tightening mechanism on each end.
- B. Sleeve Materials:
  1. For Dissimilar Pipes: ASTM D 5926, PVC or other material compatible with pipe materials being joined.
- C. Unshielded, Flexible Couplings:
  1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
    - a. Dallas Specialty & Mfg. Co.
    - b. Fernco Inc.
    - c. Logan Clay Pipe.
    - d. Mission Rubber Company; a division of MCP Industries, Inc.
  2. Description: Elastomeric sleeve with stainless-steel shear ring and corrosion-resistant-metal tension band and tightening mechanism on each end.

D. Shielded, Flexible Couplings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Cascade Waterworks Mfg.
  - b. Dallas Specialty & Mfg. Co.
  - c. Mission Rubber Company; a division of MCP Industries, Inc.
2. Description: ASTM C 1460, elastomeric or rubber sleeve with full-length, corrosion-resistant outer shield and corrosion-resistant-metal tension band and tightening mechanism on each end.

E. Ring-Type, Flexible Couplings:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Fernco Inc.
  - b. Logan Clay Pipe.
  - c. Mission Rubber Company; a division of MCP Industries, Inc.
2. Description: Elastomeric compression seal with dimensions to fit inside bell of larger pipe and for spigot of smaller pipe to fit inside ring.

2.06 CLEANOUTS

A. Cast-Iron Cleanouts:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.36.2M, round, gray-iron housing with clamping device and round, secured, scoriated, gray-iron cover. Include gray-iron ferrule with inside calk or spigot connection and countersunk, tapered-thread, brass closure plug.
3. Top-Loading Classification: Heavy Duty.
4. Sewer Pipe Fitting and Riser to Cleanout: ASTM A 74, Service class, cast-iron soil pipe and fittings.

2.07 DRAINS

A. Cast-Iron Area Drains:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:

- a. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.6.3 gray-iron round body with anchor flange and round grate. Include bottom outlet with inside calk or spigot connection, of sizes indicated.
  3. Top-Loading Classification(s): Heavy Duty.

B. Cast-Iron Trench Drains:

1. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  - a. Josam Company.
  - b. MIFAB, Inc.
  - c. Smith, Jay R. Mfg. Co.
  - d. Tyler Pipe.
  - e. Watts Water Technologies, Inc.
  - f. Zurn Specification Drainage Operation; Zurn Plumbing Products Group.
2. Description: ASME A112.6.3, 6-inch wide top surface, rectangular body with anchor flange or other anchoring device, and rectangular grate. Include units of total length indicated and quantity of bottom outlets with inside calk or spigot connections, of sizes indicated.
3. Top-Loading Classification(s): Heavy Duty.

2.08 MANHOLES

A. Standard Precast Concrete Manholes:

1. Description: ASTM C 478, precast, reinforced concrete, of depth indicated, with provision for sealant joints.
2. Diameter: 48 inches minimum unless otherwise indicated.
3. Ballast: Increase thickness of precast concrete sections or add concrete to base section as required to prevent flotation.
4. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
5. Riser Sections: 4-inch minimum thickness, and lengths to provide depth indicated.
6. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated, and top of cone of size that matches grade rings.
7. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
8. Steps: Individual FRP steps wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12-inch intervals. Omit steps if total depth from floor of manhole to finished grade is less than 60 inches.
9. Grade Rings: Reinforced-concrete rings, 6-inch total thickness, to match diameter of manhole frame and cover, and height as required to adjust manhole frame and cover to indicated elevation and slope.

B. Manhole Frames and Covers:

1. Description: Ferrous; 24-inch ID by 7- to 9-inch riser with 4-inch minimum width flange and 26-inch diameter cover. Include indented top design with lettering cast into cover, using wording equivalent to "STORM SEWER."
2. Material: ASTM A 536, Grade 60-40-18 ductile or ASTM A 48/A 48M, Class 35 gray iron unless otherwise indicated.

## 2.09 POLYMER-CONCRETE, CHANNEL DRAINAGE SYSTEMS

- A. General Requirements for Polymer-Concrete, Channel Drainage Systems: Modular system of precast, polymer-concrete channel sections, grates, and appurtenances; designed so grates fit into channel recesses without rocking or rattling. Include quantity of units required to form total lengths indicated.
- B. Manufacturers: Subject to compliance with requirements, available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following:
  1. ABT, Inc.
  2. ACO USA.
  3. Innovative Plastic, Inc.; a subsidiary of T-H Marine Supplies, Inc.
  4. Mea-Josam Div.; Josam Company.
  5. Poly-Cast.
- C. Sloped-Invert, Polymer-Concrete Systems:
  1. Channel Sections:
    - a. Interlocking-joint, precast, modular units with end caps.
    - b. 4-inch inside width and deep, rounded bottom, with built-in invert slope of 0.6 percent and with outlets in quantities, sizes, and locations indicated.
    - c. Extension sections necessary for required depth.
    - d. Frame: Include gray-iron or steel frame for grate.
  2. Grates:
    - a. Manufacturer's designation "ADA Heavy Duty," with slots or perforations that fit recesses in channels.
    - b. Material: Stainless steel.
  3. Covers: Solid gray iron if indicated.
  4. Locking Mechanism: Manufacturer's standard device for securing grates to channel sections.
- D. Drainage Specialties: Precast, polymer-concrete units.
  1. Large Catch Basins:
    - a. 24-by-12-inch polymer-concrete body, with outlets in quantities and sizes indicated.
    - b. Gray-iron slotted grate.
    - c. Frame: Include gray-iron or steel frame for grate.
  2. Small Catch Basins:
    - a. 19- to 24-inch by approximately 6-inch polymer-concrete body, with outlets in quantities and sizes indicated.
    - b. Gray-iron slotted grate.

- c. Frame: Include gray-iron or steel frame for grate.
- 3. Sediment Interceptors:
  - a. 27-inch square, polymer-concrete body, with outlets in quantities and sizes indicated.
  - b. 24-inch square, gray-iron frame and slotted grate.
- E. Supports, Anchors, and Setting Devices: Manufacturer's standard unless otherwise indicated.
- F. Channel-Section Joining and Fastening Materials: As recommended by system manufacturer.

## 2.10 CATCH BASINS

- A. Standard Precast Concrete Catch Basins:
  - 1. Description: ASTM C 478 precast, reinforced concrete, of depth indicated, with provision for sealant joints.
  - 2. Base Section: 6-inch minimum thickness for floor slab and 4-inch minimum thickness for walls and base riser section, and separate base slab or base section with integral floor.
  - 3. Riser Sections: 4-inch minimum thickness, 48-inch diameter, and lengths to provide depth indicated.
  - 4. Top Section: Eccentric-cone type unless concentric-cone or flat-slab-top type is indicated. Top of cone of size that matches grade rings.
  - 5. Joint Sealant: ASTM C 990, bitumen or butyl rubber.
  - 6. Grade Rings: Include two or three reinforced-concrete rings, of 6-inch total thickness, that match 24-inch diameter frame and grate.
  - 7. Steps: Individual FRP steps wide enough to allow worker to place both feet on one step and designed to prevent lateral slippage off step. Cast or anchor steps into sidewalls at 12-inch intervals. Omit steps if total depth from floor of catch basin to finished grade is less than 60 inches.
  - 8. Pipe Connectors: ASTM C 923 resilient, of size required, for each pipe connecting to base section.

## 2.11 STORMWATER INLETS

- A. Combination Inlets: Made with vertical curb and horizontal gutter openings, of materials and dimensions according to City standards. Include heavy-duty frames and grates.
- B. Frames and Grates: Heavy duty, according to City standards.

## 2.12 PIPE OUTLETS

- A. Head Walls: Cast-in-place reinforced concrete, with apron and tapered sides.
- B. Riprap Basins: Broken, irregularly sized and shaped, graded stone according to NSSGA's "Quarried Stone for Erosion and Sediment Control."
  - 1. Average Size: NSSGA No. R-5, screen opening 5 inches.
- C. Filter Stone: According to NSSGA's "Quarried Stone for Erosion and Sediment Control," No. FS-2, No. 4 screen opening, average-size graded stone.
- D. Energy Dissipaters: According to NSSGA's "Quarried Stone for Erosion and Sediment Control," No. A-1, 3-ton average weight armor stone, unless otherwise indicated.

## PART III EXECUTION

### 3.01 EARTHWORK



- A. Excavation, trenching, and backfilling are specified in Division 31 Section "Earth Moving."

### 3.02 PIPING INSTALLATION

- A. General Locations and Arrangements: Drawing plans and details indicate general location and arrangement of underground storm drainage piping. Location and arrangement of piping layout take into account design considerations. Install piping as indicated, to extent practical. Where specific installation is not indicated, follow piping manufacturer's written instructions.
- B. Install piping beginning at low point, true to grades and alignment indicated with unbroken continuity of invert. Place bell ends of piping facing upstream. Install gaskets, seals, sleeves, and couplings according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements.
- C. Install manholes for changes in direction unless fittings are indicated. Use fittings for branch connections unless direct tap into existing sewer is indicated.
- D. Install proper size increasers, reducers, and couplings where different sizes or materials of pipes and fittings are connected. Reducing size of piping in direction of flow is prohibited.
- E. When installing pipe under streets or other obstructions that cannot be disturbed, use pipe-jacking process of microtunneling.
- F. Install gravity-flow, non-pressure drainage piping according to the following:
  - 1. Install piping pitched down in direction of flow.
  - 2. Install piping NPS 6 and larger with restrained joints at tee fittings and at changes in direction. Use corrosion-resistant rods, pipe or fitting manufacturer's proprietary restraint system, or cast-in-place concrete supports or anchors.
  - 3. Install piping with 24-inch minimum cover.
  - 4. Install hub-and-spigot, cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook."
  - 5. Install corrugated steel piping according to ASTM A 798/A 798M.
  - 6. Install PVC sewer piping according to ASTM D 2321 and ASTM F 1668.
  - 7. Install reinforced-concrete sewer piping according to ASTM C 1479 and ACPA's "Concrete Pipe Installation Manual."
- G. Install corrosion-protection piping encasement over the following underground metal piping according to ASTM A 674 or AWWA C105:
  - 1. Hub-and-spigot, cast-iron soil pipe and fittings.

### 3.03 PIPE JOINT CONSTRUCTION

- A. Join gravity-flow, non-pressure drainage piping according to the following:
  - 1. Join hub-and-spigot, cast-iron soil piping with gasketed joints according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook" for compression joints.
  - 2. Join corrugated steel sewer piping according to ASTM A 798/A 798M.
  - 3. Join PVC sewer piping according to ASTM D 2321 and ASTM D 3034 for elastomeric-seal joints or ASTM D 3034 for elastomeric-gasketed joints.
  - 4. Join reinforced-concrete sewer piping according to ACPA's "Concrete Pipe Installation Manual" for rubber-gasketed joints.
  - 5. Join dissimilar pipe materials with non-pressure-type flexible couplings.

### 3.04 CLEANOUT INSTALLATION

- A. Install cleanouts and riser extensions from sewer pipes to cleanouts at grade. Use cast-iron soil pipe fittings in sewer pipes at branches for cleanouts and cast-iron, or PVC, soil pipe for riser extensions to cleanouts. Install piping so cleanouts open in direction of flow in sewer pipe.
  - 1. Use Light-Duty, top-loading classification cleanouts in earth or unpaved foot-traffic areas.
  - 2. Use Medium-Duty, top-loading classification cleanouts in asphalt or Portland cement concrete paved foot-traffic areas.
  - 3. Use Heavy-Duty, top-loading classification cleanouts in vehicle-traffic service areas.
- B. Set cleanout frames and covers in earth in cast-in-place concrete block, 18 by 18 by 12 inches deep. Set with tops 1 inch above surrounding earth grade.
- C. Set cleanout frames and covers in concrete pavement and roads with tops flush with pavement surface.

### 3.05 DRAIN INSTALLATION

- A. Install type of drains in locations indicated.
  - 1. Use Light-Duty, top-loading classification drains in earth or unpaved foot-traffic areas.
  - 2. Use Medium-Duty, top-loading classification drains in paved foot-traffic areas.
- B. Embed drains in 4-inch minimum concrete around bottom and sides.
- C. Fasten grates to drains if indicated.
- D. Set drain frames and covers with tops flush with pavement surface.
- E. Assemble trench sections with flanged joints.
- F. Embed trench sections in 4-inch minimum concrete around bottom and sides.

### 3.06 MANHOLE INSTALLATION

- A. General: Install manholes, complete with appurtenances and accessories indicated.
- B. Install precast concrete manhole sections with sealants according to ASTM C 891.
- C. Where specific manhole construction is not indicated, follow manhole manufacturer's written instructions.
- D. Set tops of frames and covers flush with finished surface of manholes that occur in pavements. Set tops 3 inches above finished surface elsewhere unless otherwise indicated.

### 3.07 CATCH BASIN INSTALLATION

- A. Construct catch basins to sizes and shapes indicated.
- B. Set frames and grates to elevations indicated.

### 3.08 STORMWATER INLET AND OUTLET INSTALLATION

- A. Construct inlet head walls, aprons, and sides of reinforced concrete, as indicated.
- B. Construct riprap of broken stone, as indicated.
- C. Install outlets that spill onto grade, anchored with concrete, where indicated.
- D. Install outlets that spill onto grade, with flared end sections that match pipe, where indicated.

- E. Construct energy dissipaters at outlets, as indicated.

### 3.09 CONCRETE PLACEMENT

- A. Place cast-in-place concrete according to ACI 318.

### 3.10 CHANNEL DRAINAGE SYSTEM INSTALLATION

- A. Install with top surfaces of components, except piping, flush with finished surface.
- B. Assemble channel sections to form slope down toward drain outlets. Use sealants, adhesives, fasteners, and other materials recommended by system manufacturer.
- C. Embed channel sections and drainage specialties in 4-inch minimum concrete around bottom and sides.
- D. Fasten grates to channel sections if indicated.
- E. Assemble channel sections with flanged or interlocking joints.
- F. Embed channel sections in 4-inch minimum concrete around bottom and sides.

### 3.11 CONNECTIONS

- A. Connect non-pressure, gravity-flow drainage piping in building's storm building drains specified in Division 22 Section "Facility Storm Drainage Piping."
- B. Connect force-main piping to building's storm drainage force mains specified in Division 22 Section "Facility Storm Drainage Piping." Terminate piping where indicated.
- C. Make connections to existing piping and underground manholes.
  - 1. Use commercially manufactured wye fittings for piping branch connections. Remove section of existing pipe; install wye fitting into existing piping; and encase entire wye fitting, plus 6-inch overlap, with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  - 2. Make branch connections from side into existing piping, NPS 4 to NPS 20. Remove section of existing pipe, install wye fitting into existing piping, and encase entire wye with not less than 6 inches of concrete with 28-day compressive strength of 3000 psi.
  - 3. Make branch connections from side into existing piping, NPS 21 or larger, or to underground manholes and structures by cutting into existing unit and creating an opening large enough to allow 3 inches of concrete to be packed around entering connection. Cut end of connection pipe passing through pipe or structure wall to conform to shape of and be flush with inside wall unless otherwise indicated. On outside of pipe, manhole, or structure wall, encase entering connection in 6 inches of concrete for minimum length of 12 inches to provide additional support of collar from connection to undisturbed ground.
    - a. Use concrete that will attain a minimum 28-day compressive strength of 3000 psi unless otherwise indicated.
    - b. Use epoxy-bonding compound as interface between new and existing concrete and piping materials.
  - 4. Protect existing piping, manholes, and structures to prevent concrete or debris from entering while making tap connections. Remove debris or other extraneous material that may accumulate.

- D. Connect to sediment interceptors specified in Division 22 Section "Sanitary Waste Interceptors."
- E. Pipe couplings with pressure ratings at least equal to piping rating may be used in applications below unless otherwise indicated.
  - 1. Use non-pressure-type flexible couplings where required to join gravity-flow, non-pressure sewer piping unless otherwise indicated.
    - a. Shielded flexible couplings for same or minor difference OD pipes.
    - b. Unshielded, increaser/reducer-pattern, flexible couplings for pipes with different OD.
    - c. Ring-type flexible couplings for piping of different sizes where annular space between smaller piping's OD and larger piping's ID permits installation.

### 3.12 CLOSING ABANDONED STORM DRAINAGE SYSTEMS

- A. Abandoned Piping: Close open ends of abandoned underground piping indicated to remain in place. Include closures strong enough to withstand hydrostatic and earth pressures that may result after ends of abandoned piping have been closed. Use either procedure below:
  - 1. Close open ends of piping with at least 8-inch thick, brick masonry bulkheads.
  - 2. Close open ends of piping with threaded metal caps, plastic plugs, or other acceptable methods suitable for size and type of material being closed. Do not use wood plugs.
- B. Abandoned Manholes and Structures: Excavate around manholes and structures as required and use one procedure below:
  - 1. Remove manhole or structure and close open ends of remaining piping.
  - 2. Remove top of manhole or structure down to at least 36 inches below final grade. Fill to within 12 inches of top with stone, rubble, gravel, or compacted dirt. Fill to top with concrete.
- C. Backfill to grade according to Division 31 Section "Earth Moving."

### 3.13 IDENTIFICATION

- A. Materials and their installation are specified in Division 31 Section "Earth Moving." Arrange for installation of green warning tape directly over piping and at outside edge of underground structures.
  - 1. Use detectable warning tape over nonferrous piping and over edges of underground structures.

### 3.14 CLEANING

- A. Clean interior of piping of dirt and superfluous materials. Flush with potable water.

End of Section