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SECTION 011100

SUMMARY OF WORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project description.
 - 2. Work by Others.
 - 3. Contractor's use of site and premises.

1.2 PROJECT DESCRIPTION

- A. Work of this Project is described as construction of a two story building entitled Sandridge Golf Club - New Clubhouse, located in Vero Beach, Florida.
- B. Work includes site construction, general construction, fire protection, plumbing, HVAC, and electrical.
- C. The Project will be constructed under a single prime contract.

1.3 WORK BY OTHERS

- A. Separate Contracts:
 - 1. The Owner may execute contracts for additional work at the site, that is excluded from the work of this Contract.
 - 2. Work under separate contract may be executed concurrent with Work of this Contract.
 - 3. Cooperate with the Owner and separate contractors to accommodate this requirement.

1.4 CONTRACTOR'S USE OF SITE AND PREMISES

- A. Limit use of site and premises to allow for:
 - 1. Work by separate contractors.
 - 2. Work by Owner.
 - 3. Use of adjacent premises by the public.
- B. Move any stored products under Contractor's control that interfere with the operations of the Owner or separate contractors.
- C. Assume full responsibility for protection and safekeeping of products under this Contract stored on site.
- D. Obtain and pay for use of any additional storage or work areas needed for operations.
- E. Coordinate use of site and premises with the Owner:
 - 1. Employee parking: In designated areas.
 - 2. Access to site and premises: In designated areas.
 - 3. Storage and staging areas: In designated areas.
 - 4. Transport materials and equipment to and from construction area along routes approved by Owner.
- F. Confine operations to construction area unless otherwise approved by Owner.
- G. Do not use or store hazardous or flammable materials on premises without Owner's approval; follow requirements of governing authorities having jurisdiction over the work.
- H. Prohibit smoking within interior spaces.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 011130

APPLICABLE REGULATIONS

PART 1 – GENERAL

1.1 APPLICABLE REGULATIONS

- A. Florida Building Code, 7th Edition (2020)
- B. Florida Mechanical Code, 7th Edition (2020)
- C. Florida Fuel Gas Code, 7th Edition (2020)
- D. Florida Plumbing Code, 7th Edition (2020)
- E. Florida Accessibility Code for Building Construction, 7th Edition (2020)
- F. Florida Building Code, Energy Conservation, 7th Edition (2020)
- G. Florida Fire Protection Code, 7th Edition (2020)
- H. NFPA 1, Uniform Fire Code, Florida Edition, 7th edition (2020)
- I. NFPA 101, Life Safety Code, Florida Edition, 6th edition (2020)
- J. NFPA 70, National Electric Code, 2020 Edition

END OF SECTION

SECTION 012100

ALLOWANCES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cash allowances.
- B. Related Sections
 - 1. Section 012900 - Payment Procedures.
 - 2. Section 013216 - Construction Progress Schedules.
 - 3. Individual specification sections.
- C. Include in Contract Sum cash allowances as indicated in the Documents.
- D. Designate in Construction Progress Schedule specified in Section 013216 delivery dates for products under each allowance.
- E. Designate in Schedule of Values specified in Section 012900 quantities of materials specified under unit cost allowances.

1.2 CASH ALLOWANCES

- A. General:
 - 1. Purchase products under each allowance as directed by Architect.
 - 2. Amount of allowance includes:
 - a. Net cost of product, less any applicable trade discounts.
 - b. Delivery to site.
 - c. Applicable taxes.
 - d. Labor required under allowance, only when labor is specified to be included in allowance.
 - 3. In addition to amounts of allowances, include in Contract Sum, Contractor's for:
 - a. Handling at site, including unloading, uncrating, and storing.
 - b. Protection from elements and from damage.
 - c. Labor required for installation and finishing, except where installation is specified to be part of allowance.
 - d. Other expenses required to complete installation.
 - e. Overhead and profit.
- B. Selection of Products:
 - 1. Architect's Duties:
 - a. Consult with Contractor in consideration of products and suppliers.
 - b. Make selection; designate products to be used.
 - c. Prepare Change Orders.
 - 2. Contractor's Duties:
 - a. Assist Architect in determining:
 - 1) Supplier or installer, as applicable.
 - 2) Cost, delivered and unloaded at site.
 - b. Obtain proposals from suppliers when requested by Architect.
 - c. Notify Architect of any effect anticipated by selection of product or supplier under consideration on construction schedule or contract sum.
 - d. On notification of selection, enter into purchase agreement with designated supplier.
- C. Delivery:
 - 1. Contractor's Duties:
 - a. Arrange for delivery and unloading.
 - b. Promptly inspect products for damage or defects.
 - c. Submit any claims for transportation damage.

- D. Installation: Comply with requirements of referenced specification section.
- E. Adjustment of Costs:
 1. Should actual purchase cost be more or less than specified amount of allowance, Contract Sum will be adjusted by Change Order equal to amount of difference.
 2. Amount of Change Order will recognize any changes in handling costs at site, labor, installation costs, overhead, profit, and other expenses caused by selection under allowance.
 3. For products specified under unit cost allowance, unit cost shall apply to quantity listed in Schedule of Values.
 4. Submit invoices or other data to substantiate quantity actually used.
 5. Submit any claims for additional costs at site or other expenses caused by selection under allowances, prior to execution of work. Failure to do so will constitute waiver of claims for additional costs.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

- A. Allowance Schedule

	DESCRIPTION	NOTES/COMMENTS	ALLOWANCE AMOUNT
1	Finish Hardware	Material and Installation	\$ 900.00/leaf
2	Exterior signage	Material and Installation	\$ 2,500.00

END OF SECTION

SECTION 012200

UNIT PRICES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Measurement.
 - 2. Payment.
- B. Related Sections:
 - 1. Individual specification sections.

1.2 UNIT PRICES

- A. Provide unit prices for items listed, for inclusion in Contract, guaranteed to apply for duration of Project as basis for additions to or deductions from Contract Sum.
- B. Take measurements and compute quantities.
- C. Quantities and measurements indicated are for Contract purposes only. Actual quantities and measurements supplied or placed in the Work will determine payment.
- D. Payment includes full compensation for all required labor, Products, tools, equipment, plant, transportation, services, and incidentals, and for erection, application, or installation of an item of the Work.
- E. Adjustments to Contract Sum will be made by Change Order based on net cumulative change for each item of the Work.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 012300

ALTERNATES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes
 - 1. Documentation of changes to Contract Sum and Contract Time.
- B. Contract Documents contain pertinent requirements for materials and methods to accomplish work described herein.
- C. Provide alternate costs for inclusion in Contract Sum if accepted by Owner.

1.2 RELATED REQUIREMENTS

- A. Owner/Contractor Agreement: Alternates accepted by Owner for incorporation into the Work.
- B. Individual specification sections identified.

1.3 PROCEDURES

- A. Alternates will be exercised at the option of Owner.
- B. Coordinate related work and modify surrounding work as required to complete the work, including changes under each Alternate, when acceptance is designated in Owner/Contractor Agreement.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 012500

SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Product Substitution Procedures.

1.2 GENERAL

- A. Definition: Proposal by Contractor to use manufacturer, product, material, or system different from one required in Contract Documents.
- B. Do not substitute Products unless a substitution request has been approved by Architect.
- C. Substitutions during Bidding: Refer to Instructions to Bidders.
- D. Architect will consider substitution requests within 30 days after award of Contract. After initial 30 day period, substitutions requests will be considered only due to non-availability of a specified Product through no fault of Contractor.
- E. In case of non-availability of a specified Product notify Architect in writing as soon as non-availability becomes apparent.

1.3 SUBSTITUTION REQUESTS

- A. Submit substitution requests on form provided by Architect.
- B. Document specified product and proposed substitution with complete data, including:
 - 1. Product identification, including name and address of manufacturer.
 - 2. Product description, performance and test data, and reference standards.
 - 3. Sample, if requested.
 - 4. Description of any anticipated effect that acceptance of proposed substitution will have on Progress Schedule, construction methods, or other items of Work.
 - 5. Description of any differences between specified product and proposed substitution.
 - 6. Difference in cost between specified product and proposed substitution.
- C. Burden of proof for substantiating compliance of proposed substitution with Contract Document requirements remains with Contractor.
- D. A request constitutes a representation that the Contractor:
 - 1. Has investigated the proposed Product and determined that it meets or exceeds the quality level of the specified Product.
 - 2. Will provide the same warranty for the substitution as for the specified Product.
 - 3. Will coordinate installation and make changes to other Work that may be required for the Work to be complete with no additional cost to Owner.
 - 4. Waives claims for additional costs or time extension that may subsequently become apparent.
 - 5. Will reimburse Owner for design services associated with re-approval by authorities or revisions to Contract Documents to accommodate the substitution.
- E. Substitutions will not be considered if:
 - 1. They are indicated or implied on Shop Drawings or other submittals without submittal of a substitution request.
 - 2. Approval will require substantial revision of Contract Documents without additional compensation to Architect.

F. Submit electronically in Adobe PDF format.

G. Architect will notify Contractor of approval or rejection of each Substitution Request.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SUBSTITUTION REQUEST FORM

DATE: _____

TO: _____

ATTENTION: _____

PROJECT: _____

We submit for your consideration the following product as a substitution for the specified product:

Section No.	Paragraph	Specified Product
_____	_____	_____

Proposed Substitution: _____

Reason for Substitution: _____

Product Data:

Attach complete technical data for both the specified product and the proposed substitution. Include information on changes to Contract Documents that the proposed substitution will require for its proper installation.

Samples:

Attached Will be furnished upon request

Does the substitution affect dimensions shown on Drawings?

No Yes (explain) _____

Effects of proposed substitution on other Work:

Differences between proposed substitution and specified Product:

Manufacturer's warranties of the proposed substitution are:

Same Different (explain) _____

Maintenance service and spare parts are available for proposed substitution from:

Previous installations where proposed substitution may be seen:

Project: _____ Project: _____
Owner: _____ Owner: _____
Architect: _____ Architect: _____
Date Installed: _____ Date Installed: _____

Cost savings to be realized by Owner, if proposed substitution is approved:

Change to Contract Time, if proposed substitution is approved:

No Change Add _____ days Deduct _____ days

Submittal constitutes a representation that Contractor has read and agrees to the provisions of Section 012500.

Submitted by Contractor:

Signature

Firm

For Use by Architect:

Based on the information supplied by the Contractor, the Architect has reviewed the proposed substitution on the basis of design concept of the Work and conformance with information given in Contract Documents.

Approved Approved as Noted Rejected

Submit Additional Information: _____

By: _____ Date: _____

SECTION 012600

CONTRACT MODIFICATION PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Supplemental Instructions.
 - 2. Proposal Requests.
 - 3. Contractor proposed changes.
 - 4. Construction Change Directives.
 - 5. Change Orders.

- B. Related Sections:
 - 1. Section 016000 - Product Requirements.

1.2 CHANGE PROCEDURES

- A. Architect's Supplemental Instructions:
 - 1. Format: Form 00948 – Work Change Directive
 - 2. Architect will advise of minor changes in Work not involving an adjustment to Contract Sum or Contract Time as authorized by the Conditions of the Contract.
 - 3. Changes requiring an adjustment to Contract Sum or Contract Time will require approval of Architect, and Owner, and be completed using Form 00942 – Change Order Form, as described in the General Conditions.

- B. Proposal Requests:
 - 1. Format: AIA Document G709 - Proposal Request.
 - 2. Architect may issue a Proposal Request that includes a detailed description of a proposed change with supplemental or revised Drawings and specifications.
 - 3. Prepare and submit an estimate of any change to Contract Sum or Contract Time within 7 days after receipt. Include:
 - a. Quantities and unit costs, with total cost or credit to Owner. If requested, furnish documentation of quantities.
 - b. Taxes, delivery charges, equipment rentals, and trade discounts as applicable.
 - c. If change in Contract Time is involved, provide updated Progress Schedule.
 - 4. Do not stop work or initiate changes in response to a Proposal Request. If approved, Architect will prepare and issue a Work Change Directive.
 - 5. Submit electronically in Adobe PDF format.

- C. Contractor Proposed Changes:
 - 1. Format: Contractor's standard.
 - 2. Contractor may propose a change by submitting request for change to Architect.
 - 3. Describe proposed change, reason for change, its full effect on Work, and any change to Contract Sum or Contract Time. Include:
 - a. Quantities and unit costs, with total cost or credit to Owner. If requested, furnish documentation of quantities.
 - b. Taxes, delivery charges, equipment rentals, and trade discounts as applicable.
 - c. If change in Contract Time is involved, provide updated Progress Schedule.
 - 4. Document any required substitutions in accordance with Section 016000.
 - 5. Submit electronically in Adobe PDF format.

- D. Construction Change Directive:
 - 1. Architect may issue a directive, signed by Owner, instructing Contractor to proceed with a change for subsequent inclusion in a Change Order.

2. Documentation will describe changes in Work and designate method of determining any change to Contract Sum or Contract Time. Promptly execute change.

E. Change Orders:

1. Format: Form 00948 – Work Change Directive
2. Execution: Prepare Change Orders for signature of parties as provided in Conditions of the Contract.
3. Submit electronically in Adobe PDF format.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 012613

REQUESTS FOR INFORMATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requests for Information (RFI's).
- B. Related Sections:
 - 1. Section 012500 - Substitution Procedures.
 - 2. Section 012600 - Contract Modification Procedures.
 - 3. Section 013300 - Submittal Procedures.
 - 4. Section 017700 - Closeout Procedures.

1.2 GENERAL

- A. Request for Information (RFI): Request from Contractor seeking interpretation or clarification of Contract Documents not involving Substitutions or changes to Contract Sum or Contract Time.
- B. RFI's constitute a request for information only.
- C. Do not submit RFI's:
 - 1. To request approval of Substitutions; refer to Section 012500.
 - 2. To request changes known to include changes to Contract Sum or Contract Time; refer to Section 012600.
 - 3. To request approval of submittals; refer to Section 013300.
 - 4. To submit Project Record Documents; refer to Section 017700.

1.3 SUBMITTAL

- A. Submit RFI's on Contractor's standard form.
- B. Include on each RFI:
 - 1. Name of Contractor.
 - 2. Project name.
 - 3. Date submitted.
 - 4. Sequential RFI number.
 - 5. Applicable Drawing sheet and detail numbers or Specification Section numbers.
 - 6. Date when response information is required to avoid impact on Construction Schedule and Construction Cost.
- C. Review and sign RFI's submitted by Subcontractors, Sub-Subcontractors, or Suppliers prior to submittal to Architect.
- D. Maintain log of RFI's showing RFI number and current status of each RFI.
- E. When RFI's require submittal of drawings, follow submittal procedures specified for Shop Drawings in Section 013300.
- F. Submit electronically in Adobe PDF format.
- G. Allow minimum 7 days for Architect's review and response to each RFI.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 012900

PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Schedule of Values.
 - 2. Applications for Payment.
- B. Related Sections:
 - 1. Section 017700 - Closeout Procedures.

1.2 SCHEDULE OF VALUES

- A. General:
 - 1. Submit a Schedule of Values to Architect at least 20 days prior to submitting first Application for Payment.
 - 2. Upon request of Architect, furnish additional data to support values given that will substantiate their correctness.
 - 3. Approved Schedule of Values will be used as basis for reviewing Contractor's Applications for Payment.
- B. Form and Content:
 - 1. Format: 00622 – Contractor's Application for Payment
 - 2. Use Table of Contents of Project Manual as basis of format for listing costs of Work.
 - 3. List installed value of component parts of Work in sufficient detail to serve as basis for computing values for progress payments.
 - 4. Include separate line items for:
 - a. Site mobilization.
 - b. Bonds and insurance.
 - c. Contractor's overhead and profit.
 - 5. For items on which payment will be requested for stored materials, break down value into:
 - a. Cost of materials, delivered and unloaded, with taxes paid.
 - b. Total installed value.
 - 6. For each line item that has a value of more than \$25,000.00, break down costs to list major products or operations under each item.
 - 7. Total of costs listed in Schedule shall equal Contract Sum.
- C. Submit electronically in Adobe PDF format.
- D. Review and Resubmittal:
 - 1. After initial review by Architect, revise and resubmit if required.
 - 2. Revise and resubmit along with next Application for Payment when a Change Order is issued. List each Change Order as a new line item. Change Orders modifying the Project Price or Project Time must also be approved by OWNER.

1.3 APPLICATIONS FOR PAYMENT

- A. Preparation:
 - 1. Format: Form 00622 – Contractor's Application for Payment .
 - 2. Prepare required information in typewritten format or on electronic media format.
 - 3. Use data from reviewed Schedule of Values. Provide dollar value in each column for each line item representing portion of work performed.
 - 4. List each authorized Change Order as a separate line item, listing Change Order number and dollar value.

5. Prepare Application for Final Payment as specified in Section 017700.

B. Waivers of Lien:

1. Along with the each Application for Payment, submit waivers of lien from Contractor and each Subcontractor or Sub-subcontractor included on the current month's Application for Payment.
2. Submit partial waivers on each item for amount requested, prior to deduction of retainage.
3. For completed items, submit full or final waiver.

C. Substantiating Data:

1. When Architect requires substantiating information, submit data justifying dollar amounts in question.
2. Provide one copy of data with cover letter showing Application number and date, and line item number and description.

D. Submittal:

1. Submit electronically in Adobe PDF format.
2. Payment period: Submit at intervals stipulated in Owner/Contractor Agreement.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 013100

PROJECT MANAGEMENT AND COORDINATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project coordination.
 - 2. Project meetings.
- B. Related Sections:
 - 1. Section 017700 - Contract Closeout.

1.2 PROJECT COORDINATION

- A. Submit required project submittals electronically in Abode PDF format.
- B. Coordinate scheduling, submittals, and work of various Sections of specifications to assure efficient and orderly sequence of installation of interdependent construction elements.
- C. Verify that utility requirement characteristics of operating equipment are compatible with building utilities. Coordinate work of various Sections having interdependent responsibilities for installing, connecting to, and placing in service such equipment.
- D. Coordinate space requirements and installation of mechanical and electrical items that are indicated diagrammatically on Drawings.
 - 1. Follow routing shown as closely as practical; place runs parallel with building lines.
 - 2. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.
- E. In finished areas, conceal pipes, ducts, and wiring within construction. Coordinate locations of fixtures and outlets with finish elements.
- F. Coordinate completion and clean up of work of separate Sections in preparation for Substantial Completion.
- G. After Owner occupancy, coordinate access to site for correction of defective Work and Work not in accordance with Contract Documents to minimize disruption of Owner's activities.

1.3 PROJECT MEETINGS

- A. Schedule and administer preconstruction conference, progress meetings, and pre-installation conferences.
- B. Make physical arrangements for meetings; notify involved parties at least 4 days in advance.
- C. Record significant proceedings and decisions at each meeting; reproduce and distribute copies to parties in attendance and others affected by proceedings and decisions made.

1.4 PRECONSTRUCTION CONFERENCE

- A. Schedule within 15 days after date of Notice to Proceed at Contractor's Project field office.
- B. Attendance:
 - 1. Contractor.
 - 2. Owner.
 - 3. Architect.

4. Major subcontractors and suppliers as Contractor deems appropriate.
 5. Representative of Testing Laboratory.
- C. Review and Discuss:
1. Relation and coordination of various parties, and responsible personnel for each party.
 2. Use of premises, including office and storage areas, temporary controls, and security procedures.
 3. Construction schedule and critical work sequencing.
 4. Processing of:
 - a. Contract modifications.
 - b. Shop Drawings, Product Data, and Samples.
 - c. Applications for Payment.
 - d. Substitutions.
 - e. Requests for Information.
 - f. Other required submittals.
 5. Adequacy of distribution of Contract Documents.
 6. Procedures for maintaining contract closeout submittals.
 7. Installation and removal of temporary facilities.
 8. Notification procedures and extent of testing and inspection services.

1.5 PROGRESS MEETINGS

- A. Schedule periodic progress meetings.
- B. Location: Contractor's Project field office.
- C. Attendance:
1. Contractor.
 2. Owner.
 3. Architect and consultants as appropriate to agenda.
 4. Subcontractors and suppliers as appropriate to agenda.
 5. Others as appropriate to agenda.
- D. Review and Discuss:
1. Work progress since previous meeting, including:
 - a. Field observations, deficiencies, conflicts, and problems.
 - b. Progress and completion date.
 - c. Corrective measures needed to maintain quality standards, progress, and completion date.
 2. Status of:
 - a. Requests for information.
 - b. Submittals.
 - c. Contract modifications.
 3. Coordination between various elements of Work.
 4. Maintenance of Project Record Documents.

1.6 PRE-INSTALLATION CONFERENCES

- A. Where required in individual specification Section, convene a pre-installation conference at project site or other designated location.
- B. Require attendance of parties directly affecting or affected by work of the specific Section.
- C. Review conditions of installation, preparation and installation procedures, and coordination with related work.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 013216

CONSTRUCTION PROGRESS SCHEDULES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Construction progress schedule.
- B. Related Sections:
 - 1. Section 011100 - Summary of Work.
 - 2. Section 012900 - Payment Procedures.

1.2 FORMAT

- A. Prepare Progress Schedule as a horizontal bar chart with separate bar for each major portion of Work or operation, identifying first work day of each week.
- B. Sequence of Listings: The chronological order of the start of each item of Work.
- C. Scale and Spacing: To provide space for notations and revisions.
- D. Sheet Size: Multiples of 8-1/2 x 11 inches.

1.3 CONTENT

- A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.
- B. Identify each item by specification Section number.
- C. Provide subschedules for each phase of Work identified in Section 011100.
- D. Provide subschedules to define critical portions of the entire Progress Schedule.
- E. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.
- F. Provide separate schedule of submittal dates for Shop Drawings, Product Data, and Samples, including:
 - 1. Dates reviewed submittals will be required from Architect.
 - 2. Decision dates for selection of finishes.
- G. Coordinate content with Schedule of Values specified in Section 012900.
- H. Revisions:
 - 1. Indicate progress of each activity to date of submittal, and projected completion date of each activity.
 - 2. Identify activities modified since previous submittal, major changes in scope, and other identifiable changes.
- I. Provide narrative report to define problem areas, anticipated delays, and impact on Progress Schedule. Report corrective action taken, or proposed, and its effect.

1.4 SUBMITTAL

- A. Submit initial Progress Schedule within 15 days after date of Notice to Proceed. After review, resubmit required revised data within 10 days.
- B. Submit revised Progress Schedule with each Application for Payment.
- C. Submit electronically in Adobe PDF format.

1.5 DISTRIBUTION

- A. Distribute copies of approved Progress Schedule to project site file, Subcontractors, suppliers, and other concerned parties.
- B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in Progress Schedule.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 013233

PHOTOGRAPHIC DOCUMENTATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Construction photographs.

1.2 PHOTOGRAPHY

- A. Take construction record photographs during construction.
- B. Provide photographs taken each month just prior to date for each scheduled Application for Payment.
- C. Provide one aerial photograph of site at beginning and completion of work at site.
- D. Photograph project from four different views at each specified time; views as directed by Architect.
- E. After interior finish work is commenced, take four additional photographs of interior; views as directed by Architect.
- F. At successive periods of photography, take photographs from same overall view as previously taken.
- G. Utilize digital technology at minimum 1216 x 912 capture resolution.
- H. Provide factual presentation.
- I. Provide correct exposure and focus, high resolution and sharpness, maximum depth of field, and minimum distortion.

1.3 DIGITAL FILES

- A. Index digital files in chronological sequence.
- B. Identify each view by listing:
 - 1. Name of Project.
 - 2. Orientation of view.
 - 3. Date taken.
 - 4. Sequential photograph number.

1.4 SUBMITTAL

- A. Submit each month's digital files along with each Application for Payment.
- B. Submit full set of digital files along with Project Record Documents.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 013300

SUBMITTAL PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Submittal procedures.
 - 2. Proposed Products list.
 - 3. Submittal schedule.
 - 4. Shop Drawings.
 - 5. Product Data.
 - 6. Samples.
 - 7. Quality control submittals.
- B. Related Sections:
 - 1. Section 014000 - Quality Requirements.

1.2 SUBMITTAL PROCEDURES

- A. Number each submittal with Project Manual section number and a sequential number within each section. Number resubmittals with original number and an alphabetic suffix.
- B. Identify Project, Contractor, Subcontractor or supplier, pertinent Drawing sheet and detail numbers, and specification Section number, as appropriate.
- C. Submit all submittals listed under "Submittals for Review" simultaneously for each Product or Specification Section.
- D. Where multiple Products function as an assembly, group submittals for all related Products into single submittal.
- E. Architect will not review incomplete submittals.
- F. Apply Contractor's stamp, signed or initialed certifying that:
 - 1. Submittal was reviewed.
 - 2. Products, field dimensions, and adjacent construction have been verified.
 - 3. Information has been coordinated with requirements of Work and Contract Documents.
- G. Schedule submittals to expedite the Project, and deliver to Architect. Coordinate submittal of related items.
- H. For each submittal, allow 14 days for Architect's review, excluding delivery time to and from Contractor.
- I. Identify variations from Contract Documents and Product or system limitations that may be detrimental to successful performance of completed Work.
- J. Revise and resubmit submittals when required; identify all changes made since previous submittal.
- K. Distribute copies of reviewed submittals to concerned parties and to Project Record Documents file. Instruct parties to promptly report any inability to comply with provisions.

1.3 PROPOSED PRODUCTS LIST

- A. Within 15 days after date of Notice to Proceed, submit a complete list of major products proposed for use, with name of manufacturer, trade name, and model number of each product.

- B. For products specified only by reference standards, give manufacturer, trade name, model or catalog designation, and reference standards.
- C. Submit electronically in Adobe PDF format.

1.4 SUBMITTAL SCHEDULE

- A. Within 15 days after date of Notice to Proceed, submit a submittal schedule showing all submittals proposed for project, including submittals listed as:
 - 1. Submittals for Review.
 - 2. Quality Control Submittals.
 - 3. Closeout Submittals.
- B. Include for each submittal:
 - 1. Specification section number.
 - 2. Description of submittal.
 - 3. Type of submittal.
 - 4. Anticipated submittal date.
 - 5. For submittals requiring Architect's review, date reviewed submittal will be required from Architect.
- C. Submit electronically in Adobe PDF format.

1.5 SHOP DRAWINGS

- A. Present information in clear and thorough manner.
- B. Identify details by reference to sheet and detail numbers or room number shown on Drawings.
- C. Reproductions of details contained in Contract Documents are not acceptable.
- D. Submit electronically in Adobe PDF format. Architect will return one electronic copy to Contractor for printing and distribution.

1.6 PRODUCT DATA

- A. Mark each copy to identify applicable products, models, options, and other data.
- B. Supplement manufacturers' standard data to provide information unique to this Project.
- C. Submit electronically in Adobe PDF format. Architect will return one electronic copy to Contractor for printing and distribution.

1.7 SAMPLES

- A. Submit samples to illustrate functional and aesthetic characteristics of Products, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
- B. Where so indicated, submit samples of finishes from the full range of manufacturers' standard colors, textures, and patterns for Architect's selection.
- C. Include identification on each sample, with full Project information.
- D. Unless otherwise specified in individual specifications, submit two of each sample.
- E. Architect will notify Contractor of approval or rejection of samples, or of selection of color, texture, or pattern if full range is submitted.

1.8 QUALITY CONTROL SUBMITTALS

- A. Quality control submittals specified in Section 014000 are for information and do not require Architect's responsive action except to require resubmission of incomplete or incorrect information.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 014000

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. References.
 - 2. Quality assurance and control of installation.
 - 3. Mockups.
 - 4. Manufacturer's field services and reports.
 - 5. Design data and calculations.
 - 6. Test reports and certifications.
 - 7. Manufacturer's installation instructions.

1.2 REFERENCES

- A. For products or workmanship specified by reference to association, trade, or industry standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- B. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.
- C. Conform to edition of reference standard in effect as of date of Project Manual.
- D. The contractual relationship of the parties to the Contract shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.3 QUALITY ASSURANCE AND CONTROL OF INSTALLATION

- A. Monitor quality control over suppliers, manufacturers, Products, services, site conditions, and workmanship, to produce Work of specified quality.
- B. Comply fully with manufacturers' instructions, including each step in sequence.
- C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.
- D. Comply with specified standards as a minimum quality for the Work except when more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- E. Perform work by persons qualified to produce workmanship of specified quality.
- F. Secure Products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion or disfigurement.

1.4 MOCKUPS

- A. Definition:
 - 1. Mockups are field samples constructed, applied, or assembled at the project site for review by the Owner and Architect that illustrate materials, equipment, or workmanship.
 - 2. Approved mockups establish the standard of quality by which the Work will be judged.
- B. Construct, apply, or assemble specified items, with related attachment and anchorage devices, flashings, seals, and finishes.

- C. Perform work in accordance with applicable specifications sections.
- D. Erect at project site at location acceptable to Architect. Protect from damage.
- E. Removal:
 - 1. Mockups may remain as part of the Work only when so designated in individual specification sections.
 - 2. Do not remove mockups until removal is approved by Architect or upon Final Completion.
 - 3. Where mockup is not permitted to remain as part of the Work, clear area after removal of mockup has been approved by Architect.

1.5 MANUFACTURERS' FIELD SERVICES AND REPORTS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, or startup of equipment, as applicable, and to initiate instructions when necessary.
- B. Individuals to report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.
- C. Submit electronically in Adobe PDF format within 10 days after each observation.

1.6 DESIGN DATA AND CALCULATIONS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide design data and calculations.
- B. Accuracy of design data and calculations is the responsibility of the Contractor.
- C. When so specified, prepare design data and calculations under the direction of a professional engineer licensed in the state in which the Project is located. Affix engineer's seal to submittals.
- D. Submit electronically in Adobe PDF format.

1.7 TEST REPORTS AND CERTIFICATIONS

- A. When specified in individual specification Sections, require material or Product suppliers or manufacturers to provide test reports and manufacturers' certifications.
- B. Indicate that material or Product conforms to or exceeds specified requirements. Submit supporting reference data, affidavits, and certifications as appropriate.
- C. Submittals may be recent or previous test results on material or Product, but must be acceptable to Architect.
- D. Submit electronically in Adobe PDF format.

1.8 MANUFACTURER'S INSTALLATION INSTRUCTIONS

- A. When Contract Documents require that Products be installed in accordance with manufacturer's instructions:
 - 1. Submit manufacturer's most recent printed instructions for delivery, storage, assembly, installation, start-up, adjusting, and finishing, as applicable.
 - a. Submit in quantities specified for Product Data.
 - b. Indicate special procedures, perimeter conditions requiring special attention, and special environmental criteria required for application or installation.
 - c. Identify conflicts between manufacturers' instructions and requirements of Contract Documents.

2. Perform installation of Products to comply with requirements of manufacturer's instructions.
3. If installation cannot be performed in accordance with manufacturer's instructions, notify Architect and await instructions.
4. Submit electronically in Adobe PDF format.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 014213

ABBREVIATIONS AND ACRONYMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Abbreviations and acronyms of industry organizations.

1.2 ACRONYMS

- A. Abbreviations and acronyms used in Contract Documents refer to recognized names of organizations according to following list.
- B. Contract Documents may not contain all abbreviations and acronyms.

ACRONYM OR ABBREVIATION	ENTITY	WEBSITE
AA	Aluminum Association	www.aluminum.org
AAMA	American Architectural Manufacturers Association	www.aamanet.org
AAADM	American Association of Automatic Door Manufacturers	www.aaadm.com
AASHTO	American Association of State Highway and Transportation Officials	www.transportation.org
ABAA	Air Barrier Association of America	www.airbarrier.org
ACI	American Concrete Institute	www.aci-int.org
AI	Asphalt Institute	www.asphaltinstitute.org
AISC	American Institute of Steel Construction	www.aisc.org
AITC	American Institute of Timber Construction	www.aitc-glulam.org
AMCA	Air Movement and Control Association International, Inc.	www.amca.org
AISI	American Iron and Steel Institute	www.steel.org
ANSI	American National Standards Institute	www.ansi.org
APA	Engineered Wood Association	www.apawood.org
ASCE	American Society of Civil Engineers	www.asce.org
ASCC	American Society of Concrete Contractors	www.ascconline.org
ASHRAE	American Society of Heating, Refrigeration, and Air-Conditioning Engineers	www.ashrae.org
ASME	American Society of Mechanical Engineers	www.asme.org
AWI	Architectural Woodwork Institute	www.awinet.org
AWS	American Welding Society	www.aws.org
ASTM	ASTM International	www.astm.org
BHMA	Builders Hardware Manufacturers Association	www.buildershardware.com
CISCA	Ceiling and Interior Systems Construction Association	www.cisca.org
CLFMI	Chain Link Fence Manufacturers Institute	www.chainlinkinfo.org
CRI	Carpet and Rug Institute	www.carpet-rug.com
CRSI	Concrete Reinforcing Steel Institute	www.crsi.org
CSI	Cast Stone Institute	www.caststone.org
CSPC	United States Consumer Product Safety Commission	www.cpsc.gov
DASMA	Door and Access Systems Manufacturers Association International	www.dasma.com
FM	Factory Mutual Insurance Co.	www.fmglobal.com
GA	Gypsum Association	www.gypsum.org

IGMA	Insulating Glass Manufacturers Alliance	www.igmaonline.org
MPI	Master Painters Institute	www.mpi.net
MVMA	Masonry Veneer Manufacturers Association	www.ncma.org
NAAMM	National Association of Architectural Metal Manufacturers	www.naamm.org
NEMA	Association of Electrical and Medical Imaging Equipment Manufacturers	www.nema.org
NFPA	National Fire Protection Association	www.nfpa.org
NFRC	National Fenestration Rating Council	www.nfrc.org
NFSI	National Floor Safety Institute	www.nfsi.org
NHLA	National Hardwood Lumber Association	www.nhla.org
NIST	National Institute of Standards and Technology	www.nist.gov
NLGA	National Lumber Grades Authority	www.nlga.org
NRCA	National Roofing Contractors Association	www.nrca.net
NWFA	National Wood Flooring Association	www.nwfa.org
PCI	Precast/Prestressed Concrete Institute	www.pci.org
PEI	Porcelain Enamel Institute	www.porcelainenamel.com
PTI	Post-Tensioning Institute	www.post-tensioning.org
RCSC	Research Council on Structural Connections	www.boltcouncil.org
RFCI	Resilient Floor Covering Institute	www.rfci.com
SDI	Steel Deck Institute	www.sdi.org
SDI	Steel Door Institute	www.steeldoor.org
SFIA	Steel Framing Industry Association	www.sfia.memberclicks.net
SIPA	Structural Insulated Panel Association	www.sips.org
SJI	Steel Joist Institute	www.steeljoist.org
SMACNA	Sheet Metal and Air Conditioning Manufacturer's Association International	www.smacna.org
SPIB	Southern Pine Inspection Bureau	www.spib.org
SPRI	Single Ply Roofing Institute	www.spri.org
SSMA	Steel Stud Manufacturer's Association	www.ssma.com
SSPC	Society for Protective Coatings	www.sspc.org
SWI	Steel Window Institute	www.steelwindows.com
TCNA	Tile Council of North America	www.tileusa.com
TMS	The Masonry Society	www.masonrysociety.org
TPI	Truss Plate Institute	www.tpinst.org
TPI	Turfgrass Producers International	www.turfgrassod.org
USDOJ	United States Department of Justice	www.ada.gov
USEPA	United States Environmental Protection Agency	www.epa.gov
USEPA	United States Environmental Protection Agency	www.energystar.gov
WDMA	Window and Door Manufacturers Association	www.wdma.com
WI	Woodwork Institute	www.woodworkinstitute.com

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 014523

TESTING AND INSPECTION SERVICES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Laboratory selection and payment.
 - 2. Laboratory duties.
 - 3. Contractor's responsibilities.
- B. Related Sections: Individual specifications sections contain specific tests and inspections to be performed.

1.2 QUALITY ASSURANCE

- A. Owner will employ and pay for services of an independent testing laboratory to perform specified testing and inspection.
- B. Contractor shall cooperate with the Testing Laboratory to facilitate performance of its work.
- C. Employment of Testing Laboratory shall in no way relieve Contractor of his obligations to perform work in accordance with Contract Documents.
- D. Refer to the Conditions of the Contract for provisions related to special inspections and testing.
- E. Qualifications of Laboratory:
 - 1. Meet requirements of ASTM C1077, D3666, D3740, E329, and E543.
 - 2. Authorized to operate in State in which project is located.

1.3 LABORATORY DUTIES

- A. Cooperate with Architect and Contractor; provide qualified personnel after due notice.
- B. Perform specified inspections, sampling, and testing of materials and methods of construction:
 - 1. Comply with specified standards.
 - 2. Ascertain compliance or noncompliance of materials with requirements of Contract Documents.
- C. Promptly notify Architect and Contractor of observed irregularities or deficiencies of Work or products.
- D. Promptly submit report of each test and inspection; submit electronically in Adobe PDF format to Architect, Owner, and Contractor.
- E. Each report shall include:
 - 1. Date issued.
 - 2. Project title and number.
 - 3. Testing Laboratory name, address, and telephone number.
 - 4. Name of Inspector and signature of individual in charge.
 - 5. Date and time of sampling or inspection.
 - 6. Record of temperature and weather conditions.
 - 7. Date of test.
 - 8. Identification of product and specification section.
 - 9. Location of sample or test in project.
 - 10. Type of inspection or test.
 - 11. Results of tests and compliance or noncompliance with Contract Documents.
 - 12. Interpretation of test results when requested by Architect or Contractor.

- F. Perform additional tests when required by Architect or Contractor.
- G. Laboratory is not authorized to:
 - 1. Release, revoke, alter, or enlarge on requirements of Contract Documents.
 - 2. Approve or accept any portion of work.
 - 3. Perform any duties of Contractor.

1.4 CONTRACTOR'S RESPONSIBILITIES

- A. Cooperate with Laboratory personnel, provide access to Work, and to manufacturer's operations.
- B. When materials require testing prior to being incorporated into Work, secure and deliver to Laboratory adequate quantities of representative samples of materials proposed to be used.
- C. Furnish copies of product test reports as required.
- D. Furnish incidental labor and facilities:
 - 1. To provide access to work to be tested.
 - 2. To obtain and handle samples at site or at source of product to be tested.
 - 3. To facilitate inspections and tests.
 - 4. For safe storage and curing of test samples.
- E. Notify Laboratory sufficiently in advance of operations to allow for Laboratory assignment of personnel and scheduling of tests.
- F. When tests or inspections cannot be performed after such notice, reimburse Owner for Laboratory personnel and travel expenses incurred due to Contractor's negligence.
- G. Make arrangements with Laboratory and pay for additional samples and tests required for Contractor's convenience.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 015000

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Temporary utilities.
 - 2. Field offices and sheds.
 - 3. Temporary controls.
 - 4. Protection of installed Work.
 - 5. Progress cleaning.
 - 6. Water, erosion, sediment, dust, and mold and mildew control.
 - 7. Access roads and parking areas.
 - 8. Removal.

PART 2 PRODUCTS

Not Used

PART 3 EXECUTION

3.1 TEMPORARY ELECTRICITY

- A. Provide temporary electrical service of capacity and characteristics required for construction.
- B. Provide power outlets for construction operations, with branch wiring and distribution boxes located as required. Provide flexible power cords as required.
- C. Maintain distribution system and provide routine repairs.

3.2 TEMPORARY LIGHTING

- A. Provide temporary lighting for construction and security purposes.
- B. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps as required.
- C. Maintain lamps and provide routine repairs.
- D. Provide portable lights when required to provide minimum lighting levels necessary for specific work.

3.3 TEMPORARY HEAT

- A. Provide temporary heating devices required to maintain specified ambient temperatures for construction.
- B. Maintain minimum ambient temperature of 50 degrees F in areas where construction is in progress, unless otherwise indicated in individual specification sections.

3.4 TEMPORARY VENTILATION

- A. Ventilate enclosed areas to facilitate curing of materials, disperse humidity, and prevent accumulations of dust, fumes, vapors, or gases.
- B. Provide temporary fan units as required to maintain clean air for construction.

3.5 TEMPORARY TELEPHONE AND COMPUTER SERVICES

- A. Contractor shall be accessible during normal business hours via mobile telephone with voice mail or an answering service.
- B. Provide computer in Contractor's field office with printer, Internet access, scanner, and email service.

3.6 TEMPORARY WATER

- A. Provide temporary water required for construction.
- B. Extend branch piping and provide temporary hoses so that water is available at locations needed for work.
- C. Protect from freezing.
- D. Maintain distribution system and provide routine repairs.

3.7 TEMPORARY SANITARY FACILITIES

- A. Provide chemical toilets for use during construction.
- B. Permanent toilets may not be used during construction.
- C. Maintain facilities in clean and sanitary condition.

3.8 FIELD OFFICES AND SHEDS

- A. Provide temporary field offices and storage sheds required for construction.
- B. Areas on site designated by Owner may be used for field office and storage of materials subject to damage by weather. Store large materials and those not subject to damage by weather outside building.
- C. Do not unreasonably encumber site or premises with excess materials or equipment.
- D. Temporary Structures:
 - 1. Portable or mobile buildings, structurally sound, weathertight, with floors raised above ground.
 - 2. Thermal transmission resistance: Compatible with occupancy and storage requirements.
 - 3. Provide connections for utility services when required.
 - 4. Provide steps and landings at entrances.
- E. Field Office:
 - 1. Size required for Contractor's use and to provide space for project meetings.
 - 2. Adequate electrical power, lighting, heating, and cooling to maintain human comfort.
 - 3. Provide facilities for storage of Project Record Documents.
 - 4. Provide thermometer mounted at convenient outside location, not in direct sunlight.

3.9 BARRIERS

- A. Provide barriers to prevent unauthorized entry to construction areas, to allow Owner's use of site and premises, and to protect adjacent properties from construction operations.
- B. Provide barricades required by governing authorities for public right-of-ways.
- C. Fencing:
 - 1. Provide temporary fencing for construction operations.
 - 2. Construction: Contractor's option.
 - 3. Height: 6 feet.

4. Locate to protect construction operations, materials, and equipment.
5. Provide vehicular and pedestrian gates.

D. Tree and Plant Protection:

1. Protect existing trees and plants at site that are designated to remain.
2. Remove roots and branches that interfere with construction.
3. Provide temporary barriers to height of 6 feet around individual or groups of trees and plants.
4. Do not permit vehicular traffic, parking, storage of materials, dumping of harmful chemicals or liquids, or standing or continuously running water within root zones.
5. Supervise earthwork operations to prevent damage to root zones.
6. Replace trees and plants that are damaged or destroyed due to construction operations.

3.10 EXTERIOR CLOSURES

- A. Provide temporary weathertight closures for exterior openings to provide acceptable interior working conditions, to allow for temporary heating and maintenance of ambient temperatures required in individual specification sections, to protect the Work, and to prevent entry of unauthorized persons.
- B. Provide access doors with locking hardware.

3.11 PROTECTION OF INSTALLED WORK

- A. Protect installed work from construction operations; provide special protection when required in individual specification sections.
- B. Minimize traffic, storage, and construction activities on roof surfaces. If traffic, storage, or activity is necessary, obtain recommendations for protection from roofing manufacturer.
- C. Prohibit traffic from landscaped areas.

3.12 PROGRESS CLEANING

- A. Maintain areas free from waste materials, debris, and rubbish. Maintain site in clean and orderly condition.
- B. Provide containers for collection of waste materials, debris, and rubbish; remove and dispose of off site as required by construction activities.
- C. Periodically clean interior areas to provide suitable conditions for finish work.

3.13 TEMPORARY CONTROLS

- A. Water Control:
 1. Grade site to drain. Prevent puddling water.
 2. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.
 3. Provide water barriers to protect site from soil erosion.
- B. Erosion and Sediment Control:
 1. Plan and execute methods to control surface drainage from cuts, fills, borrow areas, and waste disposal areas. Prevent erosion and sedimentation.
 2. Minimize amount of bare soil exposed at any one time.
 3. Provide temporary measures such as silt fences, dikes, berms, settlement basins, and drainage systems to prevent water flow and sedimentation.
 4. Periodically inspect earthwork to detect erosion and sedimentation; promptly employ corrective measures.
- C. Dust Control:
 1. Provide dust control materials and methods to minimize dust from construction operations.
 2. Prevent dust from dispersing into atmosphere.

- D. Mold and Mildew Control:
 - 1. Provide continuous measures to prevent formation of mold and mildew in construction.
 - 2. Do not install materials sensitive to mold and mildew growth until protection can be provided.
 - 3. Promptly remove and replace materials exhibiting mold and mildew growth.

3.14 ACCESS ROADS AND PARKING AREAS

- A. Existing roads designated by Owner may be used for construction purposes. Do not allow heavy vehicles or construction equipment in parking areas.
- B. Provide for access by emergency vehicles.
- C. Keep fire hydrants and water control valves free from obstruction and accessible for use.
- D. Provide parking facilities for construction personnel. When parking needs exceed on site capacity, provide additional off site facilities.
- E. Maintain existing construction, and restore to original or specified condition at completion of Work.

3.15 REMOVAL

- A. Remove temporary utilities, equipment, facilities, and services when construction needs can be met by use of permanent construction or upon completion of Project.
- B. Remove foundations and underground installations; grade site as indicated.
- C. Clean and repair damage caused by installation or use of temporary work.
- D. Restore permanent facilities used during construction to original or to specified condition.

END OF SECTION

SECTION 015639

TEMPORARY TREE PROTECTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Temporary tree protection during construction.
 - 2. Removal.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Chain Link Fencing: Conform to CLFMI Product Manual.
 - 1. Framing: Type I or II - round posts.
 - 2. Fabric: CLFMI Standard Industrial, Heavy Residential service.
 - 3. Finish: Galvanized, to CLFMI Product Manual.
- B. Vinyl Mesh Fencing:
 - 1. Mesh: 4 foot high Guardian Orange Safety Fence by Tenax (www.tenax.net) or approved substitute, ultraviolet protected.
 - 2. Posts: 1.25 pound studded steel T-posts.
 - 3. Ties: Nylon.

PART 3 EXECUTION

3.1 GENERAL

- A. Protect existing trees and plants at site that are designated to remain where indicated on Drawings and at other locations where trees are subject to damage during construction.
- B. Do not permit vehicular traffic, parking, storage of materials, dumping of harmful chemicals or liquids, or standing or continuously running water within root zones.
- C. Supervise earthwork operations to prevent damage to root zones.
- D. Provide temporary barriers to height of 4 feet around individual or groups of trees and plants.
- E. Maintain barriers in good repair for duration of construction.
- F. Replace trees and plants that are damaged or destroyed due to construction operations.

3.2 CHAIN LINK BARRIERS

- A. Drill post holes into undisturbed or compacted soil.
- B. Set posts minimum 24 inches below grade.
- C. Backfill around posts in maximum 12 inch lifts; compact each lift to density of existing soil.
- D. Space posts maximum 6 feet on center.
- E. Stretch fabric taut and secure to posts with wire ties spaced maximum 16 inches on center.

3.3 VINYL MESH BARRIERS

- A. Drive posts into undisturbed or compacted soil.
- B. Space posts maximum 6 feet on center.

3.4 REMOVAL

- A. Remove temporary barriers upon completion of Project.

END OF SECTION

SECTION 015800

PROJECT IDENTIFICATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Project identification sign.
 - 2. Maintenance and removal.

1.2 QUALITY ASSURANCE

- A. Project Sign:
 - 1. Design sign and structure to withstand 50 MPH wind velocity.
 - 2. Sign Painter: Experienced as a professional sign painter for minimum 3 years.
 - 3. Finishes, Painting: Adequate to withstand weathering, fading, and chipping for duration of construction.
- B. Do not erect other signs at site without Owner's approval, except those required by governing authorities.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show content, layout, lettering, colors, structure, sizes, and grades of members.
 - 2. Samples: 3 x 3 inch samples of each paint color.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Structure and Framing: New lumber, structurally adequate.
- B. Sign Surfaces: Exterior grade plywood with medium density overlay, nominally 3/4 inch thick, standard large sizes to minimize joints.
- C. Rough Hardware: Galvanized steel or aluminum.
- D. Paints: Latex type, exterior quality, gloss sheen.

2.2 FABRICATION

- A. Provide one sign of following design:
 - 1. Area: 32 square feet.
 - 2. Bottom edge of sign: 6 feet above ground.
 - 3. Content:
 - a. Project title and logo.
 - b. Owner's name.
 - c. Names and titles of Architect and Consultants.
 - d. Name of Contractor.
 - 4. Graphic design, colors, and lettering style: As designated by Architect.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install project identification sign within 30 days after date of Notice to Proceed.
- B. Erect at designated location.
- C. Erect supports and framing on secure foundation, rigidly braced and framed to resist wind loadings.
- D. Install sign surface plumb and level, with butt joints. Anchor securely.
- E. Paint exposed surfaces of sign, supports, and framing.

3.2 MAINTENANCE

- A. Maintain signs and supports clean. Repair deterioration and damage.

3.3 REMOVAL

- A. Remove signs, framing, supports, and foundations at completion of Project and restore the area.

END OF SECTION

SECTION 016000

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Products.
 - 2. Transportation and handling.
 - 3. Storage and protection.
 - 4. Product options.
- B. Related Sections:
 - 1. Section 012500 - Substitution Procedures.

1.2 PRODUCTS

- A. Provide interchangeable components by the same manufacturer for identical items.
- B. Do not use products containing asbestos or other known hazardous materials.
- C. Do not reuse materials and equipment removed from existing construction in completed Work, except as specifically permitted by the Contract Documents.

1.3 TRANSPORTATION AND HANDLING

- A. Coordinate delivery of Products to prevent conflict with Work and adverse conditions at site.
- B. Transport and handle Products in accordance with manufacturer's instructions.
- C. Promptly inspect shipments to ensure that Products comply with requirements of Contract Documents, are undamaged, and quantities are correct.
- D. Provide equipment and personnel to handle products by methods to prevent damage.

1.4 STORAGE AND PROTECTION

- A. Store and protect Products in accordance with manufacturer's instructions with manufacturer's seals and labels intact and legible.
- B. Store Products on site unless prior written approval to store off site has been obtained from Owner.
- C. Store Products subject to damage by elements in weathertight enclosures. Maintain temperature and humidity within ranges required by manufacturer's instructions.
- D. Exterior Storage:
 - 1. Store fabricated Products above ground; prevent soiling and staining.
 - 2. Cover products subject to deterioration with impervious sheet coverings; provide ventilation to prevent condensation.
 - 3. Store loose granular materials in well drained area on solid surfaces; prevent mixing with foreign matter.
- E. Arrange storage areas to permit access for inspection. Periodically inspect stored products to verify that products are undamaged and in acceptable condition.

1.5 PRODUCT OPTIONS

- A. Products specified by reference standard only:
 - 1. Select any Product meeting the specified standard.
 - 2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.
- B. Products specified by naming two or more acceptable Products: Select any named Product.
- C. Products specified by stating that the Contract Documents are based on a Product by a single manufacturer followed by the statement "Equivalent products by the following manufacturers are acceptable":
 - 1. Select the specified Product or a Product by a named manufacturer having equivalent or superior characteristics to the specified Product and meeting the requirements of the Contract Documents.
 - 2. If the specified Product is not selected, submit Product Data to substantiate compliance of proposed Product with specified requirements.
 - 3. The specified Product establishes the required standard of quality.
- D. Products specified by naming one or more Products followed by "or approved substitute" or similar statement:
 - 1. Submit a substitution request under provisions of Section 012500 for Products not listed.
 - 2. The specified Product establishes the required standard of quality.
- E. Products specified by naming one or more Products or manufacturers followed by the statement "Substitutions: Under provisions of Division 01":
 - 1. Submit a substitution request under provisions of Section 012500 for Products not listed.
 - 2. The specified Product establishes the required standard of quality.
- F. Products specified by naming one Product followed by the statement "Substitutions: Not permitted": Substitutions will not be allowed.
- G. Products specified by required performance or attributes, without naming a manufacturer or Product:
 - 1. Select any Product meeting specified requirements.
 - 2. Submit Product Data to substantiate compliance of proposed Product with specified requirements.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 017123
FIELD ENGINEERING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Survey and field engineering.
 - 2. Submittals.
 - 3. Records.

- B. Provide and pay for field engineering services required for Project:
 - 1. Survey work required in execution of Work.
 - 2. Other professional engineering services specified or required to execute Contractor's construction methods.

1.2 QUALIFICATIONS

- A. Surveyor: Qualified land surveyor, licensed in State in which project is located.

1.3 SUBMITTALS

- A. Submit documentation to verify accuracy of field engineering work upon Architect's request.

- B. Submit certification that elevations and locations of improvements are in conformance with Contract Documents.

1.4 SURVEY REFERENCE POINTS

- A. Existing horizontal and vertical control points for project are those designated on Drawings.

- B. Locate, verify, and protect control points prior to beginning Work; preserve permanent reference points during construction.

1.5 PROJECT SURVEY REQUIREMENTS

- A. Establish minimum of two permanent bench marks on site, referenced to survey control points. Record locations on Project Record Documents.

- B. Establish lines and levels, locate and lay out, by instrumentation:
 - 1. Site improvements:
 - a. Stakes for grading, fill, and topsoil placement.
 - b. Utility slopes and invert elevations.
 - 2. Building foundation and column locations, floor elevations, and other controlling dimensions.
 - 3. Controlling lines and levels required for mechanical and electrical trades.

- C. Verify property corners, easements, building setbacks, and horizontal control dimensions with information contained in Contract Documents.

- D. Promptly notify Architect of any errors or discrepancies noted; await instructions prior to proceeding with Work.

1.6 RECORDS

- A. Maintain accurate log of control and survey work.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 017329

CUTTING AND PATCHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Requirements and limitations for cutting and patching of work.
- B. Related sections:
 - 1. Section 012500 - Substitution Procedures.

1.2 SUBMITTALS

- A. Submit written request in advance of executing cutting or alteration that affects:
 - 1. Work of Owner or separate contractor.
 - 2. Structural integrity of project.
 - 3. Integrity or effectiveness of weather exposed or moisture resistant elements or systems.
 - 4. Efficiency, operational life, maintenance, or safety of operational elements.
 - 5. Visual qualities of sight exposed elements.
- B. Include in Request:
 - 1. Identification of project.
 - 2. Description of work affected.
 - 3. Necessity for cutting or patching.
 - 4. Effect of cutting or patching on work of Owner or separate contractor, or on structural, weatherproof, or visual integrity of project.
 - 5. Description of proposed work:
 - a. Scope of cutting and patching.
 - b. Subcontractor and trades to execute work.
 - c. Products proposed to be used.
 - d. Extent of refinishing.
 - 6. Alternate to cutting and patching.
 - 7. Cost proposal, if applicable.
 - 8. Written permission of any separate contractor whose work will be affected.
- C. If conditions of work or schedule necessitate a change of material from that originally installed, submit substitution request in accordance with Section 012500.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 PREPARATION

- A. Examine existing conditions of work, including elements subject to movement or damage during cutting and patching.
- B. After uncovering work, examine conditions affecting installation of new products or performance of work.
- C. Provide protection for other portions of project.
- D. Provide protection from elements.

3.2 CUTTING AND PATCHING

- A. Execute cutting to include excavating, fitting, and patching of Work required to:
 - 1. Make several parts fit properly.
 - 2. Uncover work to provide for installation of ill timed work.
 - 3. Remove and replace defective work.
 - 4. Remove and replace work not conforming to requirements of Contract Documents.
 - 5. Provide routine penetrations of nonstructural surfaces for installation of piping and electrical conduit.
- B. Execute fitting and adjustment of products to provide finished installation to comply with specified tolerances, and finishes.
- C. Execute cutting and demolition by methods that will prevent damage to other work, and will provide proper surfaces to receive installation of repairs and new work.
- D. Execute excavating and backfilling by methods that will prevent damage to other Work, and will prevent settlement.
- E. Employ original installer or fabricator to perform cutting and patching for:
 - 1. Weather exposed or moisture resistant elements.
 - 2. Sight exposed finished surfaces.
- F. Restore work that has been cut or removed; install new products to provide completed Work in accordance with requirements of Contract Documents.
- G. Refinish entire surfaces as necessary to provide an even finish:
 - 1. Continuous surfaces: To nearest intersections.
 - 2. Assembly: Refinish entirely.

END OF SECTION

SECTION 017700

CLOSEOUT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Closeout procedures.
 - 2. Final cleaning.
 - 3. Adjusting.
 - 4. Project record documents.
 - 5. Operation and maintenance data.
 - 6. Warranties.
 - 7. Spare parts and maintenance materials.
 - 8. Starting of systems.
 - 9. Demonstration and instructions.

1.2 CLOSEOUT PROCEDURES

- A. Final Inspection:
 - 1. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with the Contract Documents and ready for Architect's inspection.
 - 2. If Architect performs reinspection due to failure of Work to comply with claims of status of completion made by Contractor, Owner will compensate Architect for such additional services and will deduct the amount of such compensation from final payment to Contractor.
- B. Submit final Application for Payment showing original Contract Sum, adjustments, previous payments, retainage withheld from previous payments, and sum remaining due.
- C. Closeout Submittals:
 - 1. Evidence of compliance with requirements of governing authorities.
 - 2. Certificate of Occupancy.
 - 3. Project Record Documents.
 - 4. Operation and Maintenance Data.
 - 5. Warranties.
 - 6. Keys and keying schedule.
 - 7. Spare parts and maintenance materials.
 - 8. Evidence of payment of Subcontractors and suppliers.
 - 9. Final lien waiver.
 - 10. Certificate of insurance for products and completed operations.
 - 11. Consent of Surety to final payment.

1.3 FINAL CLEANING

- A. Execute final cleaning prior to final inspection.
- B. Clean surfaces exposed to view:
 - 1. Clean glass.
 - 2. Remove temporary labels, stains and foreign substances.
 - 3. Polish transparent and glossy surfaces.
 - 4. Vacuum carpeted surfaces; damp mop hard surface flooring.
- C. Clean equipment and fixtures to a sanitary condition.
- D. Clean or replace filters of operating equipment.

- E. Clean debris from roofs and drainage systems.
- F. Clean site; sweep paved areas, rake clean landscaped surfaces.
- G. Remove waste and surplus materials, rubbish, and construction facilities from the site.

1.4 ADJUSTING

- A. Adjust operating Products and equipment to ensure smooth and unhindered operation.

1.5 PROJECT RECORD DOCUMENTS

- A. Maintain following record documents on site; record actual revisions to the Work:
 - 1. Drawings.
 - 2. Specifications.
 - 3. Addenda.
 - 4. Change Orders and other Modifications to the Contract.
 - 5. Reviewed Shop Drawings, Product Data, and Samples.
 - 6. Material Safety Data Sheets.
- B. Store Record Documents separate from documents used for construction.
- C. Record information concurrent with construction progress.
- D. Make entries neatly and accurately.
- E. Label each set or volume with "PROJECT RECORD DOCUMENTS", project title, and description of contents.
 - 1. Organize contents according to Project Manual table of Contents.
 - 2. Provide table of contents for each volume.
- F. Drawings: Mark each item to record actual construction including:
 - 1. Measured depths of foundations in relation to finish floor datum.
 - 2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
 - 3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the Work.
 - 4. Field changes of dimension and detail.
 - 5. Details not on original Drawings.
- G. Specifications: Mark each Product section description of actual Products installed, including the following:
 - 1. Manufacturer's name and product model and number.
 - 2. Product substitutions or alternates utilized.
 - 3. Changes made by Addenda and Modifications.
- H. Shop Drawings: Mark each item to record actual construction including:
 - 1. Field changes of dimension and detail.
 - 2. Details not on original Shop Drawings.
- I. Submit electronically in Adobe PDF format along with final Application for Payment.

1.6 OPERATION AND MAINTENANCE DATA

- A. Identify as "OPERATION AND MAINTENANCE INSTRUCTIONS" and title of project.

- B. Contents:
 - 1. Directory: List names, addresses, and telephone numbers of Architect, Contractor, Subcontractors, and major equipment suppliers.
 - 2. Operation and maintenance instructions: Arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and suppliers. Identify the following:
 - a. Significant design criteria.
 - b. List of equipment.
 - c. Parts list for each component.
 - d. Operating instructions.
 - e. Maintenance instructions for equipment and systems.
 - f. Maintenance instructions for special finishes, including recommended cleaning methods and materials and special precautions identifying detrimental agents.
 - 3. Project documents and certificates including:
 - a. Shop drawings and product data.
 - b. HVAC balance reports.
 - c. Certificates.
 - d. Copies of warranties and bonds.
- C. Submittal:
 - 1. Submit electronically in Adobe PDF format at least 15 days prior to final inspection.
 - 2. Architect will notify Contractor of any required revisions after final inspection.
 - 3. Revise content of documents as required prior to final submittal.
 - 4. Submit revised documents electronically in Adobe PDF format within 10 days after final inspection.

1.7 WARRANTIES

- A. Execute and assemble documents from Subcontractors, suppliers, and manufacturers.
- B. Include Table of Contents.
- C. Submit electronically in Adobe PDF format along with final Application for Payment.
- D. For items of Work delayed beyond date of Substantial Completion, provide updated submittal within 10 days after acceptance, listing date of acceptance as start of warranty period.

1.8 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 in location as directed; obtain receipt prior to final payment.

1.9 STARTING OF SYSTEMS

- A. Notify Owner and Architect at least seven days prior to startup of each system or piece of equipment.
- B. Prior to beginning startup verify that:
 - 1. Lubrication has been performed.
 - 2. Drive rotation, belt tension, control sequences, tests, meter readings, and electrical characteristics are within manufacturer's requirements.
 - 3. Utility connections and support components are complete and tested.
- C. Execute start-up under supervision of applicable manufacturer's representative or Contractor's personnel in accordance with manufacturers' instructions.

- D. When specified in individual specification Sections, require manufacturer to provide authorized representative to be present at site to inspect, check, and approve equipment or system installation prior to startup, and to supervise placing equipment or system in operation.
- E. Submit written report that equipment or system has been properly installed and is functioning correctly.

1.10 DEMONSTRATION AND INSTRUCTIONS

- A. Demonstrate operation and maintenance of Products to Owner's personnel two weeks prior to date of Substantial Completion.
- B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.
- C. Utilize Operation and Maintenance Manuals as basis for instruction. Review contents of manual with Owners' personnel in detail to explain all aspects of operation and maintenance.
- D. Demonstrate startup, operation, control, adjustment, troubleshooting, servicing, maintenance, and shutdown of each item of equipment at agreed upon times, at equipment location.
- E. Prepare and insert additional data in Operation and Maintenance Manuals when need for additional data becomes apparent during instruction.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

Not used

END OF SECTION

SECTION 033500
CONCRETE FINISHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Finishing interior concrete slabs.
 - 2. Floor sealer/hardener.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Structural Drawings and Specifications.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Descriptive data for sealer/hardener.

1.3 QUALITY ASSURANCE

- A. Mockup:
 - 1. Construct mockup of each finish on previously placed concrete.
 - 2. Size: 4 x 4 feet.
 - 3. Show steel trowel finish and sealer. Final selection of sheen will be made from mockup.
 - 4. Locate where directed.
 - 5. Approved mockup may remain as part of the Work.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Concrete Materials: Refer to Structural Drawings and Specifications.
- B. Floor Sealer/Hardener: Water soluble, magnesium-fluorosilicate based, reactive with free lime in concrete, non-film forming.

2.2 CONCRETE MIX

- A. Mix concrete in accordance with Structural Drawings and Specifications.

PART 3 EXECUTION

3.1 FINISHING INTERIOR FLOOR SURFACES

- A. Place, finish, and cure concrete under provisions of Structural Drawings and Specifications.
- B. Place concrete continuously between predetermined expansion and control joints. Do not interrupt successive placement such that cold joints occur.
- C. Finish concrete floor surfaces in accordance with ACI 301 and ACI 302.1.
- D. Steel trowel surfaces to receive resilient flooring, resinous flooring, and carpeting.
- E. Steel trowel and fine broom finish surfaces to receive tile.
- F. Steel trowel surfaces to be exposed where scheduled. Apply sealer/hardener in accordance with manufacturer's instructions. Burnish to smooth, even finish.

- G. Tolerances:
 - 1. Maximum variation of surface flatness: 1/4 inch in 10 feet.
 - 2. Correct defects by grinding or removal and replacement of defective work. Re-measure corrected areas by same process.

- H. Maintain concrete with minimal moisture loss at relatively constant temperature for a period necessary for hydration of cement and concrete hardening.

END OF SECTION

SECTION 055000

METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Shop fabricated metal components.
 - 2. Ladders.
 - 3. Guard rails and handrails.
 - 4. Bollards.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SYSTEM DESCRIPTION

- A. Minimum design loads:
 - 1. Ladders:
 - a. Ladder assembly: Minimum of two 250 pound loads concentrated between any two consecutive attachments.
 - b. Individual rungs: Minimum 250 pound load applied in middle of rung.
 - c. Ladder fall protection system (Required on ladders over 24 feet in height): Minimum 500 pound load in free fall of 18 inches.
 - 2. Other pedestrian loading:
 - a. Uniform load of 100 PSF.
 - b. Concentrated load of 300 pounds.
 - c. Maximum deflection under loading: $L/180$.
 - 3. Guard rails and handrails:
 - a. 50 pounds per linear foot applied in any direction at top, transferred via attachments and supports to building structure.
 - b. Concentrated 200 pound load applied in any direction at any point along top, transferred via attachments and supports to building structure.
 - c. Maximum deflection under loading: $L/120$.
 - 4. Concentrated and uniform loads do not need to be applied simultaneously.
 - 5. Perform design under direct supervision of Professional Structural Engineer licensed in State in which Project is located, with minimum 2 years documented experience in work of this Section.
- B. Fabricate guard rails and handrails in accordance with ASTM E985.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show dimensions, metal thicknesses, finishes, joints, attachments, and relationship of work to adjacent construction.
- B. Quality Control Submittals:
 - 1. Certificate of Compliance from Professional Structural Engineer performing system design.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Minimum 3 years documented experience in work of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store steel above ground on platforms, skids, or other supports; separate with wooden separators.

- B. Protect steel from corrosion.
- C. Prevent damage to prime coat and galvanized coatings.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Shapes: ASTM A36/A36M.
- B. Plate: ASTM A283.
- C. Sheet: ASTM A1008/A1008M.
- D. Pipe: ASTM A501.
- E. Tube: ASTM A500.
- F. Bars: ASTM A108.

2.2 MATERIALS - ALUMINUM

- A. Extrusions: ASTM B221, 6063-T5 alloy and temper.
- B. Sheet: ASTM B209, alloy and temper best suited to application.
- C. Pipe: ASTM B241, extruded, anodizing quality, 6063 aluminum pipe, Schedule 40.

2.3 ACCESSORIES

- A. Exposed Screws: Same material as metal being fastened; Phillips flat head, countersunk, unless noted otherwise.
- B. Bolts: ASTM A307, hexagonal head type.
- C. Primer Paint: SSPC Paint 15, Type 1, red oxide.
- D. Anchoring Cement: Non-shrink cementitious type.

2.4 FABRICATION

- A. Fit and shop assemble items in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.
- C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- D. Exposed Mechanical Fastenings: Flush countersunk screws or bolts, unobtrusively located, consistent with design of component except where specifically noted otherwise.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- F. Conceal fastenings where possible.
- G. Welding to conform to AWS D1.1/D1.1M and D1.2/D1.2M.
 - 1. Use welds for permanent connections where possible. Grind exposed welds smooth.
 - 2. Tack welds prohibited on exposed surfaces.

2.5 FINISHES

- A. Exterior Ferrous Metal: Galvanized; ASTM A123/A123M, to 2.0 ounces per square foot.
- B. Interior Ferrous Metal:
 - 1. Shop painted except steel to be encased in concrete and surfaces to be welded.
 - 2. Surface preparation: SSPC SP2 - Hand Tool Cleaning or SP3 - Power Tool Cleaning.
 - 3. Application: One coat; follow coating manufacturer's instructions.
 - 4. Minimum dry film thickness: 2.0 mils.
- C. Aluminum: AAMA 2605 fluoropolymer coating containing minimum 70 percent polyvinylidene resins, three coat system, color to be selected from manufacturer's full color range.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install items in accordance with approved Shop Drawings.
- B. Install components plumb, level, and rigid.
- C. Welding: AWS D1.1/D1.1M and D1.2/D1.2M. Grind and fill exposed welds; finish smooth and flush.
- D. Install sleeved components with anchoring cement.
- E. Prevent contact of exterior aluminum and dissimilar metals by use of zinc rich paint, bituminous coating, or non-absorptive gaskets.

3.2 ADJUSTING

- A. Clean and touch up damaged primer paint with same product as applied in shop.
- B. Clean and touch up galvanized coatings at welded and abraded surfaces in accordance with ASTM A780, Annex A2.

3.3 SCHEDULE

- A. This Schedule includes principal items only; refer to Drawings for additional items not listed.
- B. Guard Rails and Handrails:
 - 1. Fabricate from aluminum extrusions of sizes and types indicated.
 - 2. Make bends uniform and free from buckles and other defects.
 - 3. Cut intersections square to within 2 degrees and to length within 1/8 inch. Remove burrs from cut ends.
 - 4. Miter and cope intersections within 2 degrees, fit to within 1/8 inch.
 - 5. Continuously weld connections.
 - 6. Where length exceeds that suitable for shipping and handling, fabricate in sections with concealed internal sleeves forming slip joints. Extend sleeves minimum 2 inches on both sides of joint; field weld and grind smooth.
- C. Ladders:
 - 1. Source: Fixed Aluminum Wall Ladders by Precision Ladders, LLC, or approved substitute.
 - 2. Fabricate ladders in accordance with ANSI A14.3.
 - 3. Side rails: Aluminum channel. (6005-T5), 2 2 1/2" x 1 1/16" x 1/8" with 3 1/8" molded polyurethane safety caps provided, eased edges, spaced 18 inches apart.
 - 4. Treads: Extruded aluminum (6005-T5), 2 1/4" x 3/4" x 1/4", treads deeply serrated for safety.
 - 5. Support ladders at top, bottom, and at intermediate points spaced maximum 5'-0" on center with steel brackets, welded or bolted to supports.
 - 6. Surface ladder components to prevent snagging of clothing and injury.

7. Minimum perpendicular clearance between ladder rungs and obstructions behind ladder: 7 inches.
- D. Ladder Fall Protection System (Required for ladders over 24 feet in height):
1. Meet OSHA CFR 1910.
 2. Include vertical rail with end stops, rung clamps, fall arrester, and attachment hardware.
 3. Provide two safety harnesses with front D-ring, minimum 400 pound capacity.
- E. Bollards:
1. Fabricate from steel pipe of sizes indicated.
 2. Set into concrete footing.
 3. Fill pipe with concrete; rod to consolidate. Dome top to shed water.

END OF SECTION

SECTION 055100

METAL STAIRS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Shop fabricated steel stairs with concrete pan treads and landings.
 - 2. Guard rails and handrails.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Structural Drawings and Specifications.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Design stair assembly to support a uniform live load of 100 PSF and a concentrated load of 300 pounds, with maximum deflection of $L/180$.
 - 2. Design guard rails and handrails to resist following without damage or permanent set:
 - a. 50 pounds per linear foot applied in any direction at top, transferred via attachments and supports to building structure.
 - b. Concentrated 200 pound load applied in any direction at any point along top, transferred via attachments and supports to building structure.
 - c. Maximum deflection under loading: $L/120$.
 - 3. Concentrated and uniform loads do not need to be applied simultaneously.
 - 4. Perform design under direct supervision of Professional Structural Engineer licensed in Indiana, with minimum 2 years documented experience in work of this Section.
- B. Fabricate stair assembly to NAAMM AMP 510, Commercial Class.
- C. Fabricate guard rails and handrails in accordance with ASTM E985.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
 - b. Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.
- B. Quality Control Submittals:
 - 1. Certificate of Compliance from Professional Structural Engineer performing system design.

1.4 QUALITY ASSURANCE

- A. Fabricator Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Perform Work in accordance with ASTM E985.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store steel above ground on platforms, skids, or other supports; separate with wooden separators.
- B. Protect steel from corrosion.

- C. Prevent damage to prime coat and galvanized coatings.

PART 2 PRODUCTS

2.1 MATERIALS - STEEL

- A. Sections: ASTM A36/A36M.
- B. Plate: ASTM A283.
- C. Pipe: ASTM A501/501M.
- D. Tube: ASTM A500/A500M.
- E. Sheet: ASTM A1008/A1008M.
- F. Wire mesh: Opening size and wire thickness as indicated on the Drawings.

2.2 MATERIALS - CONCRETE

- A. Concrete: ASTM C94; 3000 psi 28 day strength, 2 to 3 inch slump.
- B. Concrete Reinforcement: Mesh type, unfinished.

2.3 ACCESSORIES

- A. Bolts, Nuts, and Washers: ASTM A307.
- B. Primer Paint: SSPC 15, Type 1, red oxide.

2.4 FABRICATION

- A. Fit and shop assemble components in largest practical sections, for delivery to site.
- B. Fabricate components with joints tightly fitted and secured.
- C. Continuously weld connections:
 - 1. Steel shapes, plate, pipe, and tube: Conform to AWS D1.1/D1.1M.
 - 2. Steel sheet: Conform to AWS D1.3/D1.3M.
- D. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.
- E. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.
- F. Accurately form components required for anchorage of stairs, landings, and railings to each other and to building structure.
- G. Treads and Landings:
 - 1. Fabricate from minimum 14 gage steel sheet, shaped to receive concrete.
 - 2. Fabricate stairs with open risers. closed steel sheet risers.
 - 3. Reinforce underside with steel angles when required to resist design loads.
 - 4. Secure pans to stringers with clip angles, welded in place.
- H. Guard Rails and Handrails:
 - 1. Fabricate from steel pipe or tube stock and steel mesh as indicated on the Drawings.
 - 2. Make bends uniform and free from buckles and other defects.

3. Where length exceeds that suitable for shipping and handling, fabricate in sections with concealed internal sleeves forming slip joints. Extend sleeves minimum 2 inches on both sides of joint; field weld and grind smooth.

2.5 FINISHES

- A. Steel:
 1. Surface preparation: SSPC SP2 - Hand Tool Cleaning or SP3 - Power Tool Cleaning.
 2. Application: One coat; follow coating manufacturer's instructions.
 3. Minimum dry film thickness: 2.0 mils.
 4. Do not prime surfaces in direct contact with concrete or where field welding is required.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install components plumb and level, accurately fitted, free from distortion and defects.
- B. Provide anchors, angles, hangers, and struts required for connecting stairs to structure.
- C. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
- D. Field weld components indicated on Shop Drawings:
 1. Steel shapes, plate, pipe, and tube: Conform to AWS D1.1/D1.1M.
 2. Steel sheet: Conform to AWS D1.3/D1.3M.
- E. Field bolt and weld to match shop bolting and welding. Conceal bolts and screws whenever possible.
- F. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.
- G. Fill treads and landings with concrete. Consolidate concrete, strike off flush with perimeter frame, and apply light broom finish with striations parallel to long dimension of tread.
- H. Installation Tolerances:
 1. Maximum variation from plumb: 1/4 inch per story, noncumulative.
 2. Maximum offset from true alignment: 1/4 inch.

3.2 ADJUSTING

- A. Clean and touch up primer paint at welded and abraded surfaces with same product as applied in shop.

END OF SECTION

SECTION 057300

DECORATIVE RAILINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aluminum handrails and railings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Design, fabricate, and install railing assemblies to resist following without damage or permanent set:
 - a. 50 pounds per linear foot applied in any direction at top, transferred via attachments and supports to building structure.
 - b. Concentrated 200 pound load applied in any direction at any point along top, transferred via attachments and supports to building structure.
 - c. Maximum deflection under loading: $L/120$.
 - 2. Concentrated and uniform loads do not need to be applied simultaneously.
 - 3. Perform design under direct supervision of Professional Structural Engineer licensed in State in which project is located, with minimum 2 years experience in work of this Section.
- B. Fabricate railings in accordance with ASTM E985.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.
- B. Quality Control Submittals: Certificate of Compliance from Professional Structural Engineer performing system design.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Perform Work in accordance with ASTM E985.

1.5 WARRANTIES

- A. Furnish manufacturer's 15 year warranty for finish of aluminum railing.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Poma Architectural Metals. (www.pomametals.com)

2.2 MATERIALS

- A. Aluminum:
 - 1. Extrusions: ASTM B221, 6063-T5 alloy and temper.
 - 2. Sheet: ASTM B209, alloy and temper best suited to application.
 - 3. Pipe: ASTM B241, extruded, anodizing quality, 6063 aluminum pipe, Schedule 40.

2.3 ACCESSORIES

- A. Anchors: Type best suited to application.

2.4 FABRICATION

- A. Fabricate in accordance with approved Shop Drawings.
- B. Fabricate railings with minimal joints, located symmetrically. Joint locations subject to Architect's approval.
- C. Fit and shop assemble railings in largest practical sizes for delivery to site.
- D. Fabricate railings with joints tightly fitted and secured. Furnish fittings to accommodate site assembly and installation.
- E. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of component, except where otherwise indicated.
- F. Supply components required for anchorage of railings. Fabricate anchors and related components of same material and finish as railing.
- G. Conceal fastenings where possible.
- H. Welding:
 - 1. Use welds for permanent connections where possible. Grind exposed welds smooth.
 - 2. Tack welds prohibited on exposed surfaces.
 - 3. Steel: Conform to AWS D1.1/D1.1M.
 - 4. Stainless steel: Conform to AWS D1.6/D1.6M.
- I. Accommodate for expansion and contraction of members and building movement without damage to connections or members.

2.5 FINISHES

- A. Aluminum:
 - 1. E.S.P. applied High Performance Fluoropolymer Polyvinylidene Fluoride (pvdf) "Kynar" finish with XL coating. Clean railings with inhibited chemicals and the surface shall be chemically converted to amorphous chromium phosphate to conform with ASTM d 1730. Type b, method 5, prior to coating. Apply manufacturer's standard 3-coat thermocured system composed of specially formulated inhibited primer, fluoropolymer color coat and fluoropolymer top coat with color coat and top coat containing not less than 70 percent (pvdf) resin by weight. Paint to have 1.6 -1.8 mils dry film thickness. Paint shall be baked on at 475 degrees for duration of 10 minutes. Substrate temperature shall reach 450 degrees for duration of 5 minutes. Paint to be "PPG'S" Duranar High Performance (pvdf) system with XL coating or equal.

2. High Performance Fluoropolymer (pvdf) "Kynar" with XL coating in manufacturers standard colors. Paint to be PPG Duranar High Performance (pvdf) system with XL coating or equal which meet and exceed AAMA 2605 specifications and have a 15 year durability rating.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install railing system in accordance with approved Shop Drawings.
- B. Install components plumb and level, accurately fitted, free from distortion and defects.
- C. Provide anchors for connecting railings to supporting construction.
- D. Fit joints tight, flush, and hairline.
- E. Welding to conform to AWS D1.2/D1.2M.
 1. Use welds for permanent connections where possible. Grind exposed welds smooth.
 2. Tack welds prohibited on exposed surfaces.
- F. Installation Tolerances:
 1. Maximum variation from level or from indicated slopes: 1/4 inch in 10 feet, noncumulative.
 2. Maximum offset from true alignment of abutting members: 1/16 inch.

3.2 ADJUSTING

- A. Touch up minor scratches and abrasions to match shop-applied finish.

END OF SECTION

SECTION 061000
ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood blocking and furring.
 - 2. Telephone and electrical panel backboards.
 - 3. Roof curbs.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 QUALITY ASSURANCE

- A. Lumber Grading Agency: Certified to NIST PS 20.
- B. Identify lumber and sheet products by official grade mark.
- C. Fire Retardant Treated Products: Bear label of recognized independent testing laboratory indicating flame spread rating of 25 or less, tested to ASTM E84.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Store materials minimum 6 inches above ground on framework or blocking and cover with protective waterproof covering providing for adequate air circulation.
- B. Do not store seasoned or treated materials in damp location.
- C. Protect edges and corners of sheet materials from damage.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Lumber - Concealed or Opaque Finish:
 - 1. Grading rules: SPIB or WWPA.
 - 2. Species: Southern Yellow Pine or Douglas Fir - Larch.
 - 3. Grade:
 - a. Concealed Locations: Kiln dried, No. 2 or better.
 - b. Exposed Locations: Kiln dried, Select Structural.
 - 4. Surfacing: Surfaced four sides (S4S) unless otherwise indicated.
 - 5. Maximum moisture content: 19 percent.
- B. Lumber - Transparent Finish:
 - 1. Grading rules: WWPA.
 - 2. Species: Western Red Cedar.
 - 3. Grade: Kiln dried, Grade A Clear or better.
 - 4. Surfacing: Surfaced four sides (S4S) unless otherwise indicated.
 - 5. Maximum moisture content: 19 percent.
- C. Sheet Products:
 - 1. Type: APA Plywood.
 - 2. Panel grade: APA Rated CDX Sheathing.
 - 3. Exposure:
 - a. Exterior applications: Exterior.

- b. Interior applications: Exposure 1.
- 4. Manufactured using low-emitting, urea formaldehyde-free binders.

2.2 ACCESSORIES

- A. Fasteners:
 - 1. Type and size: As required by conditions of use.
 - 2. Exterior locations and treated products: Stainless steel, ASTM F593, Type 304 or 316.
 - 3. Other interior locations: Plain steel.

2.3 FABRICATION

- A. Preservative Treatment:
 - 1. Treat lumber and sheet products in accordance with AWWA U1:
 - a. Interior locations protected from moisture sources: Category UC1 - Interior/Dry.
 - b. Interior locations subject to sources of moisture: Category UC2 - Interior/Damp.
 - c. Exterior locations above ground: Category UC3A - Above Ground/Protected.
 - d. Exterior locations in contact with ground: Category UC4B - Ground Contact/Heavy Duty.
 - 2. Treatment process: Type MCA - Micronized Copper Azole.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide blocking, nailers, grounds, furring, and other similar items required to receive and support work.
- B. Set members level, plumb, and rigid.
- C. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.
- D. Install telephone and electrical panel backboards where indicated. Oversize panel by 12 inches on all sides.
- E. Treat field cuts and holes in members providing structural support in accordance with AWWA M4.

END OF SECTION

SECTION 061643

GYPSUM SHEATHING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Exterior gypsum wall sheathing.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Illustrate panel product types, thicknesses, and installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by GP Gypsum Corporation. (www.gp.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Exterior Sheathing:
 - 1. Source: Densglass by GP Gypsum Corporation or approved substitute.
 - 2. Type: ASTM C1177/C1177M or ASTM C1278/C1278M; 48 inches wide x thickness indicated, maximum practical length, square cut ends and edges.
 - 3. Mold resistance: 10, tested to ASTM D3273.

2.3 ACCESSORIES

- A. Fasteners: ASTM C1002, Type W or S screws as required, hot-dip galvanized or fluoropolymer coated steel, minimum 5/8 inch penetration into framing.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with ASTM C1280 and manufacturer's instructions.
- B. Accurately cut panels to fit around openings and projections.
- C. Apply panels horizontally, tongue edge up, with ends occurring over supports. Stagger end joints in adjacent rows.
- D. Fasten panels to framing at maximum 8 inches on center. Place fasteners minimum 3/8 inch from edges of panels; drive heads flush with surface. Stagger fasteners at abutting edges.

END OF SECTION

SECTION 064000

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Exterior trim.
 - 2. Wood paneling.
 - 3. Wood trim.
 - 4. Shop finishing.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Show details full size.
 - b. Show locations and sizes of furring, blocking, and hanging strips, including concealed blocking and reinforcement specified in other Sections.
 - c. Show locations and sizes of cutouts and holes for plumbing fixtures, faucets, soap dispensers and other items installed in architectural woodwork ..
 - d. Show veneer leaves with dimensions, grain direction, exposed face, and identification numbers indicating the flitch and sequence within the flitch for each leaf.
 - e. Apply WI-certified compliance label to first page of Shop Drawings.
 - f. Designate wood Species and Finish.
 - 2. Samples:
 - a. 12 x 12 inch panel samples showing finish.

1.3 QUALITY ASSURANCE

- A. Millworker Qualifications:
 - 1. Minimum 3 years documented experience in work of this Section.
- B. Fire-Retardant Treated Products: Bear label of recognized independent testing laboratory indicating flame spread rating of 25 or less, tested to ASTM E84.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver materials until proper protection can be provided, and until needed for installation.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain following conditions in building for minimum 7 days prior to, during, and after installation of woodwork:
 - 1. Temperature: 60 to 80 degrees F.
 - 2. Humidity: 25 to 55 percent.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Exterior Wood:
 - 1. Grading rules: WWPA.
 - 2. Species: Western Red Cedar.
 - 3. Grade: Kiln dried, Grade A Clear or better.

- B. Sheet Products:
 - 1. Graded in accordance with AWI Architectural Woodwork Standards for quality grade specified.
 - 2. Plywood panels:
 - a. Fire-retardant treated.
 - b. Refer to Material Finish Legend for face species and cut.
 - 3. Free from added urea formaldehydes.

- C. Interior Wood:
 - 1. Graded in accordance with AWI Architectural Woodwork Standards for quality grade specified, average moisture content of 6 percent.
 - 2. Species and cut:
 - a. Transparent Finish: White Oak, cut to be selected, of quality suitable for transparent finish. Match designer's sample.
 - b. Painted Finish: Poplar, FAS1F, of quality suitable for opaque finish.

2.2 ACCESSORIES

- A. Fasteners: Type and size as required by conditions of use.

- B. Adhesive:
 - 1. Waterproof, water based type, compatible with backing and veneer materials.
 - 2. Maximum volatile organic compound (VOC) content: 70 grams per liter.

2.3 FABRICATION

- A. Wood Trim and Paneling- Transparent Finish:
 - 1. Quality: AWI Architectural Woodwork Standards, Custom Grade.
 - 2. Species: Refer to Finish Schedule for species and cut, of quality suitable for transparent finish.

- B. Wood Trim and Paneling- Opaque Finish:
 - 1. Quality: AWI Architectural Woodwork Standards, Custom Grade.
 - 2. Species: Poplar, FAS1F, quality suitable for opaque finish.

- C. Shop assemble for delivery to project site in pieces easily handled.

- D. Prior to fabrication, field verify dimensions to ensure correct fit.

- E. Where field fitting is required, provide ample allowance for cutting. Provide trim for scribing and site conditions.

2.4 FINISHES

- A. Factory Finishing:
 - 1. Factory finish paneling in accordance with AWI Architectural Woodwork Standards, Section 5.
 - 2. Finish system: 8 - UV Curable, Acrylated Epoxy, Polyester, or Urethane.
 - 3. Color: Refer to Finish Schedule.
 - 4. Sheen: Satin.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to installation, condition paneling to average humidity that will prevail after installation.

3.2 INSTALLATION

- A. Install in accordance with AWI Architectural Woodwork Standards.
- B. Set plumb, rigid and level.
- C. Scribe to adjacent construction with maximum 1/8 inch gaps.

END OF SECTION

SECTION 064100

ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Special fabricated cabinet units.
 - 2. Shop finishing.
 - 3. Cabinet hardware.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealers.
 - 3. Section 123600 - Countertops.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Include dimensioned plan, sections, elevations, and details, including interface with adjacent work.
 - b. Designate wood species and finishes.
 - 2. Samples:
 - a. 3 x 3 inch plastic laminate samples in each color and finish.
 - b. Each hardware component.
 - c. 6 inch long lumber samples for transparent finish.
 - d. 12 x 12 inch sheet product samples for transparent finish.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications:
 - 1. Minimum 5 years documented experience in work of this Section.
 - 2. Certified under AWI/AWMAC/WI Quality Certification Program.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Do not deliver materials until proper protection can be provided, and until needed for installation.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain following conditions in building for minimum 7 days prior to, during, and after installation of casework:
 - 1. Temperature: 60 to 80 degrees F.
 - 2. Humidity: 25 to 55 percent.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Sheet Products:
 - 1. Graded in accordance with AWI Architectural Woodwork Standards for quality grade specified.
 - 2. Exposed and semi-exposed locations:
 - a. Transparent Finish: White Oak, cut to be selected, of quality suitable for transparent finish.
 - b. Opaque Finish: Poplar FAS1F, of quality suitable for opaque finish.

- B. Lumber:
 1. Graded in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 3 requirements for quality grade specified, average moisture content of 6 percent.
 2. Exposed and semi-exposed locations: Species and cut to match sheet products, of quality suitable for opaque or transparent finish as indicated.
- C. Plastic Laminate: NEMA LD-3.
 1. High pressure decorative laminate:
 - a. Horizontal surfaces:
 - 1) Backing sheet: Grade BGF.
 - 2) Postformed surfaces: Grade HGP.
 - 3) Other surfaces: Grade HGS.
 - b. Vertical surfaces:
 - 1) Backing sheet: Grade BLF.
 - 2) Cabinet liner: Grade CLS.
 - 3) Other surfaces: Grade VGP.
 2. Colors: See Finish Schedule.
 3. Finish: See Finish Schedule.

2.2 ACCESSORIES

- A. Countertops: Specified in Sections 123600.
- B. Fasteners: Type and size as required by conditions of use.
- C. Adhesives: Waterproof, water based type, compatible with backing and veneer and laminate materials.
- D. Finish Hardware: As scheduled at end of Section or approved substitute.
- E. Joint Sealants: Specified in Section 079200.

2.3 FABRICATION

- A. Cabinets - Plastic Laminate Finish:
 1. Quality: AWI Architectural Woodwork Standards, Custom Grade.
 2. Construction type: Frameless.
 3. Interface style: Overlay.
 4. Semi-exposed surfaces: High pressure decorative laminate.
 5. Fit exposed and semi-exposed edges with matching laminate edging.
 6. Fabricate drawer bodies to full depth of drawer fronts less 1/2 inch.
- B. Cabinets - Transparent and Opaque Finish:
 1. Quality: AWI Architectural Woodwork Standards, Custom Grade.
 2. Construction type: Frameless.
 3. Interface style: Overlay.
 4. Semi-exposed surfaces: Wood to match exposed surfaces.
 5. Fit exposed and semi-exposed edges with matching wood edging.
 6. Fabricate drawer bodies to full depth of drawer fronts less 1/2 inch.
- C. Shop assemble for delivery to project site in units easily handled.
- D. Prior to fabrication, field verify dimensions to ensure correct fit.
- E. Apply plastic laminate in full uninterrupted sheets; fit corners and joints to hairline. Slightly bevel arises. Apply laminate backing sheet to reverse side of laminate faced surfaces.
- F. Where field fitting is required, provide ample allowance for cutting. Provide trim for scribing and site conditions.

- G. Provide cutouts and reinforcement for plumbing, electrical, appliances, and accessories. Prime paint surfaces of cut edges.

2.4 FINISHES

- A. Factory Finishing:
 - 1. Factory finish casework in accordance with AWI Architectural Woodwork Standards, Section 5.
 - 2. Finish system: 8 - UV Curable, Acrylated Epoxy, Polyester, or Urethane.
 - 3. Color: See Finish Schedule.
 - 4. Sheen: Semigloss.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to installation, condition cabinets to average humidity that will prevail after installation.

3.2 INSTALLATION

- A. Install in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
- B. Set plumb, rigid and level.
- C. Scribe to adjacent construction with maximum 1/8 inch gaps.
- D. Adhere countertops, splashes, and skirts with beads of adhesive.
- E. Fill joints between cabinets, tops, splashes, and adjacent construction with joint sealer as specified in Section 079200; finish flush.

3.3 FINISH HARDWARE SCHEDULE

- A. Schedule: Refer to Drawings.

END OF SECTION

SECTION 068000

COMPOSITE FABRICATIONS

PART 1 - GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. PVC column wrap and trim.
 - 2. PVC architectural brackets.
 - 3. PVC architectural rafter tails.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Indicate components, sizes, profiles, materials, and fire hazard classifications.
 - 2. Samples: Full size samples of capital and base and portion of column.

1.3 QUALITY ASSURANCE

- A. Fire Hazard Classification: Class A, tested to ASTM E84.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. PVC Column Wrap:
 - 1. Manufacturer: Melton Classics.
 - 2. Column Style: Meltoncraft Cellular PVC Columns.
 - 3. Column Cap and Base Style: Tuscan Non-tapered.
 - 4. Full and Pilaster Column Wraps: See Plan
 - 5. Finish: Painted
- B. PVC Architectural Brackets:
 - 1. Manufacturer: Hardie Boys
 - 2. Bracket Style: Bkt-3021-5-8.03.1
 - 3. See Plans for Size
 - 4. Finish: Painted
- C. PVC Architectural Rafter Tails:
 - 1. Manufacturer: Hardie Boys.
 - 2. Rafter Tail Style: Rt4270-4.
 - 3. See Plans for Size.

2.2 ACCESSORIES

- A. Adhesive and Joint Compound: Types recommended by manufacturer.
- B. Fasteners: Type best suited to application; hot dip galvanized steel.

PART 3- EXECUTION

3.1 INSTALLATION

- A. Install column wraps, brackets, and rafter tails in accordance with manufacturer's instructions.

- B. Secure to substrate with adhesive and fasteners.
- C. Butt adjacent pieces tight.
- D. Fill joints between adjacent units with joint compound; finish flush.

END OF SECTION

SECTION 071325

SELF-ADHERING SHEET WATERPROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Self adhering modified bitumen sheet waterproofing.
 - 2. Drainage board.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealers.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include termination details and interface with adjacent construction.
 - 2. Product Data: Manufacturer's data for waterproofing and drainage board including product description and performance characteristics.
 - 3. Warranty: Sample warranty form.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications:
 - 1. Minimum 2 years documented experience in work of this Section.
 - 2. Licensed or certified by waterproofing manufacturer.
- B. Pre-Installation Conference:
 - 1. Convene at site 2 weeks prior to beginning work of this Section.
 - 2. Attendance: Architect, Contractor, waterproofing applicator, waterproofing manufacturer's representative, and related trades.
 - 3. Review and discuss Contract Documents, waterproofing system manufacturer's literature, job conditions, scheduling, and other matters affecting application as appropriate.
 - 4. Tour representative areas of waterproofing substrates, and discuss substrate construction, related items, work conditions, and materials compatibility.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials in enclosed space; protect from weather and direct sun. Maintain temperature range in storage area between 40 to 90 degrees F.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements: Do not apply during inclement weather.
- B. Substrate: Cured minimum 7 days.

1.6 WARRANTIES

- A. Furnish manufacturer's 5 year warranty providing coverage against water leakage through waterproofing system.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Carlisle Coatings and Waterproofing. (www.carlisle-ccw.com)
 - 2. GCP Applied Technologies, Inc. (www.gcpat.com)
 - 3. W.R. Meadows, Inc. (www.wrmeadows.com)
 - 4. AVM Industries, Inc. (www.avmindustries.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Bituminous Sheet Membrane Waterproofing System:
 - 1. Preformed rubberized asphalt laminated to polyethylene film with release paper facing, self adhering, minimum 1/16 inch thick, 36 inch wide rolls.
 - 2. Physical properties:

PROPERTY	TEST METHOD	RESULTS
Tensile Strength, Film	ASTM D882 modified	Minimum 5,000 psi
Tensile Strength, Membrane	ASTM D412 modified	Minimum 325 psi
Elongation, Membrane	ASTM D412 modified	Minimum 300 percent
Moisture Vapor Permeance	ASTM E96, Section 12	Maximum 0.05 perms
Puncture Resistance, Membrane	ASTM E154	Minimum 50 pounds
Water Absorption, Membrane	ASTM D570	Maximum 0.1 percent by weight

2.3 ACCESSORIES

- A. Primers, Mastics, and Liquid Membranes: As recommended by waterproofing system manufacturer.
- B. Patching Compound: Premixed, latex modified Portland cement grout.
- C. Termination Bar: Steel sheet, minimum 22 gage core steel, 2 inches high, G90 hot-dip galvanized coating.
- D. Fasteners: Hot dip galvanized or fluoropolymer coated steel, type best suited to application.
- E. Joint Sealants: Specified in Section 079200.
- F. Drainage Board:
 - 1. Studded, non-biodegradable, molded plastic sheet drainage core with nonwoven, needle-punched geotextile facing laminated to one side and polymeric film bonded to other side.
 - 2. Vertical flow rate: Minimum 165 gallons per minute per square foot.
 - 3. Horizontal flow rate: Minimum 90 gallons per minute per square foot.
 - 4. Thickness: Nominal .44 inches.
 - 5. Adhesive: Type recommended by drainage board manufacturer.
 - 6. Detail Tape: Type recommended by drainage board manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Substrate Preparation:
 - 1. Remove protrusions flush with adjacent surface.
 - 2. Remove loose and spalled concrete.
 - 3. Patch holes and depressions with patching compound; finish flush.
- B. Concrete: Clean surfaces to ASTM D4258.
- C. Dynamic Cracks and Joints:
 - 1. Remove loose and spalled concrete.
 - 2. Patch holes and depressions with patching compound.
 - 3. Rout out crack or joint to minimum dimensions of 1/4 inch deep x 1/2 inch wide.
 - 4. Apply sealant to prepared cracks and joints as specified in Section 079200.

3.2 INSTALLATION OF WATERPROOFING

- A. Install waterproofing system in accordance with manufacturer's instructions and NRCA Manual.
- B. Apply primer to coverage rate required by manufacturer.
 - 1. Allow to dry until tack free.
 - 2. Cover only that area that will be covered with membrane in same day.
 - 3. Re-apply if left uncovered over 24 hours.
- C. Form 3/4 inch fillet with liquid membrane on inside corners; extend minimum 6 inches on both sides of corner at minimum 90 mils thick.
- D. Cover static cracks and joints in substrate with minimum 9 inch wide membrane strip.
- E. Cover dynamic cracks and joints with minimum 9 inch wide membrane strip applied in reverse, with release paper left in place to form bond breaker. Cover that with an 18 inch wide strip placed in normal manner.
- F. Cover inside and outside corners with minimum 12 inch wide membrane centered over corner.
- G. Apply membrane with minimum 2-1/2 inch side and end laps; roll surface to eliminate wrinkles and air spaces.
- H. Terminate top edge of membrane at grade with metal termination bar.
- I. Terminate bottom edge of membrane within 1 inch of bottom of wall; seal edge with trowel bead of mastic.
- J. Apply membrane on horizontal surfaces starting at low point, laying membrane perpendicular to slope. Weatherlap joints.
- K. Provide double membrane layer minimum 6 inches around penetrations; seal with mastic.
- L. If application is not complete at end of work day, seal exposed edges with mastic.

3.3 INSTALLATION OF DRAINAGE BOARD

- A. Apply drainage board same day membrane is applied.
- B. Cut pieces from roll to required length. Cut to fit at perimeter.
- C. Install in accordance with manufacturer's instructions:
 - 1. Vertical Applications:
 - a. Position drainage board so that geotextile fabric filter is facing toward groundwater, soil or overburden. Apply to substrate vertically and extend from perimeter discharge pipe to a point approximately 6 in. below the anticipated grade line.
 - b. When adhering drainage board directly to Bituthene waterproofing membranes, use Detail Tape. Press drainage board into tape firmly to ensure good adhesion.
 - c. Substrate and job site conditions will determine the attachment pattern. Additional consideration should be given in high wind exposures. Abut adjacent rolls with excess fabric overlapping in shingle fashion.
 - d. For inside and outside corners, abut adjoining drainage composite at corner. Cover open core with extra geotextile filter fabric.
 - e. The exposed core along top terminations should be covered with a strip of geotextile to prevent intrusion of soil into core.
 - f. At the bottom termination extend drainage board out from structure so that it passes behind and under the perimeter discharge pipe. Additional geotextile should be wrapped over the pipe to prevent soil intrusion.
 - 2. Horizontal Applications:
 - a. Place over waterproofing application.
 - b. Abut edges tightly with excess geotextile placed over adjacent roll in shingle fashion.
- D. Cut drainage board to fit snugly around protrusions. To secure drainage board around protrusions, apply Detail Tape around protrusion in a picture frame configuration. Press the cut edge firmly into Detail Tape.
- E. Complete backfilling as soon as possible after application of drainage board; within 7 days maximum.
- F. Do not allow motor vehicles, construction equipment or other trades on the drainage board.

3.4 FIELD QUALITY CONTROL

- A. Prior to applying drainage or protection course, inspect surfaces for voids, ruptures, and other damage.
- B. Repair damaged and defective areas.
- C. Horizontal Applications:
 - 1. Dam areas and flood with minimum 1 inch of water prior to applying protection course.
 - 2. After 24 hours, check for leaks. If leaks are encountered, repair and repeat test.
 - 3. When proven watertight, drain water and remove dams.

END OF SECTION

SECTION 071416

COLD FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cold fluid-applied polyurethane membrane waterproofing at retaining wall and elevated terraces and covered entries.
 - 2. Protection board.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Manufacturer's data for waterproofing and drainage board including product description and performance characteristics.
 - 2. Samples: 3 x 3 inch waterproofing samples on representative backing.
 - 3. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Applicator's license certificate issued by manufacturer of waterproofing material.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications:
 - 1. Minimum 3 years documented experience in work of this Section.
 - 2. Licensed or certified by waterproofing manufacturer.
- B. Pre-Installation Conference:
 - 1. Convene at site 2 weeks prior to beginning work of this Section.
 - 2. Attendance: Architect, Owner, Contractor, waterproofing applicator, waterproofing manufacturer's representative, and related trades that may affect waterproofing installation prior to, during, or following installation.
 - 3. Review and discuss Contract Documents, waterproofing system manufacturer's literature, job conditions, scheduling, and other matters affecting application as appropriate.
 - 4. Tour representative areas of waterproofing substrates, and discuss substrate construction, related items, work conditions, and materials compatibility.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials at minimum 75 degrees F; prevent damage to containers. Do not store in direct sunlight.

1.5 PROJECT CONDITIONS

- A. Environmental Conditions:
 - 1. Do not apply waterproofing when ambient or surface temperature is less than 40 degrees F or if precipitation is imminent.
 - 2. Do not apply material to wet surfaces.
- B. Substrate: Cured minimum 28 days prior to applying waterproofing.

1.6 WARRANTIES

- A. Furnish manufacturer's 5 year warranty providing coverage against water leakage through waterproofing system.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents based on products by Tremco, Inc. (www.tremcosealants.com)
- B. Other Acceptable Manufacturers:
 - 1. Kemper System America, Inc. (www.kemper-system.com)
 - 2. Neogard Corporation. (www.neogard.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Fluid Applied Waterproofing - Retaining Wall:
 - 1. Source: TREMproof 250GC by Tremco, Inc., or approved substitute.
 - 2. Type: Single-component, bitumen modified, cold liquid applied moisture curing urethane complying with ASTM C836.
 - 3. Physical properties:
 - a. Elongation: Minimum 600 percent, tested to ASTM D412.
 - b. Tensile strength: Minimum 150 psi, tested to ASTM D412.
 - c. 100 percent modulus: Minimum 80 psi, tested to ASTM D412.
 - d. Crack bridging: Pass 1/16 inch with no loss of bond or cracking exhibited, cycled 10 times per 24 hours at 15 degrees F, tested to ASTM C836.
 - e. Moisture vapor permeability: Maximum 0.1 perm, tested to ASTM E96.
- B. Fluid Applied Waterproofing - Elevated Terraces and Covered Entries:
 - 1. Source: Vulkem 350NF/Tremco Epoxy Primer by Tremco, Inc., or approved substitute.
 - 2. Type: Under tile waterproofing system comprised of a tough-curing liquid polyurethane base coat and highly durable, low-modulus epoxy top coat.
 - 3. Physical properties:
 - a. Elongation: Minimum 600 percent, tested to ASTM D412.
 - b. Tensile strength: Minimum 220 psi, tested to ASTM D412.
- C. Reinforcing Fabric: Waterproofing manufacturer's standard.

2.3 ACCESSORIES

- A. Surface Conditioner, Joint Sealers, and Patching Compounds: Type recommended by waterproofing manufacturer.
- B. Protection Board:
 - 1. Waterproofing manufacturer's standard product.
 - 2. Adhesive: Type recommended by protection board manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Concrete: Clean surfaces to ASTM D4258.
- B. Clean exposed metals; apply surface conditioner and coat of waterproofing material to minimum 60 mils thickness. Extend preparatory coat minimum 3 inches onto adjacent surfaces and up vertical surfaces to level of topping slab.

- C. Clean cracks and joints in substrate less than 1/16 inch in width and apply preparatory coat of waterproofing material, minimum 60 mils wet film thickness; extend minimum 3 inches onto adjacent surfaces.
- D. Rout out cracks and joints over 1/16 inch in width to minimum 1/4 inch depth, and fill with waterproofing. Apply preparatory coat of waterproofing material, minimum 60 mils wet film thickness; extend minimum 3 inches onto adjacent surfaces.
- E. At changes in plane of substrate, form cant of waterproofing material, minimum 1 inch high.
- F. Allow preparatory work to cure minimum 12 hours, then clean and apply surface conditioner.

3.2 APPLICATION OF WATERPROOFING

- A. Apply waterproofing system in accordance with manufacturer's instructions.
- B. Apply in as many coats as needed to achieve minimum wet film thickness as recommended by the manufacturer, excluding preparatory work.
- C. Extend membrane up vertical surfaces to level of topping slab.
- D. Seal items projecting through membrane.
- E. Apply waterproofing with reinforcing fabric at locations of potential high movement, including intersections not structurally connected.

3.3 INSTALLATION OF PROTECTION BOARD

- A. Apply protection board the same day membrane is applied.
- B. Install in accordance with manufacturer's instructions.
- C. Apply adhesive at rates as recommended by manufacturer; set boards in adhesive with edges butted.
- D. Complete backfilling as soon as possible after application of protection board; within 7 days maximum.

3.4 FIELD QUALITY CONTROL

- A. Vertical Surfaces:
 - 1. Prior to applying drainage course, inspect surfaces for voids, ruptures, and other damage.
 - 2. Repair damaged and defective areas.

END OF SECTION

SECTION 071600

CEMENTITIOUS WATERPROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Cementitious waterproofing for openings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 QUALITY ASSURANCE

- A. Applicator Qualifications:
 - 1. Minimum 5 years documented experience in work of this Section.
 - 2. Approved by manufacturer.

1.3 PROJECT CONDITIONS

- A. Do not apply waterproofing if ambient or surface temperature is below 40 degrees F or if expected to fall below that point within 24 hours after application.

1.4 WARRANTY

- A. Provide manufacturer's 2 year warranty against water penetration through waterproofing system.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cementitious Waterproofing System:
 - 1. Source: AQUAFIN-1K by Aquafin Inc. (www.aquafin.net) or approved substitute.
 - 2. Description: Cementitious, 1-component, polymer enhanced, ready-mixed, efflorescence-free surface waterproofer liner with hydrophobic properties, that requires just the addition of water, resistant to water and moisture.
 - 3. Compressive Strength:(ASTM C-109) 4000 psi @ 28 days
 - 4. Flexural Strength: (ASTM C-348) 440 psi @ 28 days
 - 5. Bond/Adhesion: (ASTM C-321) >220 psi
 - 6. Vapor Permeability: (ASTM E-96) 8 US perms (untreated control = 10)
 - 7. Microbiological growth: Not supported
- B. Water: Clean and potable.

2.2 ACCESSORIES

- A. Patching Compound: Pre-blended, cementitious repair mortar recommended or approved by waterproofing manufacturer for patching.

PART 3 EXECUTION

3.1 PREPARATION

- A. Thoroughly clean surfaces to remove oil, grease, and other contaminants that could affect performance of waterproofing.
- B. Grind off ridges and other projections flush with adjacent surface.

- C. Repair of Defects: Repair concrete defects using patching compound in accordance with manufacturer's recommendations.

3.2 APPLICATION

- A. Mix waterproof lining material in proportions recommended by manufacturer.
- B. Apply in accordance with manufacturer's recommendations.
- C. Apply waterproofing to concrete surfaces with trowel to thickness recommended by manufacturer.

3.3 PROTECTION

- A. During the curing period, protect treated surfaces from damage by wind, sun, rain, puddling of water and temperatures below 36 degrees F. If plastic sheeting is used for protection, it must be raised off of the waterproofing coating to allow sufficient air circulation.

END OF SECTION

SECTION 071700

BENTONITE WATERPROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Bentonite clay waterproofing in geotextile sheet form.
 - 2. Drainage board.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include termination and penetration details, corner conditions, and interface with adjacent construction.
 - 2. Product Data: Include product description and performance characteristics.
 - 3. Warranty: Sample warranty form.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications:
 - 1. Minimum 3 years documented experience in work of this Section.
 - 2. Licensed or certified by waterproofing system manufacturer.
- B. Pre-Installation Conference:
 - 1. Convene at site 2 weeks prior to beginning work of this Section.
 - 2. Attendance: Architect, Design/Builder, Contractor, Construction Manager, waterproofing applicator, waterproofing manufacturer's representative, and related trades that may affect waterproofing installation prior to, during, or following installation.
 - 3. Review and discuss Contract Documents, waterproofing system manufacturer's literature, job conditions, scheduling, and other matters affecting application as appropriate.
 - 4. Tour representative areas of waterproofing substrates, and discuss substrate construction, related items, work conditions, and materials compatibility.

1.4 PROJECT CONDITIONS

- A. Materials may be applied to damp surfaces, but not in standing water or during precipitation.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Provide continuous protection for bentonite products against moisture absorption and wetting.

1.6 WARRANTIES

- A. Furnish manufacturer's 5 year warranty providing coverage against water leakage through waterproofing system.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are Tremco, Inc., or approved substitute. (www.tremcosealants.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Bentonite Waterproofing System:
 - 1. Description: Minimum 78 mil thick sodium bentonite compound bonded to 12 mil thick HPDE sheet, with release film facing.
 - 2. Source: Paraseal by Tremco, Inc. (www.tremcosealants.com) or approved substitute.
 - 3. Accessories:
 - a. Trowel grade bentonite.
 - b. Granular bentonite.
 - c. Bentonite tape.

2.3 ACCESSORIES

- A. Patching Compound: Cementitious based.
- B. Fasteners: Type best suited to application.
- C. Cover Sheet: Minimum 4 mil thick polyethylene sheet.
- D. Drainage Board:
 - 1. Source: TremDrain by Tremco, Inc., or approved substitute.
 - 2. Studded, non-biodegradable, molded plastic sheet drainage core with nonwoven, needle-punched geotextile facing laminated to one side and polymeric film bonded to other side.
 - 3. Vertical flow rate: Minimum 9 gallons per minute per foot.
 - 4. Thickness: Nominally 1/4 inch.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare substrate to receive waterproofing:
 - 1. Remove protrusions flush with adjacent surface.
 - 2. Remove loose and spalled concrete and masonry.
 - 3. Patch holes and depressions with patching compound; finish flush with adjacent surfaces.

3.2 INSTALLATION OF WATERPROOFING

- A. Install waterproofing system in accordance with manufacturer's instructions.
- B. Cover patched areas with trowel grade bentonite.
- C. Apply continuous 3/4 inch thick trowel grade bentonite fillet at vertical inside corners.
- D. Apply 3/4 inch thick trowel grade bentonite cant around penetrations; extend minimum 6 inches outward from penetration at 90 mils thick.
- E. Apply 2 inch cant of trowel grade bentonite at wall to footing joint.
- F. Apply adhesive to substrate at minimum rate recommended by manufacturer. Allow to dry completely. Recoat areas not covered with membrane within 8 hours after application.
- G. Begin application at bottom of wall, placing panels either horizontally or vertically. Stagger vertical joints. Weatherlap succeeding panels 2 inches minimum. Lap ends 2 inches minimum.
- H. Extend waterproofing minimum 6 inches onto footing.
- I. Terminate panels at grade; seal top edge with bentonite tape.

3.3 INSTALLATION OF DRAINAGE BOARD

- A. Apply drainage board the same day membrane is applied.
- B. Install in accordance with manufacturer's instructions.
- C. Cut pieces from roll to required length. Cut to fit around penetrations and at perimeter.
- D. Mechanically fasten to substrate. Place with filter fabric to earth.
- E. Overlap and secure filter fabric on adjacent sheets.
- F. Complete backfilling as soon as possible after application of protection board; within 7 days maximum.

END OF SECTION

SECTION 072113
BOARD INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Board insulation at exterior walls.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Indicate product composition and performance characteristics.
 - 2. Samples: 12 x 12 inch samples of each insulation.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that insulation meets fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Fire Hazard Classification:
 - 1. Maximum flame spread/smoke developed rating of 25/50, tested to ASTM E84.
 - 2. Tested and approved for use in NFPA 285 rated wall assembly.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store insulation in clean, dry, sheltered area, off ground or floor, until used. Protect against wetting and moisture absorption.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on Hunter Panels. (www.hpanels.com)
- B. Acceptable Manufacturers:
 - 1. Dow Chemical Co. (www.dow.com)
 - 2. Johns Manville. (www.jm.com)
 - 3. OX Engineered Products. (www.oxengineeredproducts.com)
 - 4. Rmax, Inc. (www.rmaxinc.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Board Insulation - Exterior structural decks over conditioned space:
 - 1. Source: xci Foil by Hunter, or approved substitute.
 - 2. ASTM C1289, rigid polyisocyanurate faced both sides with aluminum foil facings, reinforced core.
 - 3. Thermal resistance: Minimum R value of 6.3 per inch of thickness.
 - 4. Thickness: Refer to Drawings.

- B. Board Insulation - Walls:
 - 1. Source: XCI Foil by Hunter Panels or approved substitute.
 - 2. Description: ASTM C1289, rigid polyisocyanurate faced both sides with aluminum foil facings, reinforced core.
 - 3. Thermal resistance: Minimum LTTR value of 6.5 per inch.
 - 4. Thickness: Refer to Drawings.

2.3 ACCESSORIES

- A. Adhesive: Type recommended by insulation manufacturer.
- B. Tape: Minimum 2 inches wide, pressure sensitive, foil faced, waterproof.

PART 3 EXECUTION

3.1 PREPARATION

- A. Substrate:
 - 1. Remove protrusions flush with adjacent surface.
 - 2. Remove dirt, dust, oil, grease, and other materials that could impair adhesion.

3.2 INSTALLATION

- A. Apply adhesive in continuous beads.
- B. Install boards in a method to maximize contact bedding.
- C. Stagger end joints.
- D. Butt edges and ends tight to adjacent boards, at perimeter, and around penetrations.
- E. Tape seal to perimeter and at joints between insulation pieces.

END OF SECTION

SECTION 072115

BATT INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Batt insulation in exterior wall and ceiling assemblies.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that insulation meets fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Fire Hazard Classification:
 - 1. Noncombustible, tested to ASTM E136.
 - 2. Flame spread/smoke developed rating of 25/450 or less, tested to ASTM E84.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store insulation in clean, dry, sheltered area, off ground or floor, until used. Protect against wetting and moisture absorption.

1.5 PROJECT CONDITIONS

- A. Do not install insulation until building is substantially water and weather tight.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Owens Corning. (www.owenscorning.com) and USG. (www.usg.com)
- B. Acceptable Manufacturers - Glass Fiber Insulation:
 - 1. Johns Manville. (www.jm.com)
 - 2. Knauf Insulation. (www.knaufinsulation.us)
- C. Acceptable Manufacturers - Mineral Wool Insulation:
 - 1. Rockwool. (www.rockwool.com)
 - 2. Johns Manville. (www.jm.com)
 - 3. Knauf Insulation. (www.knaufinsulation.us)
 - 4. Owens Corning. (www.owenscorning.com)
- D. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Thermal Batt Insulation - Glass Fiber:
 - 1. Source: Owens Corning, or approved substitute.
 - 2. Type: ASTM C665, glass fiber composition.

3. Facing: Unfaced.
 4. Stapling flanges: None.
 5. Free from urea-formaldehyde resins.
 6. Thermal resistance: 6-1/4 inches thick: R-value of 19.00.
 7. Thickness: As indicated on Drawings.
- B. Thermal Batt Insulation - Mineral Wool:
1. Source: USG, or approved substitute.
 2. Type: Non-combustible, lightweight, mineral wool batt insulation to ASTM C665, Type 1, that provides fire resistance to ASTM E136 and a sound control to ASTM E90 and ASTM C423.
 3. Facing: Unfaced.
 4. Thermal resistance:
 - a. 5-1/2 inches thick: R-value of 23.00.
 - b. 7 inches thick: R-value of 30.00.
 5. Thickness: As indicated on Drawings.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Friction fit between framing members.
- B. Butt insulation to adjacent construction. Butt ends and edges.
- C. Carry insulation around pipes, wiring, boxes, and other components.
- D. Ensure complete enclosure of spaces without voids.

END OF SECTION

SECTION 072119

FOAMED-IN-PLACE INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Foamed-in-place insulation.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Provide product description, insulation properties, and preparation requirements.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 2 years documented experience in work of this Section.

1.4 PROJECT CONDITIONS

- A. Do not install insulation when ambient temperature is below 70 degrees F.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Huntsman Building Solutions. (www.huntsman.com)
- B. Other Acceptable Manufacturers:
 - 1. Demilec USA (www.demilecusa.com)
 - 2. NCFI Polyurethanes. (www.ncfi.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Foamed-In-Place Insulation - Open Cell:
 - 1. Source: Classic Ultra by Huntsman Building Solutions, or approved substitute.
 - 2. Type: Two component, plastic resin and catalyst, cold setting foam, open cell.
 - 3. Thermal Resistance:
 - a. Per inch of thickness: Aged thermal resistance of 3.7.
 - b. Overall: R-30.
 - 4. No CFC or HCFC emissions and total formaldehyde emissions less than 1 percent, cured for 7 days and tested to ASTM D5116 for 24 hours.
 - 5. Maximum volatile organic compound (VOC) content: 50 grams per liter.
 - 6. Greenguard Gold Certified.

PART 3 EXECUTION

3.1 PREPARATION

- A. Protect adjacent surfaces from accidental application.

3.2 APPLICATION

- A. Apply insulation in accordance with manufacturer's instructions.
- B. Apply insulation by froth method, to uniform monolithic density without voids.
- C. Install thermal and ignition barrier where exposed.

3.3 ADJUSTING

- A. Patch damaged areas.

END OF SECTION

SECTION 072400

EXTERIOR INSULATION AND FINISH SYSTEM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Foam Core Exterior Trim.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SYSTEM DESCRIPTION

- A. Fire Hazard Classification: Maximum flame spread/smoke developed rating of 25/450, tested to ASTM E84.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate joint layout and dimensions, system penetration details, and termination details.
 - 2. Product Data: Include primary and secondary product descriptions, application instructions, performance criteria, and list of sealants approved for use with system.
 - 3. Samples:
 - a. 24 x 24 inch samples showing proposed system, including insulation, reinforcing, and finish coat in proposed color and texture.
 - b. 6 inch long trim samples.
 - 4. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance:
 - a. Manufacturer's certification that installed system complies with requirements of Contract Documents.
 - b. Certificate of approval by Code authorities having jurisdiction over Project.
 - c. Certification from an independent testing laboratory that system meets fire hazard classification requirements.
 - d. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - 1) Certification mark or listing.
 - 2) Test report.
 - 3) Evaluation report from an evaluation entity.
 - 4) Evaluation report from an Architect or Engineer licensed in State of Florida.

1.4 QUALITY ASSURANCE

- A. Furnish EIFS system components from single manufacturer.
- B. Installer Qualifications: Minimum 2 years documented experience in work of this Section.
- C. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Approved for use by local authorities having jurisdiction or Florida Building Commission.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials in protected, dry area until used, at temperature between 40 and 90 degrees F.

1.6 PROJECT CONDITIONS

- A. Do not apply adhesives and coatings if:
 - 1. Ambient temperature is below 40 degrees F, or is expected to fall below that temperature within 24 hours after application.
 - 2. Relative humidity is above 85 percent and surface temperature is lower than 5 degrees F below dew point.
 - 3. Wind velocity is over 20 MPH.

1.7 WARRANTIES

- A. Furnish manufacturer's 5 year warranty providing coverage against air and water leakage through EIFS system.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Foam Supply. (www.foamsupply.com)
Contact: Rob Garson
954.482.4080
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Foam Core Exterior Trim:
 - 1. Source: Foam Supply, or approved substitute.
 - 2. Description: Hardcoat, high density, virgin EPS foam core exterior trim.
 - 3. Finish: Hardcoat System with Sand Finish, painted.
 - 4. Profiles/Details: Refer to Drawings.

2.3 ACCESSORIES

- A. Trim:
 - 1. Extruded PVC, perforated attachment flanges, of longest practical length.
 - 2. Corner bead: Beaded edge, size and profile to suit application.
 - 3. Casing bead: Thickness governed by system thickness, square edge.
 - 4. Drainage casing: Thickness governed by system thickness, square edge, perforated for drainage.
- B. Fasteners: ASTM C1513, hot-dip galvanized or fluoropolymer coated steel, minimum 5/8 inch penetration into framing.
- C. Water: Clean and potable.

2.4 MIXES

- A. Finish Coat: Mix in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.1 APPLICATION

- A. Install trim system in accordance with ANSI/EIMA 99A and manufacturer's instructions.
- B. Wrap reinforcement and adhesive around insulation edge at reveals, control joints and where system abuts dissimilar materials or stops with edge exposed, except at bottom edges.

3.2 APPLICATION OF FINISH COAT

- A. Apply in accordance with manufacturer's instructions.
- B. Work in continuous operation in each panel formed by trim and intersections to ensure even texture.
- C. Cut edges in clean and sharp where work joins other materials.
- D. Apply to uniform texture and color without streaks, laps, heavy buildups, and missed areas.
- E. Ensure consistent application and uniform appearance.

3.3 ADJUSTING

- A. Touch up finish coat as required to obtain uniform texture.

END OF SECTION

SECTION 072500

WEATHER BARRIERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sheet materials for controlling air and moisture movement at exterior wall assemblies.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 QUALITY ASSURANCE

- A. Provide continuous air and water resistive barrier, flashed to discharge incidental condensation and water penetration.
- B. Fire Hazard Characteristics:
 - 1. Maximum flame spread/smoke developed rating of 75/450, tested to ASTM E84.
 - 2. Tested and approved for use in NFPA 285 rated wall assembly.
- C. Installer Qualifications:
 - 1. Minimum 2 years documented experience in work of this Section.
 - 2. Approved by weather barrier manufacturer.
- D. Mockup:
 - 1. Construct mockup of typical exterior wall, minimum 8 feet wide x 8 feet high.
 - 2. Incorporate back-up construction, weather barrier, typical opening, flashings, and critical junctions.
 - 3. Locate where directed.
 - 4. Approved mockup may remain as part of the Work.
- E. Provide materials and components from a single source.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Show locations and extent of air barrier.
 - b. Include details for substrate joints and cracks, counterflashing strips, penetrations, inside and outside corners, terminations, and tie-ins with adjoining construction.
 - c. Include details of interfaces with other materials that form part of air barrier.
 - 2. Product Data: Include manufacturer's descriptive data, technical data, and tested physical and performance properties
 - 3. Samples: 12 x 12 inch weather barrier samples.

1.4 WARRANTY

- A. Provide manufacturer's 10 year manufacturer's Labor and Materials warranty against failure of system including costs of labor and materials. This warranty requires oversight by a manufacturer's specialist. Coordinate with manufacturer to meet the oversight requirements.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by DuPont. (www.tyvek.com)

B. Other Acceptable Manufacturers - Sheet Weather Barriers:

1. VaproShield. (www.vaproshield.com)
2. Typar. (www.typar.com)

C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Weather Barrier: Tyvek Commercial Wrap by DuPont or approved substitute.

2.3 ACCESSORIES

A. Fasteners: Hot-dip galvanized or fluoropolymer coated steel nails with 1 inch diameter plastic washers, minimum 5/8 inch penetration into framing.

B. Joint Tape: Minimum 2 inches wide, pressure sensitive, waterproof, of type recommended by weather barrier manufacturer.

C. Flashing Sheet: Type recommended by weather barrier manufacturer.

D. Primer: Type recommended by weather barrier manufacturer.

E. Patching Compound: Type recommended by weather barrier manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION - SHEET WEATHER BARRIERS

A. Provide complete and continuous barrier.

B. Apply primer when required by weather barrier manufacturer.

C. Install weather barrier without tears, voids, and holes.

D. Begin application at low point; weatherlap succeeding courses minimum 4 inches.

E. Lap ends 6 inches minimum. Tape seal lapped ends and edges.

F. Fasten at maximum 12 inches on center.

G. Seal to door and window frames, around penetrations, and at perimeter with flashing sheet. Press to full bond with substrate without voids, wrinkles, bridging, or fishmouths.

3.2 FIELD QUALITY CONTROL

A. Inspect weather barrier for damage just prior to covering.

B. Clean damaged areas and cover with additional weather barrier material minimum 6 inches larger than damaged area on all sides. Seal to main weather barrier with continuous tape.

END OF SECTION

SECTION 074113

METAL ROOF PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Standing seam metal roofing.
 - 2. Underlayment.
 - 3. Flashings, trim, anchorage, and accessories.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealants.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements; design roof system to withstand:
 - 1. Live and dead loads in accordance with Building Code and ASCE 7.
 - 2. Minimum wind pressures in accordance with Building Code, with maximum allowable deflection of L/240, tested in accordance with ASTM E1592.
 - 3. Movement caused by an ambient temperature range of 120 degrees F and a surface temperature range of 160 degrees F.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show configuration of panels, trim members, and closures.
 - 2. Product Data: Show system components including panels, trim, and accessories.
 - 3. Samples: Submit 12 inch long panel samples in selected finish.
 - 4. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Test Reports: Certified results of previous tests by a recognized independent laboratory substantiating compliance with specified design and performance criteria, current within past 5 years.
 - 2. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - a. Certification mark or listing.
 - b. Test report.
 - c. Evaluation report from an evaluation entity.
 - d. Evaluation report from an Architect or Engineer licensed in State of Florida.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Approved for use by local authorities having jurisdiction or Florida Building Commission.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Protect panels from contact with materials that could cause staining or discoloration of finish.

1.6 PROJECT CONDITIONS

- A. Do not install underlayment at ambient or surface temperatures less than 40 degrees F or on wet or frozen substrate.
- B. Do not install panels on wet or frozen substrate.

1.7 WARRANTIES

- A. Furnish manufacturer's 20 year warranty providing coverage against water leakage through roofing system.
 - 1. Make repairs to roofing system required due to defects in materials or workmanship resulting in water leakage into or through roofing system.
 - 2. Include cost of labor and materials necessary to make required repairs.
 - 3. Not limited to specific dollar amount.
 - 4. Transferable to subsequent building owners during warranty period.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Berridge Manufacturing Co. (www.berridge.com)
- B. Other Acceptable Manufacturers:
 - 1. AEP-Span. (www.aepspan.com)
 - 2. Centria Architectural Systems. (www.centria.com)
 - 3. Fabral. (www.fabral.com)
 - 4. MBCI. (www.mbc.com)
 - 5. Morin, A Kingspan Group Company. (www.kingspan.com)
 - 6. Petersen Aluminum Corp. (www.pac-clad.com)
 - 7. The Bryer Company. (www.thebryercompany.com)
 - 8. Western States Metal Roofing. (www.westernstatesmetalroofing.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Metal Roof Panels:
 - 1. Source: Standing Seam Metal Roof - Berridge Double Lock Zee-Lock Panel, or approved substitute.
 - 2. Aluminum Sheet: ASTM B209, alloy 3015-H14 or equivalent, 0.040 thickness.
 - 3. Panel Profile: 2 inch high mechanically locked 180 degree standing seams spaced 16 inches on center, flat panel.
 - 4. Finish: Cityscape.
- B. Underlayment:
 - 1. Source: Grace Ultra by GCP Applied Technologies Inc. (www.gcpat.com), or approved substitute
 - 2. Type: ASTM D1970; minimum 30 mil thick 100 percent butyl rubber adhesive backed by a layer of high density cross laminated polyethylene film, specifically formulated for extended high in-service temperatures up to 300 degrees F.
 - 3. Elongation: Minimum 250 percent, tested to ASTM D412, Die Method C.
 - 4. Tensile strength: Minimum 250 PSI, tested to ASTM D412, Die Method C.

2.3 ACCESSORIES

- A. Fasteners: 300 Series stainless steel, square drive screws with neoprene gasketed washers.
- B. Panel End Closures: Sponge neoprene, cut to fit panel configuration, minimum 1 inch depth.
- C. Joint Sealants: Specified in Section 079200.

2.4 FABRICATION

- A. Trim: Profiles as indicated or as required, fabricated from same material as panels.
- B. Roll form panels and trim to required profiles in longest practical lengths.

PART 3 EXECUTION

3.1 INSTALLATION OF UNDERLAYMENT

- A. Starting at low edge, apply underlayment horizontally on roof. Weatherlap each sheet 4 inches over preceding sheet. Lap ends 6 inches minimum.
- B. Press to full bond with substrate without voids, wrinkles, bridging, or fishmouths. Seal ends and edges.
- C. Lap underlayment minimum 12 inches over hips and ridges from both sides. Apply 36 inch wide strip centered lengthwise over ridge.
- D. Extend minimum 4 inches up abutting vertical surfaces.

3.2 INSTALLATION OF METAL PANELS

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Install aligned, level, and plumb.
- C. Fasten panels in regular pattern recommended by manufacturer.
- D. Locate panel joints over supports. Lap end joints 4 inches minimum. Install panels in continuous lengths from eave to ridge without end joints.
- E. Install trim to maintain visual continuity of system.
- F. Install joint sealants and gaskets to prevent water penetration.
- G. Flash penetrations through roofing with metal trim to match panels:
 - 1. Lap flashings over roof panels 12 inches minimum on all sides and seal with double bead of joint sealant.
 - 2. Install metal draw band and joint sealant at top of pipe penetrations.
 - 3. Install water diverter at uphill side of square and rectangular penetrations.
- H. Installation Tolerances:
 - 1. Variation from location: Plus or minus 1/4 inch.
 - 2. Variation from plane: 1/4 inch in 10 feet.

3.3 ADJUSTING

- A. Touch up field cuts and abrasions on finished surfaces to match factory finish.

END OF SECTION

SECTION 074623

WOOD SOFFITS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood soffits.
 - 2. Trim, anchorage, and accessories.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 076200 - Sheet Metal Flashing and Trim.
 - 3. Section 079200 - Joint Sealers.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Indicate profiles, sizes, fastening methods, surface texture, and accessories.
 - 2. Samples: 12 inch long samples.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Mockup:
 - 1. Size: Minimum 4 feet by 4 feet.
 - 2. Locate where directed by Architect.
 - 3. Approved mockup may remain as part of the Work.

1.4 PROJECT CONDITIONS

- A. Do not install soffit on wet or frozen substrate.
- B. Do not install soffit at temperatures below 40 degrees F.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wood Soffit:
 - 1. Tongue and Groove: Refer to Keynote Legend.
 - 2. Bead Board: Refer to Keynote Legend.
 - 3. Average moisture content: 9 percent.

2.2 ACCESSORIES

- A. Fasteners: Type recommended by soffit manufacturer; stainless steel.
- B. Sheet Metal Flashings and Trim: Specified in Section 076200.
- C. Joint Sealers: Specified in Section 079200.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to installation, condition wood to average humidity that will prevail after installation.
- B. Finish back side of soffit prior to installation.

3.2 INSTALLATION

- A. Install plumb and level, evenly spaced.
- B. Butt end joints; fit tight. Locate end joints over bearing surfaces.
- C. Cut to fit at perimeter and around penetrations with maximum 1/4 inch gaps. Sand and seal cut edges.
- D. Blind fasten at each support.
- E. Apply joint sealer between wood soffit and adjacent surfaces as specified in Section 079200. Ensure watertight condition.

END OF SECTION

SECTION 074646

MINERAL-FIBER CEMENT SIDING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Mineral-fiber cement siding.
 - 2. Mineral-fiber cement fascia.
 - 3. Mineral-fiber cement trim.
 - 4. Trim, anchorage, and accessories.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 076200 - Sheet Metal Flashing and Trim.
 - 3. Section 079200 - Joint Sealants.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Indicate profiles, sizes, fastening methods, surface texture, and finish.
 - 2. Samples: 12 inch long trim samples.
 - 3. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that siding meets fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years experience in work of this Section.
- B. Products must meet requirements for use in Miami/Dade County High Velocity Hurricane Zones (HVHZ).

1.4 WARRANTIES

- A. Furnish manufacturer's 25 year warranty providing coverage against cracking, rotting, or delamination of siding.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by James Hardie Building Products.
(www.jameshardie.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Mineral-Fiber Cement Siding, Fascia, and Trim:
 - 1. ASTM C1186, Grade II, Type A; formulated from Portland cement, ground sand, cellulose fibers, additives, and water; formed under pressure to required profile.
 - 2. Finish: Factory prime painted.
 - 3. Fire hazard classification: Class A, tested to ASTM E84.
 - 4. Profile, Size, and Thickness: As indicated on the Drawings.
 - 5. Surface texture: Smooth.

2.3 ACCESSORIES

- A. Fasteners: Type recommended by siding manufacturer; stainless steel.
- B. Sheet Metal Flashings and Trim: Specified in Section 076200.
- C. Joint Sealants: Specified in Section 079200.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install with edges and ends over firm bearing.
- C. Butt joints tight.
- D. Set plumb and level.
- E. Cut to fit at perimeter and around penetrations with maximum 1/4 inch gaps. Smooth cut edges.
- F. Fasten at maximum 12 inches on center in orderly fastening pattern.
- G. Apply joint sealant between trim and adjacent surfaces as specified in Section 079200.

END OF SECTION

SECTION 075200

MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Rigid roof insulation.
 - 2. Cover board.
 - 3. Modified bituminous membrane roofing.
 - 4. Base flashings.
 - 5. Walkway pads.

- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 061100 - Framing and Sheathing.
 - 3. Section 072119 - Foamed-In-Place Insulation.
 - 4. Section 076200 - Sheet Metal Flashing and Trim.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Design roofing system to resist minimum wind loads in accordance with ASCE 7 and Building Code.
 - 2. Products used must have active Miami/Dade County Notice of Approval Letters for High Velocity Hurricane Zones (HVHZ).

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings - Indicate:
 - a. Setting plan for insulation.
 - b. Roof slopes.
 - c. Base flashing, termination, and special details.
 - d. Fastener types and locations.
 - 2. Product Data:
 - a. Manufacturer's product specifications, installation instructions, and general recommendations for each principal roofing product.
 - b. Include bitumen softening point, flash point, equiviscous temperature (EVT), and finished blowing temperature.
 - 3. Warranty: Sample warranty form.

- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that roofing system meets fire hazard and windstorm classification requirements.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications:
 - 1. Minimum 3 years documented experience in work of this Section.
 - 2. Licensed or certified by roofing materials manufacturer.

- B. Roofing System:
 - 1. Class A Fire Hazard Classification, tested to ASTM E108.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Handle rolled goods to prevent damage to ends.
- B. Protect materials against moisture absorption, direct sunlight, damage, and temperatures above 110 degrees F and below 40 degrees F.
- C. Store materials off ground or roof deck on pallets. Cover materials stored outside with breathable covering, properly vented.
- D. Stockpile gravel surfacing near building in clean, well drained area. Prevent inclusion of vegetation, building debris, and other deleterious material in surfacing.

1.6 PROJECT CONDITIONS

- A. Environmental Requirements:
 - 1. Do not apply roofing to damp, wet, or frozen substrates, or during precipitation.
 - 2. Do not apply emulsions when temperature is below 40 degrees F, or if freezing weather is anticipated within 24 hours after application.
 - 3. Do not use frozen materials.

1.7 SEQUENCING

- A. Do not install more insulation than can be protected with roofing during the same day.
- B. Staging of roof membrane application or temporary membrane is not acceptable; install system in final form each day. If phased roofing occurs as result of emergency conditions, install additional plies over phased areas.
- C. Install water stops at exposed edges of roofing system if work is stopped due to adverse weather conditions.
- D. Complete flashings daily.

1.8 WARRANTIES

- A. Furnish manufacturer's 10 year warranty providing coverage against water leakage through roofing system.
 - 1. Make repairs to roofing system required due to defects in materials or workmanship resulting in water leakage into or through roofing system.
 - 2. Include cost of labor and materials necessary to make required repairs.
 - 3. Cover all roofing system components including roofing membrane, built-up and metal flashings, high wall waterproof flashings, roof insulation, and preflashed accessories.
 - 4. Not limited to specific dollar amount.
 - 5. Transferable to subsequent building owners during warranty period.
 - 6. Include coverage for wind speeds up to 90 MPH.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Johns Manville. (www.jm.com)
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Firestone Building Products Co. (www.firestonebpc.com)
 - 2. GAF Materials Corp. (www.gaf.com)
 - 3. Tamko Roofing Products, Inc. (www.tamko.com)
 - 4. Siplast, Inc. (www.siplast.com)

- C. Acceptable Manufacturers - Cover Board:
 - 1. GP Gypsum Corporation. (www.gp.com)
- D. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Modified Bitumen/Cap Sheet Roof System over Rigid Insulation (At Roof Well and at High Flat Roof over Tapered Insulation):
 - 1. Roofing System:
 - a. Source: 4FID by Johns Manville or approved substitute.
 - b. Description: Four Ply Hot Asphalt Applied Roofing System with SBS Mineral Surfaced Modified Bitumen Cap Sheet.
 - 2. Rigid Insulation:
 - a. Source: Energy 3 by Johns Manville.
 - b. Type: ASTM C1289, Type II, rigid polyisocyanurate faced both sides with glass fiber mat facings.
 - c. Thickness: Refer to Drawings.
 - d. Thermal resistance: Minimum LTTR value of 5 per inch of thickness.
 - 3. Cover Board:
 - a. 3/4 Fesco Board.
 - b. R value: 20.
- B. Modified Bitumen/Cap Sheet Roof System over Concrete (High Flat Roofs over Exterior Sheathing):
 - 1. Roofing System:
 - a. Source: 4FND by Johns Manville or approved substitute.
 - b. Description: Four Ply Hot Asphalt Applied Roofing System with SBS Mineral Surfaced Modified Bitumen Cap Sheet.
 - 2. Roof Insulation: Foamed-In-Place insulation inside building, refer to Section 072119.
- C. Flashing Sheet:
 - 1. Source: DFE 7 through 15 by Johns Manville or approved substitute.
 - 2. Description: Manufacturer's standard polyester mat reinforced, styrene butadiene styrene (SBS) modified bitumen flashing sheet to match roof membrane.
- D. Walkway Pads:
 - 1. Source: Dyna Tread Plus by Johns Manville or approved substitute.
 - 2. Description: Monolithic, inorganic, consisting of bitumen, fibers, and fillers, minimum 1/2 inch thick.
- E. Bitumen: ASTM D312, Type as applicable to slope.
- F. Primer: ASTM D41.
- G. Roof Cement: ASTM D4586, Type I.

2.3 ACCESSORIES

- A. Edge Strips: Perlite, ASTM C728, 12 inches wide, tapered from 1-1/2 inches thick.
- B. Cant Strips: Perlite, ASTM C728, 4 inch nominal vertical height, 45 degree face.
- C. Fasteners: Hot-dip galvanized or fluoropolymer coated steel, approved by roofing system manufacturer, type and length suited to project conditions.
- D. Insulation Fasteners: Hot-dip galvanized or fluoropolymer coated steel, approved by roofing system manufacturer, type and length suited to project conditions, with plastic plates.
- E. Nailers and Curbs:

1. Preservative treated wood, specified in Section 061100.
2. Nailers: 3-1/2 inch face dimension x insulation thickness.

F. Metal Flashings: Specified in Section 076200.

PART 3 EXECUTION

3.1 PREPARATION

- A. Complete roof penetrations and preparation for drains, flashings, and other penetrations prior to beginning roofing.
- B. Protect adjacent and underlying surfaces.

3.2 APPLICATION - GENERAL

- A. Apply roofing system in accordance with manufacturer's instructions, NRCA Manual, and approved Shop Drawings.

3.3 APPLICATION OF BITUMEN

- A. Do not heat above flash point; apply before bitumen cools below application temperature.
- B. Do not heat above finished blowing temperature for longer than 4 hours. If heated above finished blowing temperature, allow to cool to specified temperature before applying.
- C. Apply at equiviscous temperature, with maximum temperature tolerance of plus or minus 25 degrees F; check temperature regularly at point of application.
- D. Maximum deviation from quantity specified: Plus or minus 15 percent.
- E. Mop solidly under each felt and minimum 1/2 inch beyond edges so that at no point does felt touch felt.
- F. Do not apply when foaming, blistering, or bubbling of bitumen occurs.

3.4 INSTALLATION OF INSULATION

- A. Adhere in solid moppings of hot bitumen applied at minimum rate of 23 pounds per square.
- B. Fit insulation to other boards and at perimeter and around penetrations with maximum 1/4 inch voids.

3.5 INSTALLATION OF COVER BOARD

- A. Apply panels with long edges continuous and perpendicular to direction of insulation. Stagger end joints in adjacent rows. Offset joints from those in insulation. Locate ends over solid bearing.
- B. Embed in solid moppings of hot bitumen at rate of 30 pounds per square.
- C. Fit panels to other panels and at perimeter and around penetrations with maximum 1/4 inch voids.

3.6 APPLICATION OF ROOFING

- A. Install bitumen dams at edges and around openings. After roofing membrane is complete and before metal flashings are installed, fold back dams over top of felts and cement in place.
- B. Roof Membrane:
 1. Apply four plies roofing membrane; weatherlap each sheet 4 inches over preceding sheet. Lap ends 6 inches minimum.

2. Hot-mopped installation: Embed in solid moppings of hot bitumen at rate of 30 pounds per square. Broom to full contact without voids and wrinkles. Seal ends and edges.
 3. Torch-applied installation: Apply heat to underside of sheets; broom to full bond with substrate without voids and wrinkles. Broom to full contact without voids and wrinkles. Seal ends and edges.
 4. Ensure 1/2 inch bitumen bleed at lapped edges. Embed matching aggregate while bitumen is still hot.
- C. Install water stops at exposed edges of insulation if work is stopped due to adverse weather conditions.
1. Cement one half of 12 inch wide strip of felt to deck, double back over exposed edge and mop adhere solidly on top of insulation.
 2. Do not cut off staggered boards at edge of insulation; temporarily fill with loose pieces of insulation.
 3. Remove water stops and loose insulation when work is resumed.

3.7 INSTALLATION OF FLASHINGS

- A. Metal Flashings:
1. Prime metal flanges.
 2. Nail flanges at 3 inches on center maximum.
 3. Strip in with one ply of roofing membrane.
- B. Membrane Flashings:
1. Horizontal to vertical surfaces:
 - a. Prime concrete and masonry surfaces.
 - b. Install cant strip at juncture of vertical surfaces and roof.
 - c. Extend roofing over cant and minimum 4 inches up vertical surfaces.
 - d. Apply two plies flashing sheet.
 - e. Embed each ply in hot bitumen applied at rate of 23 pounds per square. Broom to full bond with substrate without voids and wrinkles. Seal ends and edges.
 - f. Mechanically fasten top edge of flashing to substrate and seal with metal flashing, or extend over top of wall.
 2. Roof drain flashings:
 - a. Taper roof insulation to drains.
 - b. Remove drain rings prior to insulation and roof application.
 - c. Embed lead sheet into roof cement and flash in accordance with roofing manufacturer's specifications.
 - d. Set drain ring into roof cement.

3.8 INSTALLATION OF WALKWAY PADS

- A. Clean substrate prior to placing; set in solid mopping of hot bitumen.
- B. Leave 3 to 6 inch space between pieces.

END OF SECTION

SECTION 075400

THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fully adhered single ply membrane roofing on parapet walls.
 - 2. Base flashings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 061000 - Rough Carpentry.
 - 3. Section 076200 - Sheet Metal Flashing and Trim.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Design roofing system to resist minimum wind loads in accordance with Building Code and ASCE 7.
 - 2. Products used must have active Miami/Dade County Notice of Approval Letters for High Velocity Hurricane Zones (HVHZ).

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate:
 - a. Setting plan for insulation.
 - b. Roof slopes.
 - c. Layout of seams.
 - d. Base flashing, termination, and special details.
 - e. Fastener types and locations.
 - 2. Product Data: Manufacturer's product specifications, installation instructions, and general recommendations for each product.
 - 3. Samples: Walkway pad.
 - 4. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that roofing system meets fire hazard and windstorm classification requirements.
 - 2. Products used must have active Miami/Dade County Notice of Approval Letters for High Velocity Hurricane Zones (HVHZ).

1.4 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Minimum 3 years documented experience in work of this Section.
 - 2. Licensed or certified by roofing materials manufacturer.
- B. Roofing System:
 - 1. Solar Reflectance Index: Minimum 78, tested to ASTM C1549 and calculated in accordance with ASTM E1980.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Store materials, other than membrane, in protected, dry area, between 60 and 80 degrees F until used; provide proper ventilation.

- B. Protect sheet goods from damage and wetting.

1.6 PROJECT CONDITIONS

- A. Do not apply roofing to damp or frozen substrate.
- B. Do not apply roofing during inclement weather or at temperatures below 40 degrees F, or above 100 degrees F or if freezing weather is anticipated within 24 hours after application. Do not use frozen materials.

1.7 WARRANTIES

- A. Furnish manufacturer's 35 year warranty providing coverage against water leakage through roofing system.
 - 1. Make repairs to roofing system required due to defects in materials or workmanship resulting in water leakage into or through roofing system.
 - 2. Include cost of labor and materials necessary to make required repairs.
 - 3. Cover all roofing system components including roofing membrane, built-up and metal flashings, high wall waterproof flashings, roof insulation, expansion joint covers, and preflashed accessories.
 - 4. Not limited to specific dollar amount.
 - 5. Transferable to subsequent building owners during warranty period.
 - 6. Include coverage for:
 - a. Wind speeds up to 115 MPH.
 - b. Accidental puncture.
 - c. Damage by hail up to 1 inch in diameter.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on roof membrane products by Johns Manville (www.johnsmanville.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Roof Membrane:
 - 1. Source: JM TPO - 60 Mil by Johns Manville, or approved substitute.
 - 2. Type: ASTM D6878, reinforced thermoplastic polyolefin (TPO), ultraviolet resistant.
 - 3. Size: Maximum sheet size permitted by application and job conditions.
 - 4. Thickness: 60 mils.
 - 5. Color: White.
- B. Flashing Sheet: Manufacturer's standard flashing sheet, color to match membrane.

2.3 ACCESSORIES

- A. Accessories: By manufacturer of roofing system, including adhesives, tapes, solvents, sealants, water cutoff mastic, and prefabricated pipe flashings.
- B. Fasteners: Hot-dip galvanized or fluoropolymer coated steel, approved by roofing system manufacturer, type and length suited to project conditions.
- C. Insulation Fasteners: Hot-dip galvanized or fluoropolymer coated steel, approved by roofing system manufacturer, type and length suited to project conditions, with plastic plates.

- D. Nailers and Curbs:
 - 1. Preservative treated wood, specified in Section 061000.
 - 2. Nailers: 3-1/2 inch face dimension x insulation thickness.
- E. Metal Flashings: Specified in Section 076200.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove projections that could puncture membrane from substrate.
- B. Clean substrate of loose and foreign material, oil, and grease.
- C. Complete roof penetrations and preparation for drains, flashings, and other penetrations prior to beginning roofing.
- D. Protect adjacent and underlying surfaces.

3.2 INSTALLATION - GENERAL

- A. Install roofing system in accordance with roofing system manufacturer's instructions, NRCA Manual, and approved Shop Drawings.

3.3 INSTALLATION OF ROOF MEMBRANE

- A. Position sheets without stretching; minimize wrinkles. Allow membrane to relax before proceeding.
- B. Provide minimum 5-1/2 inch lap at joints between adjacent sheets.
- C. Splice sheets by heat welding method.
- D. Bond membrane to substrate with adhesive applied in accordance with manufacturer's instructions.
- E. Fasten membrane to perimeter nailers with fasteners spaced 6 inches on center maximum.
- F. Daily Seal:
 - 1. Ensure that water does not flow beneath completed sections of roof.
 - 2. Temporarily seal loose edge of membrane with night seal when weather is threatening.
 - 3. When work is resumed, pull sheet free before continuing installation.

3.4 INSTALLATION OF FLASHINGS

- A. Construct in accordance with roofing system manufacturer's standard details.
- B. Juncture of Horizontal and Vertical Surfaces:
 - 1. Use longest practical length flashing to minimize joints.
 - 2. Complete splice between flashing and main roof sheet before bonding flashing to vertical surface. Extend splice 3 inches beyond fasteners that attach membrane to horizontal surface.
 - 3. Adhere flashing to substrate with full bed of adhesive.
 - 4. Fasten top of flashing at 12 inches on center maximum, under metal flashing.
- C. Penetrations through Membrane:
 - 1. Flash pipe with premolded pipe flashings wherever possible.
 - 2. Where molded pipe flashings cannot be installed, use field fabricated pipe seals.
 - 3. Seal clusters of pipes and unusually shaped penetrations with minimum 2 inch high flashing containing pourable sealer.

END OF SECTION

SECTION 076200

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal flashings and trim.
 - 2. Edge flashings.
 - 3. Gutters and downspouts.
 - 4. Flashings at tile roofing.
 - 5. Counterflashings over membrane roof base flashings.
 - 6. Counterflashings at roof mounted equipment and utility penetrations.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealants.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show locations, types and thicknesses of metal, profiles, dimensions, fastening methods, provisions for expansion and contraction, and joint details.
 - 2. Samples:
 - a. 3 x 3 inch prefinished metal samples in specified color.

1.3 QUALITY ASSURANCE

- A. Fabricator and Installer Qualifications: Minimum 5 years documented experience in work of this Section.
- B. Design, fabricate, and install edge flashings in accordance with ANSI/SPRI ES-1.
- C. Conform to SMACNA Manual for nominal sizing of gutters and downspouts for rainfall intensity determined by a storm occurrence of 1 in 50 years.
- D. Meet product and installation requirements for use in Miami/Dade County High Velocity Hurricane Zones (HVHZ).

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aluminum Sheet:
 - 1. ASTM B209, alloy 3003, temper H14, 0.040 inch thick.
 - 2. Finish: AAMA 2605, fluoropolymer coating containing minimum 70 percent PVDF resins, two coat system, color to be selected from manufacturer's full color range.

2.2 ACCESSORIES

- A. Solder: ASTM B32.
- B. Fasteners: Same material and finish as sheet metal, with neoprene gasketed washers where exposed.
- C. Joint Sealers: Specified in Section 079200.

2.3 FABRICATION

- A. Fabricate components in accordance with SMACNA Manual.
- B. Profiles:
 - 1. Gutters and downspouts: Profiles as indicated in the Drawings.
 - 2. Fabricate end caps, downspout outlets and headers, straps, brackets, and downspout strainers in profile to suit gutters and downspouts.
- C. Edge Flashings:
 - 1. Furnish continuous cleats of same material as edge flashing to support edge of external leg.
 - 2. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
 - 3. Provide 6 inch wide joint cover plates in same material and gage as edge flashing.
 - 4. Fabricate corners in single units with minimum 18 inch long legs.
 - 5. Provide expansion joints in lengths exceeding 15 feet:
 - a. Place joints at 10 feet on center maximum and maximum 2 feet from corners and intersections.
 - b. Joint width: Consistent with types and sizes of materials, minimum width 1/4 inch.
- D. Counterflashings:
 - 1. Two piece construction with receiver and counterflashing.
 - 2. Fabricate with bottom edge formed outward 1/4 inch at 45 degrees and hemmed to form drip.
- E. Solder shop formed joints except pop rivet and seal joints at prefinished metal. After soldering, remove flux and wash clean.
- F. Form sections accurate to size and shape, square and free from distortion and defects.
- G. Unless otherwise indicated, provide minimum 3/4 inch wide flat lock seams; lap in direction of water flow.
- H. Fabricate cleats and starter strips of same material as sheet metal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install flashing and sheet metal as indicated and in accordance with SMACNA Manual.
- B. Install cleats and starter strips before starting installation of sheet metal. Fasten at 6 inches on center maximum.
- C. Expansion Joints in Edge Flashings:
 - 1. Center backing plate between flashing pieces at end joints.
 - 2. Apply two continuous beads of joint sealer between backing plate and flashing sections at each end.
 - 3. Install flashing pieces with 1/2 inch expansion space at abutting ends; apply sealer to expansion space.
 - 4. Apply two continuous beads of joint sealer between cover plate and flashing sections at each end.
- D. Secure flashings with concealed fasteners where possible.
- E. Apply plastic cement between metal and bituminous flashings.
- F. Fit flashings tight, with square corners and surfaces true and straight.
- G. Seam and seal field joints.

- H. Separate dissimilar metals with bituminous coating or non-absorptive gaskets.
- I. Reglets:
 - 1. Install reglets true to line and level. Seal top of surface mounted reglet with joint sealer.
 - 2. Install flashings into reglets to form tight fit. Secure with lead or plastic wedges at 9 inches on center maximum. Seal remaining space with joint sealer.
- J. Gutters: Secure with straps spaced maximum 36 inches on center and within 12 inches of ends.
- K. Downspouts:
 - 1. Secure with straps spaced maximum 8 feet on center and within 2 feet of ends and elbows.
 - 2. Flash downspouts into gutters and fasten.
 - 3. Flash upper sections into lower sections minimum 2 inches at joints; fasten sections together.
- L. Apply joint sealers as specified in Section 079200.

3.2 CLEANING

- A. Clean sheet metal; remove slag, flux, stains, spots, and minor abrasions without etching surfaces.

END OF SECTION

SECTION 077233

ROOF ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Prefabricated roof hatches with integral curbs and operating hardware.
 - 2. Roof curbs.
 - 3. Roof supports.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate locations, dimensions, materials, finishes, attachment, and relationship to adjacent construction.
 - 2. Product Data: Manufacturer's literature including description of materials, finishes, operation, and installation instructions.
 - 3. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - a. Certification mark or listing.
 - b. Test report.
 - c. Evaluation report from an evaluation entity.
 - d. Evaluation report from an Architect or Engineer licensed in State of Florida.

1.3 QUALITY ASSURANCE

- A. Roof Hatches: Support minimum 40 PSF live load.
- B. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Units shall be Miami-Dade Product approved, approved for use by local authorities having jurisdiction, and Florida Building Commission.

1.4 WARRANTIES

- A. Furnish manufacturer's 2 year warranty providing coverage against defective materials and workmanship.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Bilco Co. (www.bilco.com), Roof Products and Systems, Inc. (www.rpscurobs.com), and Thaler Metal Industries. (www.thalermetal.com)
- B. Other Acceptable Manufacturers:
 - 1. Babcock-Davis Hatchways, Inc. (www.babcockdavis.com)
 - 2. Milcor. (www.milcorinc.com)
 - 3. Nystrom, Inc. (www.nystrom.com)
 - 4. Precision Ladders, LLC. (www.precisionladders.com)

C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Galvanized Steel Sheet: ASTM A653/A653M, Structural Quality, G90 coating class.

B. Insulation: Rigid fiberboard.

2.3 MANUFACTURED UNITS

A. Roof Hatch:

1. Source: NB-20HZ by Bilco Co., or approved substitute.
2. Type: Single leaf, ladder access.
3. Nominal opening size: 30 inches wide x 54 inches long.
4. Frame:
 - a. Minimum 14 gage galvanized steel with 12 inch high curb, integral cap flashing, 3-1/2 inch wide flanges with attachment holes and 1 inch thick insulation bonded to exterior.
5. Cover:
 - a. Minimum 14 gage galvanized steel exterior and 22 gage galvanized steel liner bonded to 1 inch thick insulation core.
6. Hardware: Zinc coated or cadmium plated.
 - a. Steel pintle hinges.
 - b. Neoprene weather seal.
 - c. Compression spring operated lifting mechanism.
 - d. Automatic locking hold open arms.
 - e. Two-point spring latch with interior and exterior turn handles and padlock hasps.
7. Finish: Factory-applied primer and polyester powder coat, sprayed and baked, color to be selected.

B. Roof Curbs:

1. Manufacturer: Roof Products and Systems, Inc.
2. Material: Stainless Steel Sheet.
3. Finish: High Performance Organic Coating.

C. Roof Supports: Thaler Metal Industries.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Set units plumb and level, without warp and rack.
- C. Secure to supporting construction.

END OF SECTION

SECTION 078400

FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Firestopping perimeter of and penetrations through fire and smoke rated assemblies.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SYSTEM DESCRIPTION

- A. Provide continuous protection against passage of heat, fire, smoke, and gases at perimeter of and penetrations through rated assemblies.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data:
 - a. Firestopping schedule; prepare in tabular format and identify:
 - 1) Type of assembly receiving firestop and required fire rating.
 - 2) Type of penetrating item.
 - 3) Proposed firestop system.
 - b. Include UL or equivalent details for each firestop system.
 - 2. Test Reports: Indicate conformance with ASTM E814, ASTM E1966, ASTM E2307, UL 1479, or UL 2079.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Indicate conformance of installed systems with specified requirements.

1.4 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Firestopping: Fire resistance rating equivalent to adjacent construction; tested to ASTM E814, ASTM E1966, ASTM E2307, UL 1479, or UL 2079.

1.5 PROJECT CONDITIONS

- A. Do not apply sealants, mortars, or putties when temperature of substrate material and surrounding air is below 40 degrees F or is anticipated to drop below that temperature within 24 hours after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Hilti, Inc. (www.us.hilti.com)
 - 2. 3M Fire Protective Products. (www.3m.com)
 - 3. Rectorseal. (www.rectorseal.com)
 - 4. Specified Technologies, Inc. (www.stifirestop.com)
 - 5. Tremco, Inc. (www.tremcosealants.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Firestopping: One or more of the following:
 - 1. Silicone elastomer compound: Single or multiple component, low modulus, moisture curing silicone sealant.
 - 2. Ceramic sealant: Single component, moisture curing ceramic sealant.
 - 3. Intumescent sealant: Single component, water based intumescent sealant.
 - 4. Acrylic sealant: Single component acrylic sealant, suitable for painting.
 - 5. Putty: Single component ceramic fiber base putty or intumescent elastomer putty that expands on exposure to surface heat gain.
 - 6. Mortar: Hydraulic cementitious mortar.
 - 7. Pillows or blocks: Formed intumescent or mineral fiber pillows or blocks.
 - 8. Intumescent strips: Solvent free intumescent wrap strips.
 - 9. Mechanical devices: Incombustible fillers or silicone elastomer covered with sheet stainless steel jacket, joined with collars, penetration sealed with flanged stops.
 - 10. Cast-in-place devices: Containing intumescent material and smoke/water seals.

2.3 ACCESSORIES

- A. Forming and Damming Materials: As recommended by firestopping manufacturer for intended use.
 - 1. Permanent: Mineral fiber board, mineral fiber matting, or mineral fiber putty.
 - 2. Temporary: Plywood, particle board, or other.
- B. Safing Insulation: Thermafiber Safing Mineral Wool Insulation by USG, or approved substitute.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare openings to receive firestopping as directed by manufacturer:
 - 1. Remove incidental and loose materials from penetration opening.
 - 2. Remove free liquids and oil from involved surfaces and penetration components.
 - 3. Install damming materials to accommodate and ensure proper thickness and fire rating requirements and provide containment during installation.
 - 4. Remove combustible materials and materials not intended for final penetration seal system.

3.2 INSTALLATION

- A. Install firestopping at perimeter of and penetrations through fire and smoke rated assemblies.
- B. Apply materials in accordance with manufacturer's instructions.
- C. Apply firestopping material in sufficient thickness to achieve required ratings.
- D. Compress fibered material to achieve a density of 40 percent of its uncompressed density.
- E. Place foamed material in layers to ensure homogenous density, filling cavities and spaces. Place sealant to completely seal junctions with adjacent dissimilar materials.
- F. Place intumescent coating in sufficient coats to achieve rating required.
- G. Remove dam material after firestopping material has cured.
- H. Finish exposed surfaces to smooth, flush appearance.

END OF SECTION

SECTION 079200

JOINT SEALANTS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Joint backup materials.
 - 2. Joint sealants.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Indicate sealants, primers, backup materials, bond breakers, and accessories proposed for use.
 - 2. Samples:
 - a. 1/2 x 1/2 x 3 inch long joint sealant samples in specified colors.
 - b. 6 inch long joint backup material samples.
 - 3. Warranty: Sample warranty form.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 2 years experience in work of this Section.
- B. Maximum Volatile Organic Compound (VOC) Content; interior sealants and accessories:
 - 1. Sealants: 250 grams per liter.
 - 2. Primers for non-porous substrates: 250 grams per liter.
 - 3. Primers for porous substrates: 775 grams per liter.
- C. Laboratory Pre-Construction Testing:
 - 1. Obtain representative samples of actual substrate materials.
 - 2. Test sealants and accessories for following:
 - a. Adhesion: Test to ASTM C794 and ASTM C719; determine surface preparation and required primer.
 - b. Compatibility: Test to ASTM C1087; determine that materials in contact with sealants do not adversely affect sealant materials or sealant color.
 - c. Staining: Test to ASTM D2203, ASTM C510, or ASTM C1248; determine that sealants will not stain joint substrates.
 - d. Pre-construction testing is not required when sealant manufacturer furnishes data acceptable to Architect based on previous testing for materials matching those of this Project.
- D. Field Pre-Construction Testing:
 - 1. Perform field testing for sealant adhesion in accordance with ASTM C1521 on exterior mockup, prior to beginning application, and for each 1000 feet of installed sealant.
 - 2. Install sealants using joint preparation methods and materials recommended by sealant manufacturer.
 - 3. When tests indicate sealant adhesion failure, modify joint preparation, primer, or both and retest until joint passes sealant adhesion test.

1.4 PROJECT CONDITIONS

- A. Do not apply sealants at temperatures below 40 degrees F unless approved by sealant manufacturer.

1.5 WARRANTIES

- A. Furnish manufacturer's 10 year warranty providing coverage for exterior sealants and accessories that fail to provide air and water tight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. BASF Building Systems. (www.buildingsystems.basf.com)
 - 2. Dow Corning Corp. (www.dowcorning.com)
 - 3. GE Silicones. (www.siliconeforbuilding.com)
 - 4. Pecora Corp. (www.pecora.com)
 - 5. Sika Corp. (www.sikausa.com)
 - 6. Tremco, Inc. (www.tremcosealants.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Joint Sealant Type 1:
 - 1. ASTM C920, Grade P, multiple component polyurethane type, self-leveling and slope grades.
 - 2. Movement capability: Plus or minus 50 percent.
 - 3. Color: To be selected from manufacturer's full color range.
- B. Joint Sealant Type 2:
 - 2. ASTM C920, Grade NS, single component silicone type, nonstaining, non sag, formulated to adhere to low energy surfaces.
 - 3. Movement capability: Plus or minus 25 percent.
 - 4. Color: White.
- C. Joint Sealant Type 3:
 - 1. ASTM C920, Grade NS, single component polyurethane type, non sag.
 - 2. Movement capability: Plus or minus 25 percent.
 - 3. Color: To be selected from manufacturer's full color range.
- D. Joint Sealant Type 4:
 - 1. ASTM C920, Grade NS, single component silicone type, nonstaining, non sag.
 - 2. Movement capability: Plus or minus 50 percent.
 - 3. Color: To be selected from manufacturer's full color range.
- E. Joint Sealant Type 5:
 - 1. ASTM C834, single component acrylic latex, non sag.
 - 2. Movement capability: Plus or minus 7-1/2 percent.
 - 3. Color: To be selected from manufacturer's full color range.
- F. Joint Sealant Type 6:
 - 1. ASTM C920, Grade NS, single component silicone, non sag, mildew resistant.
 - 2. Movement capability: Plus or minus 25 percent.
 - 3. Color: To be selected from manufacturer's full color range.
- G. Joint Sealant Type 7:
 - 1. ASTM C834, single component acrylic latex, non sag, non-hardening, non-corrosive, recommended by manufacturer for acoustical applications.
 - 2. Movement capability: Plus or minus 7-1/2 percent.
 - 3. Color: To be selected from manufacturer's full color range.

2.3 ACCESSORIES

- A. Primers, Bondbreakers, and Solvents: As recommended by sealant manufacturer.
- B. Joint Backing:
 - 1. ASTM C1330, closed cell polyethylene foam, preformed round joint filler, non absorbing, non staining, resilient, compatible with sealant and primer, recommended by sealant manufacturer for each sealant type.
 - 2. Size: Minimum 1.25 times joint width.

2.4 MIXES

- A. Mix multiple component sealants in accordance with manufacturer's instructions.
 - 1. Mix with mechanical mixer; prevent air entrainment and overheating.
 - 2. Continue mixing until color is uniform.

PART 3 EXECUTION

3.1 PREPARATION

- A. Remove loose and foreign matter that could impair adhesion. If surface has been subject to chemical contamination, contact sealant manufacturer for recommendation.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Protect adjacent surfaces with masking tape or protective coverings.
- D. Calculate joint dimensions in accordance with ASTM C1472.

3.2 APPLICATION

- A. Apply products in accordance with manufacturer's instructions.
- B. Install sealants and accessories in accordance with ASTM C1193.
- C. Install acoustical sealants and accessories in accordance with ASTM C919.
- D. Install joint backing to maintain required sealant dimensions. Compress backing approximately 25 percent without puncturing skin. Do not twist or stretch.
- E. Use bondbreaker tape where joint backing is not installed.
- F. Fill joints full without air pockets, embedded materials, ridges, and sags.
- G. Tool sealant to smooth profile.
- H. Apply sealant within manufacturer's recommended temperature range.

3.3 CLEANING

- A. Remove masking tape and protective coverings after sealant has cured.
- B. Clean adjacent surfaces.

3.4 SCHEDULE

JOINT LOCATION OR TYPE	SEALANT TYPE
Exterior Joints:	
Joints in horizontal surfaces subject to pedestrian traffic	1
Joints in concealed above-grade surfaces at flexible flashings (if required)	2
Joints in plaster surfaces above grade	3
Joints in above-grade surfaces	4
Interior Joints:	
Joints in horizontal surfaces subject to pedestrian traffic	1
Joints in toilet rooms and countertops	6
Joints in acoustical assemblies	7
Other joints	5

END OF SECTION

SECTION 081113

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Hollow steel doors and frames.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 087100 - Door Hardware.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show locations, elevations, dimensions, model designations, thermal and acoustical ratings, preparation for hardware, and anchoring details.
 - 2. Product Data: Show elevations, dimensions, gages of metal, hardware reinforcing gages and locations, and anchor types.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification that products furnished comply with ANSI/SDI A250.3, ANSI/SDI 250.4, and ANSI/SDI A250.10.
 - 2. Test Reports: Certified results of previous tests by a recognized independent laboratory substantiating compliance with specified design and performance criteria, current within past 5 years.
 - 3. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - a. Certification mark or listing.
 - b. Test report.
 - c. Evaluation report from an evaluation entity.
 - d. Evaluation report from an Architect or Engineer licensed in State of Florida.

1.3 QUALITY ASSURANCE

- A. Doors: ANSI/SDI A250.8.
 - 1. Grade: III - Extra Heavy Duty.
 - 2. Model: 2 - Seamless.
 - 3. Exterior doors: Maximum thermal transmittance (U-value) of 0.50, tested to ASTM C518.
- B. Frames: ANSI/SDI A250.8, Grade III - Extra Heavy Duty.
- C. Acoustic Door and Frame Assemblies: Minimum STC rating of 45, measured in accordance with ASTM E413.
- D. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Approved for use by local authorities having jurisdiction or Florida Building Commission.
 - 4. Meet requirements of Miami Dade High Velocity Hurricane Zones (HVHZ).

1.4 DELIVERY, STORAGE AND HANDLING

- A. Ship door frames with removable angle spreader; do not remove until frame is installed.
- B. Do not cover with non vented coverings that create excessive humidity.

- C. Remove wet coverings immediately.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Ceco Door. (www.cecodoor.com)
- B. Other Acceptable Manufacturers:
 - 1. Curries. (www.curries.com)
 - 2. Fleming Door Products. (www.flemingdoor.com)
 - 3. Pioneer Industries, Inc. (www.pioneerindustries.com)
 - 4. Steelcraft. (www.steelcraft.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Steel Sheet: ASTM A1008/1008M, cold rolled.
- B. Galvanized Steel Sheet: ASTM A653/A653M, hot dipped, Structural Quality, Class G40 galvanized.
- C. Door Core:
 - 1. Exterior doors: Foamed-in-place polyurethane insulation.
 - 2. Interior doors: Resin impregnated fibrous honeycomb.

2.3 ACCESSORIES

- A. Primer: Zinc rich type.

2.4 FABRICATION

- A. Fabricate frames in accordance with ANSI/SDI A250.8.
- B. Fabricate doors and frames from galvanized steel sheet.
- C. Fabricate exterior frames with 3/8 inch vinyl thermal break separating interior and exterior surfaces.
- D. Doors:
 - 1. Fabricate interior doors from 0.0598 inch minimum interior galvanized steel sheet and exterior doors from minimum 0.0635 inch thick galvanized steel sheet.
 - 2. Close top and bottom edges of doors with steel channel, minimum 16 gage, extending full width of door, and spot welded to both faces, with top channel flush and bottom channel recessed.
 - 3. Fabricate vertical door edges as vertical seam edge filled, dressed smooth, intermittently welded seams, edge filled, dressed smooth, or continuously welded seam, dressed smooth.
- E. Frames:
 - 1. Fabricate from minimum 0.067 inch thick cold rolled steel sheet.
 - 2. Close corner joints tight with trim faces mitered and face welded, full profile welded, or continuously welded and ground smooth.
 - 3. Anchors:
 - a. Provide one anchor at each jamb for each 30 inches of door height.
 - b. Design anchors to provide positive fastenings to adjacent construction.
 - c. Provide one floor anchor welded to each jamb.
 - 4. Where frames will be filled with concrete or grout, install silencers in frames before erection.
- F. Accurately form to required sizes and profiles.
- G. Grind and dress exposed welds to form smooth, flush surfaces.

- H. Do not use metallic filler to conceal manufacturing defects.
- I. Fabricate with internal reinforcement for hardware specified in Section 087100; weld in place.
- J. Design Clearances:
 - 1. Between door and frame: Maximum 1/8 inch.
 - 2. Between meeting edges of pairs of doors: 3/16 inch plus or minus 1/16 inch.
 - 3. Undercut: Maximum 3/4 inch.
 - 4. Between face of door and stop: 1/16 to 3/32 inch.
- K. Manufacturing Tolerances: In accordance with SDI-117.

2.5 FINISHES

- A. Dress tool marks and surface imperfections to smooth surfaces.
- B. Clean and chemically treat steel surfaces.
- C. Touch up damaged metallic coatings.
- D. Apply manufacturer's standard rust inhibiting primer paint, air-dried or baked on, meeting requirements of ANSI/SDI A250.10.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install doors and frames in accordance with ANSI/SDI A250.11.
- B. Set plumb and level.
- C. Secure to adjacent construction using fastener type best suited to application.
- D. Install hardware in accordance with Section 087100.

3.2 ADJUSTING

- A. Touch up minor scratches and abrasions in primer paint to match factory finish.

END OF SECTION

SECTION 081116
ALUMINUM FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aluminum framing systems for interior doors and glazed openings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 081416 - Flush Wood Doors.
 - 3. Section 087100 - Door Hardware.
 - 4. Section 088000 - Glazing.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings; Include:
 - a. Door and frame elevations, dimensions, material thicknesses, reinforcement locations, and attachments.
 - b. Relationship to adjacent construction.
 - c. Glass opening sizes and locations, glass types, and glazing details.
 - d. Fire ratings.
 - 2. Samples: 6 inch long frame samples showing profile and finish.

1.3 QUALITY ASSURANCE

- A. Fire Door Construction: Conform to UL 10C.
- B. Installed Fire Rated Door Assembly: Conform to NFPA 80.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Handle products in accordance with AAMA CW-10.
- B. Package doors and frames in individual cartons, with frame pieces individually wrapped.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Avalon International. (www.avalonint.com)
 - 2. Frameworks. (www.frameworks.com)
 - 3. RACO Interior Products, Inc. (www.racointeriors.com)
 - 4. Wilson Partitions. (www.wilsonpart.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Aluminum Extrusions: ASTM B221, 6063-T5 alloy and temper.

2.3 ACCESSORIES

- A. Door Seals: Replaceable synthetic pile strip or neoprene extrusions.
- B. Fasteners: Stainless or corrosion resistant coated steel.
- C. Glass, Glazing Gaskets, and Accessories: Specified in Section 088000.
- D. Door Hardware: Specified in Section 087100.

2.4 FABRICATION

- A. Fabricate frames to permit installation in stud partitions faced with gypsum board. Permit removal of frames without damage to partitions.
- B. Conceal frame fasteners with tight fitting snap-on trim.
- C. Fabricate frames with butted corners.
- D. Provide internal reinforcement for door hardware specified in Section 087100. Do not attach hinges or strike plates directly to frames without reinforcement.

2.5 FINISHES

- A. Aluminum: AAMA 611, Architectural Class II anodized to 0.0004 inch minimum thickness, refer to Schedule of Finishes and Equipment for color.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Set plumb and level, free from warp or twist.
- C. Rigidly attach frames using fasteners of type best suited to application.
- D. Fit corners and intersections to flush, hairline joints.
- E. Install door hardware as specified in Section 087100.
- F. Install glass and accessories in accordance with Section 088000.

3.2 ADJUSTING

- A. Touch up minor scratches and abrasions to match original finish.

END OF SECTION

SECTION 081416
FLUSH WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood veneer faced flush doors.
 - 2. Factory finishing.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 087100 - Door Hardware.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show locations, elevations, dimensions, acoustical ratings, and preparation for hardware.
 - 2. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Manufacturer's certification that doors comply with specified acoustical requirements.

1.3 QUALITY ASSURANCE

- A. Acoustic Rated Doors: Tested by independent testing laboratory in accordance with ASTM E90 and certified for STC Class of 48.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Package doors in heavy plastic with identifying marks; slit plastic wrap on site to permit ventilation, but do not remove from plastic until ready to install.
- B. Do not deliver doors until building is substantially water and weather tight.
- C. Store doors flat and level, with spacers between doors to allow for air circulation, in protected, dry area.
- D. Environmental Requirements: Maintain following conditions in building for minimum 7 days prior to, during, and after installation of doors:
 - 1. Temperature: 60 to 80 degrees F.
 - 2. Humidity: 25 to 55 percent.

1.5 WARRANTIES

- A. Furnish manufacturer's 10 year warranty providing coverage against defects in materials and workmanship and warpage beyond specified amount.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by VT Industries, Inc. (www.vtindustries.com)

- B. Other Acceptable Manufacturers:
 - 1. Eggers Industries. (www.eggersindustries.com)
 - 2. Marshfield-Algoma by Masonite Architectural. (www.masonite.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Flush Wood Doors:
 - 1. AWI Architectural Woodwork Standards.
 - 2. Core type:
 - a. Solid, non rated: Particleboard or Medium Density Fiberboard.
 - 3. Crossbands: Wood veneer.
 - 4. Wood veneer faces - Transparent Finish: White Maple, of quality suitable for transparent finish.
 - 5. Wood veneer faces - Opaque Finish: Poplar, of quality suitable for opaque finish.
 - 6. Adhesives: Resistant type.

2.3 FABRICATION

- A. Fabricate doors in accordance with AWI Architectural Woodwork Standards.
 - 1. Grade: Premium.
 - 2. Performance Level: Heavy Duty.
 - 3. Edge Type: Manufacturer's option.
 - 4. Number of plies: 5.
- B. Prefitting; fit doors to frames at factory with following clearances:
 - 1. Acoustic rated doors:
 - a. Width: Cut lock edge only; 3/16 inch maximum.
 - b. Height: Cut bottom edge only; 1 inch maximum.
 - 2. Non-rated doors:
 - a. Width: Cut hinge and lock edges equally.
 - b. Height: Cut bottom edge only; maximum 3/4 inch.
 - 3. Edge clearances:
 - a. Jambs and head: 1/8 inch maximum between door and frame.
 - b. Sills without thresholds: 1/8 inch maximum between door and top of finish floor.
 - c. Sills with thresholds: 1/4 inch maximum between door and top of threshold.
 - d. Meeting stiles of pairs: 1/8 inch maximum between doors.
 - 4. Lock edge: Bevel 1/8 inch in 2 inches.
- C. Premachining: Machine doors at factory to receive hardware specified in Section 087100.

2.4 FINISHES

- A. Factory Finishing:
 - 1. Factory finish doors in accordance with AWI Architectural Woodwork Standards.
 - 2. Finish system: 2B - Laquer, Precatalyzed.
 - 3. Color: To be selected from manufacturer's full color range.
 - 4. Sheen: Satin.

PART 3 EXECUTION

3.1 PREPARATION

- A. Condition doors to average humidity that will be encountered after installation.

3.2 INSTALLATION

- A. Install doors in accordance with AWI Architectural Woodwork Standards.

- B. Install doors plumb and level.
- C. If field cutting for height is necessary, cut bottom edge only, 3/4 inch maximum.
- D. Seal field cut surfaces.
- E. Install door hardware in accordance with Section 087100.
- F. Installation Tolerances:
 - 1. Warp: Maximum 1/4 inch in any 3'-0" x 7'-0" portion of door, measured with taut string or straight edge on concave face of door.

END OF SECTION

SECTION 081433

STILE AND RAIL WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wood stile and rail doors.
 - 2. Custom wood exterior stile and rail doors.
 - 3. Factory finishing.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 087100 - Door Hardware.
 - 3. Section 088000 - Glazing.
 - 4. Section 081113 - Hollow Metal Doors and Frames.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Show locations, elevations, dimensions, fire ratings, and preparation for hardware.
 - 2. Samples:
 - a. Corner sample 12 inches x 12 inches showing stile, rail, and panel.
 - b. 6 x 12 inch wood samples showing specified selected stain color and finish.
 - 3. Warranty: Sample warranty form.
 - 4. For exterior doors, submit engineered shop drawings, signed, sealed, and dated by Engineer registered in the state of Florida specifying all connection details and certifying that all applicable wind force and impact loads are met or exceeded as required by code.
- B. Quality Control Submittals:
 - 1. Test Reports: Certified results of previous tests by a recognized independent laboratory substantiating compliance with specified design and performance criteria, current within past 5 years.
 - 2. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - a. Certification mark or listing.
 - b. Test report.
 - c. Evaluation report from an evaluation entity.
 - d. Evaluation report from an Architect or Engineer licensed in State of Florida.

1.3 DELIVERY, STORAGE AND HANDLING

- A. Package doors in heavy plastic with identifying marks; slit plastic wrap on site to permit ventilation, but do not remove from plastic until ready to install.
- B. Do not deliver doors until building is substantially water and weather tight.
- C. Store doors flat and level, with spacers between doors to allow for air circulation, in protected, dry area.
- D. Environmental Requirements: Maintain following conditions in building for minimum 7 days prior to, during, and after installation of doors:
 - 1. Temperature: 60 to 80 degrees F.
 - 2. Humidity: 25 to 55 percent.

1.4 QUALITY ASSURANCE

- A. Single Source Responsibility: Obtain panel wood doors from a single manufacturer. All details including panels, sticking and profiles shall match. Plant-ens for fire rated doors will not be acceptable.
- B. Fire-Rated Panel Wood Doors: Provide panel wood doors which are identical in materials and construction to units tested in door and frame assemblies per ASTM E 152 and which are labeled and listed for fire ratings indicated by UL, Warnock Hersey or other testing and inspection agency acceptable to authorities having jurisdiction.
- C. Product Certification: Require door manufacturer to certify that doors comply with specified requirements including those of referenced door standard.
 - 1. Mark, label or otherwise identify panel wood doors as complying with NWWDA I.S.6.
- D. Safety Glazing Standard: Provide safety glass of type indicated or required by authorities having jurisdiction for doors and sidelights; comply with ANSI Z97.1 and testing requirements of 16 CFR Part 1201 for Category II materials except where those of Category I are expressly indicated and permitted.
- E. STC ratings shall be operable and shall have been tested and not estimated. Manufacturer shall have testing lab documentation of STC ratings.
- F. Warranties
 - 1. Workmanship and Materials: Lifetime.
 - 2. Finish on Exterior Wood Surface: Ten (10) Years.
- G. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Approved for use by local authorities having jurisdiction or Florida Building Commission.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by VT Industries, Inc. (www.vtindustries.com) and Millwork 360. (www.millwork360.net)
- B. Other Acceptable Manufacturers:
 - 1. Custom Wood Doors, Inc. (www.lagdesign.com)
 - 2. Maiman. (www.maiman.com)
 - 3. Florida Impact Door Systems, Inc. (www.floridaimpactdoors.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Stile and Rail Wood Doors: AWI Architectural Woodwork Standards.
 - 1. Source: Eggers Stile and Rail Collection by VT Industries, Inc., or approved substitute.
 - 2. Types:
 - a. Exterior and Interior Stile and Rail Doors with Flat Panels (Fire Rated and Non Fire Rated)
 - b. Interior Stile and Rail Doors with Flat Panel below and Flat Panel above
 - c. Interior Stile and Rail Doors with Raised or Flat Panel below and Glass Panel above
 - d. Interior Stile and Rail Door with Single Glass Panel
 - e. Interior Stile and Rail Door with Flat Panel below and Louvered Panel above
 - 3. Exposed wood:
 - a. Transparent Finish: Faces Mahogany, cut to be selected, of quality suitable for transparent finish
 - b. Opaque Finishes: Faces Poplar, of quality suitable for opaque finish.
- B. Custom Exterior Wood Doors:

1. Source: Millwork 360, or approved substitute.
2. Type: Custom Impact Wood Mahogany Exterior Swing Doors.
3. Configuration: Pair of 1 Lite over Raised Panel with Side Lites and Transom.

2.3 ACCESSORIES

- A. Glass and Glazing Accessories: Specified in Section 088000.
- B. Door Hardware: Specified in Section 087100.

2.4 FABRICATION

- A. Fabricate doors in accordance with AWI Architectural Woodwork Standards.
 1. Grade: Custom.
 2. Performance Level: Heavy Duty.
 3. Panel and glass retention: Molded stop type.
 4. Stiles and rails: Solid wood construction.
 5. Panels: Veneered construction; flat type.
- B. Prefitting; fit doors to frames at factory with following clearances:
 1. Acoustic rated doors:
 - a. Width: Cut lock edge only; 3/16 inch maximum.
 - b. Height: Cut bottom edge only; 1 inch maximum.
 2. Non-rated doors:
 - a. Width: Cut hinge and lock edges equally.
 - b. Height: Cut bottom edge only; maximum 3/4 inch.
 3. Edge clearances:
 - a. Jambs and head: 1/8 inch maximum between door and frame.
 - b. Sills without thresholds: 1/8 inch maximum between door and top of finish floor.
 - c. Sills with thresholds: 1/4 inch maximum between door and top of threshold.
 - d. Meeting stiles of pairs: 1/8 inch maximum between doors.
 4. Lock edge: Bevel 1/8 inch in 2 inches.
- C. Premachining: Machine doors at factory to receive hardware specified in Section 087100.

2.5 FINISHES

- A. Factory Finishing:
 1. Factory finish doors in accordance with AWI Architectural Woodwork Standards.
 2. Finish system: 8 - UV Curable, Acrylated Epoxy, Polyester, or Urethane.
 3. Color: To be selected from manufacturer's full color range for clear finish in stained trim rooms and paint to match adjacent casing in painted trim rooms.
 4. Sheen: Semi-Gloss.

PART 3 EXECUTION

3.1 PREPARATION

- A. Condition doors to average humidity that will be encountered after installation.

3.2 INSTALLATION

- A. Install doors in accordance with AWI Architectural Woodwork Standards and approved shop drawings.
- B. Install doors plumb and level.
- C. If field cutting for height is necessary, cut bottom edge only, 3/4 inch maximum.
- D. Seal field cut surfaces.

- E. Install door hardware in accordance with Section 087100.
- F. Install glass as specified in Section 088000.
- G. Installation Tolerances:
 - 1. Warp: Maximum 1/4 inch in any 3'-0" x 7'-0" portion of door, measured with taut string or straight edge on concave face of door.

END OF SECTION

SECTION 081479
WOOD DOOR FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Prefabricated wood door frames.
 - 2. Shop finishing.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 081416 - Flush Wood Doors.
 - 3. Section 081433 - Stile and Rail Wood Doors.
 - 4. Section 087100 - Door Hardware.

1.2 QUALITY ASSURANCE

- A. Wood Door Frames: AWI Custom Grade.
- B. Fire Door Frame Construction: Conform to UL 10C.
- C. Installed Fire Rated Door Frame Assembly: Conform to NFPA 80.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Samples: 6 inch long frame samples, with finish applied.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Package frames in heavy cartons with identifying marks prior to shipment; do not remove from cartons until ready to install.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by VT Industries, Inc. (www.vtindustries.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Wood:
 - 1. Exposed solid wood and veneer: Species and cut to be selected, of quality suitable for transparent finish.
 - 2. Core: Solid or glued lumber.

2.3 FABRICATION

- A. Fabricate frames to AWI Section 900.
- B. Profile: To be selected from manufacturer's full range of profiles.
- C. Premachining: Prepare frames at factory to receive hardware in accordance with approved hardware schedule.

2.4 FINISHES

- A. Finish frames at factory to match wood doors specified in Section 081416 and 081433.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prior to installation, condition frames to average humidity that will be encountered after installation.

3.2 INSTALLATION

- A. Install frames in accordance with AWI Section 1700.
- B. Fit frames for height; cut bottom edges only.
- C. Before installation, apply sealer to field cut surfaces.
- D. Set plumb, level, and rigid.
- E. Secure to adjacent construction behind stop before stop is applied.
- F. Apply stops with finishing nails; set nail heads below surface.
- G. Fill and finish nail heads to match frames.
- H. Install hardware as specified in Section 087100.

END OF SECTION

SECTION 083100

ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Access doors and frames for wall and ceiling surfaces.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Provide sizes, types, finishes, scheduled locations, and details of adjoining work.

1.3 QUALITY ASSURANCE

- A. Fire Door Construction: Conform to UL 10B.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Wind-lock (www.wind-lock.com) and Milcor (www.milcorinc.com).
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. Acudor Products, Inc. (www.acudor.com)
 - 2. Babcock-Davis, Inc. (www.babcockdavis.com)
 - 3. J.L. Industries. (www.jlindustries.com)
 - 4. Karp Associates, Inc. (www.karpinc.com)
 - 5. Nystrom, Inc. (www.nystrom.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Steel Sheet: ASTM A1008/A1008M, cold rolled.
- B. Galvanized Steel Sheet: ASTM A653/A653M, Structural Quality.
- C. Access Panels - Public Spaces:
 - 1. Source: Hinged Stealth GFRG Access Panels for Drywall by Wind-Lock or approved substitute.
 - 2. Description: Glass-fiber-reinforced-gypsum access panels and frames.
 - 3. Size: Refer to Drawings.
- D. Access Panels - Back of House (non-rated):
 - 1. Source: Standard Flush Door by Milcor or approved substitute.
 - 2. Size: 22 inches X 22 inches or 24 inches X 24 inches as required.
- E. Access Panels - Back of House (rated):
 - 1. Source: Insulated Fire Rated Door by Milcor or approved substitute.
 - 2. Size: 24 inches X 24 inches.

2.3 FABRICATION

- A. Fabricate door frame of steel sheet:
 - 1. Doors 16 x 16 inches and smaller: Minimum 18 gage.
 - 2. Doors over 16 x 16 inches: Minimum 16 gage.
 - 3. Fabricate frames with flange type to suit installation conditions.
- B. Fabricate non-rated door panels of minimum 14 gage steel sheet.
- C. Fabricate fire rated door panels of two sheets of minimum 20 gage steel sheet. Fill core with noncombustible insulation.
- D. Recess door face to receive gypsum board flush with adjacent surface.
- E. Weld, fill, and grind joints to flush and square appearance.
- F. Hardware:
 - 1. Continuous steel hinges, 175 degree opening.
 - 2. Screwdriver operated cam latch.
 - 3. Automatic closers for fire rated doors.

2.4 FINISHES

- A. Exterior Doors and Interior Doors in Wet Locations: Hot dip galvanized, G90 coating class.
- B. Other Interior Doors: One coat rust-inhibiting primer paint, sprayed and baked.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install units in accordance with manufacturer's instructions.
- B. Install plumb and level in openings. Secure rigidly in place.
- C. Position units where indicated or where required to provide convenient access to concealed work requiring maintenance.

END OF SECTION

SECTION 083513

SLIDING AND FOLDING ALUMINUM AND GLASS DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Shop fabricated folding aluminum and glass doors and frames.
 - 2. Shop fabricated sliding aluminum and glass doors and frames.
 - 3. Shop glazing.
 - 4. Operating hardware.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealants.
 - 3. Section 088000 - Glazing.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include locations, dimensions, profiles, relationship to adjacent construction, and attachments.
 - 2. Samples:
 - a. Door corner, minimum 12 x 12 inches, showing corner construction, cross section, and finish.
 - b. 3 x 3 inch finish samples showing available colors.
- B. Quality Control Submittals:
 - 1. Test Reports: Certified results of previous tests by a recognized independent laboratory substantiating compliance with specified design and performance criteria, current within past 5 years.
 - 2. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - a. Certification mark or listing.
 - b. Test report.
 - c. Evaluation report from an evaluation entity.
 - d. Evaluation report from an Architect or Engineer licensed in State of Florida.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Conform to applicable accessibility code for locating hardware.
- C. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Approved for use by local authorities having jurisdiction or Florida Building Commission.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract Documents are based on products by Euro-Wall Systems, LLC. (www.euro-wall.com)
- B. Other Acceptable Manufacturers:
 - 1. Nana Wall Systems, Inc. (www.nanawall.com)

C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

A. Folding Aluminum and Glass Doors:

1. Manufacturer: Eurowall - Euro Vista Fold Impact Rated.
2. Type: Aluminum Folding Door.
3. Finish: Powder Coat.

B. Sliding Aluminum and Glass Doors:

1. Manufacturer: Eurowall - Euro Vista Slide Impact Rated.
2. Type: Aluminum Sliding Door.
3. Finish: Powder Coat.

C. Aluminum:

1. Extrusions: ASTM B221, 6063-T5 alloy and temper.
2. Sheet: ASTM B209, alloy and temper best suited to application.

D. Glass and Glazing Accessories: Specified in Section 088000.

E. Operating Hardware:

1. Manufacturer's standard combination sliding/folding hardware, top hung with top and bottom tracks and flush threshold.
2. Running carriages: Sealed, self-lubricating, ball bearing multi-rollers.
3. Locking hardware and handles: Manufacturer's standard flat handle and concealed two point locking hardware.

2.3 ACCESSORIES

A. Fasteners:

1. Series 300 stainless steel for wet locations and exposed fasteners.
2. Stainless or fluoropolymer coated steel for other locations.

B. Joint Sealants: Specified in Section 079200.

C. Glass and Glazing Accessories: Specified in Section 088000.

2.4 FABRICATION

A. Fabricate with minimal clearances and shim spaces around perimeter.

B. Accurately fit and secure joints and intersections. Make joints flush, hairline, and weathertight.

C. Conceal fasteners and attachments from view.

D. Fabricate fascias, covers, closures, flashings, and trim members from same material as doors.

E. Fabricate aluminum components with integral low conductance thermal barrier located between exterior and interior exposed components that eliminates metal-to-metal contact.

F. Corner Construction: Mechanically fastened and welded.

G. Provide weatherstripping at door head, jambs, meeting stiles, and sills.

H. Prepare with internal reinforcements for door hardware.

2.5 FINISHES

A. Hardware: Baked enamel, color to be selected from manufacturer's full color range.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install doors in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Set plumb, level, and rigid, free from warpage.
- C. Provide alignment attachments and anchors to permanently attach components to supporting construction.
- D. Installation Tolerances:
 - 1. Maximum variation from plumb or level: 1/8 inch in 3 feet or 1/4 inch in any 10 feet, whichever is less.
 - 2. Maximum misalignment of members abutting end to end: 1/32 inch.

3.2 ADJUSTING

- A. Touch up minor scratches and abrasions in factory finish.

END OF SECTION

SECTION 085113

ALUMINUM WINDOWS AND GLASS DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aluminum framed windows, with fixed and operable sash.
 - 2. Aluminum framed glass doors and frames.
 - 3. Field glazing.
 - 4. Operating hardware and insect screens.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 088000 - Glazing.

1.2 SYSTEM DESCRIPTION

- A. Windows: AAMA/WDMA/CSA 101/I.S.2/A440.
 - 1. Product types: As indicated in the Drawings.
 - 2. Performance Classification: AW.
 - 3. Performance Grade: 40.
 - 4. Thermal transmittance of window assembly: Maximum U-value of 0.35 BTU/square foot per hour per degree F, tested to AAMA 1503.1.
 - 5. Condensation resistance factor: Minimum 45, tested to AAMA 1503.1.
 - 6. Forced entrance resistance: Conform to ASTM F588.
- B. Design Requirements; design windows to withstand:
 - 1. Wind loads in accordance with ASCE 7.
 - 2. Movement caused by an ambient temperature range of 120 degrees F and a surface temperature range of 160 degrees F.
 - 3. Movement between system and adjacent construction.
 - 4. Dynamic loading and release of loads.
 - 5. Deflection of supports.
 - 6. Overhead structure deflection of 1/2 inch.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include locations, elevations, sections, materials, finishes, and attachments.
 - 2. Samples:
 - a. 3 x 3 inch finish samples showing available colors.
- B. Quality Control Submittals:
 - 1. Test Reports: Certified results of previous tests by a recognized independent laboratory substantiating compliance with specified design and performance criteria, current within past 5 years.
 - 2. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - a. Certification mark or listing.
 - b. Test report.
 - c. Evaluation report from an evaluation entity.
 - d. Evaluation report from an Architect or Engineer licensed in State of Florida.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.

- B. Conform to applicable accessibility code for locating hardware.
- C. Mockup:
 - 1. Size: One full sized window unit.
 - 2. Locate where directed.
 - 3. Approved mockup may remain as part of the Work.
- D. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Approved for use by local authorities having jurisdiction or Florida Building Commission.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Handle products in accordance with AAMA CW-10.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by ES Windows. (www.eswindows.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Aluminum Windows:
 - 1. Manufacturer: ES Windows
 - 2. Type: Fixed Casement Units Commercial Series 5100 Matching Casement Unit Sight Lines. Impact Rated.
 - 3. Extruded Aluminum Tube Mullions.
 - 4. Finish: Powder Coated.
- B. Aluminum Framed Swing Door:
 - 1. Manufacturer: ES Windows.
 - 2. Type: French Doors Commercial Series 9000. Impact Rated.
 - 3. Type: Sidelights to Match French Doors Series 9000. Impact Rated.
 - 4. Type: Transoms to Match French Doors Series 9000. Impact Rated.
 - 5. Extruded Aluminum Tube Mullions.
 - 6. Finish: Powder Coat.
- C. Aluminum Extrusions: ASTM B221, alloy and temper best suited to application.
- D. Glass and Glazing Accessories: Specified in Section 088000.
- E. Operating Hardware:
 - 1. Aluminum, stainless steel, plated steel, or other noncorroding material compatible with aluminum.
 - 2. Casement windows: Lever action handle operator, projecting sash arms with limit stops, and cam type lock.
 - 3. Hinged doors: Butt hinges, multi point lockset, premium handle, accessible compliant threshold, and deadbolt.

2.3 ACCESSORIES

- A. Fasteners: Stainless steel, hot-dip galvanized steel, or fluoropolymer coated steel; type best suite to application.
- B. Weatherstripping: Nylon pile, permanently resilient, profiled for weather seal.

- C. Insect Screens: Phifer Ultra Vue or approved equal.

2.4 FABRICATION

- A. Fabricate to AAMA/WDMA/CSA 101/I.S.2/A440.
- B. Fabricate with minimum clearances and shim spaces around perimeter, yet enabling installation and dynamic movement.
- C. Accurately fit and secure joints and intersections. Make joints flush, hairline, and weathertight.
- D. Miter cut corners of frames and sashes and weld on both exposed faces and outside edge. Grind exposed welds to a smooth finish with adjacent surfaces.
- E. Fabricate in largest practical units.
- F. Weatherstrip operable sash.
- G. Fabricate aluminum components with integral low conductance thermal barrier located between exterior and interior exposed components that eliminates metal-to-metal contact.
- H. Conceal fasteners and attachments from view.
- I. Reinforce corners and intersections of frames and mullions.
- J. Provide internal drainage weep holes and channels to route moisture to exterior.
- K. Form glass stops, exterior sills, closures, weatherstops, and flashings of same material as frame.
- L. Mount screens in removable, rewireable aluminum frame.

2.5 FINISHES

- A. Screens: Color to be selected.
- B. Hardware: Finish to be selected.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install windows and glass doors in accordance with ASTM E2112, manufacturer's instructions, and approved Shop Drawings.
- B. Set plumb, level, and rigid, free from warpage.
- C. Anchor to supporting construction.
- D. Installation Tolerances:
 - 1. Maximum variation from plumb or level: 1/8 inch in 3 feet or 1/4 inch in any 10 feet, whichever is less.
 - 2. Maximum misalignment of members abutting end to end: 1/32 inch.

3.2 FIELD QUALITY CONTROL

A. Testing and Inspection Services:

1. At beginning of installation, Architect will select one location of each window type for field testing:
 - a. Test specimen size: One window unit of each type.
 - b. Perform air infiltration testing in accordance with ASTM E783 with allowable rate of air leakage of 1.5 times specified laboratory test rate to maximum of 0.09 cubic feet per minute per square foot of fixed wall area.
 - c. Perform water infiltration testing in accordance with AAMA 502.
 - d. If test area fails to meet specified air or water infiltration testing:
 - 1) Submit description of proposed remedial work to Architect.
 - 2) Complete remedial work on test specimen and repeat testing.
 - 3) When test results meet specified requirements, incorporate remedial work into other work on Project.
2. When installation is 50 percent complete, Architect will select one additional location of each window type for field testing.
3. For each area with failing test results, Architect will select one additional location for field testing.

3.3 ADJUSTING

- A. Adjust for smooth operation.
- B. Touch up minor scratches and abrasions to match original finish.

END OF SECTION

SECTION 088000

GLAZING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Glass for other sections referencing this Section.
 - 2. Mirrors.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SYSTEM DESCRIPTION

- A. Glass Thicknesses:
 - 1. Indicated thicknesses are minimums; select actual glass thicknesses by analyzing loads and conditions.
 - 2. Size glass to withstand positive and negative wind pressure acting normal to plane in accordance with ASCE 7 and Building Code as measured in accordance with ASTM E330.
 - 3. Provide glass in thicknesses and strengths to meet or exceed following criteria:
 - a. Comply with ASTM E1300.
 - b. Probability of breakage for vertical glazing: 8 lites per 1000 for lites set within 15 degrees of vertical and under wind load for load duration of 3 seconds.
 - c. Probability of breakage for sloped glazing: 1 lite per 1000 for lites set more than 15 degrees off vertical and under wind load for duration of 30 days.
 - d. Thickness of tinted glass: Provide same thickness for each tint color for all applications.
- B. Thermal and Optical Performance Properties: Provide glass meeting specified performance properties, based on manufacturer's published test data for units of thickness indicated:
 - 1. U-factor: Per NFRC 100 expressed as Btu/square foot x hour x degree F.
 - 2. Solar heat gain coefficient: Per NFRC 200.
 - 3. Solar optical properties: Per NFRC 300.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Descriptive data and performance attributes for insulated glass.
 - 2. Samples:
 - a. 12 x 12 inch glass samples except clear.
 - b. 1/4 x 1/4 x 3 inch long sealant and glazing compound samples.
 - 3. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Test Report: Preconstruction adhesion and compatibility test report from glazing sealant manufacturer, based on submitted samples or acceptable data from previous testing of current formulations with similar products.
 - 2. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - a. Certification mark or listing.
 - b. Test report.
 - c. Evaluation report from an evaluation entity.
 - d. Evaluation report from an Architect or Engineer licensed in State of Florida.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.

- B. Regulatory Requirements:
 - 1. Provide safety glass for locations subject to human impact as required by Building Code.
 - 2. Safety glass: Tested and labeled to CPSC 16 CFR 1201.
- C. Perform Work in accordance with GANA Glazing Manual, GANA Laminated Glass Design Guide, and SIGMA TM-3000.
- D. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Approved for use by local authorities having jurisdiction or Florida Building Commission.

1.5 PROJECT CONDITIONS

- A. Perform glazing when ambient temperature is above 40 degrees F.
- B. Perform glazing on dry surfaces.

1.6 WARRANTIES

- A. Insulating Glass Units: Provide manufacturer's 10 year warranty against material obstruction of vision through unit due to:
 - 1. Intrusion of dust or moisture.
 - 2. Internal condensation.
 - 3. Film formation on internal glass surfaces caused by failure of hermetic seal except failure caused in whole or in part by breakage or fracturing of any portion of glass surface.
- B. Glass Coatings: Provide manufacturer's 10 year warranty against peeling, cracking, or deterioration of coating under normal conditions.
- C. Laminated Glass Units: Provide manufacturer's 5 year warranty against manufacturing defects resulting in edge separation, delamination, or material obstruction of vision through glass surface.
- D. Mirrors: Provide manufacturer's 10 year warranty against silver spoilage resulting from manufacturing defects.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Glass:
 - 1. Guardian Industries Corp. (www.guardian.com)
 - 2. Oldcastle BuildingEnvelope. (www.oldcastlebe.com)
 - 3. Pilkington Architectural. (www.pilkington.com)
 - 4. PPG Industries, Inc. (www.ppg.com)
 - 5. Viracon, Inc. (www.viracon.com)
 - 6. Vitro Architectural Glass. (www.vitroglazings.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS - GLASS

- A. Clear Glass: ASTM C1036, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select.
- B. Clear Tempered Glass: ASTM C1048, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select, Kind FT fully tempered.
- C. Clear Heat Strengthened Glass: ASTM C1048, Type 1 transparent flat, Class 1 clear, Quality q3 glazing select, Kind HS heat strengthened.

- D. Mirror Glass: ASTM C1036, Type I transparent flat, Class 1 clear, Quality q1 mirror select.

2.3 ACCESSORIES

- A. Setting Blocks: ASTM C864, neoprene or EPDM, or ASTM C1115, silicone; 80 to 90 Shore A durometer hardness.
- B. Spacers: ASTM C864, neoprene or EPDM, or ASTM C1115, silicone; 50 to 60 Shore A durometer hardness.
- C. Glazing Gaskets:
 - 1. Dense compression gaskets: ASTM C864, neoprene or EPDM, or ASTM C1115, silicone or thermoplastic polyolefin rubber, molded or extruded shape to fit glazing channel retaining slot; black color.
 - 2. Soft compression gaskets: ASTM C509, Type II, black, molded or extruded, neoprene, EPDM, silicone or thermoplastic polyolefin rubber, of profile and hardness required to maintain watertight seal; black color.
- D. Glazing Sealant: ASTM C920, Type S, Grade NS, Class 25; single component silicone, low modulus, non sag, color to be selected from manufacturer's full color range.
- E. Sealant Backing: ASTM C1330, Type O, size and density to control glazing sealant depth and produce optimum glazing sealant performance.
- F. Primer: As recommended by glazing sealant manufacturer.
- G. Glazing Tape: ASTM C1281 and AAMA 800; butyl based elastomeric tape with integral resilient tube spacer, 10 to 15 Shore A durometer hardness, black color, coiled on release paper; widths required for installation.
- H. Mirror Adhesive: Adhesive setting compound, produced specifically for setting mirrors by spot application method.
- I. Laminating Film: Polyvinyl butyral sheet, minimum 30 mils thick, clear.

2.4 FABRICATION

- A. Annealed Glass: Comply with ASTM C1036.
- B. Heat Strengthened or Tempered Glass:
 - 1. Comply with ASTM C1048.
 - 2. Process in horizontal position so that inherent roller distortion will run parallel to building floor lines after installation.
- C. Sealed Insulating Glass:
 - 1. Comply with ASTM E2190.
 - 2. Fabricate spacer bar frame of tubular aluminum filled with desiccant.
 - 3. Bond spacer bar frame to glass panes with twin primary seals.
 - 4. Fill space outside frame to glass edge with elastomeric sealant.
- D. Laminated Glass:
 - 1. Comply with ASTM C1172 and ANSI Z97.1.
 - 2. Laminate glass with laminating film by manufacturer's standard heat and pressure process.
 - 3. Cut glass to required size at factory.
 - 4. Discard glass with voids, delamination, or entrapped dirt or foreign matter.
- E. Low-E Coated Glass: Apply low-emissivity coating to scheduled glass surface.

- F. Mirror Glass:
 - 1. Apply one coat of silver, one coat of electroplated copper, and one coat of organic mirror backing compound to back surface of glass.
 - 2. Ease and polish edges.
- G. Fabrication Tolerances: ASTM C1036 and ASTM C1048.
- H. Glass Identification:
 - 1. Apply manufacturer's label indicating type and thickness to each light of glass. Show position of exterior face when installed, where applicable.
 - 2. Etch manufacturer's label on each light of tempered glass.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean glazing rabbets; remove loose and foreign matter.
- B. Remove protective coatings on metal surfaces.
- C. Clean glass just prior to installation.

3.2 INSTALLATION - GENERAL

- A. Install glass in accordance with glass manufacturer's instructions.
- B. Maintain manufacturer's recommended edge and face clearances between glass and frame members.

3.3 INSTALLATION - GASKET GLAZING METHOD

- A. Fabricate gaskets to fit openings; allow for stretching of gaskets during installation.
- B. Set soft compression gasket against fixed stop or frame with bonded miter cut joints at corners.
- C. Set glass centered in openings on setting blocks.
- D. Install removable stops and insert dense compression gaskets at corners, working toward centers of glass, compressing glass against soft compression gaskets to produce weathertight seal.
- E. Seal joints in gaskets.
- F. Allow gaskets to protrude past face of glazing stops.

3.4 INSTALLATION - SEALANT AND TAPE GLAZING METHOD

- A. Apply tape to permanent stops, projecting slightly above sight line.
- B. Press glass into contact with tape.
- C. Install removable stops with spacer shims between stop and glass.
- D. Fill gap between removable stop and glass with glazing sealant.
- E. Trim protruding tape edges.

3.5 INSTALLATION - MIRRORS

- A. Apply mirror adhesive in accordance with manufacturer's instructions to cover maximum 25 percent of back of mirror. Set mirror and press against substrate to ensure adhesive bond.

- B. Leave minimum 1/8 inch open ventilation space between mirror and substrate over 75 percent of mirror area. Do not seal off ventilation space at edges.
- C. Place plumb and level without distortion.

3.6 PROTECTION

- A. After installation, mark glass with an 'X' using removable plastic tape.

3.7 SCHEDULE

- A. Type GL-1:
 - 1. Description:
 - a. Nominally 9/16 inch thick laminated glass.
 - b. Visible Light Transmittance: 60 percent.
 - c. Summer U = .86.
 - d. SHGC = .37.
 - e. Shading Coefficient = .42.
 - 2. Locations: Aluminum Windows and Glass Doors. Sliding and Folding Aluminum and Glass Doors.
- B. Type GL-2:
 - 1. Description: 1/4 inch thick clear tempered glass.
 - 2. Locations: Interior doors and glazed openings at locations subject to human impact.
- C. Type GL-3:
 - 1. Description: 1/4 inch thick clear glass.
 - 2. Locations: Interior glazed openings at locations not subject to human impact.
- D. Type GL-4:
 - 1. Description: 1/4 inch thick clear mirror glass.
 - 2. Locations: Toilet room mirrors.

END OF SECTION

SECTION 089100

LOUVERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fixed louvers and frames.
 - 2. Bird screens.
 - 3. Insect screens.
 - 4. Blank off panels.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements: Design louvers to withstand:
 - 1. Design wind pressure in accordance with ASCE 7 and Building Code, with maximum allowable deflection of L/180, tested in accordance with ASTM E330.
 - 2. Movement caused by an ambient temperature range of 120 degrees F and a surface temperature range of 160 degrees F.
- B. Performance Requirements: Bear AMCA Certified Ratings Seal for air performance.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include locations, elevations, sections, dimensions, materials, finishes, attachment, and relationship to adjacent construction.
 - 2. Samples:
 - a. 3 x 3 inch coating samples showing available colors.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: AMCA licensed test data.
 - 2. Document product approval by local authorities having jurisdiction or Florida Building Commission by submission of:
 - a. Certification mark or listing.
 - b. Test report.
 - c. Evaluation report from an evaluation entity.
 - d. Evaluation report from an Architect or Engineer licensed in State of Florida.

1.4 QUALITY ASSURANCE

- A. Exterior assemblies must meet the following:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
 - 3. Approved for use by local authorities having jurisdiction or Florida Building Commission.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Ruskin. (www.ruskin.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Aluminum: ASTM B221, 6063-T5 or T6 alloy and temper.
- B. Insect Screen: 16 x 18 mesh aluminum.
- C. Bird Screen: 16 gage x 1/2 mesh aluminum.

2.3 COMPONENTS

- A. Metal Louvers:
 - 1. Source: Ruskin, or approved substitute.
 - 2. Type: Drainable stationary louver, Miami Dade approved, Florida Product Approval.
 - 3. Depth: 6 inches.
 - 4. Thickness: .081 inches.
 - 5. Sizes: Refer to MEP Drawings.
- B. Vents:
 - 1. Depth and Thickness: Refer to Drawings.

2.4 ACCESSORIES

- A. Anchors: Stainless steel, type best suited to application.

2.5 FABRICATION

- A. Fabricate frame from minimum 0.081 inch thick aluminum.
- B. Fabricate blades from minimum 0.063 inch thick aluminum.
- C. Fit components to hairline joints. Weld connections, with welds ground smooth and filled.
- D. Join vertical mullions with I-shaped slip connection.
- E. Fabricate horizontal mullions to appear as single louver.
- F. Mount screen in rewirable U-shaped frame.
- G. Provide metal sheeting of same material and finish as frame to blank out unused portions of louvers.

2.6 FINISHES

- A. Aluminum: AAMA 2605, fluoropolymer coating containing minimum 70 percent PVDF resins, color to be selected from manufacturer's standard selections.
- B. Apply bituminous coating to aluminum surfaces in contact with cementitious materials.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Set plumb, level, and rigid, with flush hairline joints.
- C. Anchor to supporting construction.
- D. Prevent contact of aluminum and dissimilar metals by use of zinc rich paint, bituminous coating, or non absorptive gaskets.

E. Install screen on inside face.

3.2 ADJUSTING

A. Touch up minor scratches and abrasions in finish coat to match factory finish.

B. Adjust operable louvers for proper operation.

END OF SECTION

SECTION 092200

METAL SUPPORT ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal stud interior partition framing.
 - 2. Suspended metal channel soffit and ceiling framing.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Illustrate framing types, gages, and locations.

1.3 QUALITY ASSURANCE

- A. Manufacturer: Current member of SSMA.
- B. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
- C. Fire Resistance Ratings:
 - 1. Construct assemblies to achieve fire resistance ratings indicated on Drawings, in accordance with applicable GA or UL design number.
 - 2. If requirements of assembly numbers referenced conflict with Contract Document requirements, conform to assembly requirements.
- D. Acoustic Ratings: Construct assemblies to achieve acoustic ratings indicated on Drawings, tested to ASTM E90 and classified in accordance with ASTM E413.
- E. Deflection Limits:
 - 1. Limit deflection of partitions to following limits, based on 5 PSF uniform design load.
 - a. Partitions to receive tile and plaster: L/240.
 - b. Other partitions: L/120.
 - c. If partition height exceeds stud manufacturer's limiting height for applicable loading and deflection, install bracing above ceiling, decrease stud spacing, or increase stud gage.
 - 2. Limit deflection of ceilings to L/360.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Allsteel and Gypsum Products, Inc. (www.allsteelproducts.com)
 - 2. Consolidated Fabricators Corp. (www.confabbpd.com)
 - 3. Craco Manufacturing., Inc. (www.cracometals.com)
 - 4. Custom Stud, Inc. (www.customstud.com)
 - 5. Design Shapes in Steel.
 - 6. Frametek Steel Products. (www.frameteksteel.com)
 - 7. Olmar Supply Inc. (www.olmarsupply.com)
 - 8. Quail Run Building Materials, Inc. (www.qrbm.com)
 - 9. SCAFECO Corporation. (www.scafco.com)
 - 10. Steel Construction Systems. (www.steelconsystems.com)
 - 11. United Metal Products, Inc. (www.unitedmetalproducts.info)

- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Steel: ASTM A653/A653M or ASTM A1003/1003M, Class G40 hot dip galvanized.

2.3 COMPONENTS

- A. Provide components in accordance with ASTM C645.
- B. Studs: Non-load bearing roll-formed steel, SSMA stud profile, C-shaped, punched for utility access.
- C. Top and Bottom Tracks:
 - 1. Same material and finish as studs, C-shaped.
 - 2. Standard track: SSMA stud track profile, 1-1/2 inch legs.
 - 3. Deep leg track: SSMA deep stud track profile, 2 inch legs.
 - 4. Deflection track: Deep leg track with slotted screw holes; permit plus or minus 1/2 inch movement of overhead structure without damage to partition.
- D. Suspended Ceiling Framing:
 - 1. Runner channels: 1-1/2 inches deep, cold roll formed, channel shaped, 16 gage base steel thickness.
 - 2. Furring channels: Hat shaped, 7/8 inch deep, 25 gage base steel thickness.
 - 3. In lieu of running and furring channels, the following proprietary system may be used at the Contractor's option:
 - a. ASTM C635; manufactured specifically for suspended gypsum board ceiling applications.
 - b. Tees: Double web design; 1-1/2 inches high with 1-3/8 inch wide knurled faces, with interlocking ends and punched holes for cross tees and hanger wires.
 - c. Material: Galvanized steel.
- E. Suspended Soffit Framing:
 - 1. Runner channels: 1-1/2 inches deep, cold roll formed, 16 gage base steel thickness.
 - 2. Furring channels: 3/4 inch deep, cold roll formed, 16 gage base steel thickness.
- F. Shaft Wall Framing: Studs formed to receive gypsum liner panels and top and bottom tracks.

2.4 ACCESSORIES

- A. Fasteners: 3/8 inch long pan head screws.
- B. Wire: ASTM A641, galvanized steel.
 - 1. Hanger wire: 8 gage base steel thickness.
 - 2. Tie wire: 18 gage base steel thickness, soft annealed.

PART 3 EXECUTION

3.1 INSTALLATION OF PARTITION FRAMING

- A. Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Attach top and bottom tracks at ends and 24 inches on center maximum.
- C. Position studs vertically in tracks, spaced maximum 16 inches on center unless indicated otherwise.
- D. Install deflection track at head of partitions extending to structure. Cut studs 1/2 inch shorter than required length and fit into top track. Fasten studs to top track in manner permitting track movement.
- E. Locate studs maximum 2 inches from door frames and abutting construction.

- F. Use heavier gage studs or double studs on both sides of openings in partitions.
- G. Install horizontal track as header above openings in partitions. Install studs from header to top track.
- H. Brace furred partitions with adjustable bracket located at mid height.
- I. Provide wood or metal bracing in partitions to receive and support fixtures, trim, accessories and other applied items.
- J. Brace ceiling height partitions to structure at 48 inches on center maximum.

3.2 INSTALLATION OF CEILING FRAMING - RUNNER AND FURRING CHANNELS

- A. Install in accordance with ASTM C754 and manufacturer's instructions.
- B. Space hanger wires 36 inches on center maximum along runner channels and within 6 inches of ends of channels; secure to structure above.
- C. Space runner channels 48 inches on center maximum and within 6 inches of abutting construction.
 1. Position channels for ceiling height; level and saddle tie along channels.
 2. Provide 1 inch clearance between channels and abutting construction.
 3. Overlap channel ends 12 inches at splices; secure each end with double loop tie wire.
- D. Space furring channels 16 inches on center maximum, perpendicular to runners and within 6 inches of abutting construction.
 1. Provide 1 inch clearance between channels and abutting construction.
 2. Secure to runners with clips on alternate sides of runners; saddle tie if clips cannot be alternated.
 3. Overlap channel ends 8 inches at splices; secure each end with double loop tie wire.
- E. Where openings interrupt furring or runner channels, install reinforcing to restore stability.
- F. Provide double runner or furring channels side by side where expansion and control joints occur; do not continue channels over joints.

3.3 INSTALLATION OF CEILING FRAMING - PROPRIETARY SYSTEM

- A. Install in accordance with ASTM C636 and manufacturer's instructions.
- B. Space hanger wires maximum 48 inches on center. Install additional hangers where required to support light fixtures and ceiling supported equipment.
- C. Do not suspend hangers directly from metal deck. Attach steel channel horizontally to adjacent framing members; place hanger at regular spacing.
- D. Hang suspension system independent of walls, columns, ducts, pipes, and conduit.
- E. Where ducts or other equipment prevent regular spacing of hangers:
 1. Reinforce nearest related hangers to span extra distance, or:
 2. Suspend steel channel horizontally beneath duct or equipment; place hanger at regular spacing.
- F. Install main tees at maximum 48 inches on center. Fully engage end locks.
- G. Install cross tees perpendicular to main tees to form 16 x 48 inch modules. Lock cross tees to main tees.

3.4 INSTALLATION OF SHAFT WALL SYSTEM

- A. Install in accordance with manufacturer's instructions.
- B. Position tracks at floor and ceiling with short leg toward finish side of wall; attach at ends and 24 inches on center maximum.
- C. If wall height exceeds maximum panel length, position panel end joints within upper or lower third of wall. Stagger joints top and bottom in adjacent panels; reinforce end joints with horizontal stud.
- D. Install stud between tracks with liner inserted into stud groove.
- E. Progressively install succeeding studs and liner panels.
- F. Install full length studs vertically at intersections, door openings, corners, and ends of partitions.
- G. Frame openings cut within a liner panel with track around perimeter.
- H. Over doors, install horizontal track; attach to studs with clip angles and screws.

END OF SECTION

SECTION 092400

PORTLAND CEMENT PLASTERING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Portland cement plaster.
 - 2. Trim.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Samples:
 - a. 3 x 3 inch plaster samples showing available colors.
 - b. After color selection, submit 12 x 12 inch plaster samples showing finish coat in specified selected color and texture.
 - c. 6 inch long trim samples.
 - 2. Hot weather procedures: Description of proposed application and curing procedures.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Mockup:
 - 1. Size: 100 square feet.
 - 2. Show: Plaster color and texture, horizontal and vertical control joints, and casings.
 - 3. Locate where directed.
 - 4. Approved mockup may not remain as part of the Work.
- C. Products and installation methods should be approved for use in Miami Dade County High Velocity Hurricane Zones (HVHZ).

1.4 PROJECT CONDITIONS

- A. Cold Weather Requirements: Do not apply plaster unless minimum ambient temperature is above 50 degrees F for 48 hours prior to, during, and after application and during curing period.
- B. Hot Weather Requirements:
 - 1. At ambient temperature above 85 degrees F, relative humidity less than 75 percent, or winds in excess of 20 MPH, fog surface with water and cover with minimum 6 mil polyethylene film weighted or taped in place.
 - 2. Leave coverings in place minimum 48 hours after application.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on Rinker stucco products by Cemex USA. (www.cemexusa.com) and accessories by ClarkDietrich Building Systems. (www.clarkdietrich.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Metal Lath:
 - 1. ASTM C847, expanded self-furring diamond mesh, galvanized.
- B. Plaster Materials:
 - 1. Portland cement: ASTM C150, Type 1.
 - 2. Lime: ASTM C206, Type S.
 - 3. Sand: ASTM C897, natural or manufactured, uniformly graded.
 - 4. Plaster mix reinforcement: ASTM C116, glass fibers, produced specifically for integral plaster reinforcement, chopped to 1/2 inch nominal length, alkali resistant.
 - 5. Colorant: Pure mineral oxide type, color to be selected from manufacturer's standards.
 - 6. Water: Potable.

2.3 ACCESSORIES

- A. Trim Accessories:
 - 1. Material: Formed zinc alloy, perforated flanges.
 - 2. Corner bead: Beaded edge, size and profile to suit application.
 - 3. Casing bead: Thickness governed by plaster thickness, square edge.
 - 4. Control joint: Accordion profile with minimum 2 inch flanges each side.
- B. Fasteners: Type and size suited to application, hot-dip galvanized or fluoropolymer coated steel.
- C. Tie Wire: 16 gage, galvanized steel, soft annealed.
- D. Bonding Agent: ASTM C932; type recommended for bonding plaster directly to concrete and concrete masonry surfaces.

2.4 MIXES

- A. Proportions:
 - 1. Scratch and brown coats: ASTM C926, Type CL. Add glass fibers at a rate of 1-1/2 pounds per sack of cement.
 - 2. Finish coat: ASTM C926, Type FL. Add colorant in accordance with manufacturer's instructions.
- B. Mixing:
 - 1. Use mechanical mixer.
 - 2. Mix each batch separately; double batching with single batch discharge not acceptable.
 - 3. Accurately proportion materials for initial mixture using measuring devices of known volume. Sand may be added by shovel after mixer is calibrated with known volumes of materials, including water.
 - 4. Thoroughly mix materials dry before adding water. Continue mixing for 3 to 5 minutes after all ingredients have been added.
 - 5. Clean equipment after each batch.
 - 6. Mixtures may be retempered one time after initial mixing.
 - 7. Discard frozen, caked, and hardened mixes. Discard mixes not used within 1-1/2 hours after initial mixing.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean substrate surfaces of foreign matter.
- B. Apply bonding agent to concrete and masonry surfaces in accordance with manufacturer's instructions.
- C. Wet high suction bases with fine water spray to produce uniformly damp surface.

3.2 INSTALLATION OF METAL LATH

- A. Perform Work in accordance with ASTM C1063.
- B. Apply with long dimension perpendicular to supports, with end joints staggered and occurring over supports. Secure end laps with tie wire where they occur between supports.
- C. Lap ends minimum 1 inch and sides minimum 1-1/2 inches.
- D. Screw to framing at maximum 6 inches on center.
- E. Secure to concrete or masonry with wire hooks or loops spaced maximum 24 inches on center in both directions.
- F. Stop lath at each side of expansion and control joints and secure.
- G. Where control joints are not installed at corners of openings, reinforce corners with 6 x 12 inch lath strip installed diagonally at each corner, wire tied to lath.
- H. If lath is not continued minimum 3 inches on each side of internal corners, reinforce with 12 inch wide lath strip bent at 90 degrees and wire tied to lath.

3.3 INSTALLATION OF ACCESSORIES

- A. Install in accordance with ASTM C1063.
- B. Install casing beads where plaster abuts dissimilar material or stops with edge exposed.
- C. Install corner beads at external corners.
- D. Install control joints:
 - 1. Locate as follows unless otherwise indicated:
 - a. As required to limit each area of plaster to 144 square feet with no dimension exceeding 12 feet.
 - b. Vertically above and below each side of openings.
 - c. Horizontally at each floor line.
 - 2. Run vertical joints continuous; butt horizontal joints into vertical joints.
 - 3. Apply joint sealer to form waterstop behind joints at intersections.
- E. Set level and true to line.

3.4 APPLICATION OF PLASTER

- A. Apply plaster in accordance with ASTM C926.
- B. Apply scratch, brown, and finish coats to minimum 3/4 inch thickness from face of lath or face of concrete or masonry.

- C. Dampen each coat prior to applying succeeding coats.
- D. Scratch Coat:
 - 1. Apply to nominal 3/8 inch thickness.
 - 2. Form full keys on lath. Cross rake surface to bond brown coat.
- E. Brown Coat:
 - 1. Apply to nominal 3/8 inch thickness.
 - 2. Bring out to grounds and rod level.
 - 3. Float surface to provide surface texture receptive to application of finish coat.
- F. Finish Coat:
 - 1. Apply to nominal 1/8 inch thickness.
 - 2. Work from wet edges to apply unbroken area in one continuous operation to eliminate joints.
 - 3. Finish surfaces to smooth texture.
 - 4. Finish surfaces true to plane, plumb and with neat, sharp corners and intersections.
 - 5. Work in panels to nearest natural break formed by intersections, corners, trim, and accessories.
 - 6. Tool plaster to V-joint at trim, grounds and accessories.
 - 7. Not acceptable: Lines caused by variations in application or finishing techniques, cold joints, and other surface defects visible when viewed from a distance of 10 feet.
- G. After application of each coat, fog spray plaster with clean water in sufficiently frequent applications to maintain plaster uniformly moist for minimum of 48 hours.
- H. Installation Tolerances:
 - 1. Plaster: Maximum 1/8 1/4 inch in 10 feet variation from true flatness.
 - 2. Trim: Maximum 1/4 inch in 10 feet variation from plumb, level, or true plane, noncumulative.

3.5 ADJUSTING

- A. Repair or replace damaged, discolored, and defective plaster. Match patched areas to surrounding plaster.

3.6 CLEANING

- A. Clean plaster from trim and accessories before it sets.

END OF SECTION

SECTION 092900

GYPSUM BOARD

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Acoustical insulation.
 - 2. Gypsum board.
 - 3. Cementitious panels.
 - 4. Taping and bedding of gypsum board.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealers.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Illustrate panel product types, thicknesses, and locations; acoustical insulation; and accessories.

1.3 QUALITY ASSURANCE

- A. Fire Resistance Ratings:
 - 1. Construct assemblies to achieve fire resistance ratings indicated on Drawings, in accordance with applicable GA or UL design number.
 - 2. If requirements of assembly numbers referenced conflict with Contract Document requirements, conform to assembly requirements.
- B. Acoustic Ratings: Construct assemblies to achieve acoustic ratings indicated on Drawings, tested to ASTM E90 and classified in accordance with ASTM E413.

1.4 PROJECT CONDITIONS

- A. Do not install gypsum board until building is substantially weathertight.
- B. Maintain temperature in spaces in which work is being performed above 50 degrees F during and after installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on gypsum panel products by GP Gypsum Corporation. (www.gp.com)
- B. Other Acceptable Manufacturers - Gypsum Panels:
 - 1. CertainTeed Gypsum, Inc. (www.certainteed.com)
 - 2. National Gypsum Co. (www.nationalgypsum.com)
 - 3. USG Corporation. (www.usg.com)
- C. Acceptable Manufacturers - Cementitious Panels:
 - 1. James Hardie Building Products, Inc. (www.jameshardie.com)
- D. Substitutions: Under provisions of Division 01.

2.2 MATERIALS - GYPSUM PANELS

- A. Regular Gypsum Board: ASTM C1396; 48 inches wide x thickness indicated, maximum practical length, tapered edge.
- B. Fire Resistant Gypsum Board: ASTM C1396, Type X; 48 inches wide x 5/8 inch thick, maximum practical length, tapered edge; apply to fire rated assemblies.
- C. Impact-Resistant Gypsum Board: ASTM C1396 and ASTM C1629, Classification Level I; 48 inches wide x thickness indicated, maximum practical length, tapered edge; apply to walls where indicated.
- D. Fire Rated, Impact-Resistant Gypsum Board:
 - 1. Source: ToughRock Fireguard X Abuse-Resistant Gypsum Board by GP Gypsum Corporation or approved substitute.
 - 2. Description: ASTM C1396 and ASTM C1629, Type X, Classification Level I; 48 inches wide x 5/8 inch thick, maximum practical length, tapered edge; apply to fire rated walls where indicated.
- E. Shaft Wall Liner: ASTM C1396; 1 inch thick x 24 inches wide, maximum practical length, square edges.
- F. Exterior Soffit Board: ASTM C1396; 48 inches wide x thickness indicated, maximum practical length, eased edges, ends square cut.
- G. Water and Mold Resistant Gypsum Board:
 - 1. Source: USG Sheetrock Brand Mold Tough Gypsum Panels Firecode C, or approved substitute.
 - 2. Description: ASTM C1396; 48 inches wide x 5/8 inch thick, maximum practical length, water resistant.

2.3 MATERIALS - CEMENTITIOUS PANELS

- A. Cementitious Panels: ANSI A 118.9, high density, cementitious with glass fiber reinforcing, thickness indicated x 48 inches wide, maximum practical length, ends and edges square cut; apply to walls where indicated in the Drawings.

2.4 ACCESSORIES

- A. Fasteners: ASTM C1002, Type W or screws as applicable, minimum 5/8 inch penetration into framing.
- B. Acoustical Insulation:
 - 1. Source: Pink Next Gen Fiberglas Insulation by Owens Corning, or approved substitute.
 - 2. ASTM C665, Type I, glass fiber composition, unfaced.
- C. Adhesive: Type recommended by gypsum panel manufacturer.
- D. Trim Accessories: ASTM C1047.
 - 1. Material: Formed steel, minimum 26 gage core steel, hot dip galvanized finish, expanded flanges.
 - 2. Corner reinforcement: GA-216, Type CB-100 x 100.
 - 3. Casing: GA-216, Type LC.
 - 4. Control joint.
- E. Acoustical Sealer: Specified in Section 079200.
- F. Joint Treatment Materials: Reinforcing tape and joint compound; ASTM C475.

PART 3 EXECUTION

3.1 INSTALLATION OF GYPSUM PANELS

- A. Install panels and accessories in accordance with ASTM C754, GA-216, and manufacturer's instructions.
- B. Accurately cut panels to fit around openings and projections. Do not tear face paper or break gypsum core.
- C. Apply panels at non fire-rated assemblies in most economical manner, with ends and edges occurring over supports.
- D. Apply panels at fire-rated assemblies as required by design assembly.
- E. Stagger joints on opposite sides of partitions.
- F. Do not locate joints to align with edges of openings unless a control joint is installed.
- G. Mechanically fasten single layer panels to framing. Place fasteners minimum 3/8 inch from edges of panels; drive heads slightly below surface. Stagger fasteners at abutting edges.
- H. Apply face layer of double layer applications with joints offset from those in base layer; secure with mechanical fasteners to framing or with adhesive to base layer.
- I. At deflection compensating head tracks, cut panels 1/2 inch short of structure at head; do not secure panels to top runner channel.
- J. Treat cut edges and holes in moisture resistant gypsum board with joint sealer.
- K. Where recessed items occur in fire rated partitions, box item on all sides with gypsum board as required to maintain continuity of fire rating.

3.2 INSTALLATION OF ACOUSTICAL PARTITIONS

- A. Extend acoustical partitions past intersecting non-acoustical partitions.
- B. Install acoustical insulation:
 - 1. Butt to framing members and adjacent construction.
 - 2. Carry around pipes, wiring, outlets, and other construction without voids.
 - 3. Press against one gypsum board surface to form slight air space on opposite side.
- C. Seal acoustical partitions at perimeter and around penetrations:
 - 1. Apply continuous bead of sealer between gypsum panel edges and adjacent construction.
 - 2. Seal space between gypsum panels at control joints, prior to installing metal control joint.
 - 3. Apply sealer to penetrations through partitions.

3.3 INSTALLATION OF ACOUSTICAL INSULATION ABOVE CEILINGS

- A. Install acoustical insulation in continuous layer. Butt tightly to adjacent insulation and to other construction.
- B. Carry over pipes, wiring, boxes, and other construction without voids.

3.4 INSTALLATION OF CEMENTITIOUS PANELS

- A. Install in accordance with ANSI A108.11 and manufacturer's instructions.
- B. Apply panels horizontally, with ends occurring over supports. Stagger end joints in adjacent rows.

- C. Cut panels to fit around openings and projections.
- D. Mechanically fasten panels to framing at maximum 12 inches on center.

3.5 INSTALLATION OF SHAFT WALL SYSTEM

- A. Install in accordance with manufacturer's instructions.
- B. Cut liner panels 3/4 inch less than wall height; install vertically between runners.
- C. Progressively install succeeding studs and liner panels.
- D. Apply gypsum panels to one or both sides as required by fire assembly description.
- E. Provide shaft cants at horizontal projections over 2 inches in width within elevator shafts. Install strips of gypsum board or sheet metal at 70 degree angle extending from projection up wall; screw to each stud.

3.6 INSTALLATION OF ACCESSORIES

- A. Install in accordance with manufacturer's instructions.
- B. Install corner reinforcement at outside corners. Use single lengths where length of corner does not exceed standard length.
- C. Install casings where indicated and where gypsum board abuts dissimilar materials or stops with edge exposed.
- D. Install control joints at ceilings:
 - 1. At maximum 50 feet on center.
 - 2. Where ceiling framing changes direction.
- E. Install control joints at walls and partitions:
 - 1. At changes in backup material.
 - 2. At maximum 30 feet on center.
 - 3. Above both jambs of openings in partitions.

3.7 JOINT TREATMENT

- A. Treat joints and fasteners in gypsum board in accordance with GA-214.
- B. Levels of Finish:
 - 1. Surfaces in plenums, janitor closets: Level 1 finish.
 - 2. Surfaces to receive tile: Level 2 finish.
 - 3. Surfaces to receive flat or eggshell paints and wall coverings: Level 4 finish.
 - 4. Surfaces to receive semigloss or gloss paints: Level 5 finish.

END OF SECTION

SECTION 093000

TILING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Tile wall and floor finishes.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealers.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Manufacturer's installation, cleaning, and maintenance instructions.
 - 2. Samples:
 - a. Tile: Full size samples in each color.
 - b. Grout: 1/2 x 1/2 x 3 inch long samples in each color.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years experience in work of this Section.
- B. Tile and Trim Units: Meet ANSI A137.1, Standard Grade.
- C. Static Coefficient of Friction for Floor Tile: Minimum 0.60, tested to ASTM C1028 in dry condition.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver mortar, adhesive, and grout containers bearing hallmark certifying compliance with reference standards.
- B. Protect adhesive containers from freezing and overheating according to manufacturer's instructions.

1.5 PROJECT CONDITIONS

- A. Environmental Requirements: Maintain minimum ambient temperature of 50 degrees F during and after installation.

1.6 MAINTENANCE

- A. Extra Materials: One unopened carton of each tile.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers - Setting and Grouting Materials:
 - 1. BASF Corporation. (www.buildingsystems.basf.com)
 - 2. Bostik, Inc. (www.bostik-us.com)
 - 3. Laticrete International, Inc. (www.laticrete.com)
 - 4. Mapei Corporation. (www.mapei.us)
 - 5. TEC. (www.tecspecialty.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Tile: Refer to Finish Schedule.

2.3 ACCESSORIES

- A. Latex-Portland Cement Mortar: ANSI A118.4, polymer modified dry set type.
- B. Dry Set Mortar for Large and Heavy Tiles: ANSI A1181, A118.4, A118.11, or A118.15; thin set mortar formulated by manufacturer to minimize slump and to facilitate thicker bond coat.
- C. Water: Clean, potable.
- D. Grout:
 - 1. ANSI A118.7, high performance polymer modified type, sanded for joints over 1/8 inch.
 - 2. Color: To be selected from manufacturer's full color range.
- E. Joint Sealers: Specified in Section 079200.
- F. Crack Suppression Membrane: ANSI A118.12, load bearing, reinforced self-adhering sheet type.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean surfaces to remove loose and foreign matter that could impair adhesion.
- B. Remove ridges and projections. Fill voids and depressions with patching compound compatible with setting materials.
- C. Allowable Substrate Tolerances:
 - 1. Maximum variation in substrate surface: 1/8 inch in 8 feet.
 - 2. Maximum height of abrupt irregularities: 1/32 inch.
- D. Test concrete substrate to ASTM D4263; do not install tile until surfaces are sufficiently dry.

3.2 INSTALLATION

- A. Install crack suppression membrane in accordance with manufacturer's instructions.
- B. Methods:
 - 1. Walls: ANSI A108.5, thin set with latex-Portland cement mortar.
 - 2. Floors: ANSI A108.5, thin set with latex-Portland cement mortar, utilize dry set mortar for heavy or large tiles (one or more edges exceeding 15 inches, or 5 pounds per square foot or heavier).
- C. Minimize pieces less than one half size. Locate cuts to be inconspicuous.
- D. Lay tile to pattern furnished by Architect. Do not interrupt tile pattern through openings.
- E. Joint Width: 1/8 inch, plus or minus 1/16 inch.
- F. Make joints watertight, without voids, cracks, excess mortar, or excess grout. Align joints in wall and floor of same-sized tile.
- G. Fit tile around projections and at perimeter. Smooth and clean cut edges. Ensure that trim will completely cover cut edges.

- H. Install Trim:
 - 1. Inside corners: Cove units.
 - 2. Outside corners: Bead units.
 - 3. Base: Base units.
 - 4. Exposed tile ends: Bullnose units.
- I. Install thresholds where tile abuts dissimilar floor finish. Center on door or opening.
- J. Allow tile to set for a minimum of 48 hours before grouting.
- K. Grout tile joints in accordance with ANSI A108.10 without excess grout.
- L. Control Joints:
 - 1. Provide control joints at:
 - a. Changes in backup material.
 - b. Changes in plane.
 - c. Over joints in substrate.
 - d. Maximum 24 feet on center at interior locations except maximum 8 feet at surfaces exposed to direct sunlight.
 - e. Maximum 16 feet on center at exterior locations.
 - 2. Form joints per TCNA Method EJ-171.
 - 3. Install joint backing and joint sealer as specified in Section 079200.

3.3 ADJUSTING

- A. Remove and replace pieces that have been damaged during installation.

3.4 PROTECTION

- A. Provide protection for completed work using nonstaining sheet coverings.
- B. Prohibit traffic on tile floors for minimum 3 days after installation.

END OF SECTION

SECTION 095100

ACOUSTICAL TILE CEILINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Suspended metal ceiling grid system.
 - 2. Acoustical ceiling panels.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Samples:
 - a. 12 x 12 inch acoustical panel samples.
 - b. 6 inch long suspension system samples showing each profile.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that acoustical panels meet fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years experience in work of this Section.
- B. Fire Hazard Classification: Class A rated, tested to ASTM E1264.

1.4 PROJECT CONDITIONS

- A. Environmental Requirements: Install in approximately same conditions of temperature and humidity as will prevail after installation.

1.5 MAINTENANCE

- A. Extra Materials: One unopened carton of each acoustical panel.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Armstrong. (www.armstrong.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Suspension Grid System:
 - 1. Ballroom/Proshop: Suprafine XI 9/16" Beveled Tegular Grid.
 - 2. Other locations: Refer to Finish Schedule.
- B. Acoustical Panels:
 - 1. Ballroom/Proshop: Tech Zone Ceiling System with Lyra PB, Armstrong Tech Zone.
 - 2. Kitchen: Kitchen Zone 672.
 - 3. Office/conference Room: Cirrus Angled Tegular Humiguard Plus 5848.

2.3 ACCESSORIES

- A. Support Channels: Galvanized steel; size and type to suit application.
- B. Hanger Wire: ASTM A641, minimum 12 gage galvanized steel.
- C. Touch-Up Paint: Color to match acoustical panels and suspension grid.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install ceilings in accordance with ASTM C636 and CISCA Handbook.
- B. Minimize panels less than one half size.
- C. Install molding around perimeters and abutting surfaces. Miter molding at exterior corners; cut flanges and bend web to form interior corners.
- D. Space hanger wires maximum 48 inches on center. Install additional hangers where required to support light fixtures and ceiling supported equipment.
- E. Do not suspend hangers directly from metal deck. Attach steel channel horizontally to adjacent framing members; place hanger at regular spacing.
- F. Hang suspension system independent of walls, columns, ducts, pipes, and conduit.
- G. Where ducts or other equipment prevent regular spacing of hangers:
 - 1. Reinforce nearest related hangers to span extra distance, or:
 - 2. Suspend steel channel horizontally beneath duct or equipment; place hanger at regular spacing.
- H. Install main tees at maximum 48 inches on center.
- I. Install cross tees to form 24 x 24 inch modules. Lock cross tees to main tees.
- J. Support ends of tees on flange of perimeter molding.
- K. Place acoustical panels with edges resting flat on suspension grid.
- L. Cutting Acoustic Units:
 - 1. Cut to fit irregular grid and perimeter edge trim and around penetrations.
 - 2. Locate cuts to be concealed.
 - 3. Cut and field paint exposed edges of reveal edge units to match factory edge.
- M. Installation Tolerances: Ceilings level to 1/8 inch in 12 feet measured in any direction.

3.2 ADJUSTING

- A. Touch up minor scratches and abrasions to match factory finish.

END OF SECTION

SECTION 095429

WOOD CEILING SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Suspended wood ceiling system.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate panel layout, dimensions, perimeter details, and location and size of penetrations through panels.
 - 2. Samples:
 - a. 12 x 12 inch wood panel samples.
 - b. 6 inch long suspension system samples showing each profile.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that panels meet fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Minimum 2 years documented experience in work of this Section.
 - 2. Approved by wood ceiling system manufacturer.
- B. Fire Hazard Classification: Class A, tested to ASTM E84.

1.4 PROJECT CONDITIONS

- A. Environmental Requirements; do not install ceiling systems until:
 - 1. HVAC systems are complete and operational.
 - 2. Humidity in installation spaces is controlled at 25 to 55 percent.
 - 3. Temperature and humidity are similar to conditions that will prevail after installation.
 - 4. Above-ceiling work is complete and inspected.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on wood ceiling products by Armstrong World Industries, Inc. (www.armstrong.com/ceilings) and Rulon. (www.rulonco.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Suspension Grid System:
 - 1. ASTM C635, intermediate duty, die cut, interlocking ends.
 - 2. Grid type: Exposed T.
 - 3. Material: Galvanized steel.
 - 4. Runners: 1-1/2 inches high, 15/16 inch exposed width, flush profile.

5. Perimeter molding: Angle shape.
6. Finish: Factory applied enamel paint, sprayed and baked, black.

- B. Wood Panels: Refer to Finish Schedule.
- C. Acoustic Insulation: Insul-SHIELD Black by Johns Manville.

2.3 ACCESSORIES

- A. Support Channels: Galvanized steel; size and type to suit application.
- B. Hanger Wire: ASTM A641, minimum 12 gage galvanized steel.
- C. Attachment Clips: Ceiling manufacturer's standard profile.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with ASTM C636, CISCA Handbook, manufacturer's instructions, and approved Shop Drawings.
- B. Minimize panels less than one half size.
- C. Install perimeter trim around perimeter and abutting surfaces.
- D. Space hanger wires maximum 48 inches on center. Install additional hangers where required to support light fixtures and ceiling supported equipment.
- E. Do not suspend hangers directly from metal deck. Attach steel channel horizontally to adjacent framing members; place hanger at regular spacing.
- F. Hang suspension system independent of walls, columns, ducts, pipes, and conduit.
- G. Where ducts or other equipment prevent regular spacing of hangers:
 1. Reinforce nearest related hangers to span extra distance, or:
 2. Suspend steel channel horizontally beneath duct or equipment; place hanger at regular spacing.
- H. Install suspension tees at maximum 48 inches on center in direction perpendicular to wood strips.
- I. Attach wood panels to suspension grid using attachment clips.
- J. Install acoustic insulation above wood panels.
- K. Cut panels to fit irregular grid and perimeter edge trim and around penetrations. Locate cuts to be concealed.

3.2 ADJUSTING

- A. Touch up minor scratches and abrasions to match factory finish.

END OF SECTION

SECTION 096513

RESILIENT BASE

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient wall base.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Samples: 4 inch long samples in each color.

1.3 MAINTENANCE

- A. Extra Materials: 2 percent of each profile and color.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Armstrong World Industries. (www.armstrong.com)
- B. Other Acceptable Manufacturers:
 - 1. Allstate Rubber Corp. (www.allstaterubber.com)
 - 2. Burke Flooring. (www.burkeflooring.com)
 - 3. Johnsonite, Inc. (www.johnsonite.com)
 - 4. Roppe Corp. (www.roppe.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Resilient Base:
 - 1. Height: 6 inches.
 - 2. Profile:
 - a. Carpet: Straight Base.
 - b. Resilient Flooring: Cove Base.
 - 3. Color: Refer to Finish Schedule.

2.3 ACCESSORIES

- A. Adhesive: Water based, waterproof, recommended by base manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare surfaces to receive base:
 - 1. Remove materials that could interfere with adhesion.
 - 2. Fill low spots with patching compound; finish flush with adjacent surface.
 - 3. Remove high spots, ridges and nibs.

3.2 INSTALLATION

- A. Apply adhesive continuously to back of base.
- B. Maintain top edge true to line and bottom edge in continuous contact with floor. Butt joints tight; butt base tight to adjacent construction.
- C. Do not install pieces less than 6 inches long.
- D. Miter and butt inside corners.
- E. At outside corners "V" cut back of base to 2/3 of its thickness and bend around corner.
- F. Scribe to door frames and other interruptions.

END OF SECTION

SECTION 096519

RESILIENT TILE FLOORING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Resilient tile flooring.
 - 2. Reducers.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Provide data on specified products, describing physical and performance characteristics.
 - 2. Samples:
 - a. Flooring: 6 x 6 inch samples in each color and pattern.
 - b. Reducers: 4 inch long samples in each color.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that flooring meets fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 2 years experience in work of this Section.
- B. Fire Hazard Classification: Class I rated, tested to ASTM E648.
- C. Static Coefficient of Friction: Minimum 0.5, tested to ASTM D2047.

1.4 PROJECT CONDITIONS

- A. Maintain temperature in spaces to receive flooring between 70 and 90 degrees F for 24 hours before, during, and for minimum 48 hours after installation.
- B. Maintain minimum temperature of 55 degrees F after flooring is installed, except as otherwise specified.

1.5 MAINTENANCE

- A. Extra Materials: One unopened carton of each color and pattern.

PART 2 PRODUCTS

- A. Contract documents are based on products by Armstrong World Industries. (www.armstrong.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Resilient Flooring:
 - 1. Type: Class 1, Smooth.
 - 2. Thickness: 0.125 inch.
 - 3. Size: 12 by 12 inches.

4. Color: Refer to Finish Schedule.

2.3 ACCESSORIES

- A. Reducer Strips: Solid vinyl or rubber composition, 1 inch wide by flooring thickness, tapered, color to match tile.
- B. Leveling Compound: White, premixed, latex based.
- C. Adhesive: Water based, waterproof, recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that concrete floors have cured a minimum 28 days and do not exhibit negative alkalinity, carbonization, or dusting.

3.2 PREPARATION

- A. Clean substrate; remove loose and foreign matter that could impede adhesion or performance of flooring.
- B. Fill cracks, voids, and depressions in substrate with leveling compound.
- C. Grind off high spots and projections in substrate; leave smooth and level to 1/4 inch in 10 feet.
- D. Test substrate for moisture content to ASTM F1869; do not install flooring until moisture emission level is acceptable to flooring manufacturer.

3.3 INSTALLATION OF TILE

- A. Install in accordance with manufacturer's instructions.
- B. Mix materials from multiple containers to ensure shade variations are consistent when flooring is placed.
- C. Spread only enough adhesive to permit installation of flooring before initial set.
- D. Lay flooring with joints parallel to building lines to produce symmetrical pattern.
- E. Install flooring to pattern directed by Architect. Allow minimum half-size units at room or area perimeter.
- F. Set flooring in place; press with heavy roller to attain full adhesion.
- G. Scribe flooring to walls, columns, cabinets, and other appurtenances to produce tight joints. Ensure that base, trim, plates, or escutcheons will completely cover cut edges.
- H. Extend flooring into recesses and under equipment.
- I. Terminate flooring at centerline of door openings where adjacent floor finish is dissimilar.

3.4 INSTALLATION OF REDUCER STRIPS

- A. Install where tile stops with edge exposed; set in adhesive.
- B. Center strips under doors where flooring terminates at door openings.
- C. Install in longest practical lengths; butt ends tight.

D. Scribe to abutting surfaces.

3.5 ADJUSTING

A. Correct tiles that are not seated; replace damaged tiles.

3.6 CLEANING

A. Clean flooring, wax, and machine buff in accordance with manufacturer's instructions.

3.7 PROTECTION

A. Do not allow traffic on flooring until adhesive has set.

B. Cover areas subject to traffic with protective covering.

END OF SECTION

SECTION 096723
RESINOUS FLOORING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Liquid applied polycrete and aggregate floor finish.
 - 2. Divider strips.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate room or space dimensions and location of dividers.
 - 2. Product Data: Provide data on specified products, describing physical and performance characteristics.
 - 3. Samples:
 - a. 6 x 6 inch flooring samples in each color.
 - b. 6 inch long divider strip samples.
 - c. Integral base mockup sample.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that flooring meets fire hazard classification requirements.
- C. Closeout Submittals:
 - 1. Maintenance Data: Include maintenance procedures, recommended maintenance materials, procedures for stain removal, repairing surface, and suggested schedule for cleaning.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Minimum 3 years experience in work of this Section.
 - 2. Approved by flooring manufacturer.
- B. Fire Hazard Classification: Self extinguishing, tested to ASTM D635 with maximum 0.25 inch extent of burning.
- C. Static Coefficient of Friction: Minimum 0.60, tested to ASTM C1028 in dry condition.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Maintain minimum temperature of 55 degrees F in storage area unless otherwise instructed by manufacturer.
- B. Store materials in installation area for 3 days prior to installation to achieve temperature stability.

1.5 PROJECT CONDITIONS

- A. Maintain ambient temperature required by manufacturer 3 days prior to, during, and for 24 hours after installation of materials.

1.6 WARRANTIES

- A. Furnish manufacturer's applicator's year warranty providing coverage against flooring delamination from substrate and degradation of surface finish.

PART 2 PRODUCTS

2.1 MANUFACTURER

- A. Contract documents are based on products by Dur-a-Flex, Inc. (www.dur-a-flex.com)
- B. Other Acceptable Manufacturers:
 - 1. RBC Industries, Inc. (www.rbcepoxy.com)
 - 2. Stonhard, Inc. (www.stonhard.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Resinous Flooring - Kitchen:
 - 1. Floor and Base: Polycrete MDB by Dur-a-Flex, Inc., or approved substitute.
 - 2. System Description: Primer/Body Coat/Quartz Broadcast/Top Coat.
 - 3. Color: Refer to Finish Schedule.
- B. Resinous Flooring - Restroom:
 - 1. Floor and Base: Hybri Flex EQ by Dur-a-Flex, Inc., or approved substitute.
 - 2. System Description: Primer/Body Coat/Quartz Broadcast(2 Layers)/Grout Coat/Topcoat.
 - 3. Color: Refer to Finish Schedule.

2.3 ACCESSORIES

- A. Divider Strips: Height to match flooring thickness, minimum 18 gage white alloy of zinc or brass, with anchoring features.
- B. Subfloor Filler: White, premixed, latex based, type recommended by flooring material manufacturer.
- C. Primers, Adhesives, and Sealers: Types recommended by flooring manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that concrete floors have cured a minimum 28 days and do not exhibit negative alkalinity, carbonization, or dusting.

3.2 PREPARATION

- A. Remove subfloor ridges and bumps. Fill low spots, cracks, joints, holes, and other defects with filler.
- B. Prepare concrete substrates to receive flooring system by water cleaning method to requirements of ASTM D4258.
- C. Test substrate for moisture content to ASTM F1869; do not install flooring until moisture emission level is acceptable to flooring manufacturer.
- D. Apply primer to substrate surfaces.

3.3 INSTALLATION

- A. Install divider strips at locations indicated. Locate additional joints to align with joints in substrate.
- B. Set strips straight and level; attach securely to substrate.
- C. Apply flooring in accordance with manufacturer's instructions to thickness of 1/4 inch.
- D. Apply base coat of binder resin and allow to dry.
- E. While binder is still wet, uniformly broadcast aggregate over wet binder.
- F. After first coat has cured, where required, apply second broadcast and grout coat.
- G. Finish to smooth level surface.
- H. After second coat has cured, apply top coat.
- I. Cove flooring at vertical surfaces to a minimum height of 4 inches. See architectural details.

3.4 PROTECTION

- A. Prohibit traffic on floor finish for 48 hours after installation.
- B. Barricade area to protect flooring until cured.

END OF SECTION

SECTION 096813

TILE CARPETING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Tile carpeting.
 - 2. Edgings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate carpet tile locations, dye lot limitations, direction of carpet tile in each room or area, and type and location of edgings.
 - 2. Samples:
 - a. Carpet tile: Full size samples in each color and pattern.
 - b. Edgings: 4 inch long samples showing selected profiles and colors.
 - 3. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that carpet tiles meet fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Fire Hazard Classification: Maximum flame spread/smoke developed rating of 75/125, tested to ASTM E84.

1.4 PROJECT CONDITIONS

- A. Do not begin installation until painting and finishing work have been completed.
- B. Environmental Requirements:
 - 1. Temperature of spaces and subfloor between 65 and 90 degrees F.
 - 2. Humidity in spaces to receive carpet tiles between 20 and 65 percent.

1.5 WARRANTIES

- A. Furnish manufacturer's 10 year warranty providing coverage against:
 - 1. Defective materials and workmanship.
 - 2. Excessive fading.
 - 3. Loss of static control.
 - 4. Edge raveling.
 - 5. Runs.
 - 6. Loss of tuft bind strength.
 - 7. Loss of face fiber.
 - 8. Excessive wear.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Carpet Tiles: Refer to Finish Schedule.

2.2 ACCESSORIES

- A. Adhesive:
 - 1. Waterproof, pressure-sensitive, latex based cement formulated specifically for installing carpet tiles; recommended by carpet tile manufacturer.
 - 2. Meet project VOC requirements.
- B. Transition Strips: Preformed rubber, profile required to suit conditions, color to be selected from manufacturer's full color range.
- C. Leveling Compound: Premixed, latex based.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that concrete floors have cured a minimum 28 days and do not exhibit negative alkalinity, carbonization, or dusting.

3.2 PREPARATION

- A. Clean substrate to ASTM D4258.
- B. Fill cracks, voids, and depressions with leveling compound.
- C. Grind ridges and high spots smooth.
- D. Test Substrate:
 - 1. Moisture vapor: Test to ASTM F1869; do not install carpet tiles until moisture emission level is acceptable to carpet manufacturer.
 - 2. Humidity: Test to ASTM F2170; do not install carpet tiles until relative humidity is acceptable to carpet manufacturer.
 - 3. Alkalinity: Test to ASTM F710; do not install carpet tiles unless pH is acceptable to carpet manufacturer.

3.3 INSTALLATION OF CARPET TILES

- A. Install in accordance with CRI 104.
- B. Install carpet tile and adhesive in accordance with manufacturers' instructions.
- C. Blend carpet tiles from different cartons to ensure minimal variation in color match.
- D. Lay out each room or area to minimize tiles less than one half size.
- E. Cut tile clean. Fit tiles tight to intersection with vertical surfaces without gaps.
- F. Lay carpet tile to manufacturer's recommended pattern, set parallel to building lines and with corners aligned.
- G. Locate change of color or pattern between rooms under door centerline.
- H. Fully adhere carpet tiles to substrate.

- I. Bind cut edges where not concealed by edge strips.

3.4 INSTALLATION OF EDGINGS

- A. Install strips where carpet tiles abut dissimilar flooring materials; secure to subfloor.
- B. Center strips under doors where carpet tiles terminate at door openings.
- C. Install in longest practical lengths; butt ends tight.
- D. Scribe to abutting surfaces.

3.5 CLEANING

- A. Clean spots as recommended by carpet tile manufacturer.
- B. Cut off loose threads flush with top surface.
- C. Clean with commercial vacuum cleaner.

END OF SECTION

SECTION 096816

SHEET CARPETING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Sheet carpet.
 - 2. Carpet pad.
 - 3. Edgings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate carpet locations, dye lot limitations, seaming plan, method of joining seams, direction of carpet in each room or area, and type and location of edgings.
 - 2. Samples:
 - a. Carpet: 12 x 24 inch samples in each color and pattern.
 - b. Carpet pad: 12 x 12 inch samples.
 - c. Edgings: 4 inch long samples in each color.
 - d. Accessories.
 - 3. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that carpet meets fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Fire Hazard Classification: Maximum flame spread/smoke developed rating of 75/125, tested to ASTM E84.

1.4 PROJECT CONDITIONS

- A. Do not begin installation until painting and finishing work have been completed.
- B. Environmental Requirements:
 - 1. Temperature of spaces and subfloor between 65 and 90 degrees F.
 - 2. Humidity in spaces to receive carpet between 20 and 65 percent.

1.5 WARRANTIES

- A. Furnish manufacturer's 10 year wear warranty providing coverage against:
 - 1. Defective materials and workmanship.
 - 2. Excessive fading.
 - 3. Loss of static control.
 - 4. Edge raveling.
 - 5. Runs.
 - 6. Loss of tuft bind strength.
 - 7. Loss of face fiber.
 - 8. Excessive wear.

1.6 MAINTENANCE

- A. Extra Materials: 2 percent of each color and pattern.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Carpet: Refer to Finish Schedule.

2.2 ACCESSORIES

- A. Seaming Materials: As recommended by carpet manufacturer.
- B. Adhesive: Waterproof, latex based cement formulated specifically for installing carpet; recommended by carpet manufacturer.
- C. Carpet Pad: Refer to Finish Schedule.
- D. Gripper Strip: As recommended by carpet manufacturer for carpet thickness, water resistant plywood with angular pins.
- E. Edgings: Preformed metal,, profile required to suit conditions, color to be selected from manufacturer's full color range.
- F. Leveling Compound: Premixed, latex based.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that concrete floors have cured a minimum 28 days and do not exhibit negative alkalinity, carbonization, or dusting.

3.2 PREPARATION

- A. Clean substrate; remove loose and foreign matter that could impede adhesion or performance of flooring.
- B. Fill cracks, voids, and depressions with leveling compound.
- C. Grind ridges and high spots smooth.
- D. Test Substrate:
 1. Moisture vapor: Test to ASTM F1869; do not install carpet until moisture emission level is acceptable to carpet manufacturer.
 2. Humidity: Test to ASTM F2170; do not install carpet until relative humidity is acceptable to carpet manufacturer.
 3. Alkalinity: Test to ASTM F710; do not install carpet unless pH is acceptable to carpet manufacturer.

3.3 INSTALLATION OF CARPET

- A. Install in accordance with CRI 104.
- B. Install carpet and pad in accordance with manufacturer's instructions.
- C. Lay out carpet so that seams will be minimized and as inconspicuous as possible.

- D. Provide seaming plan for approval.
- E. Provide floor plan for approval.
- F. Longitudinal seams not permitted where width of room or space is less than width of carpet.
- G. Do not change run of pile in any room where carpet is continued through a wall opening into another room.
- H. Verify carpet match before cutting to ensure minimal variation between dye lots.
- I. Install gripper strip at perimeter and around abutting objects. Secure to subfloor.
- J. Install double stick pad using maximum size pieces. Butt edges together and tight. Remove air pockets and wrinkles; tape joints with 2 inch wide waterproof tape.
- K. Stretch carpet according to manufacturer's instructions for percentage of stretch. Install over double stick pad.
- L. Fasten carpet securely to strips so that all pins penetrate carpet backing. Tuck raw edges behind strips.
- M. Join seams with hot seaming tape. Form seams straight and free of peaks or gaps.
- N. Lay carpet tight and flat on pad, well fastened at edges, with uniform appearance. Provide monolithic color, pattern, and texture match within any one room or area.
- O. Fit carpet tight to abutting surfaces and penetrations without gaps. Ensure coverage of carpet edges by wall base, trim, escutcheons, and cover plates.
- P. Provide monolithic color, pattern, and texture within each area.

3.4 INSTALLATION OF EDGINGS

- A. Install strips where carpet abuts dissimilar flooring materials; secure to subfloor.
- B. Center strips under doors where carpet terminates at door openings.
- C. Install in longest practical lengths; butt ends tight.
- D. Scribe to abutting surfaces.

3.5 CLEANING

- A. Clean spots as recommended by carpet manufacturer.
- B. Cut off loose threads flush with top surface.
- C. Clean with commercial vacuum cleaner.

END OF SECTION

SECTION 097200

WALL COVERINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Wall coverings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Provide seaming diagram for approval.
 - 2. Product Data: Manufacturer's descriptive data for each wall covering.
 - 3. Samples: 12 x 24 inch wall covering samples in each color and pattern.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that wall covering meets fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Fire Hazard Classification: Tested to ASTM E84 with following results:
 - 1. Flame spread: Maximum 200.
 - 2. Smoke density: Maximum 450.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials in clean, dry storage area at minimum 40 degrees F and normal humidity.
- B. Do not store rolls in upright position.

1.5 PROJECT CONDITIONS

- A. Maintain minimum temperature of 50 degrees F in areas to receive wall covering for three days prior to, during, and after installation.

1.6 MAINTENANCE

- A. Extra Materials: 2 percent of each color and pattern.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wall Covering: Refer to Finish Schedule.

2.2 ACCESSORIES

- A. Sealer: Type recommended by wall covering manufacturer.
- B. Adhesive: Type recommended by wall covering manufacturer; water based, mildew resistant.
- C. Patching Compound: White latex type.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare substrate to receive wall covering:
 - 1. Remove high spots.
 - 2. Fill holes, cracks, and depressions with patching compound; sand smooth and flush.
 - 3. Remove loose and foreign matter that could impair adhesion.
 - 4. Apply sealer as recommended by wall covering manufacturer.
- B. Remove wall covering from packaging, place in installation area, and allow to acclimatize for minimum 24 hours prior to installation.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install panels vertically **unless otherwise noted.**
- C. Do not locate joints within 6 inches of corners. Horizontal joints not permitted.
- D. Smooth wall covering to eliminate bubbles and ensure adhesion. Remove excess adhesive from seams immediately.
- E. Use panels in exact order they are cut from roll. Reverse every other panel of non matching patterns.
- F. Fill in above and below openings with panels cut in consecutive order from roll.
- G. Install wall covering free from bubbles, wrinkles, open or loose seams, and other visible defects.

END OF SECTION

SECTION 097733

SANITARY WALL PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Prefinished sanitary wall panels.
 - 2. Trim.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealers.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Samples:
 - a. 6 x 6 inch panel samples in each color.
 - b. 6 inch long trim samples.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that panels meet fire hazard classification requirements.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years experience in work of this Section.
- B. Fire Hazard Classification: Tested to ASTM E84.
 - 1. Flame spread: Maximum 200.
 - 2. Smoke density: Maximum 450.

1.4 PROJECT CONDITIONS

- A. Do not install products if temperature, humidity, and ventilation requirements are outside limits recommended by manufacturer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Panolam Industries International, Inc. (www.panolam.com)
- B. Other Acceptable Manufacturers:
 - 1. Crane Composites (www.cranecomposites.com)
 - 2. Nudo Products, Inc. (www.nudo.com)
 - 3. Marlite. (www.marlite.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Sanitary Wall Panels:
 - 1. Type: Glass fiber reinforced plastic, USDA approved for incidental food contact.
 - 2. Size: 3/32 inch thick x 48 inches wide x maximum practical length.
 - 3. Color: To be selected from manufacturer's full color range.
 - 4. Surface texture: To be selected.

2.3 ACCESSORIES

- A. Trim:
 - 1. One piece extruded PVC, manufacturer's standard profile.
 - 2. Inside and outside corners, division bar, and J-molding.
 - 3. Color: To be selected from manufacturer's full color range.
- B. Adhesive: Compatible with panels and substrate; recommended by panel manufacturer.
- C. Joint Sealer: Specified in Section 079200.
- D. Patching Compound: White latex type.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare substrate to receive panels:
 - 1. Remove high spots.
 - 2. Fill low spots with patching compound; sand smooth.
 - 3. Remove loose and foreign matter that could impair adhesion.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Install trim:
 - 1. Panel-to-panel joints: Division bar.
 - 2. Internal and external corners.
 - 3. Exposed edges: J molding.
 - 4. Secure to substrate.
- C. Cut panels to fit at perimeter and around penetrations. Ensure that trim will completely cover cut edges.
- D. Maintain 1/8 to 3/16 inch expansion space at perimeter and around penetrations.
- E. Adhere panels to substrate with continuous beads of adhesive.
- F. Install continuous bead of joint sealer between panels and trim and between trim and adjacent construction.

END OF SECTION

SECTION 098413

ACOUSTICAL WALL PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Fabric covered acoustical wall panels.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate panel locations, sizes, attachment, and relationship to adjacent construction.
 - 2. Product Data: Manufacturer's descriptive data for wall panels.
 - 3. Samples:
 - a. 6 x 6 inch fabric samples in each color and pattern.
 - b. After fabric selections submit 24 x 24 inch panel samples showing backing, facings, and edges.
- B. Quality Control Submittals:
 - 1. Certification: Manufacturer's certification that Products comply with requirements for fire hazard classification.

1.3 QUALITY ASSURANCE

- A. Fabric: Tested to ASTM E84 with following results:
 - 1. Flame spread: Maximum 25.
 - 2. Smoke density: Maximum 450.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store materials in clean, dry storage area at minimum 40 degrees F and normal humidity.

1.5 PROJECT CONDITIONS

- A. Maintain minimum temperature of 50 degrees F in areas to receive wall panels for three days prior to, during, and after installation.

1.6 MAINTENANCE

- A. Extra Stock: 2 percent extra fabric in each color and pattern.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by FabriTrak Systems, Inc. (www.fabritrak.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MANUFACTURED UNITS

A. Fabric Covered Wall Panels:

1. Source: FabriTrak Acoustical Wall System by FabriTrak Systems, Inc., or approved substitute.
2. Fabric, Core, and Depth: Refer to Finish Schedule.

2.3 ACCESSORIES

- ### A. Mounting Accessories: Type recommended by Manufacturer.

PART 3 EXECUTION

3.1 PREPARATION

A. Prepare substrate to receive wall panels:

1. Remove high spots.
2. Clean surfaces of materials that could impair adhesion.
- 3. Block out wall devices to accept panel thickness.**
- 4. Block out trim to accept wall panel thickness.**

3.2 INSTALLATION

- #### A. Install panels in accordance with manufacturer's instructions and approved Shop Drawings.
- #### B. Place panels plumb, level, and evenly spaced.

END OF SECTION

SECTION 099100

PAINTING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Surface preparation and field application of paints.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Manufacturer's data on materials proposed for use including:
 - a. Product designation and grade.
 - b. Product analysis and performance characteristics.
 - c. Standards compliance.
 - d. Material content.
 - e. Mixing and application procedures.
 - 2. Samples:
 - a. 3 x 6 inch samples of each coating system on representative substrate. Step back successive coats so that all coats remain exposed. Indicate type of material used for each coat.
 - 3. Paint Schedule: Indicate types and locations of each surface, paint materials, and number of coats to be applied.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Minimum 3 years documented experience in work of this Section.
- B. Materials, Preparation, and Workmanship: Conform to MPI Painting Manual.
- C. Mockup:
 - 1. Construct mockup panels for interior wall finishes, 4 feet wide x full height.
 - 2. Show: Each color and texture.
 - 3. Locate where directed.
 - 4. Approved mockup may remain as part of the Work.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Container Labels: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage rates, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.
- B. Paint Materials: Store at ambient temperature from 45 to 90 degrees F in ventilated area, or as required by manufacturer's instructions.

1.5 PROJECT CONDITIONS

- A. Do not apply materials when surface and ambient temperatures or relative humidity are outside ranges required by paint manufacturer.
- B. Maintain ambient and substrate temperatures above manufacturer's minimum requirements for 24 hours before, during, and after paint application.

- C. Do not apply materials when relative humidity is above 85 percent or when dew point is less than 5 degrees F different than ambient or surface temperature.
- D. Provide lighting level of 30 footcandles at substrate surface.

1.6 MAINTENANCE

- A. Extra Materials: 1 gallon of each color and sheen.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Sherwin Williams. (www.sherwin-williams.com)
- B. Other Acceptable Manufacturers:
 - 1. Benjamin Moore and Co. (www.benjaminmoore.com)
 - 2. Devoe Paint Co. (www.devoepaint.com)
 - 3. Glidden. (www.gliddenprofessional.com)
 - 4. Kelly-Moore Paints. (www.kellymoore.com)
 - 5. PPG Architectural Finishes, Inc. (www.pittsburghpaints.com)
 - 6. Pratt and Lambert Paints. (www.prattandlambert.com)
 - 7.
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Paints:
 - 1. As scheduled at end of Section, or approved substitute.
 - 2. Free from all forms of lead and mercury.
- B. Maximum Volatile Organic Compound (VOC) Content for interior paints, coatings, and accessories, tested to ASTM D6886:
 - 1. Primers: 100 grams per liter.
 - 2. Flat paints and coatings: 50 grams per liter.
 - 3. Non-flat paints and coatings: 50 grams per liter.
 - 4. Rust preventative coatings: 100 grams per liter.
 - 5. Clear wood finishes: 275 grams per liter.
 - 6. Stains: 100 grams per liter.
 - 7. Dryfall coatings: 150 grams per liter.
- C. Gloss Ratings:

Gloss Designation	Units at 60 Degrees	Units at 85 Degrees
Flat	0 to 5	Maximum 10
Eggshell	10 to 25	10 to 35
Satin	20 to 35	Minimum 35
Semigloss	35 to 70	
Gloss	70 to 85	
High Gloss	Minimum 85	

2.3 ACCESSORIES

- A. Accessory Materials: Paint thinners and other materials required to achieve specified finishes; commercial quality.
- B. Patching Materials: Latex filler.
- C. Fastener Head Cover Materials: Latex filler.

2.4 MIXES

- A. Deliver paints pre-mixed and pre-tinted.
- B. Uniformly mix to thoroughly disperse pigments.
- C. Do not thin in excess of manufacturer's recommendations.
- D. Re-mix paint during application; ensure complete dispersion of settled pigment and uniformity of color and gloss.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Test shop applied primer for compatibility with subsequent coatings.
- B. Measure moisture content of surfaces using electronic moisture meter. Do not apply coatings unless moisture content of surfaces are below following maximums:
 - 1. Gypsum board: 12 percent.
 - 2. Wood: 15 percent, measured to ASTM D4442.

3.2 PREPARATION

- A. General:
 - 1. Protect adjacent and underlying surfaces.
 - 2. Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.
 - 3. Correct defects and clean surfaces capable of affecting work of this section.
 - 4. Seal marks that may bleed through surface finishes with shellac.
- B. Impervious Surfaces: Remove mildew by scrubbing with solution of trisodium phosphate and bleach. Rinse with clean water and allow to dry.
- C. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.
- D. Galvanized Steel: SSPC Method SP1 - Solvent Cleaning.
- E. Aluminum: SSPC Method SP1 - Solvent Cleaning.
- F. Uncoated Ferrous Metals: SSPC Method SP2 - Hand Tool Cleaning or Method SP3 - Power Tool Cleaning.
- G. Shop Primed Ferrous Metals:
 - 1. SSPC Method SP2 - Hand Tool Cleaning or Method SP3 - Power Tool Cleaning.
 - 2. Feather edges to make patches inconspicuous.
 - 3. Prime bare steel surfaces.

- H. Interior Wood:
 - 1. Wipe off dust and grit.
 - 2. Seal knots, pitch streaks, and sappy sections with sealer.
 - 3. Fill nail holes and cracks after primer has dried; sand between coats.
- I. Exterior Wood:
 - 1. Remove dust, grit, and foreign matter.
 - 2. Seal knots, pitch streaks, and sappy sections.

3.3 APPLICATION

- A. Apply paints in accordance with manufacturer's instructions and MPI Painting Manual, Custom Grade finish requirements.
- B. Apply primer or first coat closely following surface preparation to prevent recontamination.
- C. Do not apply finishes to surfaces that are not dry.
- D. Apply coatings to minimum dry film thickness recommended by manufacturer.
- E. Apply each coat of paint slightly darker than preceding coat unless specified otherwise.
- F. Apply coatings to uniform appearance without laps, sags, curtains, holidays, and brush marks.
- G. Allow applied coats to dry before next coat is applied.
- H. When required on deep and bright colors apply an additional finish coat to ensure color consistency.
- I. Continue paint finishes behind wall-mounted accessories.
- J. Sand between coats on interior wood and metal surfaces.
- K. Match final coat to approved color samples.
- L. Where clear finishes are specified, tint fillers to match wood. Work fillers into grain before set. Wipe excess from surface.
- M. Prime concealed surfaces of exterior wood and interior wood in contact with masonry or cementitious materials with one coat primer paint.
- N. Mechanical and Electrical Components:
 - 1. Paint factory primed equipment.
 - 2. Remove unfinished and primed louvers, grilles, covers, and access panels; paint separately.
 - 3. Paint exposed and insulated pipes, conduit, boxes, ducts, hangers, brackets, collars, and supports unless factory finished.
 - 4. Do not paint name tags or identifying markings.
 - 5. Paint exposed conduit and electrical equipment in finished areas.
 - 6. Paint duct work behind louvers, grills, and diffusers flat black to minimum of 18 inches or beyond sight line.
- O. Do not Paint:
 - 1. Surfaces indicated on Drawings or specified to be unpainted or unfinished.
 - 2. Surfaces with factory applied finish coat or integral finish.
 - 3. Architectural metals, including brass, bronze, stainless steel, and chrome plating.

3.4 ADJUSTING

- A. Touch up or refinish disfigured surfaces.

3.5 CLEANING

- A. Remove paint from adjacent surfaces.

3.6 PAINT SCHEDULE

- A. Types of paint listed herein are set forth as standard of quality and type of coating required for each type of surface.
 - 1. Paint exposed surfaces of types listed in Paint Schedule.
 - 2. Paint other exposed surfaces not specifically listed with not less than two coats of appropriate type of coating.
- B. Prime coat consists of touch up on shop primed and existing surfaces with intact coatings.

SUBSTRATE	MANUFACTURER	PRIMER	TOP COATS
Exterior Surfaces:			
Ferrous and Galvanized Metals	Sherwin Williams	All Surface Enamel Latex Primer	SuperPaint Exterior Latex Enamel Coating
Exterior Flat Acrylic Paint	Sherwin Williams	All Surface Enamel Latex Primer	A-100 Exterior Latex Flat House & Trim Paint A6 Series
Exterior Low-Luster Acrylic Paint	Sherwin Williams	All Surface Enamel Latex Primer	A-100 Exterior Latex Satin House & Trim Paint A82 Series
Exterior Semigloss Acrylic Enamel	Sherwin Williams	All Surface Enamel Latex Primer	A-100 Latex Gloss A8 Series
Exterior Full-Gloss Acrylic Enamel for Concrete, Masonry, and Wood	Sherwin Williams	All Surface Enamel Latex Primer	SuperPaint Exterior High Gloss Latex Enamel A85 Series
Exterior Full-Gloss Acrylic Enamel for Ferrous and Other Metals	Sherwin Williams	DTM Bonding Primer	DTM Acrylic Coating Gloss (Waterborne) B66W100 Series
Exterior Full-Gloss Alkyd Enamel	Sherwin Williams	Pro Industrial Pro-Cryl Primer	Industrial Enamel B-54 Series
Interior Painted Surfaces:			
Gypsum Board, Latex Flat Finish	Sherwin Williams	PrepRite Classic Latex Primer	ProMar 200 Interior Latex Flat Wall Paint
Gypsum Board, Latex Eggshell Enamel Finish	Sherwin Williams	PrepRite Classic Latex Primer	ProMar 200 Interior Latex Eg-Shel Enamel
Gypsum board, Latex semi-gloss Enamel finish	Sherwin Williams	PrepRite Classic Latex Primer	ProMar 200 Interior Latex Semi-Gloss Enamel
Ferrous and Galvanized Metals	Sherwin Williams	All Surface Enamel Latex Primer	ProClassic Interior Alkyd Semi-Gloss Enamel

SUBSTRATE	MANUFACTURER	PRIMER	TOP COATS
Wood, Opaque, Latex Enamel Finish	Sherwin Williams	PrepRite Wall and Wood Interior Primer/Undercoater	ProMar 200 Interior Latex Semi-Gloss Enamel
Wood, Transparent Finish	Sherwin Williams	Wood Classics Interior Stain	Wood Classics Polyurethane Varnish, Semi-Gloss
Interior Flat Acrylic Paint	Sherwin Williams	PrepRite Classic Latex Primer	ProMar 200 Interior Latex Flat Wall Paint B30W200 Series
Interior Flat Latex-Emulsion Size	Sherwin Williams	PrepRite Classic Latex Primer	ProMar 200 Interior Latex Flat Wall Paint B30W200 Series
Interior Low-Luster Acrylic Enamel	Sherwin Williams	PrepRite Classic Latex Primer	ProMar 200 Interior Latex Egg-Shell Enamel B20W200 Series
Interior Semigloss Acrylic Enamel	Sherwin Williams	PrepRite Classic Latex Primer	ProMar 200 Interior Latex Semi-Gloss Enamel B31W200 Series
Interior Full Gloss Acrylic Enamel	Sherwin Williams	PrepRite Classic Latex Primer	ProMar 200 Interior Latex Gloss Enamel B21W201 Series
Interior Semigloss Alkyd Enamel	Sherwin Williams	Alkyd Primer	ProMar 200 Interior Alkyd Semi-Gloss Enamel B34W200 Series
Interior Full-Gloss Alkyd Enamel for Gypsum Board and Plaster	Sherwin Williams	Alkyd Primer	ProMar 200 Interior Alkyd Gloss Enamel B35W200 Series
Interior Full-Gloss Alkyd Enamel for Wood and Metal Surfaces	Sherwin Williams	Alkyd Primer	ProMar 200 Interior Alkyd Gloss Enamel B35W200 Series
Interior Wood Stains and Varnishes			
Open-Grain Wood Filler			none recommended
Interior Wood Stain: Alkyd Based	Sherwin Williams		Wood Classics Interior Oil Stain A-48 Series.
Clear Sanding Sealer, Fast Drying, Alkyd Based	Sherwin Williams		Wood Classics Fast Dry Sanding Sealer B26V43.
Interior Alkyd or Polyurethane Clear Satin Varnish	Sherwin Williams		Wood Classics Fast Dry Oil Varnish Satin, A66-300 Series.

SUBSTRATE	MANUFACTURER	PRIMER	TOP COATS
Interior Waterborne Clear Satin Varnish; Acrylic Based Polyurethane	Sherwin Williams		Wood Classics Waterborne Polyurethane Satin, A68 Series.
Interior Waterborne Clear Gloss Varnish; Acrylic Based Polyurethane Paste Wax	Sherwin Williams		Wood Classics Waterborne Polyurethane Gloss, A68 Series. Type recommended by Manufacturer.

3.7 EXTERIOR FINISH SCHEDULE

- A. Concrete, Stucco, and Masonry (Other Than Concrete Unit Masonry):
 - 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Exterior concrete and masonry primer.
 - b. Finish Coats: Exterior flat acrylic paint.
- B. Concrete Unit Masonry:
 - 1. Acrylic Finish: Two finish coats over a block filler.
 - a. Block Filler: Concrete unit masonry block filler.
 - b. Finish Coats: Exterior low-luster acrylic paint.
- C. Mineral-Fiber-Reinforced Cement Panels:
 - 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Exterior concrete and masonry primer.
 - b. Finish Coats: Exterior flat acrylic paint.
- D. Smooth Wood:
 - 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Exterior wood primer for acrylic enamels.
 - b. Finish Coats: Exterior semigloss acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Exterior wood primer for alkyd enamels.
 - b. Finish Coats: Exterior full-gloss alkyd enamel.
- E. Wood Trim:
 - 1. Acrylic-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Exterior wood primer for acrylic enamels.
 - b. Finish Coats: Exterior semigloss acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Exterior wood trim primer for full-gloss alkyd enamels.
 - b. Finish Coats: Exterior full-gloss alkyd enamel.
- F. Plywood:
 - 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Exterior wood primer for acrylic enamels.
 - b. Finish Coats: Exterior low-luster acrylic paint.
- G. Ferrous Metal:
 - 1. Acrylic Finish: Two finish coats over a rust-inhibitive primer.
 - a. Primer: Exterior ferrous-metal primer (not required on shop-primed items).
 - b. Finish Coats: Exterior full-gloss acrylic enamel for ferrous and other metals.
 - 2. Alkyd-Enamel Finish: Two finish coats over a rust-inhibitive primer.

- a. Primer: Exterior ferrous-metal primer (not required on shop-primed items).
 - b. Finish Coats: Exterior full-gloss alkyd enamel.
- H. Zinc-Coated Metal:
- 1. Acrylic Finish: Two finish coats over a galvanized metal primer.
 - a. Primer: Exterior galvanized metal primer.
 - b. Finish Coats: Exterior full-gloss acrylic enamel for ferrous and other metals.
 - 2. Alkyd-Enamel Finish: Two finish coats over a galvanized metal primer.
 - a. Primer: Exterior galvanized metal primer.
 - b. Finish Coats: Exterior full-gloss alkyd enamel.
- I. Aluminum:
- 1. Acrylic-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Exterior aluminum primer under acrylic finishes.
 - b. Finish Coats: Exterior full-gloss acrylic enamel for ferrous and other metals.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Exterior aluminum primer under alkyd finishes.
 - b. Finish Coats: Exterior full-gloss alkyd enamel.

3.8 INTERIOR PAINT SCHEDULE

- A. Concrete, Stucco, and Masonry (Other Than Concrete Unit Masonry):
- 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Interior concrete and masonry primer.
 - b. Finish Coats: Interior semigloss acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior concrete and masonry primer.
 - b. Finish Coat: Interior semigloss alkyd enamel.
- B. Concrete Unit Masonry:
- 1. Acrylic Finish: Two finish coats over a block filler.
 - a. Block Filler: Concrete unit masonry block filler.
 - b. Finish Coats: Interior semigloss acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a filled surface.
 - a. Block Filler: Concrete unit masonry block filler.
 - b. Finish Coat: Interior semigloss alkyd enamel.
- C. Mineral-Fiber-Reinforced Cement Panels:
- 1. Flat Acrylic Finish: Two finish coats.
 - a. Finish Coats: Interior flat acrylic paint.
- D. Gypsum Board:
- 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Interior gypsum board primer.
 - b. Finish Coats: Interior satin acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior gypsum board primer.
 - b. Finish Coats: Interior satin alkyd enamel.
- E. Plaster:
- 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Interior plaster primer.
 - b. Finish Coats: Interior semigloss acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior plaster primer.
 - b. Finish Coats: Interior semigloss alkyd enamel.
- F. Acoustical Plaster:
- 1. Flat Acrylic-Latex Finish: Two finish coats.
 - a. Finish Coats: Interior flat acrylic paint.

- G. Wood and Hardboard:
 - 1. Acrylic-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior wood primer for acrylic-enamel and semigloss alkyd-enamel finishes.
 - B. Finish Coats: Interior semigloss acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior wood primer for acrylic-enamel and semigloss alkyd-enamel finishes.
 - b. Finish Coats: Interior semigloss alkyd-enamel.

- H. Ferrous Metal:
 - 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Interior ferrous-metal primer.
 - b. Finish Coats: Interior semigloss acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior ferrous-metal primer.
 - b. Finish Coats: Interior semigloss alkyd enamel.

- I. Zinc-Coated Metal:
 - 1. Acrylic Finish: Two finish coats over a primer.
 - a. Primer: Interior zinc-coated metal primer.
 - b. Finish Coats: Interior semigloss acrylic enamel.
 - 2. Alkyd-Enamel Finish: Two finish coats over a primer.
 - a. Primer: Interior zinc-coated metal primer.
 - b. Finish Coats: Interior semigloss alkyd enamel.

- J. All-Service Jacket over Insulation:
 - 1. Acrylic Finish: Two finish coats. Add fungicidal agent to render fabric mildew proof.
 - a. Finish Coats: Interior flat latex-emulsion size.

3.9 INTERIOR STAIN AND NATURAL-FINISH WOODWORK SCHEDULE

- A. Stain-Varnish Finish: Two finish coats of varnish over a sealer coat and interior wood stain.
 - 1. Filler Coat: Open-grain wood filler.
 - 2. Stain Coat: Interior wood stain.
 - 3. Sealer Coat: Clear sanding sealer.
 - 4. Finish Coats: Interior alkyd- or polyurethane-based clear satin varnish.

- B. Natural-Varnish Finish: Two finish coats of varnish over a sealer coat and a filler coat.
 - 1. Filler Coat: Open-grain wood filler.
 - 2. Sealer Coat: Clear sanding sealer.
 - 3. Finish Coats: Interior alkyd- or polyurethane-based clear satin varnish.

- C. Wax-Polished Finish: Three. Finish coats of paste wax over a sealer coat and alkyd-based interior wood stain.
 - 1. Stain Coat: Interior wood stain.
 - 2. Sealer Coat: Clear sanding sealer.
 - 3. Finish Coats: Paste wax.

END OF SECTION

SECTION 101423

INTERIOR PANEL SIGNS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Plastic interior panel signs.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include sign locations, sizes, mounting heights, and content.
 - 2. Samples:
 - a. 3 x 3 inch sign samples showing available colors.
 - b. After color selection, submit typical sign illustrating pictograms, characters, and Braille indications.

1.3 QUALITY ASSURANCE

- A. Conform to applicable accessibility code for sign design, construction, location, and mounting height.
- B. Mockup:
 - 1. Size: One full-size sign with millwork frame (1) painted or (1) stained.
 - 2. Locate where directed.
 - 3. Approved mockup may remain as part of the Work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Andco Industries Corp.
- B. Equivalent products by the following manufacturers are acceptable:
 - 1. APCO Graphics, Inc. (www.apcosigns.com)
 - 2. Best Sign Systems, Inc. (www.bestsigns.com)
 - 3. Seton Identification Products. (www.seton.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Signs:
 - 1. Type: Ultraviolet hardened, 1/32 inch thick raised photopolymer characters and Braille, chemically fused to the PETG surface, single piece construction.
 - 2. Thickness: 1/8 inch.
 - 3. Color: To be selected from manufacturer's full color range.

2.3 ACCESSORIES

- A. Tape: Double sided, waterproof, pressure sensitive.

2.4 FABRICATION

- A. Fabricate signs by photopolymer process using film negatives to produce characters and graphics in contrasting color, raised 1/32 inch.
- B. Characters:
 - 1. Height: 5/8 inch.
 - 2. Style: Sans serif style to be selected, upper case.
 - 3. Stroke width, strike thickness, character spacing, and line spacing: In accordance with applicable accessibility code.
- C. Pictograms:
 - 1. Utilize standard international pictograms.
 - 2. Locate pictograms within 6 inch vertical void with text descriptors below pictogram.
- D. Provide round Grade II Braille indications with contractions placed below each corresponding character.
- E. Corners: Square.
- F. Edges: Square.
- G. Border: 3/8 inch wide set into millwork frame.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean surfaces of loose and foreign matter.

3.2 INSTALLATION

- A. Install with double stick foam tape.
- B. Locate signs on wall adjacent to scheduled doors where possible.

3.3 SCHEDULE

- A. See Signage Schedule in Interior Design Documents.

END OF SECTION

SECTION 102226

OPERABLE PARTITIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Moveable partitions.
 - 2. Ceiling track and operating hardware.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

- A. ASTM International (ASTM):
 - 1. E84 - Standard Test Method for Surface Burning Characteristics of Building Materials.
 - 2. E90 - Standard Test Method for Airborne Sound Transmission Loss of Building Partitions.
 - 3. E413 - Standard Test Method for Classification for Rating Sound Insulation.
 - 4. E557 - Standard Guide for the Installation of Operable Partitions.

1.3 SYSTEM DESCRIPTION

- A. Partition Type: Top supported, single panels.
- B. Operation: Manual.

1.4 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, static and dynamic loads, location and details of pass door and frame, adjacent construction and finish trim, and stacking sizes.
 - 2. Product Data: Provide data on partition operation, hardware and accessories, colors and finishes available.
 - 3. Samples: 6 x 6 inch fabric samples in each color.
 - 4. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Certificates of Compliance: Certification from an independent testing laboratory that panels meet fire hazard classification requirements.
- C. Closeout Submittals:
 - 1. Operation and Maintenance Data.

1.5 QUALITY ASSURANCE

- A. Installer Qualifications:
 - 1. Minimum 3 years documented experience in work of this Section.
 - 2. Approved by partition manufacturer.
- B. Partition Sound Transmission Class: Minimum STC rating of 51, tested to ASTM E90 and classified in accordance with ASTM E413.
- C. Fire Hazard Classification: Maximum flame spread/smoke developed rating of 25/50, tested to ASTM E84.

1.6 WARRANTIES

- A. Furnish manufacturer's 10 year warranty providing coverage against defects in materials and installation.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Hufcor, Inc. (www.hufcor.com)
- B. Other Acceptable Manufacturers:
 - 1. Holcomb and Hoke Manufacturing Co. (www.foldoor.com)
 - 2. Moderco, Inc. (www.moderco.com)
 - 3. Modernfold, Inc. (www.modernfold.com)
 - 4. Panelfold, Inc. (www.panelfold.com)
- C. Substitutions: Under provisions of Division 01.

2.2 COMPONENTS

- A. Panels:
 - 1. Source: 631 by Hufcor, Inc., or approved substitute.
 - 2. Construction: Single panel, minimum 16 gage formed sheet steel frame top, bottom, jambs, and intermediates, welded construction, internally reinforced at suspension points, with acoustical insulation fill.
 - 3. Thickness: 3 inches.
 - 4. Maximum panel width: 48 inches.
 - 5. Trim: Trimless to receive trim by millworker.
 - 6. Closure panels: By millworker.
- B. Sound Seals:
 - 1. Vertical panel edges: Tongue and groove astragals with neoprene gaskets.
 - 2. Bottom: Drop seal, automatic, operated by panel closure, light finish.
 - 3. Top and bottom: Continuous contact sweep type.
- C. Suspension System:
 - 1. Continuous steel track supported by adjustable hanger rod assemblies.
 - 2. Carriers: Nylon tire ball bearing wheels on trolley carrier at top of every second panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.

2.3 FINISHES

- A. Panel Facings: Fabric, color to be selected from manufacturer's full color range.
- B. Trim: Baked enamel, color to be selected from manufacturer's full color range, to receive trim by millworker.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and ASTM E557.
- B. Fit and align partition assembly pocket doors and pass doors level and plumb. Include allowances for trim.
- C. Lubricate moving components.

3.2 ADJUSTING

- A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.
- B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.
- C. Adjust to achieve light tight seal.

3.3 DEMONSTRATION

- A. Demonstrate proper operation to Owner's personnel.

END OF SECTION

SECTION 102600
WALL PROTECTION

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Corner guards.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Indicate profiles, accessories, and attachments.
 - 2. Samples: 12 inch long corner guard samples.

1.3 QUALITY ASSURANCE

- A. Flush Mounted Corner Guards in Fire Rated Partitions: Tested and approved by recognized independent testing laboratory with fire resistance rating equivalent to partition construction.

1.4 PROJECT CONDITIONS

- A. Do not install guards until after painting and finishing work is completed.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. Construction Specialties, Inc. (www.c-sgroup.com)
 - 2. Inpro Corporation. (www.inprocorp.com)
 - 3. Nystrom, Inc. (www.nystrom.com)
 - 4. Pawling Corp. (www.pawling.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Stainless Steel: ASTM A666, Type 304 or 316.

2.3 COMPONENTS

- A. Corner Guards:
 - 1. Type: Surface mounted, stainless steel, minimum 16 gage.
 - 2. Attachment: Countersunk fasteners.
 - 3. Size: 2 inches x 2 inches x 48 inches high.
 - 4. Finish: No. 4 satin.

2.4 ACCESSORIES

- A. Fasteners: Type best suited to application, exposed heads of same material and finish as guards.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Secure corner guards with fasteners.
- C. Set plumb, level, and rigid.

END OF SECTION

SECTION 102813

TOILET ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Toilet accessories.
 - 2. Framed mirrors.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data:
 - a. Schedule accessories by room; show plans and elevations, and identify room name and number, type and quantity of accessories, and mounting heights.
 - b. Include manufacturer's brochures showing sizes, details of function, finishes, and attachment methods.
 - 2. Samples: One of each accessory, if requested.
 - 3. Warranty: Sample warranty form.

1.3 QUALITY ASSURANCE

- A. Conform to applicable accessibility code for locating accessories.

1.4 WARRANTIES

- A. Furnish manufacturer's 5 year warranty providing coverage against mirror silver spoilage.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. AJW Architectural Products. (www.ajw.com)
 - 2. American Specialties, Inc. (www.americanspecialties.com)
 - 3. Bobrick Washroom Equipment, Inc. (www.bobrick.com)
 - 4. Bradley Corp. (www.bradleycorp.com)
 - 5. Brizo. (www.brizo.com)
 - 6. GAMCO. (www.gamcousa.com)
 - 7. World Dryer Corp. (www.worlddryer.com)

- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Stainless Steel:
 - 1. Sheet: ASTM A666, Type 304, rollable temper.
 - 2. Tubing: ASTM A269.
- B. Galvanized Steel: ASTM A1008/1008M.
- C. Mirror Glass: ASTM C1036, Type I, Class 1, Quality q1, 1/4 inch thick.

2.3 ACCESSORIES

- A. Fasteners: Stainless steel where exposed, hot dip galvanized where concealed; type best suited to substrate conditions.

2.4 FABRICATION

- A. Use stainless steel for exposed surfaces; galvanized steel may be used in concealed locations.
- B. Form exposed surfaces from single sheet of stock, free from joints, and flat, without distortion.
- C. Weld joints of fabricated components and grind smooth.
- D. Fabricate grab bars of tubing, free of visible joints, return to wall with end attachment flanges.
- E. Fabricate soap dispensers to operate with less than 5 pound force.
- F. Provide hangers, adapters, anchor plates, and accessories required for installation.
- G. Key locks alike; furnish six keys.
- H. Mirrors:
 - 1. Frame: One piece, roll formed stainless steel channel, 1/2 x 1/2 inch, with corners mitered and welded.
 - 2. Mirror: Apply one coat of silver, one coat of electroplated copper, and one coat of organic mirror backing compound to back surface of glass.
 - 3. Backing: Galvanized steel sheet.
 - 4. Isolate glass from frame and backing with resilient, waterproof padding.
- I. Shop assemble units and package complete with anchors and fittings.

2.5 FINISHES

- A. Stainless Steel: No. 4 satin.
- B. Galvanizing: ASTM A123/A123M to 1.25 ounces per square foot.
- C. Chrome Plating: ASTM B456, Type SC 2, polished.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Set plumb, level, square, and rigid.

3.2 SCHEDULE

- A. Refer to Drawings.

END OF SECTION

SECTION 104413

FIRE EXTINGUISHERS AND CABINETS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Portable fire extinguishers.
 - 2. Cabinets and wall brackets.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate cabinet bracket locations and mounting heights.
 - 2. Product Data: Include data on extinguishers and cabinets, brackets, cabinet dimensions, operational features, materials, finishes, and anchorage.
- B. Closeout Submittals:
 - 1. Maintenance Data: Include test, refill, or recharge schedules and re-certification requirements.

1.3 QUALITY ASSURANCE

- A. Provide fire extinguishers complying with UL 711 and applicable code.
- B. Cabinets in Fire Rated Partitions: Tested in accordance with ASTM E814 with fire resistance rating equivalent to adjacent construction.
- C. Conform to applicable accessibility code for locating extinguishers.

1.4 PROJECT CONDITIONS

- A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by JL Industries. (www.jlindustries.com)
- B. Other Acceptable Manufacturers:
 - 1. Larsen's Mfg. Co. (www.larsensmfg.com)
 - 2. Potter Roemer. (www.potterroemer.com)
- C. Substitutions: Under provisions of Division 01.

2.2 COMPONENTS

- A. Extinguishers:
 - 1. Source: Cosmic 10E by JL Industries or approved substitute.
 - 2. Description: Multi-purpose dry chemical type, UL 299, cast steel tank, Class 4A:60B:C, 10 pound nominal capacity.

- B. Cabinets:
 - 1. Source: Embassy by JL Industries or approved substitute.
 - 2. Formed galvanized steel sheet, 18 gage minimum.
 - 3. Configuration: Recessed, sized to accommodate extinguishers.
 - 4. Trim: Trimless.
 - 5. Door:
 - a. Solid style S21, equipped with concealed pull.
 - b. Hinge doors for 180 degree opening with continuous piano hinge.

2.3 ACCESSORIES

- A. Mounting Hardware: Type best suited to application.

2.4 FINISHES

- A. Cabinet:
 - 1. Exterior and door: Powder coated, color to match adjacent wall finish.
 - 2. Interior: Powder coated, color to be selected from manufacturer's full color range.
- B. Extinguishers: Baked enamel, red color.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install cabinets and brackets in accordance with manufacturer's instructions.
- B. Set plumb, level, and rigid.
- C. Place an extinguisher in each cabinet.

END OF SECTION

SECTION 105113

METAL LOCKERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Metal locker units with hinged doors.
 - 2. Metal bases, tops, and filler panels.
 - 3. Wood benches.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include dimensioned layout, elevations, trim, closures, and accessories.
 - 2. Product Data: Manufacturer's descriptive data.
 - 3. Samples: 3 x 3 inch paint samples showing available colors.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Acceptable Manufacturers:
 - 1. List Industries Inc. (www.listindustries.com)
 - 2. Lyon Workspace Products. (www.lyonworkspace.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Galvanized Steel Sheet: ASTM A653/A653M, Structural Quality, G90 coating class.

2.3 COMPONENTS

- A. Lockers:
 - 1. Type: Standard louver.
 - 2. Configuration: Five Tier.
 - 3. Size: As indicated on Drawings.
 - 4. Mounting: Free standing.
 - 5. Class: Quiet.
 - a. Sound deadening panel welded to interior of doors.
 - b. Ventilation provided by means of slots in top and bottom of doors.
 - c. Latch configured to provide rattle-free operation.
 - d. Lock bar contained in polyethylene guides and limited with resilient cushioning devices.
 - e. Rubber silencer installed on each frame hook.
 - f. Latch lifting trigger encased in molded thermoplastic cover providing isolation from metal-to-metal contact.
 - 6. Construction:
 - a. Frame and door: Minimum 16 gage galvanized steel, welded joints.
 - b. Sides , tops, and back: Minimum 24 gage galvanized steel.
 - c. Ends , sloped tops, and filler panels: Minimum 20 gage galvanized steel.
 - 7. Latching device: Tamper proof automatic single three point latch.
 - 8. Locks: Built-in combination locks with master key control; furnish four master keys.

9. Accessories:
 - a. For each locker: Two double prong hooks, hat shelf, metal number plate, and rubber bumper.
 - b. 4 inch high closed base.
 - c. End and filler panels.
 - d. Sloped metal top with end closures.

- B. Locker Benches:
 1. Type: Stationary.
 2. Size: As indicated on Drawings.
 3. Construction: Laminated Birch with chromed plated steel pedestals.

2.4 FINISHES

- A. Steel: Baked enamel, color to be selected from manufacturer's full color range.
- B. Wood: Stain and Two coats clear lacquer.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Set lockers on prepared metal locker base.
- C. Set plumb, level, and aligned.
- D. Attach lockers to supporting construction with anchors best suited to substrate conditions.
- E. Bolt adjacent locker units together to provide rigid installation.
- F. Install end panels, filler panels, and sloped tops.

3.2 ADJUSTING

- A. Adjust doors and latches to operate correctly.
- B. Touch up minor scratches and abrasions to match factory finish.

END OF SECTION

SECTION 107113
EXTERIOR SHUTTERS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Louvers at gable ends and metal shutters for exterior openings.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Indicate shutter and screen locations, dimensions, attachment, and relationship to adjacent construction.
 - 2. Product Data: Manufacturer's descriptive data and performance characteristics.
 - 3. Samples: 3 x 3 inch finish samples showing available colors.

1.3 QUALITY ASSURANCE

- A. Exterior Shutters:
 - 1. Pass ASTM E1886 cyclical wind loading requirements.
 - 2. Pass ASTM E1996 large and small scale missile tests.
- B. Installer Qualifications: Minimum 2 years experience in work of this Section.
- C. Mockups:
 - 1. Size: One full-size shutter of each type.
 - 2. Show shutters, screens, and attachments.
 - 3. Locate where directed.
 - 4. Approved mockups may remain as part of the Work.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver shutters with manufacturer's protective coverings intact; do not remove until just prior to installation.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aluminum:
 - 1. Extrusions: ASTM B221, 6063-T5 or T6 alloy and temper.
 - 2. Sheet: ASTM B209, alloy and temper best suited to application.

2.2 COMPONENTS

- A. Exterior Shutters:
 - 1. Source: Willard Shutter Company. (www.willardshutterco.com)
 - 2. Style: Islander Louver.
 - 3. Finish: Powder Coat, color to be selected from manufacturer's standards.
 - 4. Sizes: Refer to Drawings.

2.3 ACCESSORIES

- A. Fasteners: Marine Grade stainless steel, type best suited to application.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Anchor to adjacent construction without distortion or stress.
- C. Fit and align shutter assemblies including hardware, level and plumb, to provide smooth operation.

3.2 ADJUSTING

- A. Adjust shutters for smooth operation throughout full operating range.

END OF SECTION

SECTION 107500

FLAGPOLES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Aluminum flagpole, ground set.
 - 2. Concrete base.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 033000 - Cast-In-Place Concrete.
 - 3. Section 079200 - Joint Sealers.

1.2 SYSTEM DESCRIPTION

- A. Design Requirements:
 - 1. Design flagpole and anchorage devices in accordance with ANSI/NAAMM FP 100197.
 - 2. Minimum design wind speed: 150 MPH with 6 x 10 foot flag.
- B. Pole Description:
 - 1. Source: Nautical style
 - 2. Type: Ground set, fixed.
 - 3. Pole: Cone tapered.
 - 4. Exposed height: 40 feet.

1.3 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include pole and base dimensions, materials, finishes, and accessories.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 3 years documented experience in work of this Section.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Handle products in accordance with AAMA CW-10.
- B. Wrap poles in heavy paper to prevent damage during shipping and handling.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by Concord American Flagpole.
(www.concordamericanflagpole.com)
- B. Other Acceptable Manufacturers:
 - 1. Baartol Co., Inc. (www.baartol.com)
 - 2. Ewing International Corp. (www.ewingflagpole.com)
 - 3. Pole-Tech Co., Inc. (www.poletech.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Aluminum: ASTM B241, seamless 6063-T6 aluminum alloy.
- B. Concrete: ASTM C94; 3000 psi 28 day strength, 2 to 3 inch slump.

2.3 COMPONENTS

- A. Poles:
 - 1. Source: Xthreme Series XESR, Extreme External Single Revolving, Rope Halyard, by Concord American Flagpole, or approved substitute.
 - 2. Height: 30 feet + set depth.
 - 3. Installation: Ground-set.
 - 4. Quantity: Three (3).
- B. Fittings:
 - 1. Ball: Spun aluminum.
 - 2. Truck: Revolving, non fouling, cast aluminum.
 - 3. Halyard: External type, 3/8 inch diameter braided nylon rope with two stainless steel swivel snap hooks.
 - 4. Winch: Internally mounted, with removable crank handle and automatic brake allowing flag to be set at any position, with counterweight and beaded retainer ring.
 - 5. Door: Flush with compression lock. Key locks alike; furnish four keys.
 - 6. Cleat: 9 inch long cast aluminum.
 - 7. Cleat box cover: Hinged cover with padlock provisions.
 - 8. Collar: Cast aluminum, minimum 1 inch larger in diameter than foundation sleeve.
 - 9. Foundation sleeve: 16 gage, 10 inch diameter, galvanized, corrugated steel with 3/8 inch base plate. Provide minimum 12 inch long lightning rod with setting plate and one set each steel and hardwood centering wedges.

2.4 ACCESSORIES

- A. Grout: Cement based, non shrink.
- B. Joint Sealer: Specified in Section 079200.

2.5 FINISHES

- A. Aluminum: AAMA 611, Architectural Class I anodized to 0.0007 inch minimum thickness, clear.
- B. Apply bituminous coating to that part of flagpole to be set in base, inside and out.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install flagpoles and accessories in accordance with manufacturer's instructions and approved Shop Drawings.
- B. Install foundation sleeve in concrete footing.
- C. Center pole in sleeve using steel wedges; plumb with hardwood wedges. Fill sleeve with clean, dry sand; top off with grout.
- D. Install collar to conceal sleeve.
- E. Apply joint sealer around pole at top of grout and collar.

END OF SECTION

SECTION 108900

CEILING FANS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Ceiling fans.
 - 2. Connection to power supply and control wiring.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Manufacturer's descriptive data including fan sizes, attachment, electrical requirements, finishes, and accessories.

1.3 WARRANTIES

- A. Provide manufacturer's standard mechanical and electrical warranty.

PART 2 PRODUCTS

2.1 EQUIPMENT

- A. Ceiling Fans: Refer to Drawings.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install fans in accordance with manufacturer's instructions.
- B. Set plumb, level, and rigid.
- C. Attach to supporting construction.
- D. Locate controllers where indicated.
- E. Connect to power supply and control wiring.

3.2 ADJUSTING

- A. Test and adjust fans to operate smoothly.

END OF SECTION

SECTION 114000

FOOD SERVICE EQUIPMENT

PART 1- GENERAL

1.1 SECTION INCLUDES:

- A. Foodservice Equipment as listed in the itemized specifications and listed on the contract drawings.

1.2 DEFINITIONS:

- A. Furnish -- Supply and deliver to the project site, ready for unloading, unpacking, setup, assembly, and installation.
- B. Install -- Will include the actual unloading, unpacking, assembly, erecting/setting in place, leveling, anchoring, protecting, cleaning, and related operations on the equipment to be made ready for utility connections by other trades as indicated.
- C. Contractor -- All references to Contractor in this Section 114000 shall refer to the Food Service Equipment Contractor (abbreviated as FSEC). Reference to any other contractor or subcontractor, shall be specific as such:
 - 1. General Contractor (abbreviated as GC)
 - 2. Plumbing Contractor (abbreviated as PC)
 - 3. Electrical Contractor (abbreviated as EC)
 - 4. Mechanical Contractor (abbreviated as MC)

1.3 RELATED SECTIONS:

- A. Refer to General Conditions, Supplementary Conditions, and applicable provisions for additional instructions.
- B. Refer to Mechanical Section for applicable provisions and sections regarding mechanical services, including, but not limited to, rough-ins, grease traps, steam traps, drain traps, atmospheric vents, valves, pipes and pipe fittings, ductwork, and other materials necessary to complete final connections to individual items as specified in this Section.
- C. Refer to Electrical Section for applicable provisions and sections regarding electrical services, including, but not limited to, rough-ins, wiring, disconnects, and other materials necessary to complete final connections to individual items as specified in this Section.
- D. Work included in other Sections will include provision of any wall, floor, and/or ceiling/roof openings, penetrations, recesses, sleeves, conduits, and equipment pads as required for installation of items included in this section. Also sealing of these openings, penetrations, recesses, sleeves, etc., after installation of the equipment items as required. Such work is not included in this Section. Work included in other Sections - Mounting and installation of gas regulators, gas hoses, gate valves, water hammer arrestors, back flow preventers, water filters, faucets, lever drains, and drain lines, and pressure-reducing valves will be performed by the plumbing contractor. Such work is not included in this section.
- E. Work included: Removal and disposal of existing equipment, which will not be re-used, shall be the responsibility of the Food Service Equipment Contractor. Removal of existing equipment, which will be reused, shall be the responsibility of the FSEC. This equipment shall be removed from the site, stored, cleaned, and delivered ready for final connections by others. Disconnection of utilities

performed by others. All existing equipment shall be relocated as per the contract drawings. FSEC shall be responsible to pump down and properly recover the existing refrigerant from any systems prior to demolition. The FSEC is responsible for installation of the walk-in cooler/freezer and refrigeration systems, and installation of the new hoods. The FSEC is responsible for mounting any hand sinks or water filter systems sink on the wall. FSEC is to confirm ability and sizing of equipment to be installed and access into the space.

1.4 STANDARDS, LAWS, AND ORDINANCES:

A. Standards: Except and unless otherwise noted, comply with the following standards as applicable to the manufacture, fabrication, and installation of the work of this Section:

1. American with Disabilities Act (ADA): Comply with requirements, as applicable to this Project.
2. National Sanitation Foundation (NSF): Comply with the latest Standards and Revisions established by NSF for equipment and installation. Provide NSF seal of approval on each applicable manufactured item, and on items of custom fabricated work.
3. Underwriters Laboratories (UL): For electrical components and assemblies provide either UL labeled and registered products or, where no labeling service is available, recognized markings to indicate listing in the UL Recognized Component Index.
4. National Fire Protection Association (NFPA): Comply with the applicable sections of the current NFPA codes for exhaust hood, ventilators, duct and fan materials, hood wet chemical fire suppression systems, construction, and installation, as well as any local codes and standards.
5. Wet chemical fire suppression systems for exhaust hoods/ventilators shall comply with UL 300 Standard or most current standard.
6. National Electrical Manufacturers Association (NEMA): Comply with the most current codes or standards.
7. American Gas Association (AGA): Comply with AGA standards for gas heated equipment and provide equipment with the AGA seal. Automatic safety pilots are to be provided on all equipment whenever available.
8. American National Standards Institute (ANSI): Comply with current standards for gas-burning equipment and provide labels indicating name of testing agency. Comply with current codes and standards for L.P. gas cylinder connections, and with applicable standards of the Compressed Gas Association for compressed gas piping. Follow codes for water connection air gaps and vacuum breakers.
9. American Society of Mechanical Engineers (ASME): Comply with ASME Boiler Code requirements for steam generating and steam heated equipment. Provide ASME inspection stamp and registration with National Board.
10. American Society for Testing and Materials (ASTM): Comply with current requirements for flat glass. Comply with codes for heat-treated flat glass, Kind HS, Kind FT coated, and uncoated glass.
11. National Electric Code (NEC): Comply with current NFPA codes for electrical wiring and devices included with foodservice equipment, and applicable NEMA and NECA standards.
12. American Society of Heating, Refrigeration, and Air Conditioning Engineers (ASHRAE):

Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration systems, components, and installation.

13. Air Conditioning and Refrigeration Institute (ARI): Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration systems, components, and installation.
14. Refrigeration Service Engineers Society (RSES): Comply with the applicable regulations and references of the latest edition of standards for remote refrigeration systems, components, and installation.
15. No CFC refrigerants shall be allowed on this project under any circumstances. HFC refrigerants and components shall be used where available. R290 refrigerant should be used where possible.
16. All walk-in coolers and freezers shall meet the applicable sections of NYECC C403.10.
17. All refrigeration components installation, repairs, and/or associated work on any refrigeration system, self-contained or remote, shall be performed by a Certified Refrigeration Mechanic.
18. All applicable local codes, standards, and regulations and any special local or job site conditions shall be complied with.

1.5 SUBSTITUTIONS:

- A. All substitutions for itemized equipment specified will require prior approval of the Foodservice Consultant and owner. Such requests must be made in writing no later than ten (10) business days prior to the bid due date. If approved, an addendum will be issued to all bidders at least five (5) business days prior to bid due date. All requests for substitutions shall comply with conditions and requirements as stated in Section 1.6 below.
- B. If custom fabricated items are submitted, and accepted as a substitute for standard manufactured items, these items shall meet the specifications of the specified manufactured items, in general, the fabrication section of this document.

1.6 APPROVED SUBSTITUTIONS OR ALTERNATES:

- A. Substitutions approved by addendum as noted in Section 1.5, and/or any alternate manufacturers listed in the Itemized Specifications, may be utilized, with the following conditions:
 1. The contract documents are designed and engineered using the primary specified manufacturer and model. The Food Service Equipment Contractor shall assume total responsibility for any deviations required due to the utilization of a substitution/alternate manufacturer or model, including but not limited to, fitting alternates into the available space, providing directions to the General Contractor for required changes, and assuming any associated cost for utility, building, architectural, or engineering changes.
 2. The submittal of an alternate manufacturer or model shall indicate agreement to the above stated conditions. At the Owner's sole discretion, failure to comply with any of these conditions, or to supply complete and correct data information shall result in the Food Service Equipment Contractor being required to provide the originally specified manufacturer and model at no additional cost to the owner.
 3. Inclusion of an alternate manufacturer in the Itemized Specifications is not intended to indicate

that there is an equal alternate unit to match every primary specified unit. It shall be the responsibility of the Food Service Equipment Contractor to ensure that the alternate unit submitted matches the primary specified unit, including all listed options and accessories, and meets the other project conditions.

4. The Food Service Equipment Contractor shall be responsible for supplying the model, which is equal to the primary specified model regarding general function, features, options, sizes, accessories, utility requirements, finish, operation, and listing approvals. If it is determined by the owner, or their appointed representative, at any time during the construction and installation prior to the final acceptance of the project, that the substitution / alternate model submitted is not equal to the primary specified model, the Food Service Equipment Contractor shall assume all associated costs, and implications required to replace the model submitted with the originally specified brand and model.
5. The Food Service Equipment Contractor's bid will clearly list any substitutions or alternates to be used, including the manufacturer and model number. The proposal shall also include a manufacturer's specification/data sheet for each substitution / alternate, with any, and all deviations between the specified manufacturer and the alternate manufacturer itemized and listed. Submittal of a manufacturer's specification sheets, only, shall not be acceptable as the data sheet. Complex alternates such as utility distribution systems, exhaust hoods, walk-in coolers/freezers, custom fabricated items, etc., will require shop drawings specific to this project.
6. Manufacturers not approved for substitutions, or listed as an approved alternate will not be permitted, unless submitted for prior approval as described above in Section 1.5, paragraph A.

1.7 SUBMITTALS:

A. Rough-In Drawings:

1. The Food Service Equipment Contractor shall be solely responsible for the accuracy of the information provided in the submittal packages.
2. In the event utility rough ins have been accomplished before a contract is awarded to the Food Service Equipment Contractor, the FSEC shall check the existing facility and adjust their equipment to suit job site conditions and utilities where possible. If this is not possible, immediately send a letter with reasons, practical solutions, and any costs associated with the proposed solutions to the owner and the Foodservice Consultant.
3. Submit required number of sets as directed by the architect for approval. After approval, reproduce, and supply the required number of distribution prints for the other trades for construction purposes.
4. If the architect utilizes an electronic submittal service or process, after approval, supply the required number of distribution prints for the other trades for construction purposes.
5. Submit minimum 3/8 inch per foot scale rough-in drawings for approval. These drawings shall be dimensioned; showing location of ducts, stubs, floor, and wall sleeves for ventilation, plumbing, steam, electrical, refrigeration lines, and concrete base/recess/curb dimensions as required for equipment. Drawings shall be submitted in a minimum of 24" x 36" format.
6. Verify mechanical, electrical, ventilating rough in, and sleeve penetration locations at project site as required.

B. Shop Drawings:

1. Submit shop drawing sets as directed by the architect for approval. After approval, reproduce, and supply the required number of distribution prints for the other trades for construction purposes.
2. Submit CAD shop drawings in PDF format for items of custom fabrication included in this contract. Shop drawings shall be submitted at minimum 3/4 inch per foot scale, and shall show dimensions, materials, construction details, installation, and relation to adjoining work or equipment requiring cutting or close fitting. Shop drawings shall also indicate all reinforcing, anchoring, and related work required for the complete installation of these items. Drawings shall be submitted in a minimum of 24" x 36" format.
3. Before proceeding with the fabrication of any item, the Food Service Equipment Contractor will verify all necessary dimensions and details with all job site dimensions and conditions considered.

C. Submittals:

1. Submit an Equipment Manual with a cover sheet, and detailed information on every item included in the Itemized Equipment List. This information shall include but not limited to item and model numbers, basic description, quantity required, all options and accessories to be provided, exact utility requirements, manufacturer specification sheets, reference to specific shop drawings, etc. Mark each data sheet with the applicable project equipment item number. Highlight model numbers and/or accessories on each sheet for a clear indication of what is included in the submittal. Each data sheet includes NEMA plug and receptacle configuration for applicable items. Every cover sheet and associated detailed submittal shall provide sufficient and complete information to verify that the Food Service Equipment Contractor is providing each item in compliance with the Contract documents.
2. Architect / Foodservice Consultant review of shop drawings, and equipment manuals is for general conformance and compliance with the design concept, and contract documents. Markings, and / or comments shall not be construed as relieving the Food Service Equipment Contractor from compliance with the contract documents. The Food Service Equipment Contractor remains solely responsible for all details and accuracy and for performing their work in a safe, satisfactory, and professional manner.

1.8 OPERATION AND MAINTENANCE MANUALS:

- A. Operation and Maintenance Manuals: The Food Service Equipment Contractor will supply a set of manuals for items of standard manufacture on, or before, the date of final acceptance of installation by the owner. Manuals are to be in alphabetical order according to the manufacturer. Each set should include a blank page for quick reference, clearly marked, separating each manual and / or section within the binder. Electronic versions are acceptable unless printed versions are required by the architect, owner, or construction manager.
- B. Submit with the operation and maintenance manuals a list of local service agencies complete with telephone numbers, address, and e-mail information for the authorized agencies to perform the warranty work.
- C. Provide a letter of warranty in the front of the manual complying with Section 1.14. This letter must include the actual date the warranty begins, and list all labor, service, workmanship, and factory warranty periods.

1.9 AS BUILT AND RECORD DOCUMENTS:

- A. Maintain one record set of Foodservice Equipment Plans with any related corrections, revisions, additions, deletions, changes, future items, etc. noted during construction and installation.
- B. Provide final sets of shop drawings and equipment manuals with any related corrections, revisions, additions, deletions, changes, future items, etc. noted during construction and installation as specifications record set.
- C. These documents shall be provided to the owner before the date of final acceptance of installation.

1.10 DISCREPANCIES

- A. If discrepancies are discovered between the drawings and the specifications, the FSEC will notify the Food Service Consultant in writing of any discrepancies discovered and await clarification prior to proceeding with the items or areas in question.

1.11 FOOD SERVICE EQUIPMENT CONTRACTOR QUALIFICATIONS:

- A. Submit evidence of compliance with the following qualifications and conditions.
 - 1. Manufacturers' authorized dealer, able to purchase, distribute, and install all items specified with this project.
 - 2. Seven (7) years minimum continuous operation under the same company name and ownership.
 - 3. Successfully completed at least eight (8) installations of similar scope and size during the last two (2) years. Provide references with contact information for verification.
 - 4. Maintain an installation staff or have access to qualified personnel with a minimum of seven (7) years' experience in the installation of comparable size and scope projects.
 - 5. Maintain a staff or have access to personnel experienced in the preparation of professional shop drawings and submittals as outlined in related sections.
 - 6. Maintain or have access to manufacturers authorized service personnel together with readily available stock of repair, and replacement parts.
 - 7. Maintain or have access to a fabrication shop with NSF and UL standards and officially listed with labeling requirements. If the fabricator will be a subcontractor for the FSEC, they shall have ten (10) years minimum experience in the fabrication of comparable size, scope, and level of quality projects. The Food Service Equipment Contractor shall submit the fabrication shop company name and credentials to the Foodservice Consultant and owner, who shall have the right of approval or disapproval of this fabricator.
- B. Any subcontractors employed by Food Service Equipment Contractor for this project shall comply with these same qualification requirements.
- C. The Architect, and/or Foodservice Consultant for the project shall approve the Food Service Equipment Contractor.

1.12 PRODUCT HANDLING:

- A. Storage of Materials, Equipment, and Fixtures. The Food Service Equipment Contractor is responsible for receiving and warehousing equipment and fixtures and holding items until the job site is ready for delivery and installation.
- B. Handling Materials and Equipment. Verify and coordinate conditions at the job site, particularly door, and/or wall opening sizes and clearances, to assure access for all equipment. Pieces too large for existing site conditions shall be hoisted, crane-lifted, or otherwise handled as required. All special handling equipment charges shall be arranged for and paid for by the Food Service Equipment Contractor and are to be included in the bid price, unless conditions change at the job site, after acceptance of bid through no fault of the FSEC.

1.13 PRODUCT PROTECTION:

- A. The Food Service Equipment Contractor is responsible during the progress of the project to protect their equipment against theft or damage, until final acceptance by the owner. Items should not be delivered to the job site before the site is ready for installation, unless at the request of the owner or the construction manager. All scheduled deliveries should be signed for and the delivery condition noted by the owner or the construction manager.
- B. Protect all items before, during, and after installation and protect the associated work and materials of the other trades.

1.14 WARRANTIES:

- A. Unless otherwise noted, items furnished shall be fully guaranteed against defects in workmanship and material(s) for two (2) full years from the date of the first event to occur of the following: Start-up for intended use by the owner/operator, Substantial completion of installation of kitchen equipment contract package as agreed to by the owner, or final acceptance of installation by the owner. Should a Temporary Certificate of Occupancy be issued for partial completion of work, the items furnished within that designated area shall be under warranty from the date of issue of the certificate. The Food Service Equipment Contractor or their service agent will make repairs and replacements without charge to the owner within a reasonable time.

1.15 SCHEDULE:

- A. Contract acceptance constitutes a guarantee that the contractor can and will obtain materials, equipment, and labor upon notice to proceed to permit overall completion of the entire building project on schedule. The contractor shall coordinate their work with the progress schedule as prepared and updated periodically by the General Contractor, or the Construction Manager.
- B. Anticipated delays, not through fault of the Food Service Equipment Contractor, shall be noted in a written notification to the Foodservice Consultant, and the Architect immediately upon the realization by FSEC that delays are possible, or probable.
- C. Extra charges from rush orders, special handling, overnight UPS/FedEx, air shipments, etc., to meet the required schedule will be paid by the Food Service Equipment Contractor, if insufficient time was allowed in placing factory orders.
- D. Failure of manufacturers to meet promised delivery dates will not grant relief to the Food Service Equipment Contractor for failure to meet schedules unless it can be proven in writing with supporting data (i.e., proof of dates orders were placed) that orders were received by the manufacturer with reasonable lead times.

PART 2 - EQUIPMENT

2.1 GENERAL:

Refer to schedule on Foodservice Drawings and Section 4, Itemized Specifications, included in this Section.

2.2 MATERIALS:

A. Quality Standards for Metals:

1. Stainless Steel: Type 302/304, #4 finish where exposed, #2B finished where not exposed.
2. Steel Sheet: Hot-rolled carbon steel.
3. Galvanized Steel Pipe: Welded or seamless, schedule 40, galvanized or heavier.
4. Steel Structural Members: Hot rolled or cold formed, carbon steel unless stainless steel is indicated.

B. Quality Standards for Plastic Laminates:

1. Comply with current NSF Standards.
2. Applied directly over 3/4" thick close-grained plywood, Grade A/B, or better of selected, smooth, sanded stock to ensure a smooth ripple-free laminated surface. OSB, MDF, or particleboard panels are not considered acceptable. If specified plywood substrate is unavailable, submit specifications and sample of alternate material for approval.
3. Adhere to substrate materials with manufacturer recommended waterproof and heatproof contact cements only.
4. Exposed faces and edges shall be faced with 1/8" thick material. Corresponding backs are to be covered with approved backing material. No unfinished exposed plywood surfaces will be acceptable.
5. All plastic laminate surfaces are to be finished without waves and unsightly joints.
6. Color and texture as selected by the Architect/Interior Designer.

C. Insulation:

1. For low temperature applications, such as ice bins, cold pans, or fabricated under counter freezers or refrigerators, use urethane, rigid board foam, or foamed-in-place; not less than two (2) inches thick, except that vertical surfaces of cold pans and ice bins may be one (1) inch thick. Insulation shall be bonded at joints with urethane or polyurethane expanding foam to fill all voids and prevent condensation on exterior. Polystyrene foam will not be acceptable.
2. For heated type applications, use mineral wool, a minimum of one (1) inch thick.
3. All insulation shall be fully encased, or enclosed.

D. Joint Materials:

1. Sealants: Silicone based, liquid elastomeric sealant, non-solvent release type. Sealants shall be NSF listed, and FDA approved for use in food zones. Installation shall comply with applicable requirements of NSF Standards.
2. Gaskets: Solid or hollow neoprene or PVC light grey, self-adhesive or prepared for either adhesive application or mechanical attachment.

E. Paints and Coatings:

1. Provide the types of painting and coating materials which, after drying or curing, are suitable for use in conjunction with foodservice and which are durable, non-toxic, non-dusting, non-flaking, mildew resistant, and comply with all governing regulations for foodservice.
2. Pretreatment. All metal surfaces to be painted are to be cleaned and/or chemically etched as per the recommendations of the manufacturer for the finish coating that is to be applied.
3. Raw metal surfaces are to be coated with suitable primer/filler paint before application of finish coat.
4. Sound Deadener: NSF listed sound deadening material, latex sound deadener, for internal surfaces of metal work, and underside of metal counters, dish tables, sink bowls, and drain boards. Install "tacky tape" between work top, and underbracing, or framing.

2.3 FABRICATED COUNTERS, TABLES, AND METAL PRODUCTS:

A. General Fabrication Requirements:

1. Remove burrs from sheared edges of all sheet metal to eliminate cutting hazard. Maintain flat, smooth surfaces without damage to finish.
2. Reinforce metal at locations of hardware and accessory attachments wherever metal is less than 14-gauge thickness or requires mortised or recessed installation. Weld in place on concealed side of work. Reinforcements will not show on finished, exposed surfaces.
3. Exposed screws or bolt heads, rivets, or butt joints filled with solder are not acceptable. Where fasteners are permitted, provide Phillips head or oval head machine screws. Cap threads with acorn nuts, unless fully concealed and inaccessible. Provide nuts and lock washers where necessary or indicated. Match fastener material and finish with finish of metal being fastened.
4. Where components of fabricated metal work are indicated to be galvanized or steel and involve welding of the metal, complete the fabrication, and clean all welding slag, then paint with a high-grade aluminum color, rust-preventative spray paint.
5. Welding and Soldering:
 - a. Welding: All welded parts shall be non-porous and free from imperfections, pits, cracks, or discolorations. Stainless steel joints and seams shall be heli-arc welded, ground smooth and polished to a No. 4 finish. Welds of galvanized steel shall be ground smooth.
 - b. Materials 18-gauge or heavier shall be welded. Seams and joints are to be shop welded or

soldered as indicated. Welds must be ground smooth and polished to match the original finish.

- c. Where galvanizing has been burned off, the weld shall be cleaned and then painted with a high-grade aluminum color, rust-preventative spray paint.
6. Provide removable panels for access to mechanical and electrical service connections and components concealed inside equipment, but only where other means of access is not possible, and not indicated through other work.
7. Where ends of equipment, rear or end splashes, shelves, etc., are open after fabrication, they are to be enclosed by forming metal and welding, adding filler sections, if necessary, to close entire opening flush to walls, adjacent fixtures, or equipment.
8. Coved Corners: Stainless steel foodservice equipment shall have a minimum of 1/4" radius coves in horizontal and vertical corners, and intersections, and are to be constructed to NSF standards.
9. Set each item of non-mobile and non-portable equipment securely in place, level and adjust to correct height. Anchor to supporting substrate where indicated and where required for sustained operation and use without shifting or dislocation. Conceal anchorages where possible. Where indicated or required for safety of equipment operator, anchor equipment to floor or wall. Where equipment is indicated to be anchored to floor, provide legs with adjustable flanged feet. Install two anchors on each foot.
10. Quality of Work: All work to be of the highest quality in the trade. Field verify all dimensions before fabricating, adjust where necessary to conform to building and job site conditions, neatly fit around pipes, offsets, and other obstructions. Fabricate only in accordance with approved shop drawings.
11. The approved manufacturers for this section are the following: **Titan Stainless** of Pageland, SC, **Custom Metals** of Whitman, MA, and **Glastender Fabrication** of Saginaw, MI. All others will be rejected.
12. All items are to be UL listed and NSF certified. All items must have a visible NSF label on each piece of equipment. If equipment has an electrical component, these items must have a visible UL label in addition to the NSF label.

B. Metal and Gauges:

1. Unless otherwise indicated in Itemized Equipment Specifications, fabricate exposed metalwork of stainless steel, and fabricate the following components from the gauges of metal as indicated:
 - a. 14-gauge 304 stainless steel with #4 finish for all sinks; drain boards, table and counter tops, reinforcements, gusset plates, and hat channels.
 - b. 16-gauge 304 stainless steel with #4 finish for all wall shelves, under shelves, inserts, trays, single-pan drawers, or door fronts.
 - c. 18-gauge 304 stainless steel with #4 finish for all wall cabinets, table, counter base cabinets, skirting, enclosure panels, trim strips, and corners, double-pan drawer fronts or doors, hoods, ventilators, access panels, or covers.

d. Type 304 stainless steel is to be used as the standard construction.

C. Fabrication Methods:

1. Fabricate metal work surfaces by forming, and welding to provide seamless construction, using welding rods matching sheet metal, or welding on stainless steel using stainless steel filler rods, grinding, and polishing to match surrounding surfaces. Where necessary for disassembly, provide waterproof field joints with gasket and concealed bolting. If field-welded field joint is indicated, provide a straight, smooth, edge.
2. Reinforce work surfaces at a minimum 24 inches on center in both directions with galvanized or stainless steel structural members as indicated.

D. Top Construction:

1. All tops, unless otherwise indicated, shall be constructed of 14-gauge stainless steel. Exterior edges not adjacent to walls or other equipment shall be turned down 1 ½" with ½" 45-degree turn in. Tops adjacent to walls shall be turned up 6" with 45-degree angle to wall and down ¾". Tops adjacent to other equipment shall be flanged straight down 2". Sound deadening material shall be provided between frame members and stainless-steel tops.
2. The edges of dish table top not adjacent to walls shall be turned up 3" and rolled down 1-1/2" with corners bull nosed. Dish table tops adjacent to walls shall be turned up 6" back 2" on a 45-degree angle and down ¾". All horizontal edges and internal corners of dish table tops shall be coved on a 5/8" minimum radius. Ends of backsplashes shall be closed, welded, ground smooth and polished.
3. Edges of preparation counter tops, with sinks, not adjacent to walls shall have non-spill edge, unless specified otherwise. Preparation counter tops, with sinks, adjacent to walls shall be turned up to 6", back 2" on a 45-degree angle and straight down ¾". All horizontal edges and internal corners of preparation counter tops shall be coved on a 5/8" minimum radius. Ends of backsplashes shall be closed, welded, ground smooth and polished. Backsplashes of counter tops with sinks shall be pierced on 8" centers over sinks.
4. All tops shall be reinforced on the underside with enclosed channels running from front to back with center bracing where required to hold tops flat.
5. Metal tops shall be one-piece welded construction, including joints only where necessary.
6. Fasten tops to supporting frames, cabinet bases, or structural members with stainless steel welded stud bolts and stainless-steel cap nuts.
7. Professionally designed bolt together field joints, trim strip, or other commercial joint material to suit requirements shall be used only where it is specified.
8. Welded Field Joints, where specified, will be welded, ground, and polished to match surrounding surfaces. Excessive distortion from the welding will not be acceptable.

E. Structural Components:

1. Unless otherwise indicated, provide framing of minimum 1-1/4" O.D. round pipe or tubing, with mitered and welded joints and gusset plates, ground smooth. Provide 16-gauge stainless steel tube for exposed or concealed framing.

2. Where indicated, enclosed bracing channels of 1" x 4" x 1" are to be used, of material specified, 14-gauge, and attached to tops as outlined in other sections.

F. Field Joints:

1. For any field joint required because of size of a particular item, use a butt-joint, reinforced with formed angles of same material on underside, attached with stud bolts. If bolt together joint is required, provide with concealed stainless-steel bolts and nuts, with waterproof gasket between angles, and seal with food grade and NSF-listed silicone sealant. If specified as field-welded joint, weld and fill with stainless steel filler rod, grind, and polish to match surrounding material.
2. Field joints shall be located for practical construction with sizes convenient for shipping and entry into building spaces. All field joints shall be fully continuous welded with the same type of metal, ground smooth and polished to the original finish of the metal.

G. Open Pipe Bases:

1. All open bases shall be constructed of 1-5/8" OD 16-gauge stainless steel tubular uprights and cross braces fully welded together, ground smooth and polished. Top of cross braces shall 12" above floor.
2. Uprights shall be fitted on the floor with adjustable, stainless-steel feet as specified inserted into uprights with inside threads to eliminate any possibility of threading collecting dirt and other matter. The tops of legs shall be fitted into die-stamped fully enclosed stainless-steel gussets welded to the reinforcing channels on the underside of stainless-steel tops.
3. Use stainless steel adjustable bullet feet or stainless steel adjustable flanged feet with mounting holes as indicated. Legs are to be spaced sufficiently close enough together to support the weight of items on top of table or counter, and in no case more than 5'-0" on center.
4. Tables 6'-0" long and under shall have four (4) legs and tables 7'-0" long shall have six (6) legs. Legs on dish tables shall be spaced not more than 5'-0" apart unless specified otherwise.

H. Cabinet Bases and Bodies:

1. All cabinet bodies and bases shall be enclosed with 18-gauge stainless steel. Exterior vertical corners shall be square. Bodies and bases shall be mounted on high sanitary adjustable counter legs with toe kicks unless otherwise noted.

I. Legs & Cross rails:

1. Equipment legs and cross rails shall be 1-5/8" O.D., 16-gauge type 304 stainless steel tubing. Fit legs with stainless steel adjustable bullet feet or stainless steel adjustable flanged feet with mounting holes as indicated. Cross rails are to be notched at end and welded to legs as specified. All welds are to be continuous, ground smooth, and polished to match surrounding material. Tack welds are not acceptable. Where flanged feet are specified, anchor to floor with either expanding, driven in stainless steel pins or stainless-steel lag bolts with expanding anchors as indicated.
2. Stainless Steel Gussets to be 16-gauge stainless steel exterior, to accept 1-5/8" O.D. stainless steel tubing, with Allen set screw for fastening and adjustment. Reinforced with 12-gauge mild steel insert welded in interior. To be welded to framing members as indicated.

3. Legs shall be fastened to equipment with gussets, as follows:
 - a. Sinks to have gussets welded to stainless steel channels, 14-gauge or heavier, anchored to either drain boards, or sink bowls as indicated, with stainless steel welded stud bolt.
 - b. Metal Top Tables and Dish Tables to have gussets welded to stainless steel channels, unless otherwise indicated, 14-gauge or heavier, anchored to top with stainless steel welded stud bolts.
 - c. Wood Top Tables to have gussets welded to stainless steel channels, 14-gauge or heavier, anchored to underside of top with stainless steel screws through slotted holes to allow for top expansion.

J. Casters:

1. Type and size as specified on drawings and specifications, NSF approved, not less than 5" diameter; heavy-duty ball-bearing, solid or disc wheel with non-marking grease proof rubber, neoprene or polyurethane wheel as specified. The minimum width of tread shall be 1-3/16". Minimum weight capacity shall be 250 pounds per caster unless otherwise noted in itemized specifications.
2. Unless otherwise indicated, each equipment item on casters is to be supplied with two (2) swivel-type casters and two (2) swivel-type casters with foot brakes. Brakes are to be on front casters for equipment against walls and on opposing corners of equipment not normally against walls.

K. Shelves:

1. All under shelves and interior shelves shall be constructed of 18-gauge stainless steel.
2. Under shelves on open base tables shall be welded to the legs.
3. Construct solid shelves under pipe base tables of 16-gauge stainless steel, with 1-1/2" turn-down front and ends, bottom edges turned in additional 2" @ 45-degrees, and 1-1/2" turn-up at rear, unless indicated otherwise. Notch and fully welded to pipe legs as necessary, ground smooth and polished to match surrounding material. Tack welds are not acceptable. In fixtures with enclosed bases, turn up shelves at both rear and sides.
4. Interior shelves of cabinet bodies and bases shall be adjustable and removable unless specified otherwise. Sides and rear edges of shelves shall be turned up and front turned down. Shelves shall be braced on the underside. Where plumbing and other appurtenances pass through counter bases, open chases, shall be provided to accommodate piping.
5. Elevated Shelves: All elevated shelves shall be constructed of 16-gauge stainless steel and shall be turned down 1-1/2" with 1/2" 45 degree turn in on front and ends. Freestanding shelves, unless specified otherwise, shall be mounted on 1 5/8" OD stainless steel tubular uprights mounted to counter tops.

L. Sinks:

1. All sinks shall be constructed of 14-gauge stainless steel having back, bottom and front formed of one (1) continuous sheet of metal with ends and partitions welded in place. All

vertical and horizontal corners of sink compartments shall be covered with metal on a 5/8" (minimum) radius. Bottom of sinks are to be creased and pitched toward drains.

2. Sink inserts shall be constructed the same as specified for sinks above with covered corners. Sink inserts shall be welded integral with stainless steel tops. Fully fabricated 14-gauge Stainless Steel construction. Deep Drawn or stamped bowls not acceptable. Sink bottoms are to be creased and pitched toward drains.
3. Partitions to be double thick, 1" minimum space between walls. Multiple compartments shall be continuous on the exterior with stainless steel apron.
4. Cove interior vertical and horizontal corners of each tub not less than 5/8-inch radius, die formed. Outer ends of drain boards to have roll rim risers not less than 3 inches high.
5. Punch rear splashes with holes for faucets as indicated 2-1/2" below top edge. Verify center-to-center spacing with faucet specified.

M. Plumbing Fixtures:

1. Where exposed or semi-exposed, provide piping in bright chrome plated brass or polished stainless steel and copper where not exposed. PVC is not acceptable for cold water drains (ice bins, soda fountains, condensate from refrigeration) unless where allowed by local codes. PVC is not acceptable on any drains where hot water will flow or for pressured water lines.
2. Vacuum Breakers: Provide with foodservice equipment items where specified.
3. Unless otherwise indicated, furnish lever or twist waste drains as specified on all sinks, with removable flat strainers and 2" IPS outlet size. If basket drains are specified, will be all stainless-steel construction.
4. Handle (lever or twist, as specified) to extend to front edge of sink. Handle to be supported and protected by stainless steel bracket where indicated. No riveting, screws, or soldering permitted to fit drains to sinks, with all parts of drains easily removable for servicing and replacement.
5. Water pans for hot food tables shall be fitted with 1" drains with chrome-plated brass standpipes or manifolded together to a single gate valve for draining as indicated.
6. All faucets furnished with equipment included in this Section shall comply with current NSF and Lead-Free Standards. No lead products are acceptable on this project and need to conform to lead testing per NYSOCCRR sub part 67-4. When the itemized specifications list a faucet by manufacturer and model, the Contractor shall verify that the listed faucet complies with this requirement. If the listed faucet does not comply, the Contractor shall notify Foodservice Consultant immediately and submit for approval a similar model, which does comply, from the same manufacturer where possible. Provide mounting kit for all splash mounted faucets to the plumber for installation. Mounting kits depend on faucet requirements.

N. Electrical Materials and Components:

1. Provide standard materials, devices and components as recommended by the manufacturer or fabricator, selected, and installed in accordance with NEMA standards and recommendations as required for safe, efficient use, and operation.
2. Components shall bear the UL label, or be UL recognized, with the whole item being UL listed.

3. Confirm all electrical requirements for project, including but not limited to, actual voltages available, single, or three-phase availability, etc.
4. Electrical work for custom fabricated equipment shall be completely pre-wired to a junction or pull box mounted on the equipment, all wires clearly marked and labeled for outlet or item served. Counters should be wired for a single connection point at the job site wherever possible and specified. Verify local requirements for UL Listing on complete assembly and provide if required.
5. Custom fabricated refrigeration units shall be provided with vapor proof light fixtures with shatterproof polycarbonate lamp shields and automatic switches. All wiring shall be concealed if possible.
6. Controls, Switches, and Receptacles: Provide recognized commercial grade signal lamps, switches, controls, and switches as indicated. All such units to be complete with pilot lights, permanent signs, and graphics to assist the user of each item. Provide stainless steel cover plates on all electrical boxes and switches; these are always to be located out of heat zones, easily accessible, and in locations that prevent accidental contact by staff.
7. Convenience Outlets and Power Receptacles:
 - a. Make cutouts and install appropriate boxes or outlets in fabricated fixtures complete with wiring, conduit, outlet, and stainless-steel cover plate.
 - b. GFCI outlets shall be furnished where adjacent to sink compartments as per the National Electrical Code.
8. Plugs and Cords: Where cords and plugs are provided, they shall comply with National Electrical Manufacturers Association (NEMA) requirements. Indicate NEMA configuration for each applicable item.
9. Heating Equipment:
 - a. Electric heating equipment shall be so installed as to be readily cleanable or removable for cleaning.
 - b. Steam heated custom fabricated equipment shall be a steam coil/heat exchanger design, and will include all necessary control valves, components, and moisture trap located and shall be installed and located in an accessible position.
10. Motors are to be enclosed type, except drip-proof type where not exposed to dust or moisture condition. Ball bearings or sleeve bearings are acceptable on small-timer motors; moisture resistant windings, horsepower, and duty-cycle ratings as indicated.
11. Internal Wiring of Fixtures and Equipment:
 - a. The FSEC shall be responsible for internal wiring of electrical devices built into fabricated equipment items. Wiring to be enclosed in metal conduit or an electrical chase where indicated, to an accessible pull-box, with all wires clearly labeled. For any item shipped in sections, all wiring shall be properly connected internally to a single connection point and verified by the FSEC.

- b. Furnish dishwashers, and conveyors internally wired to junction box, or distribution panel as specified; including all required switches, motors, immersion heaters, solenoids, and other components required for proper operation.
- c. Where light fixtures are specified or detailed as part of counters, cases, or fixtures; light fixtures, lamps, and shields shall be furnished and installed. If fluorescent light fixtures are specified, warm white lamps are to be used unless otherwise specified and ballasts shall be included. Shatter shields shall be provided for all light fixtures.
- d. All wiring shall conform to the National Electrical Code and shall be UL listed.
- e. Exposed flexible steel conduit on kitchen equipment shall be neoprene jacketed Seal-Tite conduit equal to Anaconda type UA/UL approved, complete with approved liquid-tight connectors on each end and designed to provide electrical grounding continuity.
- f. Exposed electrical conduit used in kitchen wet area applications, except for flexible connections, shall be rigid galvanized steel. Thin wall conduit (EMT) shall not be permitted for wet areas. Exposed outlet boxes shall be liquid-tight type, with threaded hubs.

O. Enclosures:

- 1. Provide enclosures, including panels, housings, skirts, trim panels, operating components, mechanical, and electrical devices associated with the foodservice equipment unless specifically indicated otherwise.

P. Doors:

- 1. Metal doors shall be double-cased stainless steel, 18-gauge with corners welded, ground smooth and polished. The inner pan shall be fitted tightly into outer pan with a sound-deadening material such as Styrofoam used as a core. The two pans shall be tack welded together and joints sealed. Door thickness to be 3/4".
- 2. Wood doors are to be constructed as detailed. If Formica or other plastic surfaces are used, sides and backs must be laminated as specified on plans or specifications.
- 3. Hinged Door Hardware: Hinged doors shall be mounted with heavy duty NSF approved hinges with pulls. Catches shall be heavy-duty magnetic type, unless otherwise indicated.
- 4. Sliding Door Hardware: Sliding doors shall be mounted on large, quiet ball bearing rollers with quiet nylon wheels in 14-gauge stainless steel overhead tracks. Rollers to be easily replaceable and doors to be removable without the use of tools (lift out).
- 5. All hardware used must be identified with the manufacturer's brand name, and part number on shop drawings so that broken or worn parts may be easily obtained and replaced.

Q. Drawer Assemblies:

- 1. Assemblies shall consist of removable drawer body mounted in a ball bearing slide assembly with fully enclosed housing. Slide assembly consists of one pair of 200-pound capacity, 300 series stainless steel, full extension, side-mounting, self-closing type, with stainless steel ball-bearings and positive stops. Drawers have side and back enclosure panels, front spacer angle, two drawer carrier angles, secured to slides and stainless-steel front. Drawer pulls shall be stainless steel full grip type with frame beveled edge.

2. Unless otherwise indicated, drawers for general storage are to have a removable 20"x 20" x 5" deep stainless-steel pan. Drawers intended to hold food products are to be designed to hold standard 12" x 20" stainless steel food pans up to 4" deep in a stainless-steel assembly.
3. Drawer fronts are double-pan construction, 3/4" thick, and 18-gauge stainless steel, welded, ground, and polished. The back pan is tightly in-fitted, tack welded, and sealed. Sound deaden with rigid insulation material.
4. Provide drawers with replaceable soft neoprene bumpers or, for refrigerated drawers, a full perimeter soft gasket.

R. Sound Deadening:

1. Sound deaden underside of metal tops, drain boards, under shelves, cabinet interior shelves, etc., above the underbracing, reinforcing, or framing only.
2. Sound Deadener: NSF listed sound deadening material, latex sound deadener for internal surfaces of metal work, and underside of metal counters, dish tables, sink bowls, and drain boards. Install "tacky tape" between work top, and underbracing, or framing.

S. Serving Counter Fabrication:

1. Tops are a minimum of 14-gauge 300 series stainless steel with not less than a #4 finish with 2" square turndown on all sides. Corners are fully welded and polished. The tops are attached to the cabinet body so that no spot weld marks appear.
2. Cabinet bodies are heavy gauge 300 series stainless steel panelized construction, 14-gauge stainless steel vertical channel supports at all tray slide bracket locations and additional galvanized channel supports as per detail shown below.
3. Starting at the base of the unit, the unit shall have a 2 " high x minimum 4" wide, 14-gauge galvanized supports running from front to rear at each leg location. Located left to right on back of the shelf nosing and across the rear of the unit are approx. 1/2 "x 2" galvanized supports. All the base bracing shall be closed off to prevent vermin from entering.
4. Inside the unit behind the end mullion, there are 20-gauge galvanized inserts to match the width of the mullion and close off any gaps. Should the unit have a work shelf on the operator side a 14-gauge backer shall be installed, so that any screws to hold the shelf in place are penetrating the 14-gauge backer.
5. In the inside rear of the unit, there are to be minimum 4" wide "C" Shaped 14 gauge 300 series stainless steel vertical supports, installed at each end of the unit, and where any attachment is made for tray slide, additional supports shall be installed vertical so that the spacing from center to center does not exceed 16" inches. Across the top of the vertical support and around the perimeter of the top, unit shall have 1/2" x 2" 20 gauge "C" shaped supports. Unit top shall have top support where needed.
6. All open shelf areas shall be the full width and depth of the base area. No cavities shall be created in the construction of the body that is not accessible without the use of tools.
7. All supports and body panels shall be welded together in a unitized or panelized body construction.

8. All units include a 300 series stainless steel built-in under shelf with utility access holes and grommets black covers. Intermediate under shelves where required are welded in position. Under shelf shall run the full distance of the unit, less the material thickness of the end panels and shall be full depth, less the material thickness of the back panel.
9. Casters are secured to a 2" x 4", minimum 14 gauge galvanized inverted channel that runs front to back.
10. The cabinets may have a choice of stainless steel or powder coated material as determined by the consultant or architect. If a powder coat is chosen, then galvanized will be used in lieu of stainless steel in the construction of the base.
11. Exterior finish can be a choice of plastic laminate veneered to body panels, removable laminated panels, powder coat paint finish, or a variety of millwork options as specified.
12. All powder coat painting must be conducted in-house at the approved manufacturer's facility to ensure quality control.
13. Tray Slides: Before fabrication of counters with tray slides, verify size and shape of tray to be used. Edge of tray shall not overhang outer support/slider by more than 2". If the edge of tray exceeds this dimension, notify Architect, in writing, for evaluation and adjustment if necessary. Tray slide to be capable of supporting 300 pounds per linear foot, live load.
14. All equipment must bear labeling and be approved by the U.L. for safety and sanitation and must be built in an ISO 9001:2000 approved manufacturing facility. Compliance with the National Sanitation Foundation's (NSF) standards 2, 4 and 7 shall be confirmed by U.L. Sanitation or other nationally known and respected third-party testing facilities.

2.4 REFRIGERATION:

A. General:

1. All refrigerant and associated components shall comply with the latest code requirements and shall comply with the latest Federal Regulations for energy efficiency. Walk-In coolers or freezers need to include the following: automatic door closing device, power air curtains on doors, heated triple pane windows on cooler and freezer doors, high efficiency lighting or automatic light switches, R-25 insulation in cooler walls, doors, and ceilings, R-32 insulation in freezer walls, doors, and ceilings, and R-28 insulation in walk-in cooler and freezer floors. Condensing units shall be equipped with PSC fan motors and evaporator fans shall utilize the ECM type fan motors. Refrigerants must comply with the latest type required by Federal Regulations and use R290 refrigerant where possible.
2. Wiring for walk-in refrigerator and freezer cabinets shall be UL approved type from exterior junction box to internal components, with insulation, unless local codes require metallic conduit (EMT or Greenfield). For freezer applications, Seal-Tite Flex or approved equal shall be used. Lighting receptacles, and door switches shall be mounted weatherproof boxes. All penetrations to be insulated with expanding foam and sealed to prevent condensation moisture buildup.
3. Furnish either single, or multiple condensing units, or a rack refrigeration system as specified and/or recommended by the manufacturer for the items on the equipment schedule. Furnish all components necessary for a complete installation of the system, including coils, receivers, compressors, motors, motor starters, mounting bases, vibration isolation units, fans, dryers, valves,

pipings, insulation, gauges, winter control equipment, etc.

4. All refrigerant and associated components shall comply with the latest code requirements. No CFC refrigerants or associated components shall be allowed on this Project. HFC refrigerants and components shall be used where available. HCFC refrigerants and components, with a minimum 2010 phase-out date and intermediate replacement refrigerants, are to be used only when HFC refrigerants are not available.
5. The minimum outdoor operating ambient temperature for design of units is -10 degrees Fahrenheit, unless otherwise specified. The maximum indoor design temperature for operation of compressor units is 95 degrees Fahrenheit. The maximum outdoor ambient design temperature shall not be less than 100 degrees Fahrenheit. Special attention is to be given to conditions at mounting locations of condensing units, such as sun exposure, restricted airflow and ventilation, fences, walls, roof color, and materials.

B. Components:

1. Expansion Valves: Remote refrigeration system shall be complete with thermostatic expansion valves at the evaporator coils.
2. Thermometers: Fabricated refrigerated compartments to be fitted with either flush dial or digital thermometers as specified on individual items. Thermometers shall be adjustable and calibrated after installation. Accuracy to be +/- 2 degrees Fahrenheit.
3. Hardware: Refrigerator hardware for fabricated refrigerator compartments shall be heavy-duty components, NSF Listed. Use self-closing, heavy duty edge mount style hinges, with Spring Kit. Latches to be magnetic edge mount type, with cylinder locks, unless specified or detailed otherwise. All doors and drawers for walk-in coolers/freezers and reach-in refrigerated compartments, both fabricated and standard shall be fitted with cylinder locks.

C. Cold Pans:

1. Ice pans, refrigerated pans, and cabinets shall be provided with breaker strips or other insulation where adjoining top or cabinet face materials to prevent transfer of cold and possible condensation problems.
2. All open top mechanically cooled custom fabricated, standard buy-out refrigerators, and / or cold pans shall comply with the latest NSF Standard #9 requirements.

D. Refrigerated Equipment Ventilation:

1. Adequate ventilation shall be provided for custom fabricated equipment with integral refrigeration condensing units, both built-in and drop-in. If flow through ventilation cannot be provided, provide flow direction partitions and an additional fan capable of cooling the condensing unit. If in the opinion of the Food Service Equipment Contractor or Refrigeration Subcontractor additional room ventilation is required to ensure correct operating temperatures of standard buy-out, custom fabricated, remote refrigeration condensing units, or compressor rack assemblies, they shall so state in a letter to the Architect for evaluation and decision.

2.5 MISCELLANEOUS:

- A. Reasonable quietness of operation of equipment is expected, and the Foodservice Contractor will be required to replace or repair any equipment producing excessive noise at no expense to the owner.

This includes but is not limited to bumpers and gaskets for doors and drawers, and sound deadening or insulation where specified and practical.

- B. Manufactured Equipment Items: Furnish items as scheduled, or herein specified. Verify dimensions, spaces, rough in, and service requirements, as well as electrical characteristics before ordering. Provide trim, accessories, and miscellaneous items for complete installation.
- C. Nameplates: Whenever possible, locate nameplates and labels on manufactured items in an accessible position, but not within the normal view of customers.
- D. All items must have a visible NSF label on each piece of equipment. If equipment has an electrical component, these items must have a visible UL label in addition to the NSF label.

PART 3- EXECUTION

3.1 SITE EXAMINATION:

- A. Verify site conditions under the provisions of the General Conditions, Supplementary Conditions, and applicable provisions of other Sections. Notify the Architect, in writing, of unsatisfactory conditions for proper installation of foodservice equipment specified in this section.
- B. Verify that all required service utilities are available, and of the correct characteristics in the required locations. Notify the Architect, in writing, of any problems or conflicts with foodservice equipment specified in this section.
- C. Verify wall, column, door, window, and ceiling locations and dimensions. Fabrication and installation should not proceed until dimensions and conditions have been verified and coordinated with fabrication details.
- D. Verify that necessary wall reinforcement or backing has been provided for wall-mounted equipment. Coordinate with General Contractor for placement of such backing during wall construction.
- E. Verify that ventilation ducts are of the correct characteristics and in the required locations.

3.2 SUPERVISION:

- A. A competent supervisor employed by the Food Service Equipment Contractor, shall be always present during progress of the FSEC's work.
- B. A competent supervisor employed by the Food Service Equipment Contractor shall be always present during work by any of the FSEC's subcontractors.

3.3 SITE CLEANUP:

- A. Throughout the progress of their work, the Food Service Equipment Contractor shall keep their working area free from debris, and shall remove all trash, rubbish, etc., daily. At no time is the FSEC to allow any trash, debris, rubbish, crating, boxes, packaging, etc. to accumulate at the job site. At the completion of their work, the FSEC shall leave the premises in a clean and finished condition.

3.4 INSTALLATION:

- A. Sequence installation and erection to ensure correct mechanical and electrical utility connections are achieved. Install items as per each manufacturer's installation manual.

- B. Set each item of non-mobile and non-portable equipment securely in place, leveled, and adjusted to correct height. Anchor where indicated, and where required for sustained operation and use without unnecessary movement. Conceal anchors wherever possible. Adjust counter tops and other work surfaces to a level tolerance of (+/-) 1/16" or better.
- C. Complete field assembly joints in all by welding, bolting / gasketing or as otherwise indicated and specified. Grind all welds smooth and restore the finish to match surrounding materials as specified.
- D. Provide anchors, supports, bracing, clips, attachments, etc., as required to comply with the local seismic restraint requirements.
- E. Verify, and coordinate mounting heights of all wall shelves and equipment with equipment located below for proper clearances.
- F. Insulate contact points between dissimilar metals to prevent electrolysis. Cut, punch, and drill components for outlets, fixtures, piping, conduit, and fittings as required. Coordinate with other trades and provide holes in food service equipment for plumbing and electrical service to and through the fixtures as required or indicated. This includes welded sleeves, collars, ferrules, or escutcheons. These services are to be located so that they do not interfere with intended use, and / or servicing of the fixture.
- G. Provide sealants and gaskets around each unit to make joints airtight, waterproof, vermin-proof, and sanitary for cleaning purposes. At internal corner joints, apply sealant or gaskets to form a sanitary cove. The shape exposed surfaces of sealant slightly concave. Sealant filled or gasketed joints will be acceptable up to 3/8" joint width. Wider joints are to be provided with a matching metal closure or trim strip with sealant application to each side of strip.

3.5 ADJUSTING:

- A. Repair or replace equipment that is found to be defective in its operation, including units that are operating with excessive noise or vibration.
- B. Test and adjust equipment, controls, and safety devices to ensure proper working order and conditions.

3.6 CLEANING AND RESTORING FINISHES:

- A. Restore damaged finishes, polish exposed metal surfaces, and touch-up painted surfaces. Replace work, which cannot be successfully restored.
- B. After completion of installation, and completion of other major work in foodservice areas, remove all protective coverings, films, etc., and clean foodservice equipment.
- C. Clean and polish glass, plastic, hardware, accessories, fixtures, and fittings and leave in a condition ready for the owner to sanitize and use.

3.7 EQUIPMENT START-UP, TESTING, AND DEMONSTRATION:

- A. Prior to final connections by other trades, the Food Service Equipment Contractor is responsible for inspecting and verifying the readiness of all utilities. FSEC to coordinate a site meeting with all trades required to review and approve all rough-in and accessory items that meet the equipment requirements per the manufacturer's recommendations. A written report shall be submitted by the FSEC to the architect and/or consultant.

- B. The Food Service Equipment Contractor is to test and start up *all* equipment prior to the equipment demonstration. Any problems shall be addressed prior to the training and a written report shall be submitted by the FSEC to the architect and/or consultant.
- C. The Food Service Equipment Contractor is to plan for a demonstration of food service equipment operation and maintenance in advance with the owner / operator. This training session for all equipment should be provided on one day or a few consecutive days pending approval by the owner/operator. Demonstrate all equipment to familiarize the owner / operator with operation and maintenance procedures including periodic preventative maintenance measures required. Include an explanation of service requirements, and simple on-site service procedures as well as information concerning the name, address, and telephone number of a qualified local source of service. The individual performing the demonstration should be knowledgeable of the operating and service aspects of the equipment. The FSEC shall provide a written attendance sheet of all attendees including owner/operator, FSEC representative, and all equipment demonstrators. Failure to provide this submittal will hinder the close-out of the project.

PART 4 - ITEMIZED SPECIFICATIONS:

ITEM: 1

MANUFACTURER: CAPTIVE - AIRE

MODEL: 6024ND-2

DESCRIPTION: EXHAUST HOOD

Provide exhaust hood as shown on plans and in accordance with the following specifications: The dry filter type hood is a Type I, commercial kitchen, U.L.710, ULC710, and ULC-S646 listed ventilator canopy, approved for use over 400° F and 600° F. The aerodynamic design includes a mechanical baffle and performance enhancing lip for exceptional capture and containment. Ventilator canopy shall be size, and shape as shown on drawing and shall be complete with grease filters, grease trough, removable grease cup, and without a fire damper in exhaust duct. This non compensating exhaust only ventilator canopy is intended for use over light to heavy-duty types of cooking appliances. The hood shall have the size, shape, and performance specified in the contract documents. The hood section is approximately (2) 8' 0" x 5'0" x 24" high with (1) 14" round exhaust collar in each hood section. The total exhaust for both sections is 4,124 CFM. Exhaust duct collars to be fully welded with 4" high and a 1" flange. Ventilator canopy is to include temperature sensors in the duct to sense heat from cooking equipment and automatically energize the exhaust and makeup air systems per IMC-2006 507.2.1.1. Control wiring to include a 15-minute delay timer to allow cooking equipment to cool down after cooking is completed to prevent fans from cycling on/off. This heat sensor is to be exposed in the duct area of the hood to promote faster response times and facilitate cleaning. Wiring from the sensor to the utility cabinet control panel shall be factory installed in the unit and will require field connections between the hood sections. Duct sizes and static pressure requirements are shown on the contract drawings. Unit shall have a fire cabinet mounted on the side complete with an electrical control system.

The electrical control system Model #SC110110MA is designed to thermostatically activate the exhaust fans for an exhaust hood whenever elevated temperatures are sensed in the exhaust system. This option will meet the requirements of IMC 507.2.1.1 by providing a thermostat(s) mounted in the duct or hood riser to sense increased exhaust temperatures. Controls shall be listed by ETL (UL 508A). The control enclosure shall be NEMA 1 rated and listed for installation inside of the exhaust hood utility cabinet. The control enclosure may be constructed of stainless steel or painted steel. Temperature probes(s) located in the duct riser shall be constructed of Stainless Steel. Once the duct temperature reaches the activation point, the exhaust fans will be activated. The controls also provide hysteresis to prevent cycling of the fans after the cooking appliances have been turned off and the heat in the exhaust system is reduced. The hysteresis is factory set 2 degrees and will keep the exhaust running until the temperature falls 2 degrees below the activation set point. A hysteresis timer

also exists to keep the fans running for at least 30 min after being activated by the temperature rise. The activation and hysteresis settings may be field adjusted on the board LCD interface located inside the control enclosure to meet application needs. The panel is factory configured to shut down supply fans, turn on the exhaust fans and turn off the hood lights in a fire condition. There is also a factory pre-wire option to turn the exhaust fans on in a fire condition. Provide a light and fan switch mounted on the face of the hood, pre-wired to the control panel.

Entire ventilator canopy shall be constructed of a minimum of 18-gauge type high grade, corrosive resistant, non-magnetic stainless steel on all surfaces. All exterior joints and seams shall be continuously welded liquid tight, ground smooth, and polished to the original finish. Construction to conform to NFPA 96 standards and shall meet UL 710 standards for operation. Ventilator canopy is constructed using the standing seam method for optimum strength. Construction shall be dependent on structural application to minimize distortion and other defects. All seams, joints, and penetrations of the hood enclosure to the lower outermost perimeter that directs and captures grease laden vapor and exhaust gases shall have a liquid tight continuous external weld in accordance with the current NFPA regulations. The ventilator is to be equipped with necessary hanger brackets welded in place by the manufacturer at front and rear for suspending from overhead structure. The hood shall have a double wall insulated front. Grease trough is concealed within the ventilator and slopes to a removable grease cup located at the end of the ventilator canopy. The ventilator canopy shall be complete with UL Listed stainless steel non loading baffle grease filters running the full length of the canopy. UL vapor proof LED light fixtures shall be installed and pre-wired to a junction box and face mounted switch.

The wall backsplash panels are to be aesthetically pleasing and span between hood and floor and the length of the unit including the fire cabinet. Wall panels to be constructed with the same material, finish, and grain as the hood. Panels should go behind the hood a minimum of two (2) inches and the hood should be sealed to the wall. FSEC is responsible for providing cut-outs in the stainless panels to accommodate any utilities coming out of the wall under the hood. Include divider bars and end trim for securing wall paneling to wall.

Provide closure panels constructed with the same material as the hood to close off space between the top of hood and ceiling as required for field installation.

Exhaust fans are to be coordinated with the CFM requirements of the hood.

The hood shall be both UL and NSF rated per the most current codes and regulations.

FSEC is responsible for verifying and coordinating the exhaust duct riser location with the ceiling joists and all other site conditions.

ITEM: 1.1

MANUFACTURER: CAPTIVE - AIRE

DESCRIPTION: EXHAUST FANS

See the detail drawings for details. F.S.E.C. to provide fans and turn over to the trades for installation.

ITEM: 1.2

MANUFACTURER: CAPTIVE - AIRE

DESCRIPTION: MAKE-UP AIR UNIT

See the detail drawings for details. F.S.E.C. to provide fans and turn over to the trades for installation.

ITEM: 2

MANUFACTURER: RATIONAL

MODEL: ICP 6-FULL / 6-FULL E

DESCRIPTION: COMBINATION OVEN

Two iCombi Pro 6-full size combination ovens, double stack, Rational intelligent connectable cooking system with four assistants: iDensity Control, iCooking Suite, iProduction Manager, and iCare System, full-size, electric, cooking controls with six (6) operating modes, five (5) cooking methods, three (3) manual operation modes: combi-Steamer, Convection Oven, or Combination. Each oven has a capacity of six (6) 18" x 26" or twelve (12) 12" x 20" pan capacity, core temp probe with six (6) point measurement, 85° to 572°F temperature range, hand shower with automatic retracting system, comes with three (3) grid shelves, quick clean, care control, eco mode, ethernet interface and Wi-Fi interface, NSF and UL listed.

Provide the following for each oven:

- 208/60/3
- Energy Star
- Door hinged on the right.
- Rational Certified Installation with Pre-Installation Site Survey, including installation of stacking kit, water filter system, and commissioning.
- F.S.E.C. is responsible in coordination with Rational, to provide water samples or test results from a recent water sample.
- Water Filtration Double Cartridge System with two (2) additional cartridges
- Certified Chef training
- Mobile oven stand on adjustable height casters, with stacking kit and safety set.
- (2) Installation Kits
- (2) Cleaner Tablets, bucket with one-hundred-fifty (150) packets
- (1) Care Tablets, bucket of one-hundred-fifty (150) packets
- (6) Stainless steel grid shelves
- (12) Fry Basket
- (6) Perforated baking trays
- (4) Grill plates
- (1) Potato Baker
- (1) Chicken Super spike
- Heat shield for left side
- Fully automatic cleaning system including deliming of the steam generator.
- Condensation breaker
- USB data memory stick
- Two-year parts and labor warranty
- Five-year steam generator warranty

ITEM: 3

MANUFACTURER: VULCAN

MODEL: EV36S-6FP208

DESCRIPTION: RANGE WITH SALAMANDER

Restaurant Range, electric, 36", six (6) 9" round 2.0 kW French hotplates, infinite controls, standard oversized oven with top browning heat control, includes one (1) rack, oven door with integrated door hinge / spring mechanism, stainless steel front and sides, fully MIG welded steel frame, full width pull-out crumb tray, 6" legs, UL and NSF listed.

- 208/60/3

- Model #36ESB-208 Salamander Broiler, Electric, 36" wide, dual temperature controls, six-position adjustable grid, removable drip pan, stainless steel top, front and sides
 - 208/60/3
- 36" Reinforced high shelf for 36" salamander
- Extra oven rack
- One-year limited parts and labor warranty

ITEM: 4

MANUFACTURER: VULCAN

MODEL: HEG24E

DESCRIPTION: COUNTERTOP GRIDDLE, ELECTRIC

Heavy Duty Griddle, electric, countertop, 24" wide x 24" deep cooking surface, 1/2" thick polished steel griddle plate, bottom mounted snap action thermostat every 12", low-profile, stainless-steel front, sides, front top ledge with "Cool Bullnose", front grease trough, 4" back and tapered side splashes, 4" adjustable legs, UL and NSF listed.

- 208/60/3
- Grooved steel plate, 24" wide x 24" deep
- One-year limited parts and labor warranty

ITEM: 5

MANUFACTURER: VULCAN

MODEL: HEG36E

DESCRIPTION: COUNTERTOP GRIDDLE, ELECTRIC

Heavy Duty Griddle, electric, countertop, 36" wide x 24" deep cooking surface, 1/2" thick polished steel griddle plate, bottom mounted snap action thermostat every 12", low-profile, stainless-steel front, sides, front top ledge with "Cool Bullnose", front grease trough, 4" back and tapered side splashes, 4" adjustable legs, UL and NSF listed.

- 208/60/3
- One-year limited parts and labor warranty

ITEM: 6

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D60GN

DESCRIPTION: REFRIGERATED EQUIPMENT STAND

Griddle Stand, refrigerated, two drawers with polished chrome drawer handles which accommodate (3) 12"x20"x6" pans each, easy glide fully extendable drawers designed to accommodate 6" deep hotel pans side-by-side, drawers designed to hold 205 pounds, marine edge top, front breathing self-contained expansion-valve refrigeration using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel exterior and interior, high density polyurethane foam insulation, single piece snap in drawer gaskets, LED lighting, electronic temperature control with exterior digital display, Hi-Low alarm, ETL and NSF listed.

- 120/60/1
- 3" Casters
- Condensing unit on the right

- 3" Stainless Steel top extension
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 7

MANUFACTURER: FRYMASTER

MODEL: FPR214

DESCRIPTION: ELECTRIC FRYER BATTERY

Fryer Battery, electric, hi-efficiency, two (2) 50-pound capacity each, built-in filtration, open fry pot design, automatic melt cycle, boil out temperature control, temperature probe, includes: rack-type basket support, basket hanger and twin baskets, stainless steel fry pots, doors, and cabinets, two (2) 14kW, UL and NSF listed.

- Two (2) 208/50/60/3
- CM3.5 controller
- Full fry pots
- (2) Model 8239414 Fry pot Cover
- Casters, 5" diameter (set of 4)
- 8030429 Brush
- Clean-Out Rod
- Shortening Disposal Unit, 100-pound oil capacity, manual pump, 9-5/8" drain height, one-way check valve, 6" wheels.
- 48" Shortening Disposal Hose, 48"
- Ninety- day parts and labor warranty
- One- year parts only pump warranty

ITEM: 8

MANUFACTURER: TITAN STAINLESS

MODEL: FS-PT8430-6630-US

DESCRIPTION: PREP TABLE

Prep table with sink shall be custom built as per General Specifications, approximately 7'0" x 2'6" x 5'6" x 2'6" x 34" x 34" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide one (1) 20" x 20" x 5" stainless steel drawer with lock on anti-slam slides with 1/2" Richlite cutting board mounted under the drawer. The cutting board shall have a handle slot to easily remove the boards from under the drawer. Provide 16" x 20" x 12" deep sink bowl with removable bowl cover, cover holder under countertop, lever waste and bracket. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, and a full-length stainless steel under shelf under the entire unit with a 2" rear up-turn and drain access.

- Coordinate wall receptacles with backsplash and over shelf height.
- Flanged feet on front corner legs only.
- Secure flanged feet to the floor with stainless steel fasteners.
- Seal the table to the wall.
- T&S Brass Model # B-0221-CR4-L22, Mixing Faucet, double, deck mount, 8" adjustable center, 12" swing nozzle with 2.2 GPM laminar flow device (062X-L22), lock washer included, quarter-turn Cerama cartridges with check valves, 4" wrist action handles with color coded indexes, 1/2" NPT female inlets, polished chrome-plated brass body, low lead content, ADA Compliant.

- Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack)
- (2) Model #017420-45 24" flex supply hoses.
- T&S Brass Model #B-3970-01, Waste Valve, lever handle, 3 1/2" sink opening, 2" drain outlet with 1 1/2" adapter and overflow assembly.

ITEM: 8.1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SWS8412-6612

DESCRIPTION: WALL SHELF (2 REQUIRED)

Solid "L" wall shelf shall be custom built as per General Specifications, approximately 7'0" x 5'6" x 1'0", 16-gauge 304 stainless steel solid shelf with enclosed ends, and 2" up-turn at rear to be tight to the wall.

- Verify mounting height with owner.
- Coordinate wall backing with General Contractor

ITEM: 9

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: SW48N12

DESCRIPTION: SANDWICH PREP REFRIGERATION

Sandwich Unit, two-section wide, one door with polished chrome drawer handles and field rehingable, spring-loaded self-closing doors with single piece snap-in santoprene door gaskets, (12) 1/6 size x 4" deep pans with 12" cutting board, insulated flat lid, front breathing and rear-mounted self-contained expansion-valve refrigeration using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel top, front and end panels, aluminum back and interior, high density polyurethane foam insulation, LED lighting, electronic temperature control with exterior digital display, Hi-Low alarm, ETL and NSF listed.

- 120/60/1
- Insulated lid
- 5" Casters
- Double over shelves
- Hinged door on left side
- Two drawers on right side, each drawers holds one (1) 12 x 18 x 6" pan per drawer, or one (1) 1/2 x 6" pan and one (1) 1/3 x 6".
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 10

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: SW48N12

DESCRIPTION: SANDWICH PREP REFRIGERATION

Sandwich Unit, two-section wide, one door with polished chrome drawer handles and field rehingable, spring-loaded self-closing doors with single piece snap-in santoprene door gaskets, (12) 1/6 size x 4" deep pans with 12" cutting board, insulated flat lid, front breathing and rear-mounted self-contained expansion-

valve refrigeration using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel top, front and end panels, aluminum back and interior, high density polyurethane foam insulation, LED lighting, electronic temperature control with exterior digital display, Hi-Low alarm, ETL and NSF listed.

- 120/60/1
- Insulated lid
- 5" Casters
- Hinged door on left side
- Two drawers on right side, each drawers holds one (1) 12 x 18 x 6" pan per drawer, or one (1) 1/2 x 6" pan and one (1) 1/3 x 6".
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 11

MANUFACTURER: CONTINENTAL REFRIGERATION

MODEL: SWF32N-U

DESCRIPTION: UNDERCOUNTER FREEZER

Undercounter Freezer, reach-in, single section, two field reversable doors, with vertical workflow handles, door hinges are self- closing with a hold open feature, snap in door gaskets, self-contained front breathing and rear mounted expansion-valve refrigeration system using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel exterior and interior, 2" polyurethane foam insulation, electronic temperature control with exterior digital display, Hi-Low alarm, UL and NSF listed.

- 120/60/1
- Door hinged on right.
- Energy Star
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 12

MANUFACTURER: TITAN STAINLESS

MODEL: FS-CT16254-CB-US-OS

DESCRIPTION: CHEF TABLE WITH DOUBLE OVERSHELF

Chef Table with cabinet base, shall be custom built as per General Specifications, approximately 13'6" x 4'6" x 34" high to work surface, 14-gauge 304 stainless steel top with square edge. Server side to have plate shelves the full length of the unit. Cabinet base to have open storage with adjustable center shelf on chef's side, utility access and mechanical connections in the center of the unit. Cabinet base to have stainless-steel bottom with stainless steel gussets and legs with bullet feet and two flanged feet.

- Provide a double table mounted, 18" over shelf, 25" from chef's side of the table. Provide allowance to mount two (2) heat lamps with remote controls in chase.
- Provide allowance for two dog house receptacles at each end of the shelf and separate boxes for data lines for POS printers. Electrical chase on one end to run all power from the ceiling or floor.
- Provide two removeable printer shelves.
- Provide electrical outlets for refrigerated units, prewired to a junction box.
- Provide allowance for undercounter freezer and sandwich unit.

- The base of the units can be manufactured in sections to bolt together in the field. Counter top should be made as one single piece or field welded if access is not permissible for a single piece top.

ITEM: 12.1

MANUFACTURER: HATCO

MODEL: GRAH-60

DESCRIPTION: HEAT LAMP (2 EACH REQUIRED)

Glo-Ray Infrared Strip Heater, 60" wide, high wattage, tubular metal heater rod, single heater rod housing, aluminum construction, 1400 watts, UTL and NSF listed.

- (2) 120/60/1 with remote controls
- Adjustable angle brackets
- One-year on-site parts and labor warranty
- One-year additional parts only warranty on all Glo-Ray metal sheathed elements

ITEM: 13

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: 1RN

DESCRIPTION: REACH-IN REFRIGERATOR

Designer Line Refrigerator, single section, self-contained expansion-valve refrigeration using R290 hydrocarbon refrigerant, automatic electric condensate evaporator, stainless steel front, aluminum interior and ends, with 3" polyurethane foam insulation throughout, standard depth cabinet, full-height doors with locks and vertical handles, door hinges are self-closing with a hold open feature, LED lighting, electronic temperature control with exterior digital display, UL and NSF listed.

- 120/60/1
- Casters
- Door hinged on the right.
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 14

MANUFACTURER: TITAN STAINLESS

MODEL: FS-PT13230-US

DESCRIPTION: PREP TABLE

Prep table with sink shall be custom built as per General Specifications, approximately 11'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide two (2) 20"x 20" x 5" stainless steel drawer with lock on anti-slam slides with 1/2" Richlite cutting board mounted under the drawer. The cutting board shall have a handle slot to easily remove the boards from under the drawer. Provide 16"x 20" x 12" deep sink bowl with removable bowl cover, cover holder under countertop, lever waste and bracket. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, and a full-length stainless steel under shelf under the entire unit with a 2" rear up-turn and drain access.

- Coordinate wall receptacles with backsplash and over shelf height.
- Flanged feet on front corner legs only.

- Secure flanged feet to the floor with stainless steel fasteners.
- Seal the table to the wall.
- T&S Brass Model # B-0221-CR4-L22, Mixing Faucet, double, deck mount, 8" adjustable center, 12" swing nozzle with 2.2 GPM laminar flow device (062X-L22), lock washer included, quarter-turn Cerama cartridges with check valves, 4" wrist action handles with color coded indexes, 1/2" NPT female inlets, polished chrome-plated brass body, low lead content, ADA Compliant.
 - Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack)
 - (2) Model #017420-45 24" flex supply hoses.
- T&S Brass Model #B-3970-01, Waste Valve, lever handle, 3 1/2" sink opening, 2" drain outlet with 1 1/2" adapter and overflow assembly.

ITEM: 14.1

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SWS13212

DESCRIPTION: WALL SHELF

Solid "L" wall shelf shall be custom built as per General Specifications, approximately 11'0" x 1'0", 16-gauge 304 stainless steel solid shelf with enclosed ends, and 2" up-turn at rear to be tight to the wall.

- Verify mounting height with owner.
- Coordinate wall backing with General Contractor

ITEM: 15

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: DRY STORAGE SHELVING (1 LOT REQUIRED)

Each unit is to consist of four (4) posts and five (5) shelves.

- (15) Model #MQ2448G Metro-Max Q Shelf, 48" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (12) Model #MQ86PE Metro-Max Q Post, 86" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

ITEM: 16

MANUFACTURER: AMERICAN PANEL

MODEL: 203555A

DESCRIPTION: WALK-IN COOLER / FREEZER

General – The overall size of the walk-in box shall be approximately 14'2" x 8' 0" x 8'6" Tall. The cooler and freezer compartment interior dimensions are as shown in the drawings. Verify size and shape as shown on the plan. Walk-ins shall be constructed of prefabricated modular panels as manufactured by American Panel Corporation, Ocala, Florida. All insulated panel structures to be set up at factory prior to shipment, checked for structural and quality accuracy, photo-graphed prior to shipment. They shall be designed for easy and accurate field assembly, future enlargement by the addition of panels, or dismantling should relocation to an alternate site be

desired. Construction shall be in strict compliance with NSF Standard 7 and UL. This unit shall be recessed into the building floor to create a smooth transition between the walk-in floor and building floor.

Panel Construction - All panels shall consist of interior and exterior metal surfaces precision roll formed to exact dimensions with double 90° edges to enhance overall panel rigidity. The finished metal surfaces shall be fitted with a teardrop profile gasket and placed in precision-tooled fixtures where they are injected with Foamed-in-Place urethane insulation. Curing of the insulating core shall take place at a controlled temperature within the foaming fixture to provide permanent adhesion to the metal surfaces, to allow uniform foam expansion and to maximize finished panel strength. Panel edges shall have a molded urethane tongue and groove profile of insulation factor equal to core material to accurately align panels during installation and to assure an airtight seal. No structural wood, steel, straps, or other non-insulating materials shall be used in panel construction. Finished panels must be UL classified building units and each should bear the Underwriters Laboratory label.

Finished panels will be 4" thick and will be provided in 11 ½", 23", 34 ½" and 46" widths to conform to project drawings. Corner panels shall be one piece 90° angled construction and shall measure 12" x 12" or 12" x 6 ½" where required. For units with multiple compartments, specially designed "Tee" panels shall be provided to form partition wall to outside wall junctures. "Tee" panels shall measure 23" x 12" or 23" x 6 ½" where required. All panels shall be interchangeable with like panels or standard doorframe sections for fast and easy assembly.

Floor Construction – Where prefabricated floor panels are required, they shall be of similar design to other panels and shall incorporate a fully die formed ¼" NSF coved radius at all interior floor to wall junctures. Floor panels shall be reinforced with ¾" exterior grade plywood and shall be capable of supporting evenly distributed loads up to 1300 pounds per square foot or more. Floor to be: 16-gauge Stainless Steel with non-skid strips in the aisle ways.

Door Construction - Entrance doors are constructed like other panels and shall be flush mount, magnetic fitting type. Door sections shall be constructed to conform to Underwriters Laboratories Standards for electrical safety and shall bear all appropriate UL listing labels. The perimeter of the door and frame shall be built of a fiberglass reinforced plastic (FRP) pultrusion weighing not less than 8.4#/lineal foot. All pultrusion's shall be non-conductive, non-corrosive, rust proof and listed by the National Sanitation Foundation. Doorjamb shall house a doorframe heater circuit, and a magnet attracting stainless steel trim strip. The doorframe shall be equipped with flexible bellows type vinyl door gasket with magnetic core, and flexible EPDM (ethylene propylene diene monomer) door sweep. Standard door frame sections 46", 57 ½" or 69" wide shall be equipped with a LED vapor proof light fixture and globe pre-wired to a rocker type light switch with pilot light. An aluminum braided heater wire with integral circuit closure providing activation while the refrigerated room is within operating temperature and a 14-gauge stainless steel threshold plate shall also be included in all door frames.

The door hardware shall be die cast zinc with brushed satin finish. Doors shall be mounted with three (3) heavy-duty cam lift hinges. The pull handle assembly shall incorporate a keyed cylinder lock and an inside safety release handle to prevent personnel entrapment. A hydraulic closer device shall assist positive door closing and sealing.

Walk-In Monitoring System IC-Plus: System to have an easy-to-read LCD display with high and low alarm set points with audible and visual alerts for alarm conditions. The system shall include Adaptive Programming for automatic set point control. Wi-Fi connectivity included for remote notifications of alarms such as, power failure alarm, high and low temperature alarms, panic alarm, and door open alarm. The system shall have an integrated push button light switch with on/off indicator light. The system shall comply with the latest federal energy requirements by incorporating an automatic lighting shut-off. The system shall actively monitor and control door heater assembly for proper operation and lower energy consumption by having programmable initiation temperature and percentage of operation time adjustability. The system shall be supplied with dry contacts for connection to equipment that requires dry contacts such as building monitoring systems, dialers, etc. The system shall have a real-time clock and data for 100% HACCP compliant data logging. Polling frequency shall be fully programmable from the face of the controller. Memory shall be non-volatile to ensure zero loss during power

outages and the system shall include a battery backup complete with integrated charging circuit. System shall have a USB interface on the face of the monitor and Wi-Fi Connectivity for automatic and on demand HACCP data extraction. The system shall be able to remotely notify over local Wi-Fi network email/SMS text communications to designated parties alarm conditions such as high/low temperature alarms, power failure, panic alarm and door ajar. The system to be supplied interior press button light switch with constant burning backlight. The system shall be supplied with a secondary temperature probe with individual alarm set points for dual zone monitoring. Coordinate remote alarm monitoring with owner and other trades as required. If possible, both digital displays should be in the exterior entrance door panel frame.

Doors to be:

Exterior entrance doors, 36" x 77" (swing as shown on drawing) to include:

- Door Closer
- Door Kick plate, 1/10" aluminum tread plate, 36" High on interior and exterior of each door
- Cam lift hinges (3)
- Deadbolt key/padlock handle with inside safety release
- Magnetic gasket
- Single Sweep gasket
- Switch with pilot light
- Monitoring System
- 14"x 24" Vision Window, heated

Finishes - The interior and exterior finish on all panel surfaces may be manufactured from any combination of the following premium grade aluminum or steel materials. The gauge or thickness of the metal material listed is rated prior to embossing.

- Exposed Exterior walls: 22-gauge beaded stainless steel with #3 finish.
- Interior walls and interior ceilings: 26-gauge embossed white stucco coating.
- Un-exposed exterior to be 26-gauge stucco embossed galvanized steel.

Insulation - Insulation shall be 4" thick high-pressure impingement mixed (HPIM) foamed-in-place urethane, minimum density of 2.4 pound per cubic foot, fully heat cured, and bonded to metal finishes. The insulation shall be manufactured using HCFC-141b expanding agent, which has an ozone depletion rating of 0.1 and a global warming rating of 0.05. The thermal conductivity ("K" factor) shall not exceed 0.133 BTU/Hour/Square Foot/Degree Fahrenheit/Inch of Thickness across the entire width of the panel. Overall coefficient of heat transfer ("U" factor) shall not exceed .033 and the resistance to heat penetration ("R" factor) shall not be less than 30. The insulation shall have a 97% closed cell structure to prevent absorption of liquids. The finished aluminum panel (not just the core material) shall be listed by Underwriters Laboratories as a Class 1 (UL-723) building material and demonstrate a flame spread rating of 20 or less and smoke developed of 350 or less in accordance with ASTM-E84 Standards. This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions. Foam used shall be Factory Mutual listed.

Panel Assembly - Assembly of Walk-In shall be accomplished using cam-action locking mechanisms precisely positioned along the outside tongue or groove edges of each panel to exactly correspond with a matching mechanism in the adjacent panel. Cam lock spacing on vertical joints shall not exceed 46" and at junction of vertical and horizontal joints by 23". Cam locks shall be foamed-in-place and anchored securely in the panel by steel "wings" integral to the lock housing. Cam locks shall be operated through access ports using a hex wrench, thereby pulling the panels together and establishing an airtight seal. All access ports shall be located on the walk-in interior to facilitate assembly when close to building structures and shall be covered by vinyl snap-in caps after final assembly. Complete step-by-step assembly instructions, and erection drawings shall be supplied by the manufacturer.

Walk-In Accessories for each compartment:

- (1) LED 48” Light fixtures per compartment, high output, for low temperature applications in cooler and freezer
- LED Vapor-proof light in each door frame
- (1) Power air curtain with backing on exterior of cooler: Berner Model #SLC-07-1036A-SS complete with cord and plug for receptacle built into the door panel.
- Non-skid strips (in aisles only)
- Exposed exterior to have two-tier bumper rails mounted at 12” AFF and 36” AFF.
- Exterior corners of building walls to be sealed with full-height stainless steel closure strips.
- Provide stainless steel closure panels between walk-in and ceiling.
- Heated pressure relief port on freezer sections

Warranty - Insulated panel products are to be warranted for a period of ten (10) years after the date of installation to the original user should the panels be installed properly and be used under normal service conditions. After an inspection authorized by the manufacturer, should any part of the product prove to be defective in material or workmanship, it will be repaired or replaced free of charge, F.O.B. factory. This warranty does not apply to accessories or components supplied but manufactured by other companies who furnish their own warranties.

F.S.E.C. shall provide an installation workmanship warranty of three (3) years from the date of installation.

All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Walk-In coolers or freezers need to include the following: automatic door closing device, strip curtains on hinged doors, heated triple pane windows on cooler and freezer doors, high efficiency lighting or automatic light switches, R-25 insulation in cooler walls, doors, and ceilings, R-32 insulation in freezer walls, doors, and ceilings, and R-28 insulation in walk-in cooler and freezer floors.

Prior to turning on refrigeration systems, K.E.C. to “test” the walk-in boxes to verify they are air tight. A smoke test, flood light test, or other means of similar testing is required. If an air-tight test is not performed, the F.S.E.C. will provide a letter of workmanship warranty for a period of five (5) years covering any defects or air leaks in the walk-in unit.

ITEM: 17

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: ZS09K4E / BEL0060 / ZS2-05Z-CT3-AST

DESCRIPTION: WALK-IN COOLER REFRIGERATION

Walk-In cooler will be provided with a condensing unit and evaporator for refrigeration equipment in accordance with ASHRAE standards. All systems shall be supplied with complete controls for a working system. Each system shall consist of a new condensing unit located in the refrigeration rack with winter controls.

Condensing units shall be accessible preassembled remote, scroll type, air-cooled units for outdoor installation with matching evaporator. Condensing units shall be equipped with PSC fan motors and evaporator fans shall utilize the ECM type fan motors. All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Refrigeration systems are to be mounted in a refrigeration rack.

Medium temperature unit shall utilize R-448a refrigerant. The manufacturer calculates heat loads and provides systems with a minimum of 105% of needed capacity to maintain holding temperature 34° F in coolers. Calculations shall take into consideration box ambient, refrigeration system ambient, airflow, and exposure to sunlight and altitude. Interconnection of refrigeration lines, insulation, and electrical wiring shall be accomplished by the appropriate trades and shall be a portion of the Kitchen Equipment Contract.

The refrigeration system on the walk-in will be equipped with the RDT Eco-Smart on-demand defrost controller factory mounted to the evaporator coil(s). The Eco-Smart will be custom designed for RDT refrigeration systems to control the electric expansion valve in response to true evaporator superheat and return air temperature. Power wiring for the evaporator coils will be provided by the E.C. as required. Off cycle and electric defrost is also available. Provide heater as required so product does not freeze.

Additionally, a refrigeration system containing an Eco-Smart controller will consist of the following factory-mounted parts:

- Electronic controller board with three-digit LED and push button panel interface for setup
- Three solid state temperature sensors
- Pressure transducer
- External relay to control liquid line solenoid valve or compressor contactor.
- Electric expansion valve
- 24V transformer

The Eco-Smart board will contain three (3) relay outputs: defrost heater (20A), evaporator fan (10A) and alarm (5A). The board will include connection points for alarm systems provided by others.

Medium temperature systems come with one (1) preprogrammed defrost per day if it needs to run in safe mode and to ensure oil return to the compressor if no demand defrosts are required. All other defrosts are by demand which will be activated by the three (3) factory mounted sensors on the evaporator coil.

COOLER CONDENSER:

Compressors shall be scroll type and shall operate on R-448A refrigerant. Multiple compressors shall be used to satisfy load requirements. Small loads shall be combined in a multiplex arrangement and satisfied using a single compressor. Each compressor unit shall also include dual pressure control, sight glass, liquid line drier and suction and discharge vibration eliminators. Provide one (1) ZS09KAE Medium temperature, 35° F, pre-assembled remote, scroll outdoor remote refrigeration condenser (1.30 H.P.) with voltage to be 208/3. Low pressure bypass and ambient safety accessories are to be provided on the outdoor condensing units to protect them under extreme outside temperatures of approximately -20° F.

COOLER EVAPORATOR:

Evaporator Coils - Matching evaporators shall be provided as required to complete the system. Evaporators shall be provided with mounted expansion valve and room thermostat. Evaporators shall be provided with the Eco-Smart Controller System. Evaporators shall be off cycle, electric or reverse cycle defrost. Provide one (1) BEL0060 evaporator unit and voltage of 120/1. Low profile evaporator coil with expansion valve, thermostat, and solenoid factory mounted. Evaporators shall be forced air type designed for ceiling installation. Air discharge shall be parallel to the walk-in ceiling. Fan motors, guards, multi-fin, and tube-type coil shall be housed in heavy gauge aluminum housing. Unit shall have drain pan with suitable drainpipe connection. Defrost shall be initiated only when required by demand defrost settings and temperature terminated with built-in fail-safe control. All cooler systems are equipped with an "off cycle" timer to maximize heat transfer and maintain optimum energy efficiency. Evaporators shall be U.L. listed.

Piping Specifications:

- The Food Service Equipment Contractor will perform all refrigeration piping. This Contractor will install all components and piping per the manufacturer's recommendations.
- Line sizes must be appropriately sized for the length of run. If units have reverse-cycle defrost, liquid line shall be upsized one nominal size.
- FSEC will make all final connections to the evaporator and the condenser, charge and test the operation of the system.
- Copper drain lines, heated and insulated where needed, installed by the Food Service Equipment Contractor.

Electrical Specifications:

- Electrical Contractor is to provide final electrical connection to the condenser, evaporator, and lights. Coordinate location with the General Contractor.

Wiring:

- All interior wiring shall be “liquidtight” fittings and sealed to prevent water migration.
- The use of Romex, BX, MC Cable is prohibited and shall be deemed to not meet specifications.
- All control wiring and inter-wiring to be done by the Food Service Equipment Contractor.

Warranty:

The successful bidder shall provide written warranties that specify, subject to normal and accepted use, at a minimum:

- Five Year Compressor Warranty
- Three Year Service / Workmanship Warranty on refrigeration installation.
- One Year Manufacturer’s Warranty on all other components.

ITEM: 18

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: ZF08K4AE / BEL0080 / ZS2-05Z-CT3-AST

DESCRIPTION: WALK-IN FREEZER REFRIGERATION

Walk-In Freezer will be provided with a condensing unit and evaporator for refrigerated equipment in accordance with ASHRAE standards. All systems shall be supplied with complete controls for a working system. Each system shall consist of a new condensing unit located in the refrigeration rack with winter controls.

Compressor units shall be accessible preassembled remote, hermetic/scroll type, air cooled units for outdoor installation with matching evaporator. The condenser shall be equipped with EC fan motors and evaporator fans shall utilize the ECM type two-speed fan motors. All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Refrigeration systems are to be mounted in a refrigeration rack.

Low temperature unit shall utilize R-448a refrigerant. The manufacturer calculates heat loads and provides systems with a minimum of 105% of needed capacity to maintain holding temperature –10° F in freezers. Calculations shall take into consideration box ambient, refrigeration system ambient, airflow, and exposure to sunlight and altitude. Interconnection of refrigeration lines, insulation, and electrical wiring shall be accomplished by the appropriate trades and shall be a portion of the Kitchen Equipment Contract.

The refrigeration system on the walk-in will be equipped with the RDT Eco-Smart on-demand defrost controller factory mounted to the evaporator coil(s). The Eco-Smart will be custom designed for RDT refrigeration systems to control the electric expansion valve in response to true evaporator superheat and return air temperature. Power wiring for the evaporator coils will be provided by the E.C. as required. Off cycle and electric defrost is also available. Provide heater as required so product does not freeze.

Additionally, a refrigeration system containing an on-demand controller will consist of the following factory-mounted parts:

- Electronic controller board with three- digit LED and push button panel interface for setup
- Three solid state temperature sensors
- Pressure transducer
- External relay to control liquid line solenoid valve or compressor contactor.
- Electric expansion valve
- 24V transformer

The Eco-Smart Controller board will contain three (3) relay outputs: defrost heater (20A), evaporator fan (10A) and alarm (5A). The board will include connection points for alarm systems provided by others.

Low temperature systems come with two (2) preprogrammed defrost per day if it needs to run in safe mode and to ensure oil return to the compressor if no demand defrosts are required. All other defrosts are by demand which will be activated by the three (3) factory mounted sensors on the evaporator coil.

The Eco-Smart Controller system will: Float the head pressure, reduce system refrigerant charge by a minimum of one third, and reduce the defrost time when hot gas is used to defrost the coil. Any proposed alternatives must perform the energy-saving functions of all three features.

FREEZER CONDENSER:

Compressors shall be hermetic/scroll type and shall operate on R-448A refrigerant. Multiple compressors shall be used to satisfy load requirements. Small loads shall be combined in a multiplex arrangement and satisfied using a single compressor. Each compressor unit shall also include dual pressure control, sight glass, liquid line drier and suction and discharge vibration eliminators. One (1) ZF08K4E Low temperature, -10° F, pre-assembled remote, hermetic/scroll type outdoor remote refrigeration condenser (2.5 H.P.) and voltage to be 208/3. Low temperature units also are to include evaporator drain line heaters. Low pressure bypass and ambient safety accessories are to be provided on the outdoor condensing units to protect them under extreme outside temperatures of approximately -20 F.

FREEZER EVAPORATOR:

Matching evaporators shall be provided as required to complete the system. Evaporators shall be provided with mounted expansion valve and room thermostat. Evaporators shall be provided with the On-Demand Defrost Control System. Evaporators shall be off cycle, electric or reverse cycle defrost. Provide one (1) BEL0080 evaporator unit with voltage of 208/1. Low profile evaporator coil with expansion valve, thermostat, and solenoid factory mounted. Evaporators shall be forced air type designed for ceiling installation. Air discharge shall be parallel to the walk-in ceiling. Fan motors, guards, multi-fin, and tube-type coil shall be housed in heavy gauge aluminum housing. Unit shall have drain pan with suitable drainpipe connection. Freezer evaporators shall utilize electric defrost and heated drain pan. Defrost shall be initiated only when required by demand defrost settings and temperature terminated with built-in fail-safe control. Evaporators shall be U.L. listed.

Piping Specifications:

- The Food Service Equipment Contractor will perform all refrigeration piping. This Contractor will install all components and piping per the manufacturer's recommendations.
- Line sizes must be appropriately sized for the length of run. If units have reverse-cycle defrost, liquid line shall be upsized one nominal size.
- FSEC will make all final connections to the evaporator and the condenser, charge and test the operation of the system.
- Copper drain lines, heated and insulated where needed, installed by the Food Service Equipment Contractor.
- The heat tape is to be powered from a separate circuit provided by the E.C. and connected by the F.S.E.C.

Electrical Specifications:

- Electrical Contractor is to provide final electrical connection to the condenser, evaporator, and lights. Coordinate location with the General Contractor.

Wiring:

- All interior wiring shall be "liquidtight" fittings and sealed to prevent water migration.
- The use of Romex, BX, MC Cable is prohibited and shall be deemed to not meet specifications.
- All control wiring and inter-wiring to be done by the Food Service Equipment Contractor.

Warranty:

The successful bidder shall provide written warranties that specify, subject to normal and accepted use, at a minimum:

- Five Year Compressor Warranty
- Three Year Service / Workmanship Warranty on refrigeration installation.
- One Year Manufacturer's Warranty on all other components.

ITEM: 19

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: DRY STORAGE SHELVING (1 LOT REQUIRED)

Each unit is to consist of four (4) posts and four (4) shelves.

- (16) Model #MQ2448G Metro-Max Q Shelf, 48" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (8) Model #MQ2460G Metro-Max Q Shelf, 60" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (24) Model #MQ74PE Metro-Max Q Post, 74" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

ITEM: 20

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SDT10840-7030-US-OS

DESCRIPTION: SOILED DISHTABLE

Soiled dish table to be custom built as per General Specifications. Dish table section shall be approximately 9'0" x 3'4" x 5'10" x 2'6" wide, 34" high to work surface, 14-gauge 304 stainless steel top with raised rolled edge and rounded corners, provide an 8" backsplash with capped ends at the dishwasher. Provide partial length under shelf under the long section of the table, balance of the table section with cross rails on the sides and rear of the balance, stainless steel gussets, legs, and flanged feet on front ends with bullet feet on rear and centers. Pre-rinse faucet is to be mounted in a recessed section on the backsplash. Provide a scrap block at the end of the table with allowance in the undershelf for a garbage can. Provide a table mounted double sided slanted rack shelf.

- Provide 20" x 20" x 6" pre-rinse sink with removable rack slide.
- (1) T&S Brass Model #B-0113-CR-BJ-ST, Easy Install Pre-Rinse Faucet, deck mount, single hole base, 1.07 GPM swivel spray valve (B-0107-J), 44" flexible stainless-steel hose, 24" riser, 18" flexible supply lines, 6" wall bracket, quarter-turn Cerama cartridges, accessory tee, low lead.
- Provide a raised flat section in the backsplash to mount the pre-rinse faucet.
- Secure flanged feet to the floor with stainless steel fasteners
- Seal unit to the wall and to the dishwasher
- Secure table to the dishwasher with stainless steel fasteners

ITEM: 21

MANUFACTURER: HOBART

MODEL: AMTL-2

DESCRIPTION: DISHWASHER, DOOR-TYPE

Two Level Door Type Dishwasher, upper and lower wash chambers with separate pumped rinse systems, high temp sanitizing, eighty (80) racks/hour, .62 gal/rack each chamber, straight-thru installation only, user-friendly smart touchscreen controls, Sense-A-Temp booster, electric tank heat, auto-fill, stainless steel scrap screen with basket, door actuated start, stainless steel tank, tank shelf, chamber, trim panels, frame and feet. UL and NSF listed.

- 208/3
- Tall chamber for sheet pans.
- Drain water tempering kit with installation.
- Water Hammer Arrestor – Assembly includes ¾” brass pressure regulator, pressure gauge, shock arrestor and garden hose adapter.
- Touch Screen Guard
- Factory Startup
- One-year parts and labor warranty
- (6) Cambro Model #FR258-151, Full size flatware rack, soft gray, NSF
- (12) Cambro Model #PR314-151, Full size peg rack, soft gray, NSF

ITEM: 22

MANUFACTURER: TITAN STAINLESS

MODEL: FS-CDT8430-US

DESCRIPTION: CLEAN DISHTABLE

Clean dish table to be custom built as per General Specifications, table shall be approximately 7’0” x 2’6” x 34” high to work surface, 14-gauge stainless steel top with raised rolled edges, corners bull nosed, provide an 8” back-splash with capped ends at the dishwasher, stainless steel legs, full length stainless steel under shelf with a 2” upturn at rear and ends. Provide the table with stainless steel gussets, legs, flanged feet on front legs only, and bullet feet on the balance.

- Secure flanged feet to the floor with stainless steel fasteners
- Seal unit to the wall and to the dishwasher
- Secure table to the dishwasher with stainless steel fasteners

ITEM: 23

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SDRS6320

DESCRIPTION: WALL MOUNTED SLANTED DISH RACK SHELF

Slanted tubular wall shelf shall be custom built as per General Specifications, approximately 5’3” x 1’8”, stainless steel shelf with enclosed ends, and rear to be tight to the wall.

- Verify mounting height with owner.
- Coordinate wall backing with General Contractor

ITEM: 24

MANUFACTURER: TITAN STAINLESS

MODEL: FS-TCS-11134-US

DESCRIPTION: THREE COMPARTMENT SINK

Three Compartment Sink shall be custom built as per General Specifications, approximately 9'3" x 2'10" x 34" high to work surface, 14 gauge 304 stainless steel top with raised rolled edge and rounded corners, provide an 8" rear backsplash with enclosed ends, space saver (3) 20"x 28" x 14" deep sink bowls with continuous front, lever waste handle bracket for lever waste and overflow, stainless steel under shelf with 2" up-turn at rear and ends mounted under right drain board, open front with cross rails under the left drainboard for garbage can, balance of the unit to have cross rails with stainless steel gussets, legs, and flanged feet on front corner legs with bullet feet on rear and centers.

- Provide (2) 12" deep louvered wall shelves with 2" rear upturn, tight to the wall.
- Coordinate over shelves with pre-rinse faucet.
- Lever-waste and overflow to be installed by sink manufacturer.
- Secure flanged feet to the floor with stainless steel fasteners
- Seal unit to the wall
- T&S Brass Model #B-0133-12CR-BJ-ST, Easy-Install Pre-Rinse Unit, 8" wall mount, add on faucet 12" swivel nozzle, Cerama cartridges with check valves, lever handles, 18" riser, 44" flexible stainless-steel hose, 1.07 GPM, accessory fitting, wall bracket, low lead, NSF (B-0230-K).
 - (2) Model #B-WH4 Wrist Action Handles, 4"
 - (2) Model #012534-45 24" flex supply hoses
- T&S Brass Model #B-0231-CR, Faucet, 12" swing nozzle, 8" wall mount base, 1/2" NPT female Inlets, quarter-turn Cerama cartridges, low lead, ADA Compliant.
 - Model #B-0230-KIT Inlet Kit, 1/2" NPT nipple, close elbows, 24" flex supply hoses
- (3) T&S Brass, Model #B-3970-01, Waste Valve, lever handle, 3 1/2" sink opening, 2" drain outlet with 1 1/2" adapter and overflow assembly.

ITEM: 25

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: DRY STORAGE SHELVING (2 UNITS REQUIRED)

Each unit is to consist of four (4) posts and four (4) shelves.

- (4) Model #MQ2448G Metro-Max Q Shelf, 48" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (4) Model #MQ2472G Metro-Max Q Shelf, 72" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (8) Model #MQ74PE Metro-Max Q Post, 74" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

ITEM: 26

MANUFACTURER: IMC TEDDY

MODEL: CSW-1S

DESCRIPTION: HAND SINK (2 REQUIRED)

Hand Sink, wall model approximately 10" x 13 ½" x 5 ½" sink bowl with inverted "V" edge, 8" integral back-splash, 304 stainless steel all welded construction, one (1) hole for splash-mounted faucet, 6" apron, includes faucet, basket drain, mounting bracket and clip with hardware, stainless steel, NSF.

- P-Trap Assembly
- Tubular Wall Brackets
- Model EFD-1SG Electronic Faucet, splash type, gooseneck, with metering/check valve.
- Mount and seal to the wall

ITEM: 27

MANUFACTURER: METRO

MODEL: HS-NFS SERIES

DESCRIPTION: TO-GO HEATED HOLDING SHELVES

Unit to consist of two unheated shelves and two heated shelves.

- (2) Model #HS1636 Super Erecta Hot Heated Shelf, 36" wide x 18" deep, adjustable thermostat to 200°F max temperature, 304 stainless steel construction, includes: four (4) split sleeves, four (4) 3" polymer feet, 120/60/1 with cord and plug for each shelf, UL and NSF listed.
- (2) Model #1836NFS Super Erecta Shelf, solid, 36" wide x 18" deep, stainless steel with aluminum split sleeves with stainless steel C rings.
- (4) Model 63P Super Erecta Site Select Post, 62" high, adjustable leveling feet, posts are grooved at 1" increments and numbered at 2" increments, double grooved every 8", chrome finish.
- Verify shelf spacing with owner.

ITEM: 28

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: LIQUOR STORAGE SHELVING (2 UNITS REQUIRED)

Each unit is to consist of four (4) posts and four (4) shelves.

- (4 Model #MQ2454G Metro-Max Q Shelf, 54" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (4) Model #MQ2472G Metro-Max Q Shelf, 72" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (8) Model #MQ74PE Metro-Max Q Post, 74 3/16" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

ITEM: 29

MANUFACTURER: CAPTIVE-AIRE

MODEL: VHB-G-484824

DESCRIPTION: CONDENSATE HOOD

This series hood is a Type II condensate hood for exhaust only. The hood shall have the size, shape, and performance specified in the contract documents. The Hood section is approximately 4'0" x 4'0" x 24" high with (1)

12" round exhaust collar exhausting a total of 600 CFM. Exhaust duct collar to be fully welded 4" high with a 1" flange. Duct sizes and static pressure requirements are shown on the contract drawings. Unit has a removable stainless-steel baffle.

Construction shall be 100 percent with type 304 stainless steel and #4 finish. Construction shall be dependent on structural application to minimize distortion and other defects. All seams, joints, and penetrations of the hood enclosure to the lower outermost perimeter shall have a liquid and airtight continuous external and internal weld in accordance with the current NFPA regulations. Hood shall be a wall type with fully welded 10-gauge corner hanging angles. Corner hanging angles have a slot pre punched at the factory. The ventilator is to be equipped with necessary hanger brackets welded in place by the manufacturer at front and rear for suspending from overhead structure. The hood shall be provided with a full perimeter condensate gutter on all sides and one corner shall be equipped with a drain on the right rear side.

- Provide closure panels constructed with the same material as the hood to close off space between the top of hood and ceiling as required for field installation.
- Exhaust Fan is to be coordinated with the CFM requirements of the Hood.
- Note: Exhaust air fan not to be provided under this contract but shall be coordinated with the CFM requirements of this unit.
- E.C. is to connect the dishwasher to hood exhaust fan for automatic activation.
- Center hood over the dishwasher.
- Seal the bottom of hood to the building wall.

ITEM: 30

MANUFACTURER: SCOTSMAN

MODEL: MC1030MA-32

DESCRIPTION: ICE MAKER

Prodigy Elite Ice Maker, cube style, air-cooled, self-contained condenser, production capacity up to 1077 pound per 24 hours at 70°/50°, medium cube size, ICELINQ mobile app, Bluetooth Connectivity, preservation mode, external bin full indicator, Auto-Alert indicating lights, Water Sense adjustable purge control, one-touch cleaning, harvest assist, front facing removable air filters, unit specific QR code, stainless steel finish, AgION antimicrobial protection, UL and NSF listed.

- 208/230/60/1
- Model #B842S Ice Bin, top-hinged front-opening door, 778-pound application capacity, for top-mounted ice maker, 42" width, metallic finish exterior, toolless removable baffle, polyurethane insulation, polyethylene liner, includes 6" legs, NSF listed.
- Model #KBT29 Bin Top Kit
- Model #AP2-P Aqua Patrol Plus Water Filtration System
- Model #APRC6-P Aqua Patrol Plus Water Filter Replacement cartridges
- Three-year parts and labor warranty
- Five-year parts and labor warranty on Evaporator
- Five-year parts on compressor and condenser

ITEM: 30.1

MANUFACTURER: TITAN STAINLESS

MODEL: FT3612

DESCRIPTION: FLOOR TROUGH

Floor Trough, 36" wide x 12" deep, subway-style fiberglass grating, 4" deep all-welded drain pan with built-in pitch, accommodates up to a 4" diameter pipe, includes stainless steel removable perforated strainer, 14/300 stainless steel, NSF listed.

ITEM: 31

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SC7824-US

DESCRIPTION: SERVER COUNTER

Cabinet Base Server Counter shall be custom built as per General Specifications, approximately 6'6" x 2'0" x 36" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Cabinet base to have open storage with stainless-steel bottom shelf, and fixed center shelf. Provide stainless steel gussets and legs with bullet feet and allowance to fasten table to the wall or the floor.

- Coordinate backsplash height with wall receptacles.

ITEM: 32

MANUFACTURER: TITAN STAINLESS

MODEL: FS-BC13234-CB

DESCRIPTION: BEVERAGE COUNTER WITH HAND SINK

Cabinet Base Beverage Counter shall be custom built as per General Specifications, approximately 11'0" x 2'10" x 36" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high end splash and backsplash with fully enclosed ends. Provide 10" x 14" x 6" deep sink bowl with strainer. Cabinet base to have door section under sink and water filler to hide utilities with drain access through bottom shelf. The cabinet base has two hinged cabinet doors, stainless-steel bottom shelf, and fixed center shelf between the refrigerator and the wall. Provide stainless steel gussets and legs with bullet feet and allowance to fasten table to the wall or the floor.

- Provide allowance under the counter for the undercounter refrigerator.
- Provide allowance and support for the water filler unit.
- Seal the unit to the wall.
- Coordinate backsplash height with wall receptacles.
- (1) T&S Brass, Model #B-0325-CR, deck mount, 4" adjustable centers, 5-3/4" swivel gooseneck spout with Series 1 stream regulator outlet (includes lock washer to convert to rigid), lever handles with color-coded indexes, quarter-turn Cerama cartridges with check valves, polished chrome-plated brass body & tubular spout, 1/2" NPT female inlets, low lead.
 - (1) T&S Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack).
 - (2) T&S Brass Model #B0425 KIT, 24" flex supply hoses.

ITEM: 32.1

MANUFACTURER: EMI

MODEL: FS-SWS6012

DESCRIPTION: WALL SHELF (2 EACH REQUIRED)

Solid wall shelf shall be custom built as per General Specifications, approximately 5'0" x 1'0", 16-gauge 304 stainless steel solid shelf with enclosed ends, and 2" up-turn at rear to be tight to the wall.

- Verify mounting height with owner.
- Coordinate wall backing with General Contractor

ITEM: 33

DESCRIPTION: SODA / ICE DISPENSER (NOT IN CONTRACT – BY VENDOR)

ITEM: 34

DESCRIPTION: SODA BAG-IN-BOX SYSTEM (NOT IN CONTRACT-BY VENDOR)

ITEM: 35

MANUFACTURER: T&S BRASS

MODEL: B-1230

DESCRIPTION: GLASS FILLER STATION

Water Station, drop-in, 10 ½” 18-gauge stainless steel drip pan, B-1210 push back glass filler.

ITEM: 36

MANUFACTURER: BUNN

MODEL: 38700.0013

DESCRIPTION: COFFEE BREWER

Twin APS Airpot Coffee Brewer, brews 15 gallon per hour capacity, twin brew head system, LCD display, hot water faucet, digital temperature control, electronic diagnostics, stainless steel funnel, brews into 1.9-to-3-liter airpots, energy-saver mode, UL and NSF listed.

- 120/240/60/1
- (4) Model #32130.0000 32130.0000 Airpot, 3.0-liter, lever-action, stainless steel liner, ETL
- Model #35728.0001 35728.0001 Universal Airpot Rack, two (2) lower racks, displays two (2) push-button or lever-action airpots, sponge-lined tray, carbon-steel wire construction.
- Model #20115.0000 20115.0000 Paper Filters

ITEM: 37

MANUFACTURER: CURTIS

MODEL: TCOC421G000

DESCRIPTION: TEA DISPENSER

Iced Tea/Coffee Dispenser, 4-gallon capacity, oval, 9-4/5" faucet clearance, welded-on handles, sloping internal bottom, combo solid/brew-thru plastic lid, faucet height fits any glass or pitcher, heavy gauge 18/8 stainless steel.

ITEM: 38

MANUFACTURER: CONTINENTAL REFRIGERATION

MODEL: SW36N-U

DESCRIPTION: UNDERCOUNTER REFRIGERATOR

Undercounter Refrigerator, reach-in, double section, two field reversible doors, with vertical workflow handles, door hinges are self-closing with a hold open feature, snap in door gaskets, self-contained front breathing and rear mounted expansion-valve refrigeration system using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel front, top, and end panels, aluminum interior, 2" polyurethane foam insulation, electronic temperature control with exterior digital display, Hi-Low alarm, UL and NSF listed.

- 120/60/1
- Energy Star
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

CATERING KITCHEN

ITEM: 100

DESCRIPTION: SPARE NUMBER

ITEM: 101

MANUFACTURER: TITAN STAINLESS

MODEL: FS-CBPT15654-DOS

DESCRIPTION: PLATING TABLE

Cabinet Base Prep Table shall be custom built as per General Specifications, approximately 13'0" x 4'6" x 34" high to work surface, 14-gauge 304 stainless steel top with square edge. Cabinet base to have hinged louvered door sections in front of drop-in units, with utility access and mechanical connections in the center of the unit, and plate cabinet storage where possible. Cabinet base to have stainless-steel bottom, and fixed center shelves. Provide stainless steel gussets and legs with bullet feet and allowance to fasten the table to the floor.

- Provide a table mounted, 12" deep solid double over shelf.
- Provide allowance and support for drop-in units.
- Provide (2) electrical outlets as shown on detail drawings, prewired to a junction box.
- Install recessed stainless steel continuous kick plate on all sides of the counter. Fasten the kick plate to the cabinet and make it in long lengths to minimize joints. There shall not be any gaps in the kick plates and shall appear as one unit.

ITEM: 102

MANUFACTURER: LOW TEMP INDUSTRIES

MODEL: TW-DW-2

DESCRIPTION: HOT FOOD WELL

Thermal-Well Hot Food Well Drop-In Unit, electric, 30 1/2" wide, wet, or dry operation, two (2) 12" x 20" sealed hot food wells, fully insulated, individual wired remote solid-state controls, stainless steel top and interior liner, galvanized exterior housing, manifold drains, UL, and NSF listed.

- 208/60/1
- Control panel mounted to apron of plating table.

ITEM: 102.1

MANUFACTURER: LOW TEMP INDUSTRIES

MODEL: DI-QSCHP-2

DESCRIPTION: HOT/COLD FOOD WELL

Quick Switch Hot/Cold/Freeze Food Well, drop-in, 34 ¼" wide x 26 ¾" deep x 21 16/25" high, 14-gauge stainless steel top, accommodates two (2) 12" x 20" pan size, wired remote, individual wired remote digital controls for hot or cold operation, manifold drain, stainless steel top and wells, galvanized exterior, UL and NSF listed.

- 120/208/60/1
- Control panel mounted to apron of plating table.

ITEM: 102.2

MANUFACTURER: LOW TEMP INDUSTRIES

MODEL: DI-2025TA

DESCRIPTION: COLD FOOD WELL

Tempest Air Cold Food Well, drop-in, refrigerated, 32 ½" wide x 26 ¾" deep x 25 ¾" high overall, accommodates two (2) pans, fully insulated, full sealing gasket, 14-gauge stainless steel top and interior liner, galvanized exterior housing, UL and NSF listed.

- 120/60/1
- Five-year compressor warranty
- Two-year parts and labor warranty

ITEM: 103

DESCRIPTION: SPARE NUMBER

ITEM: 104

DESCRIPTION: SPARE NUMBER

ITEM: 105

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: DL1WI-SS

DESCRIPTION: ROLL-IN HEATED CABINET

Designer Line Series Heated Cabinet, single section, stainless-steel exterior, and interior with polyurethane foam insulation throughout, standard depth cabinet, accommodates sheet pans or hotel pans, full height doors with lock and vertical handle, door hinges are self-closing with a hold open feature, and electronic controls with exterior digital thermometer, UL and NSF listed.

- 208/60/1 with cord and plug
- Left hand hinged door.
- Three-year parts and labor warranty
- Made in the USA

ITEM: 106

MANUFACTURER: FOOD WARMING EQUIPMENT

MODEL: RH-18

DESCRIPTION: RETHERMALIZER / HOLDING CABINET

Rethermalization and Holding Cabinet, electric, mobile, (18) 18" x 26" sheet pans or (36) 12" x 20" x 2 ½" hotel pan capacity, 3" spacing adjustable to 1 ½" increments, dual-cycle, automatic controls, heating temperature up to 340° F, holding temperature up to 190° F, digital display, top, bottom, back, sides and doors are fully insulated, (2) dutch doors with heavy duty hinges, adjustable venting, stainless steel all welded construction, 5" casters (2) rigid & (2) swivel with brakes on 10 gauge stainless steel reinforced corner plates, UL and NSF listed.

- 208/50/60/1
- Product probe
- Push/Pull Handle
- Floor Lock with 6" casters
- Two-year parts warranty
- One-year labor warranty

ITEM: 107

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D2RIN

DESCRIPTION: ROLL-IN REFRIGERATOR

Designer Line Refrigerator, single section roll-in, self-contained expansion-valve refrigeration with R290 hydrocarbon refrigerant, stainless steel front, aluminum interior and ends, with polyurethane foam insulation throughout, standard depth cabinet, full height doors with lock and vertical handle, door hinges are self-closing with a hold open feature, LED lighting, electronic control with exterior digital display with hi/low alarm, UL and NSF listed.

- 120/60/1
- Stainless steel ramps
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 108

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: SW48N12

DESCRIPTION: SANDWICH / SALAD PREPERATION REFRIGERATOR

Sandwich Unit, two-section wide, one door with polished chrome drawer handles and field rehingable, spring-loaded self-closing doors with single piece snap-in santoprene door gaskets, (12) 1/6 size x 4" deep pans with 12" cutting board, insulated flat lid, front breathing and rear-mounted self-contained expansion-valve refrigeration using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel top, front and end panels, aluminum back and interior, high density polyurethane foam insulation, LED lighting, electronic temperature control with exterior digital display, Hi-Low alarm, ETL and NSF listed.

- 120/60/1
- Insulated lid
- 5" Casters
- Double over shelves
- Hinged door on left side

- Two drawers on right side, each drawers holds one (1) 12 x 18 x 6" pan per drawer, or one (1) 1/2 x 6" pan and one (1) 1/3 x 6".
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 109

MANUFACTURER: TITAN STAINLESS

MODEL: FS-PT7230-US

DESCRIPTION: PREP TABLE

Prep table with sink shall be custom built as per General Specifications, approximately 6'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide 16"x 20" x 12" deep sink bowl with removable bowl cover, cover holder under countertop, lever waste and bracket. Provide stainless steel gussets and legs with flanged feet on front ends, bullet feet on balance, and a full-length stainless steel under shelf under the entire unit with a 2" rear up-turn and drain access.

- Coordinate wall receptacles with backsplash and over shelf height.
- Flanged feet on front corner legs only.
- Secure flanged feet to the floor with stainless steel fasteners.
- Seal the table to the wall.
- T&S Brass Model # B-0221-CR4-L22, Mixing Faucet, double, deck mount, 8" adjustable center, 12" swing nozzle with 2.2 GPM laminar flow device (062X-L22), lock washer included, quarter-turn Ceramic cartridges with check valves, 4" wrist action handles with color coded indexes, 1/2" NPT female inlets, polished chrome-plated brass body, low lead content, ADA Compliant.
 - Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack)
 - (2) Model #017420-45 24" flex supply hoses.
- T&S Brass Model #B-3970-01, Waste Valve, lever handle, 3 1/2" sink opening, 2" drain outlet with 1 1/2" adapter and overflow assembly.

ITEM: 110

MANUFACTURER: TITAN STAINLESS

MODEL: FS-MWT7230-US

DESCRIPTION: MOBILE WORK TABLE

Work Table shall be custom built as per General Specifications, approximately 6'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with square edge and bull-nosed corners, turn-down on all four sides. Provide stainless steel gussets and legs on swivel-stopper casters with brakes, and full-length stainless steel under shelf with turn-down on all sides.

ITEM: 111

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SWS10212

DESCRIPTION: SOLID WALL SHELF

Solid wall shelf shall be custom built as per General Specifications, approximately 8'6" x 1'0", 16-gauge 304 stainless steel solid shelf with enclosed ends, and 2" up-turn at rear to be tight to the wall.

- Verify mounting height with owner.
- Coordinate wall backing with General Contractor

ITEM: 112

MANUFACTURER: TITAN STAINLESS

MODEL: FS-BC11436-CB

DESCRIPTION: BEVERAGE COUNTER

Cabinet Base Beverage Counter shall be custom built as per General Specifications, approximately 9'6" x 3'0" x 34" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash with fully enclosed ends. Provide 10"x 14" x 6" deep sink bowl with strainer. Cabinet base to have door section under sink and water filler to hide utilities with drain access through bottom shelf. The cabinet base is to have hinged cabinet doors, stainless-steel bottom shelf, and fixed center shelf between the refrigerator and the sink. Provide stainless steel gussets and legs with bullet feet and allowance to fasten table to the wall or the floor.

- Provide allowance under the counter for the undercounter refrigerator and ice machine.
- Provide allowance and support for the water filler unit.
- Seal the unit to the wall.
- Coordinate backsplash height with wall receptacles.
- (1) T&S Brass, Model #B-0325-CR, deck mount, 4" adjustable centers, 5-3/4" swivel gooseneck spout with Series 1 stream regulator outlet (includes lock washer to convert to rigid), lever handles with color-coded indexes, quarter-turn Cerama cartridges with check valves, polished chrome-plated brass body & tubular spout, 1/2" NPT female inlets, low lead.
 - (1) T&S Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack).
 - (2) T&S Brass Model #B0425 KIT, 24" flex supply hoses.

ITEM: 113

DESCRIPTION: SPARE NUMBER

ITEM: 114

MANUFACTURER: T&S BRASS

MODEL: B-1230

DESCRIPTION: GLASS FILLER STATION

Water Station, drop-in, 10 1/2" 18-gauge stainless steel drip pan, B-1210 push back glass filler.

ITEM: 115

MANUFACTURER: BUNN

MODEL: 38700.0013

DESCRIPTION: COFFEE BREWER

Twin APS Airpot Coffee Brewer, brews 15 gallon per hour capacity, twin brew head system, LCD display, hot water faucet, digital temperature control, electronic diagnostics, stainless steel funnel, brews into 1.9-to-3-liter airpots, energy-saver mode, UL and NSF listed.

- 120/240/60/1
- (2) Model #32130.0000 32130.0000 Airpot, 3.0-liter, lever-action, stainless steel liner, ETL

- Model #20115.0000 20115.0000 Paper Filters

ITEM: 116

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: SW27N-U

DESCRIPTION: UNDERCOUNTER REFRIGERATOR

Undercounter Refrigerator, reach-in, single section, one field reversible doors, with vertical workflow handles, door hinges are self-closing with a hold open feature, snap in door gaskets, self-contained front breathing and rear mounted expansion-valve refrigeration system using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel front, top, and end panels, aluminum interior, 2" polyurethane foam insulation, electronic temperature control with exterior digital display, Hi-Low alarm, UL and NSF listed.

- 120/60/1
- 1 3/8" plate casters
- Right door hinge
- Energy Star
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 117

MANUFACTURER: SCOTSMAN

MODEL: CU0920MA-1

DESCRIPTION: ICE MAKER WITH BIN

Undercounter Ice Maker with bin, cube style, air-cooled, 20" width, self-contained condenser, horizontal evaporator, production capacity up to 100 pounds in 24 hours at 70°/50°, 57-pound bin storage capacity, medium cube size, Auto-Alert indicator lights, Water-Sense adaptive purge control, unit specific QR code, metallic finish, includes 6" legs, includes power cord with NEMA 5-15P plug, ADA compliant with floor mount kit, no side clearance required, ice scoop included, UL and NSF listed.

- 120/60/1
- Undercounter floor mount kit
- Model #SSM1-P SSM Plus Water Filter Assembly, single system, 1.67 gallons per minute max flow, includes Aqua-Armor by AgION for antimicrobial protection, NSF and U listed.
- Model #SSMRC1 Replacement Cartridge
- Three-year parts and labor warranty
- Five-year parts on compressor and condenser
- Five-year parts and labor on evaporator

ITEM: 118

MANUFACTURER: TITAN STAINLESS

MODEL: FS-MWT4830-US

DESCRIPTION: MOBILE WORK TABLE

Work Table shall be custom built as per General Specifications, approximately 4'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with square edge and bull-nosed corners, turn-down on all four sides.

Provide stainless steel gussets and legs on swivel-stopper casters with brakes, and full-length stainless steel under shelf with turn-down on all sides.

ITEM: 119

MANUFACTURER: TITAN STAINLESS

MODEL: FS-MWT7230-US

DESCRIPTION: WORK TABLE, MOBILE

Work Table shall be custom built as per General Specifications, approximately 6'0" x 2'6" x 34" high to work surface, 14-gauge 304 stainless steel top with square edge and bull-nosed corners, turn-down on all four sides. Provide stainless steel gussets and legs on swivel-stopper casters with brakes, and full-length stainless steel under shelf with turn-down on all sides.

ITEM: 120

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SDT1207030-US

DESCRIPTION: SOILED DISHTABLE

Soiled dish table to be custom built as per General Specifications. Dish table section shall be approximately 10'0" x 5' 10" x 2'6" x wide, 34" high to work surface, 14-gauge 304 stainless steel top with raised rolled edge and rounded corners, provide an 8" rear backsplash with capped ends at the dishwasher. provide under shelf with 2" rear from the end of the table up to the pre-rinse sink, with cross rails on the sides and rear of the balance, stainless steel gussets, legs, and flanged feet on front ends with bullet feet on rear and centers. Provide 20" x 20" x 6" pre-rinse sink with removable rack slide. Pre-rinse faucet is to be mounted in a recessed section on the backsplash.

- Provide a raised flat section in the backsplash to mount the pre-rinse faucet.
- Secure flanged feet to the floor with stainless steel fasteners
- Seal unit to the wall and to the dishwasher
- Secure table to the dishwasher with stainless steel fasteners
- (1) T&S Brass Model #B-0113-CR-BJ-ST, Easy Install Pre-Rinse Faucet, deck mount, single hole base, 1.07 GPM swivel spray valve (B-0107-J), 44" flexible stainless-steel hose, 24" riser, 18" flexible supply lines, 6" wall bracket, quarter-turn Cerama cartridges, accessory tee, low lead.

ITEM: 121

MANUFACTURER: HOBART

MODEL: CL44EN-ERG

DESCRIPTION: DISHWASHER, CONVEYOR TYPE

Conveyor Dishwasher, energy recovery, single tank, two-hundred-two (202) racks per hour, insulated double hinged doors with door interlock switch, .62 gallons per rack, stainless steel enclosure panels, microprocessor controls, with low temperature, dirty water, and de-lime indicators, pot and pan mode, 19 ½" chamber opening, energy saving mode, stainless steel anti-clogging wash arms, stainless steel self-draining pumps and impellers, ball detent clutch drive system to prevent damage to the conveyor and drive motor if a rack should be obstructed, vent fan and booster heater control, UL and NSF listed.

- 208/60/3
- Left to Right operation.
- Electric tank heat with 30kw built-in booster

- Table limit switch, interconnected by F.S.E.C.
- Drain water tempering kit as part of energy recovery system.
- Splash guards
- Water shock absorber and Pressure Regulator
- Energy Star
- One-year parts and labor warranty
- Factory start-up
- E.C. to interconnect dishwasher contacts to exhaust fan for automatic activation.
- Fasten and seal dish tables to the dishwasher.
- (6) Vollrath Model #TR3, Traex Full Size Peg Rack, 3 ¼" max inside height, (9) rows x (9) rows with 1-7/8" peg spacing, open bottom and sidewall, handles on all (4) sides, co-polymer plastic, full size 19 ¾" x 19 ¾" double wall construction, snap-fit extenders, Royal Blue, NSF, Made in USA.
- (6) Vollrath Model #TR2, Traex Full Size Flatware Rack, full size, 19 ¾" wide x 19 ¾" deep x 4"high, handles on all (4) sides, double wall construction, co-polymer plastic, Royal Blue, NSF, Made in USA.
- (3) Vollrath Model #5267810, Signature Tray and Pan Rack, full size, open end, 19 ¾" wide x 10"deep x 3 ¾" high, stainless steel reinforced channel for support, light green, BPA Free, NSF, Made in USA.

ITEM: 122

MANUFACTURER: TITAN STAINLESS

MODEL: FS-CDT3084-US

DESCRIPTION: CLEAN DISHTABLE

Clean dish table to be custom built as per General Specifications, table shall be approximately 7'0" x 2'6" x 34" high to work surface, 14-gauge stainless steel top with raised rolled edges, corners bull nosed, provide an 8" back-splash with capped ends at the dishwasher, stainless steel legs, and open underneath for racks with cross rails on side and back. Provide the table with stainless steel gussets, legs, flanged feet on front legs only, and bullet feet on the balance.

- Allowance for table limit switch, connected by the F.S.E.C.
- Secure flanged feet to the floor with stainless steel fasteners
- Seal unit to the wall and to the dishwasher
- Secure table to the dishwasher with stainless steel fasteners

ITEM: 123

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SDRS6320

DESCRIPTION: WALL MOUNTED SLANTED DISH RACK SHELF (2 REQUIRED)

Slanted tubular wall shelf shall be custom built as per General Specifications, approximately 5'3" x 1'8", stainless steel shelf with enclosed ends, and rear to be tight to the wall.

- Verify mounting height with owner.
- Coordinate wall backing with General Contractor

ITEM: 124

MANUFACTURER: METRO

MODEL: PCD11A

DESCRIPTION: DISH CART / DOLLY (3 REQUIRED)

Poker Chip Dish Dolly, 26 5/8" wide x 26 5/8" deep x 31 15/16" high, adjustable, dish size 4 1/4" to 11-3/4", removable dividers and towers, two-handed access, recessed handles, 5" diameter swivel casters with neoprene wheels (2 with brakes), chip-resistant polymer shell with Microban® antimicrobial protection, aesthetic blue, vinyl dust/water splash cover, NSF

ITEM: 125

MANUFACTURER: CAMBRO

MODEL: CDR2020H151

DESCRIPTION: GLASS RACK DOLLY (4 EACH REQUIRED)

Dolly, for Cup/Glass Rack, platform design, 37" high x 21 3/8" wide x 23 3/8" long, designed for 20" x 20" racks, 350-pound capacity, all aluminum construction, handle, four (4) 3 1/3" swivel casters, no brakes.

ITEM: 126

MANUFACTURER: CHANNEL MANUFACTURING

MODEL: AXD-UTR-14

DESCRIPTION: REFRIGERATOR / FREEZER RACK, ROLL-IN (5 REQUIRED)

Pan Rack, heavy-duty series, 21" wide x 26" deep x 64" high, all aluminum welded construction, end load, 4" Angle Spacing, fifteen (15) tiers to hold one (1) 18" x 26" or two (2) 12" x 20" steam table pans per shelf, 5" x 2" heavy-duty swivel plate casters with Zerk grease fitting style, NSF listed.

- Made in USA
- Corner Bumpers
- (2) Heavy-duty casters with brakes
- Aluminum pan stop
- Lifetime warranty against rust and corrosion

ITEM: 127

MANUFACTURER: IMC TEDDY

MODEL: CSW-1S

DESCRIPTION: HAND SINK (2 REQUIRED)

Hand Sink, wall model approximately 10" x 13 1/2" x 5 1/2" sink bowl with inverted "V" edge, 8" integral back-splash, 304 stainless steel all welded construction, one (1) hole for splash-mounted faucet, 6" apron, includes faucet, basket drain, mounting bracket and clip with hardware, stainless steel, NSF.

- P-Trap Assembly
- Tubular Wall Brackets
- Model EFD-1SG Electronic Faucet, splash type, gooseneck, with metering/check valve.
- Mount and seal to the wall

ITEM: 128

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: SHELVING WITH METAL FRAME (2 UNITS REQUIRED)

Each unit is to consist of four (4) posts and four (4) shelves.

- (10) Model #MQ2460G Metro-Max Q Shelf, 60" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (8) Model #MQ86PE Metro-Max Q Post, 86" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

ITEM: 129

MANUFACTURER: CAPTIVE-AIRE

MODEL: VHB-G-604824

DESCRIPTION: CONDENSATE HOOD

This series hood is a Type II condensate hood for exhaust only. The hood shall have the size, shape, and performance specified in the contract documents. The Hood section is approximately 6'0" x 4'0" x 24" high with (1) 12" round exhaust collar exhausting a total of 900 CFM. Exhaust duct collar to be fully welded 4" high with a 1" flange. Duct sizes and static pressure requirements are shown on the contract drawings. Unit has a removable stainless-steel baffle.

Construction shall be 100 percent with type 304 stainless steel and #4 finish. Construction shall be dependent on structural application to minimize distortion and other defects. All seams, joints, and penetrations of the hood enclosure to the lower outermost perimeter shall have a liquid and airtight continuous external and internal weld in accordance with the current NFPA regulations. Hood shall be a wall type with fully welded 10-gauge corner hanging angles. Corner hanging angles have a slot pre punched at the factory. The ventilator is to be equipped with necessary hanger brackets welded in place by the manufacturer at front and rear for suspending from overhead structure. The hood shall be provided with a full perimeter condensate gutter on all sides and one corner shall be equipped with a drain on the right rear side.

- Provide closure panels constructed with the same material as the hood to close off space between the top of hood and ceiling as required for field installation.
- Exhaust Fan is to be coordinated with the CFM requirements of the Hood.
- Note: Exhaust air fan not to be provided under this contract but shall be coordinated with the CFM requirements of this unit.
- E.C. is to connect the dishwasher to hood exhaust fan for automatic activation.
- Center hood over the dishwasher.
- Seal the bottom of hood to the building wall.

ITEM: 130

MANUFACTURER: AMERICAN PANEL

MODEL: 203555B

DESCRIPTION: WALK-IN COOLER / FREEZER

General – The overall size of the walk-in box shall be approximately 11'6" x 13' ½" x 8'6" Tall. The cooler and freezer compartment interior dimensions are as shown in the drawings. Verify size and shape as shown on the plan. Walk-ins shall be constructed of prefabricated modular panels as manufactured by American Panel Corporation, Ocala, Florida. All insulated panel structures to be set up at factory prior to shipment, checked for structural and quality accuracy, photo-graphed prior to shipment. They shall be designed for easy and accurate field assembly, future enlargement by the addition of panels, or dismantling should relocation to an alternate site be

desired. Construction shall be in strict compliance with NSF Standard 7 and UL. This unit shall be recessed into the building floor to create a smooth transition between the walk-in floor and building floor.

Panel Construction - All panels shall consist of interior and exterior metal surfaces precision roll formed to exact dimensions with double 90° edges to enhance overall panel rigidity. The finished metal surfaces shall be fitted with a teardrop profile gasket and placed in precision-tooled fixtures where they are injected with Foamed-in-Place urethane insulation. Curing of the insulating core shall take place at a controlled temperature within the foaming fixture to provide permanent adhesion to the metal surfaces, to allow uniform foam expansion and to maximize finished panel strength. Panel edges shall have a molded urethane tongue and groove profile of insulation factor equal to core material to accurately align panels during installation and to assure an airtight seal. No structural wood, steel, straps, or other non-insulating materials shall be used in panel construction. Finished panels must be UL classified building units and each should bear the Underwriters Laboratory label.

Finished panels will be 4" thick and will be provided in 11 ½", 23", 34 ½" and 46" widths to conform to project drawings. Corner panels shall be one piece 90° angled construction and shall measure 12" x 12" or 12" x 6 ½" where required. For units with multiple compartments, specially designed "Tee" panels shall be provided to form partition wall to outside wall junctures. "Tee" panels shall measure 23" x 12" or 23" x 6 ½" where required. All panels shall be interchangeable with like panels or standard doorframe sections for fast and easy assembly.

Floor Construction – Where prefabricated floor panels are required, they shall be of similar design to other panels and shall incorporate a fully die formed ¼" NSF coved radius at all interior floor to wall junctures. Floor panels shall be reinforced with ¾" exterior grade plywood and shall be capable of supporting evenly distributed loads up to 1300 pounds per square foot or more. Floor to be: 16-gauge Stainless Steel with non-skid strips in the aisle ways.

Door Construction - Entrance doors are constructed like other panels and shall be flush mount, magnetic fitting type. Door sections shall be constructed to conform to Underwriters Laboratories Standards for electrical safety and shall bear all appropriate UL listing labels. The perimeter of the door and frame shall be built of a fiberglass reinforced plastic (FRP) pultrusion weighing not less than 8.4#/lineal foot. All pultrusion's shall be non-conductive, non-corrosive, rust proof and listed by the National Sanitation Foundation. Doorjamb shall house a doorframe heater circuit, and a magnet attracting stainless steel trim strip. The doorframe shall be equipped with flexible bellows type vinyl door gasket with magnetic core, and flexible EPDM (ethylene propylene diene monomer) door sweep. Standard door frame sections 46", 57 ½" or 69" wide shall be equipped with a LED vapor proof light fixture and globe pre-wired to a rocker type light switch with pilot light. An aluminum braided heater wire with integral circuit closure providing activation while the refrigerated room is within operating temperature and a 14-gauge stainless steel threshold plate shall also be included in all door frames.

The door hardware shall be die cast zinc with brushed satin finish. Doors shall be mounted with three (3) heavy-duty cam lift hinges. The pull handle assembly shall incorporate a keyed cylinder lock and an inside safety release handle to prevent personnel entrapment. A hydraulic closer device shall assist positive door closing and sealing.

Walk-In Monitoring System IC-Plus: System to have an easy-to-read LCD display with high and low alarm set points with audible and visual alerts for alarm conditions. The system shall include Adaptive Programming for automatic set point control. Wi-Fi connectivity included for remote notifications of alarms such as, power failure alarm, high and low temperature alarms, panic alarm, and door open alarm. The system shall have an integrated push button light switch with on/off indicator light. The system shall comply with the latest federal energy requirements by incorporating an automatic lighting shut-off. The system shall actively monitor and control door heater assembly for proper operation and lower energy consumption by having programmable initiation temperature and percentage of operation time adjustability. The system shall be supplied with dry contacts for connection to equipment that requires dry contacts such as building monitoring systems, dialers, etc. The system shall have a real-time clock and data for 100% HACCP compliant data logging. Polling frequency shall be fully programmable from the face of the controller. Memory shall be non-volatile to ensure zero loss during power

outages and the system shall include a battery backup complete with integrated charging circuit. System shall have a USB interface on the face of the monitor and Wi-Fi Connectivity for automatic and on demand HACCP data extraction. The system shall be able to remotely notify over local Wi-Fi network email/SMS text communications to designated parties alarm conditions such as high/low temperature alarms, power failure, panic alarm and door ajar. The system to be supplied interior press button light switch with constant burning backlight. The system shall be supplied with a secondary temperature probe with individual alarm set points for dual zone monitoring. Coordinate remote alarm monitoring with owner and other trades as required. If possible, both digital displays should be in the exterior entrance door panel frame.

Doors to be:

Exterior entrance doors, 36" x 77" (swing as shown on drawing) to include:

- Door Closer
- Door Kick plate, 1/10" aluminum tread plate, 36" High on interior and exterior of each door
- Cam lift hinges (3)
- Deadbolt key/padlock handle with inside safety release
- Magnetic gasket
- Single Sweep gasket
- Switch with pilot light
- Monitoring System
- 14"x 24" Vision Window, heated

Finishes - The interior and exterior finish on all panel surfaces may be manufactured from any combination of the following premium grade aluminum or steel materials. The gauge or thickness of the metal material listed is rated prior to embossing.

- Exposed Exterior walls: 22-gauge beaded stainless steel with #3 finish.
- Interior walls and interior ceilings: 26-gauge embossed white stucco coating.
- Un-exposed exterior to be 26-gauge stucco embossed galvanized steel.

Insulation - Insulation shall be 4" thick high-pressure impingement mixed (HPIM) foamed-in-place urethane, minimum density of 2.4 pound per cubic foot, fully heat cured, and bonded to metal finishes. The insulation shall be manufactured using HCFC-141b expanding agent, which has an ozone depletion rating of 0.1 and a global warming rating of 0.05. The thermal conductivity ("K" factor) shall not exceed 0.133 BTU/Hour/Square Foot/Degree Fahrenheit/Inch of Thickness across the entire width of the panel. Overall coefficient of heat transfer ("U" factor) shall not exceed .033 and the resistance to heat penetration ("R" factor) shall not be less than 30. The insulation shall have a 97% closed cell structure to prevent absorption of liquids. The finished aluminum panel (not just the core material) shall be listed by Underwriters Laboratories as a Class 1 (UL-723) building material and demonstrate a flame spread rating of 20 or less and smoke developed of 350 or less in accordance with ASTM-E84 Standards. This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions. Foam used shall be Factory Mutual listed.

Panel Assembly - Assembly of Walk-In shall be accomplished using cam-action locking mechanisms precisely positioned along the outside tongue or groove edges of each panel to exactly correspond with a matching mechanism in the adjacent panel. Cam lock spacing on vertical joints shall not exceed 46" and at junction of vertical and horizontal joints by 23". Cam locks shall be foamed-in-place and anchored securely in the panel by steel "wings" integral to the lock housing. Cam locks shall be operated through access ports using a hex wrench, thereby pulling the panels together and establishing an airtight seal. All access ports shall be located on the walk-in interior to facilitate assembly when close to building structures and shall be covered by vinyl snap-in caps after final assembly. Complete step-by-step assembly instructions, and erection drawings shall be supplied by the manufacturer.

Walk-In Accessories for each compartment:

- (1) LED 48” Light fixtures per compartment, high output, for low temperature applications in cooler and freezer
- LED Vapor-proof light in each door frame
- (1) Power air curtain with backing on exterior of cooler: Berner Model #SLC-07-1036A-SS complete with cord and plug for receptacle built into the door panel.
- Non-skid strips (in aisles only)
- Exposed exterior to have two-tier bumper rails mounted at 12” AFF and 36” AFF.
- Exterior corners of building walls to be sealed with full-height stainless steel closure strips.
- Provide stainless steel closure panels between walk-in and ceiling.
- Heated pressure relief port on freezer sections

Warranty - Insulated panel products are to be warranted for a period of ten (10) years after the date of installation to the original user should the panels be installed properly and be used under normal service conditions. After an inspection authorized by the manufacturer, should any part of the product prove to be defective in material or workmanship, it will be repaired or replaced free of charge, F.O.B. factory. This warranty does not apply to accessories or components supplied but manufactured by other companies who furnish their own warranties.

F.S.E.C. shall provide an installation workmanship warranty of three (3) years from the date of installation.

All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Walk-In coolers or freezers need to include the following: automatic door closing device, strip curtains on hinged doors, heated triple pane windows on cooler and freezer doors, high efficiency lighting or automatic light switches, R-25 insulation in cooler walls, doors, and ceilings, R-32 insulation in freezer walls, doors, and ceilings, and R-28 insulation in walk-in cooler and freezer floors.

Prior to turning on refrigeration systems, K.E.C. to “test” the walk-in boxes to verify they are air tight. A smoke test, flood light test, or other means of similar testing is required. If an air-tight test is not performed, the F.S.E.C. will provide a letter of workmanship warranty for a period of five (5) years covering any defects or air leaks in the walk-in unit.

ITEM: 131

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: ZS09K4E / BEL0095 / ZS2-05Z-CT3-AST

DESCRIPTION: WALK-IN COOLER REFRIGERATION

Walk-In cooler will be provided with a condensing unit and evaporator for refrigeration equipment in accordance with ASHRAE standards. All systems shall be supplied with complete controls for a working system. Each system shall consist of a new condensing unit located in the refrigeration rack with winter controls.

Condensing units shall be accessible preassembled remote, scroll type, air-cooled units for outdoor installation with matching evaporator. Condensing units shall be equipped with PSC fan motors and evaporator fans shall utilize the ECM type fan motors. All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Refrigeration systems are to be mounted in a refrigeration rack.

Medium temperature unit shall utilize R-448a refrigerant. The manufacturer calculates heat loads and provides systems with a minimum of 105% of needed capacity to maintain holding temperature 34° F in coolers. Calculations shall take into consideration box ambient, refrigeration system ambient, airflow, and exposure to sunlight and altitude. Interconnection of refrigeration lines, insulation, and electrical wiring shall be accomplished by the appropriate trades and shall be a portion of the Kitchen Equipment Contract.

The refrigeration system on the walk-in will be equipped with the RDT Eco-Smart on-demand defrost controller factory mounted to the evaporator coil(s). The Eco-Smart will be custom designed for RDT refrigeration systems to control the electric expansion valve in response to true evaporator superheat and return air temperature. Power wiring for the evaporator coils will be provided by the E.C. as required. Off cycle and electric defrost is also available. Provide heater as required so product does not freeze.

Additionally, a refrigeration system containing an Eco-Smart controller will consist of the following factory-mounted parts:

- Electronic controller board with three-digit LED and push button panel interface for setup
- Three solid state temperature sensors
- Pressure transducer
- External relay to control liquid line solenoid valve or compressor contactor.
- Electric expansion valve
- 24V transformer

The Eco-Smart board will contain three (3) relay outputs: defrost heater (20A), evaporator fan (10A) and alarm (5A). The board will include connection points for alarm systems provided by others.

Medium temperature systems come with one (1) preprogrammed defrost per day if it needs to run in safe mode and to ensure oil return to the compressor if no demand defrosts are required. All other defrosts are by demand which will be activated by the three (3) factory mounted sensors on the evaporator coil.

COOLER CONDENSER:

Compressors shall be scroll type and shall operate on R-448A refrigerant. Multiple compressors shall be used to satisfy load requirements. Small loads shall be combined in a multiplex arrangement and satisfied using a single compressor. Each compressor unit shall also include dual pressure control, sight glass, liquid line drier and suction and discharge vibration eliminators. Provide one (1) ZS09KAE Medium temperature, 35° F, pre-assembled remote, scroll outdoor remote refrigeration condenser (1.30 H.P.) with voltage to be 208/3. Low pressure bypass and ambient safety accessories are to be provided on the outdoor condensing units to protect them under extreme outside temperatures of approximately -20° F.

COOLER EVAPORATOR:

Evaporator Coils - Matching evaporators shall be provided as required to complete the system. Evaporators shall be provided with mounted expansion valve and room thermostat. Evaporators shall be provided with the Eco-Smart Controller System. Evaporators shall be off cycle, electric or reverse cycle defrost. Provide one (1) BEL0095 evaporator unit and voltage of 120/1. Low profile evaporator coil with expansion valve, thermostat, and solenoid factory mounted. Evaporators shall be forced air type designed for ceiling installation. Air discharge shall be parallel to the walk-in ceiling. Fan motors, guards, multi-fin, and tube-type coil shall be housed in heavy gauge aluminum housing. Unit shall have drain pan with suitable drainpipe connection. Defrost shall be initiated only when required by demand defrost settings and temperature terminated with built-in fail-safe control. All cooler systems are equipped with an "off cycle" timer to maximize heat transfer and maintain optimum energy efficiency. Evaporators shall be U.L. listed.

Piping Specifications:

- The Food Service Equipment Contractor will perform all refrigeration piping. This Contractor will install all components and piping per the manufacturer's recommendations.
- Line sizes must be appropriately sized for the length of run. If units have reverse-cycle defrost, liquid line shall be upsized one nominal size.
- FSEC will make all final connections to the evaporator and the condenser, charge and test the operation of the system.
- Copper drain lines, heated and insulated where needed, installed by the Food Service Equipment Contractor.

Electrical Specifications:

- Electrical Contractor is to provide final electrical connection to the condenser, evaporator, and lights. Coordinate location with the General Contractor.

Wiring:

- All interior wiring shall be “liquidtight” fittings and sealed to prevent water migration.
- The use of Romex, BX, MC Cable is prohibited and shall be deemed to not meet specifications.
- All control wiring and inter-wiring to be done by the Food Service Equipment Contractor.

Warranty:

The successful bidder shall provide written warranties that specify, subject to normal and accepted use, at a minimum:

- Five Year Compressor Warranty
- Three Year Service / Workmanship Warranty on refrigeration installation.
- One Year Manufacturer’s Warranty on all other components.

ITEM: 132

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: ZF08K4AE / BEL0080 / ZS2-05Z-CT3-AST

DESCRIPTION: WALK-IN FREEZER REFRIGERATION

Walk-In Freezer will be provided with a condensing unit and evaporator for refrigerated equipment in accordance with ASHRAE standards. All systems shall be supplied with complete controls for a working system. Each system shall consist of a new condensing unit located in the refrigeration rack with winter controls.

Compressor units shall be accessible preassembled remote, hermetic/scroll type, air cooled units for outdoor installation with matching evaporator. The condenser shall be equipped with EC fan motors and evaporator fans shall utilize the ECM type two-speed fan motors. All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Refrigeration systems are to be mounted in a refrigeration rack.

Low temperature unit shall utilize R-448a refrigerant. The manufacturer calculates heat loads and provides systems with a minimum of 105% of needed capacity to maintain holding temperature –10° F in freezers. Calculations shall take into consideration box ambient, refrigeration system ambient, airflow, and exposure to sunlight and altitude. Interconnection of refrigeration lines, insulation, and electrical wiring shall be accomplished by the appropriate trades and shall be a portion of the Kitchen Equipment Contract.

The refrigeration system on the walk-in will be equipped with the RDT Eco-Smart on-demand defrost controller factory mounted to the evaporator coil(s). The Eco-Smart will be custom designed for RDT refrigeration systems to control the electric expansion valve in response to true evaporator superheat and return air temperature. Power wiring for the evaporator coils will be provided by the E.C. as required. Off cycle and electric defrost is also available. Provide heater as required so product does not freeze.

Additionally, a refrigeration system containing an on-demand controller will consist of the following factory-mounted parts:

- Electronic controller board with three- digit LED and push button panel interface for setup
- Three solid state temperature sensors
- Pressure transducer
- External relay to control liquid line solenoid valve or compressor contactor.
- Electric expansion valve
- 24V transformer

The Eco-Smart Controller board will contain three (3) relay outputs: defrost heater (20A), evaporator fan (10A) and alarm (5A). The board will include connection points for alarm systems provided by others.

Low temperature systems come with two (2) preprogrammed defrost per day if it needs to run in safe mode and to ensure oil return to the compressor if no demand defrosts are required. All other defrosts are by demand which will be activated by the three (3) factory mounted sensors on the evaporator coil.

The Eco-Smart Controller system will: Float the head pressure, reduce system refrigerant charge by a minimum of one third, and reduce the defrost time when hot gas is used to defrost the coil. Any proposed alternatives must perform the energy-saving functions of all three features.

FREEZER CONDENSER:

Compressors shall be hermetic/scroll type and shall operate on R-448A refrigerant. Multiple compressors shall be used to satisfy load requirements. Small loads shall be combined in a multiplex arrangement and satisfied using a single compressor. Each compressor unit shall also include dual pressure control, sight glass, liquid line drier and suction and discharge vibration eliminators. One (1) ZF08K4E Low temperature, -10° F, pre-assembled remote, hermetic/scroll type outdoor remote refrigeration condenser (2.5 H.P.) and voltage to be 208/3. Low temperature units also are to include evaporator drain line heaters. Low pressure bypass and ambient safety accessories are to be provided on the outdoor condensing units to protect them under extreme outside temperatures of approximately -20 F.

FREEZER EVAPORATOR:

Matching evaporators shall be provided as required to complete the system. Evaporators shall be provided with mounted expansion valve and room thermostat. Evaporators shall be provided with the On-Demand Defrost Control System. Evaporators shall be off cycle, electric or reverse cycle defrost. Provide one (1) BEL0080 evaporator unit with voltage of 208/1. Low profile evaporator coil with expansion valve, thermostat, and solenoid factory mounted. Evaporators shall be forced air type designed for ceiling installation. Air discharge shall be parallel to the walk-in ceiling. Fan motors, guards, multi-fin, and tube-type coil shall be housed in heavy gauge aluminum housing. Unit shall have drain pan with suitable drainpipe connection. Freezer evaporators shall utilize electric defrost and heated drain pan. Defrost shall be initiated only when required by demand defrost settings and temperature terminated with built-in fail-safe control. Evaporators shall be U.L. listed.

Piping Specifications:

- The Food Service Equipment Contractor will perform all refrigeration piping. This Contractor will install all components and piping per the manufacturer's recommendations.
- Line sizes must be appropriately sized for the length of run. If units have reverse-cycle defrost, liquid line shall be upsized one nominal size.
- FSEC will make all final connections to the evaporator and the condenser, charge and test the operation of the system.
- Copper drain lines, heated and insulated where needed, installed by the Food Service Equipment Contractor.
- The heat tape is to be powered from a separate circuit provided by the E.C. and connected by the F.S.E.C.

Electrical Specifications:

- Electrical Contractor is to provide final electrical connection to the condenser, evaporator, and lights. Coordinate location with the General Contractor.

Wiring:

- All interior wiring shall be "liquidtight" fittings and sealed to prevent water migration.
- The use of Romex, BX, MC Cable is prohibited and shall be deemed to not meet specifications.
- All control wiring and inter-wiring to be done by the Food Service Equipment Contractor.

Warranty:

The successful bidder shall provide written warranties that specify, subject to normal and accepted use, at a minimum:

- Five Year Compressor Warranty
- Three Year Service / Workmanship Warranty on refrigeration installation.
- One Year Manufacturer's Warranty on all other components.

ITEM: 133

MANUFACTURER: METRO

MODEL: MQ-G SERIES

DESCRIPTION: SHELVING WITH METAL FRAME (1 LOT REQUIRED)

Each unit is to consist of four (4) posts and four (4) shelves.

- (4) Model #MQ1848G Metro-Max Q Shelf, 48" wide x 18" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (12) Model #MQ2448G Metro-Max Q Shelf, 48" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (4) Model #MQ2460G Metro-Max Q Shelf, 60" wide x 24" deep, removable open grid polymer with Microban antimicrobial protection, epoxy coat steel frame, wedge connectors with quick adjust corner releases, NSF.
- (20) Model #MQ74PE Metro-Max Q Post, 74" high, adjustable foot, epoxy coated steel with built in Microban antimicrobial product protection, NSF.
- Verify sizes with site conditions and verify shelf spacing with owner.

BAR

ITEM: 200

MANUFACTURER: GLASTENDER

MODEL: MD

DESCRIPTION: MODULAR BAR SYSTEM

Glastender Modular Bar Die, 16-gauge galvanized steel structure with 300 series stainless steel bartender side finish, built-in chase ways, removable panels, and prefabricated wall sections with bar equipment attached at the factory. Field installation of the wall system is the responsibility of the F.S.E.C. The structure is configured to the exact size and shape of the underbar equipment to allow for free standing equipment with no legs, on a curb base. Interior chases run the entire length of the structure. A 5 ½" open zone is furnished behind the equipment to provide room for trunk lines, soda lines, plumbing, and electrical, to be connected front the front of the bar with panels removed. Electrical boxes will be installed in the wall system, but the wiring is to be done in the field by the E.C. Dedicated chase locations for hot/cold water supply lines, beverage line conduits, and electrical conduit is accessible with the chase from the floor and runs the entire length of the bar.

The die wall system is designed to accommodate two types of millwork panel applications to the front of the bar. Millwork panels are to be designed to be removable to access plumbing, electrical, and beverage lines. Front panels use interlocking panels and hidden screws. The bar top and front millwork panels are provided by others and installed in the field after bar equipment is set. The F.S.E.C. is responsible for coordinating all aspects of the installation.

- GFI outlets in electrical Boxes

- LED lights built into bar die wall above underbar equipment.
- Full size foot print template printed on mylar paper.
- F.S.E.C. is responsible for installing the bar wall system and coordinating with all the trades.
- See drawing for more details.
- 60" long x 32" high ADA flat wall section

ITEM: 201

MANUFACTURER: GLASTENDER

MODEL: MFT-20

DESCRIPTION: UNDERBAR SINK UNITS (2 EACH REQUIRED)

Underbar Mixology Unit, free standing, 20" wide x 24" deep overall, 9 ¼" wide x 11 ½" front-to-back x 6" deep bowl, splash mounted faucet, lift-out plastic perforated sink strainer, push-down rinsing faucet, 6" diameter tool well with faucet, 11" wide x 8" deep removable cutting board, removable scoop well, stainless steel construction, stainless steel legs with adjustable bullet feet, low lead compliant, NSF listed.

- (2) Faucet with aerator
- (2) 4" Faucet, backsplash mounted

ITEM: 202

MANUFACTURER: GLASTENDER

MODEL: LDA-12S

DESCRIPTION: BOTTLE STORAGE (2 EACH REQUIRED)

Underbar Liquor Steps, free standing, 12" wide x 24" deep, four (4) steps, extra-wide rear step, includes clear lift-off liquor-identification cover, stainless steel construction, stainless steel legs with adjustable bullet feet, NSF listed.

- One-year parts and labor warranty

ITEM: 203

MANUFACTURER: GLASTENDER

MODEL: IBA-30-CP10

DESCRIPTION: ICE BIN (2 EACH REQUIRED)

Underbar Ice Bin, with 10-circuit cold plate, 30" wide x 19" deep, 84 pounds ice capacity, 10 ½" deep bin liner, PVC breaker strip around ice bin liner, includes sliding stainless steel bin cover, stainless steel construction, stainless steel legs with adjustable stainless steel bullet feet, NSF listed.

- Tubing chase, 2-3/8" by 4", centered in backsplash.
- Undercounter Mount Soda Gun Holder, fits Wunder-Bar or Schroeder America style soda guns, includes 10 feet of clear vinyl drain tube, rubber grommet, plastic drip pan, 14-gauge stainless steel construction.
- (2) Model #SSR-30 Single Speed Rail, 30" wide, open step-and-rail design, PVC sound-deadening covers, clear snap-on liquor identification label cover, field installed, stainless steel construction, NSF listed
- (2) Model #ACB-30 Underbar Add-On Cabinet Base, with doors, 30" wide x 24" deep x 16" high, two (2) hinged doors with integral handles, fits beneath underbar equipment for additional storage, removable floor with utility access, double-wall stainless steel construction, legs with adjustable stainless steel bullet feet, NSF listed.
- One-year parts and labor warranty

ITEM: 204

MANUFACTURER: GLASTENDER

MODEL: DBGR-24-RS

DESCRIPTION: GLASS RACK (2 EACH REQUIRED)

Underbar Glass Rack Storage Unit, drainboard top, 24" wide x 24" deep, open front base, holds two (2) 20" x 20" glass racks, roll-out intermediate shelf, and roll-out bottom shelf, drain pan with removable perforated insert and 1/2" drain, stainless steel construction, stainless steel legs with adjustable bullet feet, NSF listed.

ITEM: 205

MANUFACTURER: GLASTENDER

MODEL: DWB-12

DESCRIPTION: UNDERBAR ADD-ON UNIT

Underbar Dry Waste Unit, 12" wide x 24" deep, 6" diameter waste chute, removable top, accommodates Rubbermaid Slim Jim trash receptacle (not included), stainless steel construction, no legs, NSF listed.

- One-year parts & labor warranty

ITEM: 206

MANUFACTURER: GLASTENDER

MODEL: SWB-24R-C

DESCRIPTION: WASTE CABINET

Underbar Wet Waste Sink, cabinet base with open front, 24" wide x 24" deep, center vertical divider, one (1) sink compartment on right, 9 1/4" wide x 11 1/2" front-to-back x 6" deep bowl, deck mount gooseneck faucet, drainboard on left with lift-out plastic perforated sink strainer, stainless steel construction, stainless steel legs with adjustable bullet feet, NSF listed.

- 4" backsplash mounted faucet
- Faucet aerator
- One-year parts and labor warranty

ITEM: 207

MANUFACTURER: GLASTENDER

MODEL: DBGR-24-RS

DESCRIPTION: GLASS RACK

Underbar Glass Rack Storage Unit, drainboard top, 24" wide x 24" deep, open front base, holds two (2) 20" x 20" glass racks, roll-out intermediate shelf, and roll-out bottom shelf, drain pan with removable perforated insert and 1/2" drain, stainless steel construction, stainless steel legs with adjustable bullet feet, NSF listed.

ITEM: 208

MANUFACTURER: GLASTENDER

MODEL: DBB-12

DESCRIPTION: DRAINBOARD (2 REQUIRED)

Underbar Drainboard, free standing, 12" wide x 24" deep, drain pan with removable perforated insert, stainless steel construction, stainless steel legs with adjustable stainless steel bullet feet, NSF listed.

- One-year parts and labor warranty

ITEM: 209

MANUFACTURER: GLASTENDER

MODEL: GW24

DESCRIPTION: GLASSWASHER, UNDERCOUNTER / UNDERBAR

Underbar Glasswasher, rotary type, 24" wide x 24" deep, low temperature chemical sanitizing, clockwise rotation, washes forty-one (41) 2 3/4" diameter glasses per cycle, 10" maximum glass height, 2.25-minute cycle, delime cycle, removable sliding cover and drainboard top, side notched design for chemical containers, removable side panels, automatic chemical pumps, includes priming switches, stainless steel construction, ETL and NSF listed.

- 120/60/1
- One-year parts and labor warranty

ITEM: 210

MANUFACTURER: GLASTENDER

MODEL: C1FB84

DESCRIPTION: BACK BAR CABINET, REFRIGERATED

Cooler, one zone, front serviced, bar profile, 84" wide, three-section, 20" wide door opening, self-contained refrigeration, LED interior lighting, front venting, stainless steel interior, R290 Hydrocarbon refrigerant, 1/4 HP, NSF Standard 7 for open food storage, ETL and NSF Listed.

- 120/60/1
- Standard 34° to 40°F operation
- Refrigeration compartment on left side
- Refrigeration compartment cover finish: Stainless steel
- First Door style: Stainless steel
- First Door hinge location: Left
- First Door Shelving style: (3) adjustable shelves
- Second Door style: Stainless steel
- Second Door hinge location: Right
- Second Door Shelving style: (3) adjustable shelves
- Third Door style: Stainless steel
- Third Door hinge location: Right
- Third Shelving style: (3) adjustable shelves
- No finished top - stainless steel sub-top
- Back finish: Galvanized steel
- Left and Right-side finish: Stainless steel
- Bright White Lights
- No legs or casters
- One-year parts and labor warranty
- Five-year compressor warranty

ITEM: 211

MANUFACTURER: GLASTENDER

MODEL: CUSTOM-BT-8-SSR

DESCRIPTION: DRAFT BAR DISPENSING TOWER & BEER SYSTEM

Tee Draft Dispensing Tower, countertop, (8) stainless steel faucets without handles, glycol-cooled, (2) 5" wide insulated columns, insulated cold plate assembly, integral drain pan with removable perforated insert, all stainless-steel construction, stainless steel finish, NSF listed.

- One-year parts and labor warranty
- Model #RFE 5" Rinser Faucet Extension on left of drain pan.
- Install backflow prevention device (not included)
- 205 Feet 4+8 Four glycol, eight product beer line set
- Beer system insulation kit
- Beer Line Chiller with Remote Installable Control Panel, air-cooled, 27" wide x 25-5/8" deep x 16" tall, (1) 100 gph circulating pump, 400 feet maximum run to taps, digital temperature control with LCD display with mounting bracket, (1) gallon capacity insulated stainless steel glycol bath with clear cover, heat exchanger housed in condensing unit, glycol filling port located on front, black vinyl exterior with galvanized steel base, R134a, 3/4 HP compressor, ETL listed.
- 220/60/1
- Wall Rack, for line chillers, 16-gauge stainless steel
- One pump, four glycol lines. For one line run with four glycol lines
- 24 Feet Glycol connection lines
- 10 Glycol, premix
- 4 Two product beer pump kit with EKD's
- 1 Tank mount CO2 Primary Regulator Kit
- 8 D System Keg Coupler, stainless steel probe
- Glastender Beer Certified System Installation
 - Notes for beer system installation quote: Conduit runs 8" PVC with 24" radius sweeps recommended, hole coring, plumbing, and electrical are not included. Penetrations through non-wood surfaces and all fire caulking is by others. All chases are in place and there is proper routing of lines at bars to dispensing stations. Conduit length is based on the information provided and is subject to change upon field verification, which may result in additional charges.

ITEM: 212

MANUFACTURER: GLASTENDER

MODEL: C1FB84

DESCRIPTION: BACK BAR CABINET, REFRIGERATED

Cooler, one zone, front serviced, bar profile, 84" wide, three-section, 20" wide door opening, self-contained refrigeration, LED interior lighting, front venting, stainless steel interior, R290 Hydrocarbon refrigerant, 1/4 HP, NSF Standard 7 for open food storage, ETL and NSF Listed.

- 120/60/1
- Standard 34° to 40°F operation
- Refrigeration compartment on right side
- Refrigeration compartment cover finish: Stainless steel
- First Door style: Stainless steel
- First Door hinge location: Left

- First Door Shelving style: (3) adjustable shelves
- Second Door style: Stainless steel
- Second Door hinge location: Right
- Second Door Shelving style: (3) adjustable shelves
- Third Door style: Stainless steel
- Third Door hinge location: Right
- Third Shelving style: (3) adjustable shelves
- No finished top - stainless steel sub-top
- Back finish: Galvanized steel
- Left and Right-side finish: Stainless steel
- Bright White Lights
- No legs or casters
- One-year parts and labor warranty
- Five-year compressor warranty

ITEM: 213

MANUFACTURER: AMERICAN PANEL

MODEL: 203555C

DESCRIPTION: KEG COOLER

General – The overall size of the walk-in box shall be approximately 12’8” x 7’ 9” x 8’6” Tall. The cooler compartment interior dimensions are as shown in the drawings. Verify size and shape as shown on the plan. Walk-ins shall be constructed of prefabricated modular panels as manufactured by American Panel Corporation, Ocala, Florida. All insulated panel structures to be set up at factory prior to shipment, checked for structural and quality accuracy, photo-graphed prior to shipment. They shall be designed for easy and accurate field assembly, future enlargement by the addition of panels, or dismantling should relocation to an alternate site be desired. Construction shall be in strict compliance with NSF Standard 7 and UL. This unit shall be recessed into the building floor to create a smooth transition between the walk-in floor and the building floor.

Panel Construction - All panels shall consist of interior and exterior metal surfaces precision roll formed to exact dimensions with double 90° edges to enhance overall panel rigidity. The finished metal surfaces shall be fitted with a teardrop profile gasket and placed in precision-tooled fixtures where they are injected with Foamed-in-Place urethane insulation. Curing of the insulating core shall take place at a controlled temperature within the foaming fixture to provide permanent adhesion to the metal surfaces, to allow uniform foam expansion and to maximize finished panel strength. Panel edges shall have a molded urethane tongue and groove profile of insulation factor equal to core material to accurately align panels during installation and to assure an airtight seal. No structural wood, steel, straps, or other non-insulating materials shall be used in panel construction. Finished panels must be UL classified building units and each should bear the Underwriters Laboratory label.

Finished panels will be 4” thick and will be provided in 11 ½”, 23”, 34 ½” and 46” widths to conform to project drawings. Corner panels shall be one piece 90° angled construction and shall measure 12” x 12” or 12” x 6 ½” where required. For units with multiple compartments, specially designed “Tee” panels shall be provided to form partition wall to outside wall junctures. “Tee” panels shall measure 23” x 12” or 23” x 6 ½” where required. All panels shall be interchangeable with like panels or standard doorframe sections for fast and easy assembly.

Floor Construction – Where prefabricated floor panels are required, they shall be of similar design to other panels and shall incorporate a fully die formed ¼” NSF coved radius at all interior floor to wall junctures. Floor panels shall be reinforced with ¾” exterior grade plywood and shall be capable of supporting evenly distributed loads up to 1300 pounds per square foot or more. Floor to be: 1/8” Diamond Aluminum treadplate foamed in place to be integral to the floor panels.

Door Construction - Entrance doors are constructed like other panels and shall be flush mount, magnetic in-fitting type. Door sections shall be constructed to conform to Underwriters Laboratories Standards for electrical safety and shall bear all appropriate UL listing labels. The perimeter of the door and frame shall be built of a fiberglass reinforced plastic (FRP) pultrusion weighing not less than 8.4#/lineal foot. All pultrusion's shall be non-conductive, non-corrosive, rust proof and listed by the National Sanitation Foundation. Doorjamb shall house a doorframe heater circuit, and a magnet attracting stainless steel trim strip. The doorframe shall be equipped with flexible bellows type vinyl door gasket with magnetic core, and flexible EPDM (ethylene propylene diene monomer) door sweep. Standard door frame sections 46", 57 1/2" or 69" wide shall be equipped with a LED vapor proof light fixture and globe pre-wired to a rocker type light switch with pilot light. An aluminum braided heater wire with integral circuit closure providing activation while the refrigerated room is within operating temperature and a 14-gauge stainless steel threshold plate shall also be included in all door frames.

The door hardware shall be die cast zinc with brushed satin finish. Doors shall be mounted with three (3) heavy-duty cam lift hinges. The pull handle assembly shall incorporate a keyed cylinder lock and an inside safety release handle to prevent personnel entrapment. A hydraulic closer device shall assist positive door closing and sealing.

Walk-In Monitoring System IC-Plus: System to have an easy-to-read LCD display with high and low alarm set points with audible and visual alerts for alarm conditions. The system shall include Adaptive Programming for automatic set point control. Wi-Fi connectivity included for remote notifications of alarms such as, power failure alarm, high and low temperature alarms, panic alarm, and door open alarm. The system shall have an integrated push button light switch with on/off indicator light. The system shall comply with the latest federal energy requirements by incorporating an automatic lighting shut-off. The system shall actively monitor and control door heater assembly for proper operation and lower energy consumption by having programmable initiation temperature and percentage of operation time adjustability. The system shall be supplied with dry contacts for connection to equipment that requires dry contacts such as building monitoring systems, dialers, etc. The system shall have a real-time clock and data for 100% HACCP compliant data logging. Polling frequency shall be fully programmable from the face of the controller. Memory shall be non-volatile to ensure zero loss during power outages and the system shall include a battery backup complete with integrated charging circuit. System shall have a USB interface on the face of the monitor and Wi-Fi Connectivity for automatic and on demand HACCP data extraction. The system shall be able to remotely notify over local Wi-Fi network email/SMS text communications to designated parties alarm conditions such as high/low temperature alarms, power failure, panic alarm and door ajar. The system to be supplied interior press button light switch with constant burning backlight. The system shall be supplied with a secondary temperature probe with individual alarm set points for dual zone monitoring. Coordinate remote alarm monitoring with owner and other trades as required. If possible, both digital displays should be in the exterior entrance door panel frame.

Doors to be:

Exterior entrance doors, 36" x 77" (swing as shown on drawing) to include:

- Door Closer
- Door Kick plate, 1/10" aluminum tread plate, 36" High on interior and exterior of each door
- Cam lift hinges (3)
- Deadbolt key/padlock handle with inside safety release
- Magnetic gasket
- Single Sweep gasket
- Switch with pilot light
- Monitoring System
- 14"x 24" Vision Window, heated

Finishes - The interior and exterior finish on all panel surfaces may be manufactured from any combination of the following premium grade aluminum or steel materials. The gauge or thickness of the metal material listed is rated prior to embossing.

- Exposed Exterior walls: 22-gauge beaded stainless steel with #3 finish.
- Interior walls and interior ceilings: 26-gauge embossed white stucco coating.
- Un-exposed exterior to be 26-gauge stucco embossed galvanized steel.

Insulation - Insulation shall be 4" thick high-pressure impingement mixed (HPIM) foamed-in-place urethane, minimum density of 2.4 pound per cubic foot, fully heat cured, and bonded to metal finishes. The insulation shall be manufactured using HCFC-141b expanding agent, which has an ozone depletion rating of 0.1 and a global warming rating of 0.05. The thermal conductivity ("K" factor) shall not exceed 0.133 BTU/Hour/Square Foot/Degree Fahrenheit/Inch of Thickness across the entire width of the panel. Overall coefficient of heat transfer ("U" factor) shall not exceed .033 and the resistance to heat penetration ("R" factor) shall not be less than 30. The insulation shall have a 97% closed cell structure to prevent absorption of liquids. The finished aluminum panel (not just the core material) shall be listed by Underwriters Laboratories as a Class 1 (UL-723) building material and demonstrate a flame spread rating of 20 or less and smoke developed of 350 or less in accordance with ASTM-E84 Standards. This rating is not intended to reflect hazards presented by this or any other material under actual fire conditions. Foam used shall be Factory Mutual listed.

Panel Assembly - Assembly of Walk-In shall be accomplished using cam-action locking mechanisms precisely positioned along the outside tongue or groove edges of each panel to exactly correspond with a matching mechanism in the adjacent panel. Cam lock spacing on vertical joints shall not exceed 46" and at junction of vertical and horizontal joints by 23". Cam locks shall be foamed-in-place and anchored securely in the panel by steel "wings" integral to the lock housing. Cam locks shall be operated through access ports using a hex wrench, thereby pulling the panels together and establishing an airtight seal. All access ports shall be located on the walk-in interior to facilitate assembly when close to building structures and shall be covered by vinyl snap-in caps after final assembly. Complete step-by-step assembly instructions, and erection drawings shall be supplied by the manufacturer.

Walk-In Accessories for each compartment:

- (2) LED 48" Light fixtures per compartment, high output, for low temperature applications in cooler and freezer
- LED Vapor-proof light in each door frame
- (1) Power air curtain with backing on exterior of cooler: Berner Model #SLC-07-1036A-SS complete with cord and plug for receptacle built into the door panel.
- Interior walls with 1/10" aluminum tread plate, 36" high.
- Exposed exterior to have two-tier bumper rails mounted at 12" AFF and 36" AFF.
- Exterior corners of building walls to be sealed with full-height stainless steel closure strips.
- Provide stainless steel closure panels between walk-in and ceiling.

Warranty - Insulated panel products are to be warranted for a period of ten (10) years after the date of installation to the original user should the panels be installed properly and be used under normal service conditions. After an inspection authorized by the manufacturer, should any part of the product prove to be defective in material or workmanship, it will be repaired or replaced free of charge, F.O.B. factory. This warranty does not apply to accessories or components supplied but manufactured by other companies who furnish their own warranties.

K.E.C. shall provide an installation workmanship warranty of three (3) years from the date of installation.

All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Walk-In coolers or freezers need to include the following: automatic door closing device, strip curtains on hinged doors, heated triple pane windows on cooler and freezer doors, high efficiency lighting or automatic light switches, R-25 insulation in cooler walls, doors, and ceilings, R-32 insulation in freezer walls, doors, and ceilings, and R-28 insulation in walk-in cooler and freezer floors.

Prior to turning on refrigeration systems, K.E.C. to “test” the walk-in boxes to verify they are air tight. A smoke test, flood light test, or other means of similar testing is required. If an air-tight test is not performed, the F.S.E.C. will provide a letter of workmanship warranty for a period of five (5) years covering any defects or air leaks in the walk-in unit.

ITEM: 214

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: ZS11K4E / BEL0095 / ZS2-05Z-CT3-AST

DESCRIPTION: KEG COOLER REFRIGERATION

Walk-In cooler will be provided with a condensing unit and evaporator for refrigeration equipment in accordance with ASHRAE standards. All systems shall be supplied with complete controls for a working system. Each system shall consist of a new condensing unit located in the refrigeration rack with winter controls.

Condensing units shall be accessible preassembled remote, scroll type, air-cooled units for outdoor installation with matching evaporator. Condensing units shall be equipped with PSC fan motors and evaporator fans shall utilize the ECM type fan motors. All refrigeration equipment shall comply with the Federal Regulations for energy efficiency. Refrigeration systems are to be mounted in a refrigeration rack.

Medium temperature unit shall utilize R-448a refrigerant. The manufacturer calculates heat loads and provides systems with a minimum of 105% of needed capacity to maintain holding temperature 34° F in coolers. Calculations shall take into consideration box ambient, refrigeration system ambient, airflow, and exposure to sunlight and altitude. Interconnection of refrigeration lines, insulation, and electrical wiring shall be accomplished by the appropriate trades and shall be a portion of the Kitchen Equipment Contract.

The refrigeration system on the walk-in will be equipped with the RDT Eco-Smart on-demand defrost controller factory mounted to the evaporator coil(s). The Eco-Smart will be custom designed for RDT refrigeration systems to control the electric expansion valve in response to true evaporator superheat and return air temperature. Power wiring for the evaporator coils will be provided by the E.C. as required. Off cycle and electric defrost is also available. Provide heater as required so product does not freeze.

Additionally, a refrigeration system containing an Eco-Smart controller will consist of the following factory-mounted parts:

- Electronic controller board with three- digit LED and push button panel interface for setup
- Three solid state temperature sensors
- Pressure transducer
- External relay to control liquid line solenoid valve or compressor contactor.
- Electric expansion valve
- 24V transformer

The Eco-Smart board will contain three (3) relay outputs: defrost heater (20A), evaporator fan (10A) and alarm (5A). The board will include connection points for alarm systems provided by others.

Medium temperature systems come with one (1) preprogrammed defrost per day if it needs to run in safe mode and to ensure oil return to the compressor if no demand defrosts are required. All other defrosts are by demand which will be activated by the three (3) factory mounted sensors on the evaporator coil.

COOLER CONDENSER:

Compressors shall be scroll type and shall operate on R-448A refrigerant. Multiple compressors shall be used to satisfy load requirements. Small loads shall be combined in a multiplex arrangement and satisfied using a single compressor. Each compressor unit shall also include dual pressure control, sight glass, liquid line drier and

suction and discharge vibration eliminators. Provide one (1) ZS11KAE Medium temperature, 35° F, pre-assembled remote, scroll outdoor remote refrigeration condenser (1.50 H.P.) with voltage to be 208/3. Low pressure bypass and ambient safety accessories are to be provided on the outdoor condensing units to protect them under extreme outside temperatures of approximately -20° F.

COOLER EVAPORATOR:

Evaporator Coils - Matching evaporators shall be provided as required to complete the system. Evaporators shall be provided with mounted expansion valve and room thermostat. Evaporators shall be provided with the Eco-Smart Controller System. Evaporators shall be off cycle, electric or reverse cycle defrost. Provide one (1) BEL0095 evaporator unit and voltage of 120/1. Low profile evaporator coil with expansion valve, thermostat, and solenoid factory mounted. Evaporators shall be forced air type designed for ceiling installation. Air discharge shall be parallel to the walk-in ceiling. Fan motors, guards, multi-fin, and tube-type coil shall be housed in heavy gauge aluminum housing. Unit shall have drain pan with suitable drainpipe connection. Defrost shall be initiated only when required by demand defrost settings and temperature terminated with built-in fail-safe control. All cooler systems are equipped with an "off cycle" timer to maximize heat transfer and maintain optimum energy efficiency. Evaporators shall be U.L. listed.

Piping Specifications:

- The Food Service Equipment Contractor will perform all refrigeration piping. This Contractor will install all components and piping per the manufacturer's recommendations.
- Line sizes must be appropriately sized for the length of run. If units have reverse-cycle defrost, liquid line shall be upsized one nominal size.
- FSEC will make all final connections to the evaporator and the condenser, charge and test the operation of the system.
- Copper drain lines, heated and insulated where needed, installed by the Food Service Equipment Contractor.

Electrical Specifications:

- Electrical Contractor is to provide final electrical connection to the condenser, evaporator, and lights. Coordinate location with the General Contractor.

Wiring:

- All interior wiring shall be "liquidtight" fittings and sealed to prevent water migration.
- The use of Romex, BX, MC Cable is prohibited and shall be deemed to not meet specifications.
- All control wiring and inter-wiring to be done by the Food Service Equipment Contractor.

Warranty:

The successful bidder shall provide written warranties that specify, subject to normal and accepted use, at a minimum:

- Five Year Compressor Warranty
- Three Year Service / Workmanship Warranty on refrigeration installation.
- One Year Manufacturer's Warranty on all other components.

ITEM: 215

MANUFACTURER: JOHN BOOS

MODEL: ALKR-2060

DESCRIPTION: KEG COOLER RACK (4 UNITS REQUIRED)

- (2) Model #ALKR-60 Keg Rack, 60" wide x 20" deep x 76" high, three (3) shelves, accommodates six (6) kegs, mid and bottom shelves are constructed of 1 3/4" square tubing running front-to-back with a load

rating of 60 pounds per square feet, top shelf is constructed of 1 3/4" square tubing running left-to-right with a load rating of 15 pounds per square feet, 1 5/16" diameter post, aluminum construction.

- (2) Model #ALKR-72 Keg Rack, 72" wide x 20" deep x 76" high, three (3) shelves, accommodates six (6) kegs, mid and bottom shelves are constructed of 1 3/4" square tubing running front-to-back with a load rating of 60 pounds per square feet, top shelf is constructed of 1 3/4" square tubing running left-to-right with a load rating of 15 pounds per square feet, 1 5/16" diameter post, aluminum construction.
- Verify sizes with site conditions.

ITEM: 216

MANUFACTURER: REFRIGERATION DESIGN TECHNOLOGIES

MODEL: ZS2-05Z-CT3-AST

DESCRIPTION: REFRIGERATION RACK

A single rack system is to be manufactured to hold the cooler and freezer compressor units in one housing. The refrigeration system is to be located on the roof of the building.

The refrigeration package shall be pre-engineered, and factory assembled air-cooled unit. The system shall be housed in a weather-protected compact powder coated steel frame. The entire housing shall be brushed stainless steel. The unit shall include an air-cooled aluminum fin copper tube condenser. The exterior housing shall feature stainless-steel one-piece louvers. Lifting points shall be integrated in the frame component. Condenser fan motors shall be mounted within the enclosure. The condenser intake surface shall be protected with stainless steel expanded metal guard to protect against vandalism and hail damage. Each unit shall be equipped with a ball-bearing fan motor, suction filter, sight glass, liquid filter, liquid line inlet and outlet valve, defrost cycle and high-pressure super-hose connections. Each unit shall be equipped with fan motor cycling controls and / or head pressure regulator where required for low ambient conditions. All refrigerant lines shall be extended to outside the housing in a neat and orderly manner. All tubing shall be securely supported and anchored with non-corrosive coated clamps. The package shall have a factory-mounted and pre-wired control panel, with main disconnect where required, circuit breakers, contractors wired for single-point connection.

Provide bottom or side access for the refrigeration lines. F.S.E.C. to coordinate the wind restraints and fastening to the building roof, which will be by other trades.

TURN BUILDING

ITEM: 300

MANUFACTURER: SCOTSMAN

MODEL: HID525A-1

DESCRIPTION: ICE & WATER DISPENSER

Meridian Ice and Water Dispenser, Touch-free infrared dispensing, H2 Nugget Ice, air-cooled, production capacity up to 500 pounds per 24 hours at 70°/50°, 25 pound bin storage capacity, sealed maintenance-free bearings, removable bin, removable air filter, Smooth-Stream water dispensing, removable spouts and sink, enlarged 0.8" sink drain, recessed utility chase, stainless steel evaporator and auger, enlarged 11" dispensing area, USB software upgrade port, unit specific QR code, stainless steel exterior, AgION antimicrobial protection, R-404a refrigerant, UL and NSF listed.

- 120/60/1 with power cord and plug
- One-year parts and labor warranty
- Three-year parts and labor warranty
- Four-year compressor warranty

ITEM: 301

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D2RNSASGD

DESCRIPTION: REACH-IN REFRIGERATOR, TWO SECTIONS

Designer Line Refrigerator, double section, self-contained expansion-valve refrigeration using R290 hydrocarbon refrigerant, automatic electric condensate evaporator, stainless steel exterior and interior, 3" polyurethane foam insulation throughout, standard depth cabinet, full-height glass doors with locks and vertical workflow handles, door hinges are self-closing with a hold open feature, welded corners on all doors, snap in door gaskets, LED lighting, electronic temperature control with exterior digital display, Hi-Low alarm, UL and NSF listed.

- 120/60/1
- Casters
- (2) Additional shelves
- Energy Star
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 302

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: D48N-U

DESCRIPTION: UNDERCOUNTER REFRIGERATOR

Undercounter Refrigerator, reach-in, double section, two field reversible doors, with vertical workflow handles, door hinges are self-closing with a hold open feature, snap in door gaskets, self-contained front breathing and rear mounted expansion-valve refrigeration system using R290 hydrocarbon refrigerant, automatic hot gas condensate evaporator, stainless steel exterior and interior, 2" polyurethane foam insulation, electronic temperature control with exterior digital display, Hi-Low alarm, UL and NSF listed.

- 120/60/1
- 1 3/8" plate casters
- Energy Star
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 303

MANUFACTURER: CONTINENTAL REFRIGERATOR

MODEL: DF48N-U

DESCRIPTION: REACH-IN UNDERCOUNTER FREEZER

Undercounter Freezer, reach-in, double section, two field reversible doors, with vertical workflow handles, door hinges are self-closing with a hold open feature, snap in door gaskets, self-contained front breathing and rear mounted expansion-valve refrigeration system using R290 hydrocarbon refrigerant, automatic hot gas

condensate evaporator, stainless steel exterior and interior, 2" polyurethane foam insulation, electronic temperature control with exterior digital display, Hi-Low alarm, UL and NSF listed.

- 120/60/1
- 1 3/8" plate casters
- Energy Star
- Six-year parts and labor warranty
- Seven-year compressor warranty
- Two-year door gasket warranty

ITEM: 304

MANUFACTURER: APW WYOTT

MODEL: HR-20S

DESCRIPTION: HOT DOG GRILL

Hot Dog Grill, ten (10) slanted chrome surface rollers, infinite controls, removable grease pan, stainless steel exterior, coated steel bottom, UL and NSF listed.

- (2) 120/60/1
- Hot Dog Bun Warmer with (36) bun capacity
- One-year parts and labor warranty

ITEM: 305

DESCRIPTION: SPARE NUMBER

ITEM: 306

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SWS4815

DESCRIPTION: WALL MOUNTED SHELVING (2 EACH REQUIRED)

Solid wall shelf shall be custom built as per General Specifications, approximately 4'0" x 1'3", 16-gauge 304 stainless steel solid shelf with enclosed ends, and 2" up-turn at rear to be tight to the wall.

- Verify mounting height with owner.
- Coordinate wall backing with General Contractor

ITEM: 307

MANUFACTURER: TITAN STAINLESS

MODEL: FS-SC17836-US

DESCRIPTION: SNACK COUNTER

Cabinet Base Snack Counter shall be custom built as per General Specifications, approximately 14'10" x 3'0" x 36" high to work surface, 14-gauge 304 stainless steel top with marine edge, 6" high backsplash at walls with fully enclosed ends. Provide 12"x 14" x 6" deep sink bowl with strainer. Cabinet base to have door section under sink to hide utilities with drain access through bottom shelf. The cabinet base is to have a hinged cabinet door at the sink, allowance for two undercounter units, and open storage cabinets in the balance, stainless-steel bottom shelf, and fixed center shelf. Provide stainless steel gussets and legs with bullet feet and allowance to fasten table to the wall or the floor.

- Provide allowance under the counter for the undercounter refrigerator and freezer.
- Seal the unit to the wall.
- Coordinate backsplash height with wall receptacles.
- (1) T&S Brass, Model #B-0325-CR, deck mount, 4" adjustable centers, 5-3/4" swivel gooseneck spout with Series 1 stream regulator outlet (includes lock washer to convert to rigid), lever handles with color-coded indexes, quarter-turn Cerama cartridges with check valves, polished chrome-plated brass body & tubular spout, 1/2" NPT female inlets, low lead.
 - (1) T&S Model #B-0425-M Supply Nipple Kit, includes one (1) 1/2" NPT x 2" long inlet supply nipple, one (1) 1/2" locknut washer and one (1) 1/2" locknut, brass (2 each per master pack).
 - (2) T&S Brass Model #B0425 KIT, 24" flex supply hoses.

END OF SECTION 114000

SECTION 122413

ROLLER WINDOW SHADES

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Electrically operated window shades.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Product Data: Indicate components, materials, finishes, attachment, and operation.
 - 2. Samples:
 - a. 12 x 12 inch shade cloth samples showing selected colors.
 - b. 3 x 3 inch paint samples showing available colors.
 - c. Roller hardware finish samples, showing available finishes.
- B. Closeout Submittals:
 - 1. Operation and Maintenance Data.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 2 years documented experience in work of this Section.
- B. Electrical Components: Listed by testing agency acceptable to authorities having jurisdiction, marked for intended use.
- C. Mockup:
 - 1. Size: One typical manual and electrically operated shade unit.
 - 2. Locate where directed.
 - 3. Include window shade, operator and controls, fascia and blackout channels, and accessories.
 - 4. Approved mockup may remain as part of the Work.

1.4 PROJECT CONDITIONS

- A. Site verify required shade dimensions prior to fabrication.
- B. Do not install shades until painting and finishing work is complete and ambient temperature and humidity conditions are maintained at occupancy levels.

1.5 WARRANTIES

- A. Furnish manufacturer's warranties providing coverage for:
 - 1. 10 years against deterioration, sag, and warp of shade cloth.
 - 2. 10 years against defective hardware.
 - 3. 5 years against defective motors and controllers.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on products by MechoShade Systems, Inc. (www.mechoshade.com)
- B. Substitutions: Under provisions of Division 01.

2.2 MANUFACTURED UNITS

- A. Window Shades:
 - 1. Source: Electroshade Motorized Shade Systems by MechoShade Systems, Inc., or approved substitute.
 - 2. Operation: Electronic drive unit housed inside head tube.
 - 3. Shadecloth orientation: Regular rolling with shade cloth falling on window side of roller.
 - 4. Mounting: Wall and Overhead.
 - 5. Head tube: Extruded aluminum.
 - 6. Fascia: Extruded aluminum.
 - 7. Blackout channels: Extruded aluminum; side and sill.
- B. Shade Cloth:
 - 1. Fabric hem pocket with RF-welded seams and hem weights concealed in continuous sealed hem pocket.
 - 2. Fabricate with heat-sealed trimmed edges to hang straight without curling or raveling.
 - 3. Provide battens when required to ensure proper tracking and uniform rolling of shade cloth.
 - 4. Fabricate shade cloth to completely fill openings from head to sill and jamb-to-jamb.
 - 5. Fabricate shade cloth to hang flat without buckling and distortion.
- C. Electric Operator:
 - 1. Motor:
 - a. IQ2 by MechoShade Systems, Inc., or approved substitute.
 - b. UL listed, asynchronous, tubular type, thermally protected, totally enclosed, with built-in reversible contactor.
 - 2. Total hanging weight of shade not to exceed 80 percent of rated lifting capacity of motor and tube assembly.
- D. Controls: UL listed, double pole, double throw master switch.

2.3 FINISHES

- A. Fabric:
 - 1. Source: Themoveil 2100 10% openness.
 - 2. Color: To be selected by Architect.
 - 3. Usable width: Verify in field.
- B. Aluminum: Baked enamel, color to be selected from manufacturer's full color range to match window mullion finish.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions.
- B. Provide adequate clearances to allow for proper operation.
- C. Place units to locate shade cloth minimum 2 inches from interior face of glass.
- D. Locate controls where directed.
- E. Install conduit and wiring between power supply, controls, and operators.

3.2 ADJUSTING

- A. Adjust shades for smooth, quiet operation.

END OF SECTION

SECTION 123600

COUNTERTOPS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Countertops.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 079200 - Joint Sealants.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings: Include location and sizes of pieces, arrangement and size of joints, and other details of installation.
 - 2. Samples: 12 x 12 inch countertop samples showing color and finish.

1.3 QUALITY ASSURANCE

- A. Fabricator and Installer Qualifications: Minimum 3 years experience in work of this Section.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store countertops off ground; prevent contact with materials that could cause staining or damage.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Countertops:
 - 1. Material: Refer to Finish Schedule.
 - 2. Provide back splashes to match countertops where indicated in Drawings

2.2 ACCESSORIES

- A. Adhesive: Gun grade; type recommended by countertop supplier.
- B. Joint Sealant: Specified in Section 079200.
- C. Cleaner: Type recommended by countertop supplier.
- D. Sealer: Type recommended by countertop supplier if required.

2.3 FABRICATION

- A. Cut countertops accurately to required shapes and dimensions, with joints dressed straight and square.
- B. Fabricate countertops for uniform coloration between adjacent units and over full area of installation.
- C. Finish exposed edges to smooth, uniform profile as indicated in the Drawings.
- D. Fabricate with hairline joints.

- E. Cut or saw bed and joint surfaces square for full thickness of unit.
- F. Backs: Sawn, fiberglass mesh backed.
- G. Fill fissures with mixture recommended by countertop supplier; finish flush.
- H. Make provisions to accommodate items attached to countertops.
- I. Fabrication Tolerances:
 - 1. Variation in width or height: Plus or minus 1/16 inch.
 - 2. Variation in thickness: Plus or minus 1/8 inch.
 - 3. Variation from true plane: Plus or minus 1/16 inch in 3 feet.

PART 3 EXECUTION

3.1 PREPARATION

- A. Clean countertops prior to installation. Do not use wire brushes or implements that can mark or damage exposed surfaces.
- B. Wet absorptive countertops in preparation for placement to minimize moisture suction from mortar.

3.2 INSTALLATION

- A. Install in accordance with approved Shop Drawings.
- B. Arrange countertop pattern to provide color uniformity and hairline joints throughout.
- C. Set countertops plumb and level. Align adjacent pieces in same plane.
- D. Obtain approval prior to cutting or fitting any item not so indicated on Drawings. Do not impair appearance or strength of countertops by cutting.
- E. Adhere countertops to supports with continuous beads of adhesive.
 - 1. Apply adhesive in accordance with manufacturer's instructions.
 - 2. Press countertops to full bond with adhesive.
- F. Fill joints in countertops and between countertops and adjacent construction with sealant as specified in Section 079200; finish flush with face of countertops.
- G. Installation Tolerances:
 - 1. Maximum variation from level and plumb: 1/8 inch in 10 feet, noncumulative.
 - 2. Maximum variation in plane between adjacent pieces at joint: Plus or minus 1/16 inch.

3.3 CLEANING

- A. Clean countertops with stiff brushes and water.
- B. If initial cleaning does not produce acceptable results, apply cleaner in accordance with manufacturer's instructions.
 - 1. Prior to applying, clean sample panel in area as directed by Architect. If approved, use same materials and techniques for cleaning remainder of countertops.
 - 2. Protect adjacent surfaces.
 - 3. Thoroughly rinse surfaces with clean water after completion of cleaning; remove all traces of cleaning solution.

3.4 SEALING

- A. If sealer is recommended by countertop manufacturer, apply sealer in accordance with manufacturer's instructions.

3.5 PROTECTION

- A. Protect countertops with nonstaining sheet coverings.

END OF SECTION

SECTION 220000

PLUMBING

PART 1 – GENERAL

1.1 DESCRIPTION

- A. The General Provisions of the Contract, including the General Requirements, Supplementary Conditions and Special Conditions, are hereby made a part of this Section as if fully repeated herein.
- B. Scope of Work: Work included under this section of the specifications shall include complete plumbing systems as shown on the drawings and as specified herein.
 - 1. Trench excavation, pumping, backfilling and compaction for underground piping and plumbing.
 - 2. Soil, waste and vent piping.
 - 3. Domestic hot and cold water piping.
 - 4. Fixtures.
 - 5. Water coolers.
 - 6. Water heaters and water heater drain pans.
 - 7. Fittings, hangers, valves, sleeves, escutcheons, etc.
 - 8. Lead flashing.
 - 9. Insulation.
 - 10. Backflow preventer.
 - 11. Roof drainage system.
 - 12. Circulating pumps.
 - 13. Sump pumps.
 - 14. Grease interceptor.
 - 15. Lint interceptor
 - 16. Controls.
 - 17. Gas piping system.
 - 18. Connections to equipment furnished and installed by others.
 - 19. Installation of and connection to equipment furnished by others.
 - 20. Disinfection of potable water piping.
- C. Related Work: The following work is specified in other sections of these specifications.
 - 1. Power wiring: Electrical - 260000.
- D. Point of Connection: Underground water and sanitary piping shall commence where shown on the drawings. Water meter will be furnished by the Water Utility Co. where shown on the drawings. Provide backflow prevention device in accordance with governing regulations. Provide and install insulation for backflow preventer to prevent freeze or as required.
- E. Prior to start of any work, the successful Contractor shall meet with the Architect to determine that no questions remain concerning the intent of the drawings or specifications. The Contractor shall bring up for discussion and decision any questions concerning the project. No work shall be performed prior to this meeting. The Architect shall set the date, time, and place of conference.

1.2 CODES, ORDINANCES AND PERMITS

- A. Comply with all codes applying to the Work of this contract including Florida Building Code 2020, Florida Building Code 2020 - Mechanical, Florida Building Code 2020 - Plumbing, Florida Building Code 2020 - Fuel Gas. Obtain information on all code restrictions and requirements. In case of

conflict between the contract documents and a governing code or ordinance, such conflict shall be immediately brought to the attention of the Architect for resolution. Extra payment will not be allowed for Work required by code restrictions except through written agreement with the Owner.

- B. Apply for, obtain, and pay for all required permits and inspection certificates. Final payment is contingent upon delivery of such certificates to the Architect.
- C. Where applicable, all materials and equipment shall bear the Underwriters' Laboratories seal or ASME code stamp. Certificates to this effect shall be furnished to the Architect upon request.

1.3 SITE INSPECTION

- A. Visit the site and thoroughly inspect conditions affecting the Work before submitting bid. Assume responsibility for meeting all existing conditions including access and workspace limitations.

1.4 DRAWINGS AND SPECIFICATIONS.

- A. Refer to the general construction drawings which are bound with the drawings of this Work for construction details, elevations, etc. Architectural and structural drawings shall take precedence over plumbing drawings. It is the intent of the plumbing drawings to show the general arrangement of the system and not to indicate all offsets, fittings and accessories which may be required, nor to show exact locations of piping, fixtures or equipment except where actual dimensions are given. All vertical piping shall be located in walls in finished spaces unless otherwise noted.
- B. Specifications and drawings shall be considered as supplementary to each other, requiring materials and labor indicated, specified, or implied by either specifications or drawings. It is the intent of the drawings and specifications to call for finished Work, tested, and ready for operation, and in complete conformance with all applicable codes, rules and regulations. Minor details not usually shown nor specified, but manifestly necessary for the proper installation and operation of the various systems, shall be included in the Work and in the bid proposal, the same as if specified or shown on the drawings.
- C. If any departures from the drawings and specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted to the Architect for approval. No departures shall be made without prior approval of the Architect.

1.5 APPROVED MANUFACTURERS

- A. Specific reference in the specifications to any article, device, product, material, fixture or type of construction, etc., by proprietary name, make or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Equal products may be submitted for approval to be used subject to compliance with requirements set forth in the General Requirements, Division 1, and, if applicable, in the Instructions to Bidders.

1.6 MANUFACTURER'S SPECIFICATIONS

- A. Where the name of a concern or manufacturer is mentioned on the drawings or in specifications in reference to his required service or product, and no qualifications or specification of such is included, then the material gauges, details of manufacturer, finish, etc., shall be in accordance with his standard practice, directions or specifications. The Contractor shall be responsible for any infringement of patents, royalties or copyrights which may be incurred thereby.
- B. Equipment scheduled on the drawings was used to arrive at space, maintenance, and utility service. If other equipment is submitted and approved, take responsibility for maintaining these space, maintenance, and utility service requirements and cost for any resulting changes including cost to change electrical service required by substituted equipment.

- C. All materials and equipment shall be new and first class in every respect. As far as is practical, similar products shall be by one manufacturer.
- D. All products designed for dispensing potable water must meet both the NSF 61 and NSF 372 test standards via third-part testing and certification.

1.7 SUBMITTALS

- A. Submit shop drawings in accordance with the General Requirements, Division 1.
- B. Samples of any plumbing equipment or materials shall be submitted if requested by the Architect. If a sample is requested, have the sample delivered to the Architect or arrange for the Architect to examine it elsewhere. Failure to comply may be cause for rejection.
- C. Submit shop drawings or catalog data for the Architect's approval before purchasing or installing the following:
 - 1. Piping (where revised from the drawings).
 - 2. Fixtures.
 - 3. Water coolers.
 - 4. Water heaters and water heater drain pans.
 - 5. Valves and appurtenances.
 - 6. Pipe hangers.
 - 7. Insulation.
 - 8. Backflow preventer.
 - 9. Floor drains and trap primers.
 - 10. Roof drains.
 - 11. Circulating pumps.
 - 12. Sump pumps.
 - 13. Controls.
 - 14. Grease interceptor.
 - 15. Lint interceptor.
 - 16. Thermostatic mixing valves.

1.8 PERFORMANCE DATA

- A. All performance data specified herein shall be considered actual performance of equipment as installed. Make suitable allowances if installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated.

1.9 CATALOG, OPERATION AND MAINTENANCE DATA

- A. Provide four (4) complete sets of a compilation of catalog data of each manufactured item of fixtures and equipment used in the Plumbing Work. In addition to the catalog data, installation, operating and maintenance data and bill of materials for all operating equipment shall be submitted. Each of the four sets of data shall be bound in loose leaf binders and submitted to the Architect before final payment is made. A complete double index shall be provided as follows:
 - 1. Listing the products alphabetically by name.
 - 2. Listing the names of manufacturers alphabetically by name together with their addresses and the names and addresses of local sales representatives.
- B. It is the intent of this catalog, operation and maintenance data to provide the Owner with complete instructions on the proper operation and use, lubrication and periodic maintenance, together with the source of replacement parts and service, for the items of equipment covered.

1.10 CONTRACTOR COORDINATION

- A. The Electrical Contractor shall furnish, set and wire all controls, disconnect devices, and starters as required for all equipment except for those items furnished with integral controls, disconnect devices, and/or starters.
- B. Furnish detailed information to the Electrical Contractor on power wiring requirements for all plumbing equipment actually purchased as soon as practical. This shall include all diagrams and instructions necessary for the Electrical Contractor to make connections properly. If equipment actually purchased requires larger electrical service than equipment scheduled, arrange and pay for required electrical service change.
- C. Coordinate location of equipment and piping with Electrical, Fire Protection and HVAC Contractors to maintain clearance for equipment maintenance, avoid interference with duct and HVAC piping runs, and to prevent piping from being installed over electrical panels. If interference develops, the Architect will decide which equipment, conduit, duct, piping, etc., must be relocated regardless of installation order. Take responsibility for relocating Plumbing work, if so ordered, including all associated costs.
- D. Within 30 days following award of the contract, report to the Architect in writing, all real or potential errors, ambiguities and/or conflicts on the Plumbing Work or between the trades and obtain an agreement with the Architect on a solution. Those reported after 30 days, except as a result of unforeseen circumstances, shall be resolved at the discretion of the Architect. Report conflicts resulting from the progress of Work to the Architect immediately or accept the expense for corrective work caused by failure to report such a conflict. Do not make any changes in design without the written approval of the Architect. Changes in design means any change which will affect the capacity, reliability, operation or safety of the systems or any parts thereof, including changes which may be required to conform to local regulations or codes.

1.11 CONTRACTOR'S WARRANTY

- A. Provide written warranties as specified in the General Requirements, Division 1, and repair any defects becoming apparent within the warranty period as directed by the Architect.

1.12 PROTECTION

- A. Protect all materials and equipment against damage and vandalism during construction. Replace any damaged material or equipment and place the systems in perfect working condition.

PART 2 - PRODUCTS

2.1 FIXTURES

- A. Fixtures including faucets, valves, drains, and trim, shall be as scheduled on drawings. Approved manufacturers are Acorn, American Standard, Bradley, Chicago, Crane, Delta, Eljer, Elkay, Just, Kohler, Plumbingwaire, Speakman, T & S.
- B. Flush valves shall be American Standard, Delaney, Sloan, Toto or Zurn.
- C. High temperature caulk shall be used on all sinks and lavatory strainers.

2.2 WATER COOLERS

- A. Water coolers shall be as scheduled on drawings. Approved manufacturers are Oasis, Elkay, Halsey Taylor.

2.3 WATER HEATERS AND DRAIN PANS

- A. Water heaters shall be as scheduled on drawings. Approved manufacturers are A.O. Smith, State, Lochinvar, Rheem, Bradford White.
- B. Drain pans for gas water heaters shall be minimum 2" deep with molded and sealed corners and shall be fabricated from 24 gage (0.0236") galvanized steel.
- C. Roof vent for gas fired water heater shall be solid wall PVC installed per manufacture instruction.

2.4 PIPE

- A. Soil, waste and vent piping above and below grade shall be solid wall DWV polyvinyl chloride (PVC), Schedule 40, solvent weld joints. Exposed sanitary piping under lavatories shall be chrome plated copper/brass. Soil and waste piping receiving high temperature waste above grade shall be spun service weight cast-iron, no hub, joints made with stainless steel clamps and neoprene gaskets. Soil and waste piping receiving high temperature waste below grade shall be spun service weight cast-iron, hub and spigot pattern joints made with elastomeric compression gasket. All cast iron pipe and fittings shall be made in the United States, marked with the collective trademark of Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International. PVC piping located in return air plenum shall be insulated to comply with local Fire Marshall requirements.
- B. Forced main piping (FM) shall be solid wall Pressure Rated polyvinyl chloride (PVC), conforming to ASTM D 2241, material shall conform to ASTM D 1784, Cell Class 12454 and a hydrostatic design stress of 2000 psi. The minimum pressure/SDR rating shall be Class 200/SDR 21 suitable for use at minimum working pressures of 200 psi at 73 deg. F. For piping 1-1/2" to 2", fittings to be installed in conjunction with the force main piping shall be of the same material and quality as the pipe and have joints as described in this section. The fittings shall be designed to withstand the same pressures required for the pipe. The supplier shall be capable of supplying fittings with combinations of spigot (plain) end and bell. For piping 3" and larger, fittings to be installed in conjunction with the force main piping shall be restrained joint ductile iron fittings conforming to ANSI A21.10/AWWA C110 and ANSI A21.22/AWWA C111. Restrained joints shall be Megalug style for PVC as manufactured by EBAA Iron, or approved equal. The joints shall be bell end coupling push-on type with joint restraints as needed. The push-on joint and gasket shall meet the requirements for ASTM D3139 and F 477.
- C. Cellular Core (Foam Core) piping is not acceptable.
- D. Cold and low temperature hot water supply piping above and below grade shall be chlorinated polyvinyl chloride (CPVC), solvent weld joints, suitable for use at minimum working pressure of 160 PSI at 73 deg. F. and 100 PSI at 180 deg. F. Pipes 1/2" thru 2" shall be CPVC-CT (copper pipe size) meeting test requirements of SDR 11. Pipes larger than 2" shall be CPVC Schedule 80 with Schedule 80 fittings. Exposed hot and cold water piping under lavatories and sinks shall be chrome plated copper/brass.
- E. High temperature hot water piping above grade shall be Type "L" hard copper with cast or wrought solder joint fittings. Exposed hot and cold water piping under lavatories and sinks shall be chrome plated copper/brass.
- F. Gas piping above grade shall be schedule 40 black steel with black 150 pound malleable iron screw fittings. Below grade piping outside building shall be schedule 80 black steel protected by approved coal tar shellac with coal tar base wrapping. Below grade piping inside building shall be installed in schedule 40 black steel conduit vented to exterior of building. Conduit shall be protected by approved coal tar shellac with coal tar base wrapping.
- G. Roof and storm drainage piping located in supply or return air plenums shall be service weight cast-iron, no hub, joints made with stainless steel clamps and neoprene gaskets. All cast iron pipe and fittings shall be made in the United States, marked with the collective trademark of Cast Iron Soil Pipe Institute (CISPI) and be listed by NSF International.

- H. Roof and storm drainage piping above and below grade not located in supply or return air plenums shall be solid wall DWV polyvinyl chloride (PVC), Schedule 40, solvent weld joints.

2.5 DIELECTRIC UNIONS

- A. Use dielectric unions when joining dissimilar metals.

2.6 FLOOR DRAINS AND TRAP PRIMERS

- A. Floor drains shall be as scheduled on drawings and shall have perforated or slotted strainers, outlets same size as waste pipe to which connected, cast-iron body with inside caulk connection, and deep seal trap. Strainers shall be minimum size required for sanitary pipe size indicated. Provide ductile iron grates for heavy traffic areas. Approved manufacturers are Ancon, Josam, Smith, Wade, Zurn.
- B. Trap primers shall be as scheduled on drawings. Pressure drop activated trap primers shall be Mifab model M1-500 with model MI-DU distribution unit (where required).

2.7 INTERIOR HOSE BIBS AND FREEZELESS EXTERIOR WALL HYDRANTS

- A. Interior hose bibs shall be angle type, all brass 3/4" inlet, with vacuum breaker and box with locking cover for recessed installation in wall or floor.
- B. Freezeless wall hydrant shall have 3/4" hose nozzle, loose operating key, compression type valve seat, vacuum breaker, and box for recessed installation in wall or floor.
- C. Approved manufacturers are Woodford, Prier, J. R. Smith and Zurn.

2.8 SHOCK ABSORBERS

- A. Shock absorbers shall be bellows or piston type water hammer arrestors. Closed end, vertical standpipe air chambers will not be accepted. Water hammer arrestors shall be sized and installed in accordance with PDI standards and the manufacturers specifications. Access shall be provided to water hammer arrestors.

2.9 CLEANOUTS

- A. Floor cleanouts shall be cast-iron with adjustable housing, ferrule with plug, with round secured nickel brass scoriated top for finished concrete floors (including those covered by carpeting) and round secured nickel brass recessed top for vinyl tile floors and carpeted floors. Ductile iron tops for heavy traffic areas.
- B. Wall cleanouts shall be screw type with chromium plated bronze or stainless steel access cover plates designed to be installed outside wall finish material.

2.10 VALVES

- A. Valves offered under these specifications shall be limited to the products of a type regularly produced for the service and capacities specified and shall be lead free. Ratings shall be in accordance with the manufacturer's latest literature available. Valves shall be line size unless specifically shown otherwise. All equipment service valves and all shut-off valves 2" and smaller shall be bronze body full port ball valves with stainless steel ball and reinforced TFE (Teflon) seat.
- B. All shut-off valves 2-1/2" and larger shall be gate valves with flanged ends, Class 125, iron body, bronze mounted, bolted bonnet, rising stem, OS & Y, solid wedge.

- C. Check valves shall be vertical lift check with bronze disc for vertically mounted valves and swing check, horizontal swing bronze disc with screw cap for horizontally mounted valves.
- D. Throttling valves shall generally be globe pattern, unless otherwise shown on drawings.
- E. Drain valves for all lines shall be 1/2" size, 200 pound, bronze globe valves with threaded ends and hose thread adapter nipple.
- F. Balancing valves for use in domestic hot water recirculation systems shall be lead free brass construction with stainless steel ball and TFE (Teflon) seat. Balancing valves shall be of the low-flow, bi-directional type with position indicator, memory stop feature, and shall be calibrated and sized for flows indicated on the Plumbing drawings, with minimum pressure drop across valve. Install balancing valves in accordance with Manufacturers instructions and guidelines.
- G. Plastic valves are not acceptable.
- H. Approved manufacturers are Apollo, Armstrong, Bell & Gossett, Brass Craft, Capital, Crane, Delany, Delta, Dunham Bush, Jamesbury, Jomar, Milwaukee, Nibco, Sloan, Stockham, T & S, Walworth, Watts, Zurn.

2.11 PIPE HANGERS

- A. Hangers and supports specified by "Type" herein shall be designed and manufactured in accordance with the Manufacturers Standardization Society of Valve and Fittings Industry (MSS) Publication SP-58 and shall be selected and applied in accordance with the Manufacturers Standardization Society of Valve and Fittings Industry (MSS) Publication SP-69.
- B. Pipe hangers shall be galvanized steel hangers selected within the manufacturer's published load ratings and shall be Auto-Grip, Fee and Mason, or Grinnel. Pipe 2-1/2 inches and smaller shall be MSS Type 7, 10. Pipe 3 inches and larger shall be MSS Type 1, 260.
- C. Hanger rods shall be galvanized steel threaded both ends or continuous thread, sized with safety factor of five (5). Approved: Grinnell Fig. 140 or 146. Rods for trapeze hangers supporting several pipes shall be sized for the total piping load.
- D. Hangers for copper pipe shall be either copper-plated type or pipe contact area shall be plastic coated to prevent direct contact between the pipe and hanger.
- E. Supports for insulated pipes shall have insulation shields MSS Type 40.
- F. Beam clamps shall be MSS Type 29.
- G. Inserts:
 1. Preset Type: Malleable iron with removable interchangeable nuts having lateral adjustment of not less than one and five-eighths inch. Continuous inserts shall have a capacity of 2000 lb. per foot and shall be hooked over reinforcing. Approved: C-B Universal Fig. 282; Unistrut Products Co., P-300; Brinkley B32-1.
 2. After Set Type: Self-drilling style expansion shells shall be used in concrete and brick. Toggle bolts shall be used on block walls and partitions. Approved: Phillips Drill Co. "Red Head"; Raul "Saber Tooth" and "Spring Wings".
 3. Power Actuated After Set Features: Pin and stud anchors shall have a withdrawal resistance four times the indicated load. Approved: Hilti Fastening Systems, Hilti, Inc.; Ramset Fastening Systems, Olin Corp.
- H. Use vibration isolators in hanger rods to isolate vibration in piping subject to vibration, or where shown on drawings.

2.12 SECONDARY PIPE POSITIONING AND SUPPORTS:

- A. Makeshift, field devised methods of plumbing pipe support, such as with the use of scrap framing materials, are not allowed. Support and positioning of piping shall be by means of engineered methods that comply with IAPMO PS 42-96. These shall be Hubbard Enterprises/HOLDRITE support systems or Owner-approved equivalent.
- B. For plenum applications use pipe supports that meet ASTM E-84 25/50 standards, such as the Hubbard Enterprises/HOLDRITE Flame Fighter™ or Owner-approved equivalent.
- C. For vertical mid-span supports of piping 4" and under, use Hubbard Enterprises/HOLDRITE Stout Brackets™ with Hubbard Enterprises/HOLDRITE Stout Clamps or two-hole pipe clamps (MSS Type 26).

2.13 SLEEVES AND ESCUTCHEONS

- A. Sleeves shall be 18 gauge galvanized steel or pre-formed plastic. Sleeves shall be sized to allow approximately 1/8" gap around the pipe or its insulation.
- B. Sleeves through floor slabs or fire walls shall be galvanized steel pipe of proper size. Sleeves through floor slabs shall extend 1/2" above the finished floor.
- C. Sleeves penetrating fire-rated walls, floors or ceilings shall be filled with fire-rated material capable of maintaining the fire-resistance rating of the wall, floor or ceiling.
- D. Escutcheon plates for finished spaces shall be nickel-plated.

2.14 EQUIPMENT, VALVE AND PIPE IDENTIFICATION

- A. All identification legends, arrows and color bands shall be stenciled on pressure-sensitive labeling material approved by the Architect. Labeling material colors for use on piping shall be as specified in ANSI A 13.1 latest revision.
- B. Valve tags shall be plastic, aluminum or brass at least 1" in diameter and stamped with contrasting colored figures as large as possible.
- C. Pipe markers shall be Seton style RPM or approved equal.

2.15 INSULATION

- A. Piping insulation shall be pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to AP Armaflex, AP Armaflex SS, IMCOA Imolock or NOMACO Nomalock, and installed in accordance with manufacturer's instructions. Pre-formed Owens-Corning 3.5 pound density fiberglass pipe insulation with all service jacket and self-sealing lap will be approved for pipe installed in dry locations. Insulation thicknesses shall be as follows:
 - 1. Cold water: 1/2" thick.
 - 2. Hot water: 1" thick.
 - 3. All PVC piping located in supply or return air plenums: 1/2" thick. Insulation shall meet all state and local code requirements for plenum use.
 - 4. Underside of roof drains and horizontal piping up to down-stream end of last elbow: 1/2" thick.
 - 5. All horizontal primary condensate drains within unconditioned areas shall be insulated with 1/2" thick pipe insulation to prevent condensation from forming on the exterior of the drain pipe.

6. When required by the Local Authority Having Jurisdiction (AHJ), all PVC piping located within ceilings shall be insulated with 1/2" thick pipe insulation. Insulation shall meet all state and local code requirements for plenum use. Contractor shall coordinate requirements with local Building Official prior to bid.

B. At all exposed piping under handicapped lavatories in rest rooms, provide pre molded vinyl Insulation. Insulation shall be "Handi Lav-guard" insulation kits as manufactured by Truebro Inc. or approved equal. Truebro Inc. phone no. is (203) 875-2868.

C. All insulation materials and coatings shall meet flame spread and smoke developed ratings per NFPA Bulletin 90-A when tested in accordance with ASTM Standard E 84 and shall meet local requirements for use in return air plenums. Smoke developed less than or equal to 50, and flame spread less than or equal to 25. All coatings and mastics shall be nonflammable in wet state.

2.16 LEAD FLASHING

A. Lead flashing shall be sheet lead weighing 4 pounds per square foot for all pipe flashing through roof.

2.17 EQUIPMENT SUPPORTS

A. Equipment supports shall be sized and designed to support the equipment and shall be hot-dip galvanized steel.

2.18 GREASE AND LINT INTERCEPTOR

A. Grease and lint interceptors shall be as scheduled and detailed on drawings.

2.19 ROOF DRAINS

A. Roof drains shall be cast-iron with large sump, flashing clamp, removable cast-iron or aluminum dome, deck clamp and sump receiver.

2.20 PUMPS

A. Pump type, capacity and electrical characteristics shall be as indicated on drawings. Approved manufacturers are QuantumFlo, Bell & Gossett, Grundfos, Taco, Delta P Systems.

B. All connections to domestic water booster pumps shall be made with flexible connections with isolation dampeners.

2.21 STRAINERS

A. Strainers shall be self-cleaning and of same size as pipe lines in which they are installed and shall be Webster, Sarco, Dunham, Hoffman, Illinois, or approved equal, Y type with 125 pound iron body, screwed connections to 2" in size and flanged ends for larger sizes.

B. Screens for water strainers shall be perforated Monel cylinders with 3/64" perforations.

C. Water strainer 2" and larger shall have a 3/4" valved blow-down connection extended full size to discharge over the nearest accessible floor drain.

2.22 MOTORS

- A. Full Load Motor Efficiencies: All motors installed in equipment specified in these specifications shall be classified under the National Electric Manufacturers Association's Standard as "energy efficient" or shall otherwise meet the requirements of the Florida Energy Code.
- B. Except where otherwise specified, all motors shall be designed for continuous service and for regular starting on full-line voltage with normal starting current. The limits on service factor and temperature rise above 40 deg. C. ambient at rated load shall be as follows:

Motor Enclosure	Service Factor	Temperature Rise
Drip-Proof	115%	40 deg. C.
Totally Enclosed	None	55 deg. C.

- C. The insulation portion of the motor leads between the lug and motor frame shall be at least 5" in length when four or less motor leads are used and at least 8" in length when more than four motor leads are used. When terminal type lugs are supplied, they shall be solderless, Burndy "Hy-Dent" type or approved equal.
- D. Motors shall be furnished for operation as specified or as noted on drawings. All motors shall conform to IEEE, NEMA and ANSI standards and shall be General Electric, Westinghouse, Louis Allis.
- E. Motors furnished for indoor installation shall be of the open, drip-proof design. Motors furnished for installation in wet locations or outdoors shall be of the totally-enclosed design. Motors furnished for installation in hazardous locations shall be of the explosion-proof design

2.23 ACCESS DOORS

- A. Access doors shall be as similar to those manufactured by Milcor Division of Inland-Ryerson of type as follows:

1. Door Location	Door Type
2. Drywall	Style "DW"
3. Masonry or Tile	Style "M-Stainless"
4. Acoustical Tile	Style "AT"
5. Plaster	Style "K"
6. Fire Rated Walls/Ceilings	Style "Fire Rated"
- B. Each door shall be equipped with two flush, screwdriver operated, cam latches and, other than Style "M", shall be finished to match adjacent surface. Door sizes shall be applicable to access required for normal service.

PART 3 - EXECUTION

3.1 INSTALLATION OF THE WORK

- A. Examine the site and all drawings before proceeding with the layout and installation of the Work. Locate all vertical piping within walls in finished spaces unless specifically noted otherwise. Such piping cannot always be shown within walls on drawings due to their small scale.
- B. Arrange the Work essentially as shown, exact layout to be made on the job to suit actual conditions. Confer and cooperate with other trades on the job so all Work will be installed in proper relationship and coordinate precise location of parts with the Work of others.
- C. Arrange for required chases, slots and openings with the General Contractor including locations of required pipe sleeves through walls and foundations. Assume liability for cutting or patching made necessary by failure to make proper arrangements in this respect.

- D. Indicated equipment connections are necessarily based on equipment of a given manufacture. Assume responsibility for proper arrangement of piping, ducts, etc. to connect approved equipment in a proper and approved manner. Follow equipment manufacturer's detailed instructions and recommendations in the installation and connection of all equipment. In case of conflict between manufacturer's instructions and the contract documents, notify the Architect before proceeding. No equipment installation or connections shall be made in a manner that voids the manufacturer's warranty.
- E. Install all Work in a neat and workmanlike manner, using only workmen thoroughly qualified in the trade or duties they are to perform. Rough Work will be rejected.

3.2 EXCAVATION, BACKFILLING AND PUMPING

- A. Cutting and replacement of concrete floors will be completed by the General Contractor.
- B. Excavate, back-fill and compact all trenches required for underground plumbing work. Maintain trenches free of water until installation is complete and provide all necessary shoring.
- C. Contractor shall field verify all existing underground utilities and avoid damage to same. Where existing utilities are damaged, the contractor shall be responsible for all repairs or replacement.
- D. Excavate trenches suitable in width to provide a minimum of 6" clear space between the barrel of the pipe and the trench wall on both sides of the pipe. Accurately grade the trench bottom to provide uniform bearing and support for each section of the pipe on undisturbed soil at every point along its entire length. Take care not to excavate below the depth necessary and excavate bell holes to ensure proper bedding. Backfill over-depths with loose, granular, moist material and thoroughly compact to the depth required.
- E. Place and compact backfill material in 6" layers until the pipe has a minimum cover of 12". Place and compact the remaining material in 12" layers. Grade the surface to a reasonable uniformity and leave the mounding in neat condition as approved by the Architect.
- F. Backfill all trenches passing under foundations with concrete to the underside of the foundation and at a 2:1 slope away from each side of the foundation. Backfill all trenches that are parallel and deeper than foundations with concrete to a point that will place the top of the concrete on a 2:1 slope away from the foundation bottom. Do not backfill trenches until all required tests and inspections are completed.

3.3 PIPE INSTALLATION – GENERAL

- A. Install all piping in a workmanlike manner, according to the best practice of the trade, properly pitched and vented to eliminate air pockets or traps, and to ensure rapid and noiseless circulation throughout the entire system. Run all piping parallel with or at right angles to building walls and partitions. Run all vertical piping within walls in finished spaces unless noted otherwise.
- B. Install all piping so as not to interfere with any electric lighting outlets, ductwork, other piping, or equipment. Do not install piping in front of any door or window and avoid interference with any such openings. Do not install any piping over any motors, transformers, electrical panels, or other electrical equipment.
- C. Cut pipes accurately to measurements established at the building and install without springing or forcing. Cut piping square and remove all burrs and fins before assembling. Use standard fittings for all reductions in size and changes in direction. Mitering of pipe to form elbows or reducers will not be permitted. Thoroughly clean all piping before installation and make sure the piping is free of all foreign material after installation.

- D. Because of the small scale of the drawings, it is not possible to indicate all offsets, fittings and valves. Carefully investigate all conditions affecting the Work to avoid interferences between pipes, ducts, valves, conduits, electrical fixtures and equipment and install as conditions may dictate as part of this contract.
- E. Install all piping in cabinets and vanities as tight to the rear of the cabinet or vanity as possible to provide full utilization of the cabinet or vanity for storage.

3.4 PIPE INSTALLATION

- A. Sanitary Piping: Locate and size sanitary piping within the building where not shown on the drawings in accordance with applicable plumbing code. Flash all vents passing through roof with sheet lead flashing extending a minimum of 6" out around base and a minimum of 6" up the stack into a cast-iron flashing collar. Support all soil and vent stacks at the base by means of piers or heavy hangers close to the bottom of the riser and at each floor by means of heavy iron clamps. Pitch all 2 1/2" and smaller drain piping at least 1/4" per foot and 3" and larger drain piping at least 1/8" per foot unless otherwise noted.
- B. Fixtures, Floor Drains and Cleanouts: Provide all fixtures and floor drains with traps to comply with local regulations and as hereinafter specified. Provide exposed traps with brass cleanout plugs. Provide floor drains with trap primers connected as shown on drawings. Provide cleanouts in soil and waste lines as shown on the plans and as required by the governing codes. Extend cleanouts for piping concealed in floor or ceiling construction through the floor above and provide with adjustable floor level cleanout set flush with the finished floor. Use wall cleanouts for piping concealed in wall construction.
- C. Water Supply Piping:
 - 1. Provide a complete system of hot and cold water piping extending from water supply to each fixture and item of equipment requiring water as indicated on drawings.
 - 2. Install all water piping systems in such a manner that systems can be drained or vented completely by providing vents and drain valves at all high and low points.
 - 3. Install valves at take-off from the main and upstream of all equipment connections and elsewhere as indicated on drawings or as required. Provide shock absorbers in accordance with PDI selection standards. Make final connection to the plumbing fixtures as specified with the plumbing fixture. Provide a union in the connection to each threaded valve, fixture or piece of apparatus so that it may be readily removed. Install unions downstream of shut-off valves.
- D. Gas Piping: Provide a complete system of gas piping from the main connection to each outlet as shown on drawings.

3.5 Roof Drains:

- A. Flash all roof drains with sheet lead flashing 30" by 30" extending outward in all directions from bearing pan or roof drain

3.6 PIPE ASSEMBLY

- A. Sweat Joints in Copper Pipe: Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends, clean soldering surface thoroughly, flux, assemble and solder before surfaces oxidize. Use approved non-corrosive flux and 95-5 lead free solder. Use sufficient heat for complete penetration of solder and wipe away excess flux and solder.
- B. Sewer Pipe: Start laying pipe so that spigot end is pointed in direction of flow. Lay all pipe with ends abutting and true to line and slope. Fit and match all pipe sections to form a sewer with a

smooth and uniform invert. Clean sockets before joining pipes and form all joints in accordance with the pipe manufacturer's recommendations.

- C. Elastomeric Compression Gasket Joints: Install elastomeric compression gasket joints in accordance with manufacturer's instructions.
- D. Solvent Weld Joints in PVC and CPVC Pipe: Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends, solvent clean joining surfaces thoroughly and form all joints in accordance with the pipe manufacturer's recommendations.
- E. No-Hub Joints: Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends, clean joining surfaces thoroughly and form all joints in accordance with the pipe manufacturer's recommendations.
- F. Threaded Joints in Steel Pipe: Cut pipe to accurate length, ream the ends, and remove burrs. Use clean, sharp dies. Imperfectly formed or torn threads will be rejected. Use approved dope on male threads only and clean away excess dope.

3.7 VALVE INSTALLATION

- A. Install all valves with the stems or spindle above the horizontal where possible and exercise utmost care not to install valves over electrical equipment. Provide extended valve stems on insulated pipe.
- B. Locate valves at all automatic valves, check valves, at all equipment so they can be isolated for repairs, at all branch lines connecting mains, and elsewhere as shown on drawings.

3.8 PIPE HANGER INSTALLATION

- A. Space hangers for horizontal pipe as follows:

1) Cast iron soil pipe	5' lengths	5' on center maximum
	10' lengths	10' " " "
2) Threaded pipe	1/2" to 1-1/4"	6' on center maximum
	1-1/2" to 3"	8' " " "
	4" and larger	10' " " "
3) Plastic pipe	1/2" to 1"	3' on center maximum
	1-1/4" and larger	4' " " "
4) Copper pipe	1-1/4" and smaller	6' on center maximum
	1-1/2" and larger	10' " " "

- B. Attach hanger rods to sufficiently rigid structural building members. If hangers must be attached to either the top chord or bottom chord of steel bar joist, attach the rods by clamp at the panel points. Do not under any circumstances burn or drill holes in either chord. Do not weld either chord. Provide additional hangers or anchoring devices necessary for proper support of piping at corners, tops of risers, etc. Provide galvanized steel shields over pipe insulation at pipe supports.
- C. Support of pipe tubing and equipment shall be accomplished through means of engineered products specific to each application. Makeshift field devised methods shall not be allowed.

3.9 SLEEVE AND ESCUTCHEON INSTALLATION

- A. Accurately locate and set required sleeves in walls, foundations, floors, etc. Where more than one pipe is necessarily passed through a single sleeve as to a unit piping enclosure or other conditions resulting in larger than 1/8" gap within the sleeve, tightly pack space with proper material to form a barrier against sound, vermin, fire, etc.

- B. Provide escutcheons on all finished surfaces where exposed piping, bare or insulated, pass through floors, walls or ceilings, except in boiler, utility or equipment rooms. Fasten escutcheons securely to pipe or pipe covering.

3.10 FIRE RATED PENETRATIONS

- A. Fill all spaces around piping and spaces between piping and sleeves passing through fire-rated walls, floors, or ceilings with material capable of maintaining the fire-resistance rating of the wall, floor or ceiling. Use Metacaulk 950GW-1 or approved equal caulking material for PVC and CPVC piping.
- B. Recessed fixture penetrations (ie. washer supply boxes, refrigerator supply boxes, etc.) of 1-hour rated firewalls shall be installed such that the required fire resistance will not be reduced. Contractor shall provide and install fire rated assembly washer supply and refrigerator supply boxes for fire rated walls. See architectural drawings for fire rated wall locations and penetration details.

3.11 ACCESS DOORS

- A. Provide access doors at circulation pumps, valves, trap primers, air vents, shock absorbers, and like items requiring adjustment or maintenance accessibility if they cannot be located over lay-in type ceilings or cannot be accessible from attics or mechanical rooms. Obtain approval from Architect for location of access doors. Provide visible markers for access doors in concealed locations.
- B. Provide visible markers on finished side of lay-in type ceilings to indicate locations of valves, air vents, and like items. See Architect for marker type.

3.12 INSULATION

- A. Use application details in accordance with the insulating material supplier's recommendations except where a higher standard is specified herein.
- B. Run covering for piping unbroken through hanger clevises, sleeves, etc. Use details for covering cold surfaces such that continuous covering with unbroken vapor barrier is provided. Use these same covering and hanging details for pipes connecting to vibrating equipment or carrying pulsating pressure to avoid metal-to-metal contact between pipes and hangers.
- C. Provide an insert, not less than 6" long, of the same thickness and contour as adjoining insulation, between support shield and piping, but under the finish jacket, on piping 2" or larger, to prevent insulation from sagging at support points. Use heavy density insulating materials suitable for the specified temperature range and strong enough to prevent crushing.
- D. Insulate exposed risers same as specified for each piping system and, in addition, provide banded aluminum jackets to at least 6 feet above floor. Install and secure aluminum jackets in accordance with manufacturer's instructions. Extend tops of aluminum jackets to same height in each room.
- E. Cover surfaces of valves, fittings, strainers, and specialties with built-up insulation around irregular shapes to form smooth cylindrical surfaces. Cover such specialties in "cold" systems with special care to maintain continuous vapor barrier. Cover flanges and ground joint unions in "cold" systems.
- F. Insulate all above grade domestic cold and hot water piping including piping run above ceilings, in attics, in crawl space and concealed inside walls.

- G. Insulate underside of roof drains and all above-grade roof drainage piping including first and last fitting connected to vertical run.

3.13 EQUIPMENT SUPPORTS INSTALLATION

- A. Furnish, fabricate, and erect all structural supports and platforms as required for all equipment installed in this Work, unless otherwise specified. Make these supports and platforms independent of all other equipment supports and suspend them from the building structural steel, roof purlins, inserts imbedded in concrete slabs, or support them on columns as required by the drawings. Attachments to steel bar joists must be approved by the Architect and must only be at panel points. Do not, under any circumstances, burn, drill or weld either chord of steel bar joist.
- B. Prepare and furnish drawing and templates indicating all concrete Work required for equipment furnished under this Work. All concrete required will be provided by the General Contractor. Provide, at the time concrete foundations, bases, or curbs are formed, all necessary anchor bolts as required for the various equipment in this Work. Grout all spaces between the equipment base and concrete supports.

3.14 STRAINERS

- A. Locate strainers ahead of each automatic control valve, suction side of each pump and elsewhere as shown on drawings.

3.15 CONTROLS

- A. Provide all pressure controls, tempering valves, aquastats, temperature and pressure relief valves and control valves necessary for the operation or adjustment of equipment and not supplied as part of the equipment.
- B. Install all high voltage (120 V or above) control wiring in EMT conduit. Install low voltage control wiring in conduit unless concealed in walls or above finished ceilings. Do not run low voltage control wiring in the same conduit as high voltage control or power wiring.

3.16 WATER HEATER DRAIN PAN SYSTEM

- A. Install drain pan under water heaters where scheduled and/or detailed on drawings. Install 3/4" drain line from drain pan to building exterior or where shown on drawing.

3.17 CONNECTIONS TO EQUIPMENT FURNISHED AND INSTALLED BY OTHERS

- A. Complete all rough-in and final connections to the kitchen and bar equipment furnished and installed by others. See Architectural drawings for details of equipment and location.

3.18 INSTALLATION OF AND CONNECTION TO RELOCATED EQUIPMENT

- A. Complete all rough-in and final connections to the equipment shown on the drawings to be relocated.
- B. See Architectural drawings for details of equipment and location.

3.19 EQUIPMENT, VALVE AND PIPE IDENTIFICATION

- A. Securely attach manufacturer's nameplate to all equipment giving data as to design and operating characteristics.

- B. Securely attach nameplates to all switches, control devices and similar items, giving the name and number of the item of equipment to which it is connected.
- C. Provide direction arrows and color bands every 25 feet where piping is located above lay-in type ceilings and in accessible attic and crawl spaces and within 5 feet of both sides of accessible wall penetrations for the following piping:
 - 1. Domestic hot water piping.
 - 2. Domestic 140 deg. hot water piping.
 - 3. Domestic cold water piping.
 - 4. Sanitary drain piping.
 - 5. Plumbing vent piping.
 - 6. Roof drain piping.
 - 7. Natural gas piping.
- D. Provide small scale drawing showing valve locations and valve number. Provide valve number on each valve tag. Intent of small scale drawing is to show what equipment each valve serves.

3.20 TESTS

- A. Testing requirements are minimum and are not intended to be limiting where additional testing methods are required by the authority having jurisdiction.
- B. All drainage, vent and inside conductor piping shall be tested before fixtures are installed by capping or plugging the openings and filling the entire system with water, allowing it to stand thus filled for 24 hours with at least 10 feet of pressure. If required to test system in sections, provide necessary test tees, plugs and stand pipe to test the system with at least 10 feet of pressure. Remake all leaking joints and retest.
- C. Test all water supply piping before fixtures, equipment and/or hydrants are connected. Cap or plug the openings, fill the system with water and apply a hydrostatic pressure of 1.5 times the operating pressure or 125 PSIG, which ever is higher. Hold test pressures for at least 24 hours. Remake all leaking joints and retest.
- D. Test each fixture for soundness, stability of support and satisfactory operation of all its parts.
- E. Gas Piping: Test all gas piping after outlet fittings are connected and entire piping system has been cleaned. Pressurize the system with compressed air to a pressure of 1.5 times the operating pressure or 125 PSIG, which ever is higher. Hold test pressures for at least 2 hours. Remake all leaking joints and retest.
- F. Forced Main Test: All forced main piping shall be tested by capping or plugging the openings and applying a pressure of 5 PSIG greater than the pump rating, and maintaining such pressures for 2 hours. Remake all leaking joints and retest.

3.21 DISINFECTION OF POTABLE WATER PIPING

- A. Disinfect any part of potable water system installed or repaired in accordance with one of the following methods before it is placed in service:
 - 1. After tests are completed, fill all water supply systems with a solution containing 50 PPM of available chlorine and allow to stand for a period of at least 24 hours before being flushed with clean water. Deliver a dated letter certifying sterilization to the Architect.
 - 2. After tests are completed, fill all water supply systems with a solution containing 200 PPM of available chlorine and allow to stand for a period of at least 3 hours before being flushed with clean water. Deliver a dated letter certifying sterilization to the Architect.

3.22 INSTRUCTION OF OWNER'S REPRESENTATIVE

- A. After final acceptance of all Work and occupancy of building, provide service to make system adjustments to suit conditions created by the occupancy; instruct Owner's operating personnel in operation adjustment and maintenance procedures of system components and acquaint Owner's operating personnel with locations and functions of valves, control devices, etc., in the system.

3.23 CLEANING AND RUBBISH

- A. During the Work, keep the premises clear of rubbish created as a result of the Work. Protect and prevent unnecessary induction of dirt into piping, fixtures and equipment. On completion of the Work, remove all rubbish and debris resulting from the Work and dispose of same. Thoroughly clean and leave in a satisfactory condition for use all equipment, pipe, fixtures, etc.

3.24 RECORD DRAWINGS

- A. The Architect will furnish one set of blue line prints of the drawings as issued for this contract. Use these prints to indicate accurately and neatly any deviation in the actual installation from the drawings as issued. At the completion of the job, deliver the marked-up drawings to the Architect for a permanent record of the exact location of all equipment, pipe runs, etc. as incorporated in the job.

3.25 COMPLETE SYSTEMS

- A. Leave all systems completely operative in all details and in satisfactory working condition, as determined by the Architect. Furnish and install as part of this contract all apparatus and material obviously a part of the systems and necessary for their operation.

END OF SECTION 220000

SECTION – 230000

HEATING, VENTILATING & AIR CONDITIONING

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. The General Provisions of the Contract, Division 01, including the General Requirements, Supplementary Conditions and Special Conditions, along with the General Requirements, are hereby made a part of this Section as if fully repeated herein.
- B. Scope of Work: The scope of the work included under this section of these specifications shall include complete heating, ventilating and air conditioning systems as shown on the drawings and specified herein. This work shall include:
 - 1. Split-system heat pump and compressor/condenser units.
 - 2. Split system air handling units.
 - 3. Dedicated outside air A/C units.
 - 4. Ductless split systems.
 - 5. Ventilating system.
 - 6. Kitchen hoods (including fire suppression system and certification of test).
 - 7. Kitchen hood supply/exhaust systems.
 - 8. Refrigeration piping.
 - 9. Condensate drain piping.
 - 10. Equipment supports and identification.
 - 11. Duct work.
 - 12. Insulation.
 - 13. Air distribution equipment.
 - 14. Access doors.
 - 15. Controls and control wiring.
 - 16. Testing, adjusting and balancing.
 - 17. Corrosion protection of outdoor compressor, condenser, and heat pump units.
 - 18. Instructions of owner's representative.
- C. Related Work Specified Elsewhere:
 - 1. Power wiring: Electrical – 26 00 00.
- D. Prior to start of any work, the successful Contractor shall meet with the Architect to determine that no questions remain concerning the intent of the drawings or specifications. The Contractor shall bring up for discussion and decision any questions concerning the project. No work shall be performed prior to this meeting. The Architect shall set the date, time, and place of conference.

1.2 CODES, ORDINANCES AND PERMITS

- A. Comply with the latest edition of all codes applicable to the Work of this contract including but not limited to the Florida Energy Efficiency Code, Florida Building Code and Florida Building Code - Mechanical. Obtain information on all code restrictions and requirements. In case of conflict between the contract documents and a governing code or ordinance, such conflict shall be immediately brought to the attention of the Architect for resolution. Extra payment will not be allowed for Work required by code restrictions except through written agreement with the Owner.
- B. Apply for, obtain, and pay for all required permits and inspection certificates. Final payment is contingent upon delivery of such certificates to the Architect.
- C. Where applicable, all materials and equipment shall bear the Underwriters' Laboratories seal or ASME code stamp. Certificates to this effect shall be furnished to the Architect upon request.

1.3 INDUSTRY STANDARDS

- A. Industry Standards: Unless modified by these specifications, the design, manufacture, testing and method of installing all materials, apparatus and equipment shall conform to the following:
 - 1. ASHRAE Standard 90, Energy Conservation in New Building Design.
 - 2. ANSI B9.1 Safety Code for Mechanical Refrigeration.
 - 3. Standards of National Fire Protection Association.

4. ASHRAE Handbook of Fundamentals.
5. SMACNA Standards for Duct work.
6. Associated Air Balance Council or National Environmental Balancing Bureau Standards for Field Measurement and Instrumentation.
7. Underwriters' Laboratories.
8. National Electrical Code.
9. Air Moving & Conditioning Association.
10. Air Conditioning & Refrigeration Institute.

1.4 SITE INSPECTION

- A. Visit the site and thoroughly inspect conditions affecting the Work before submitting bid. Assume responsibility for meeting all existing conditions including access and work space limitations.

1.5 DRAWINGS AND SPECIFICATIONS.

- A. Refer to the general construction drawings which are bound with the drawings of this Work for construction details, elevations, etc. Architectural and structural drawings shall take precedence over Division 23 drawings (Mechanical Drawings). It is the intent of the Mechanical Drawings to show the general arrangement of the system and not to indicate all offsets, fittings and accessories which may be required, nor to show exact locations of piping, duct work or equipment except where actual dimensions are given. All vertical piping shall be located in walls in finished spaces unless otherwise noted.
- B. Specifications and drawings shall be considered as supplementary to each other, requiring materials and labor indicated, specified, or implied by either specifications or drawings. It is the intent of the drawings and specifications to call for finished Work, tested, and ready for operation, and in complete conformance with all applicable codes, rules and regulations. Minor details not usually shown or specified, but manifestly necessary for the proper installation and operation of the various systems, shall be included in the Work and in the proposal, the same as if specified or shown on the drawings.
- C. If any departures from the drawings and specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted to the Architect for approval. No departures shall be made without prior approval of the Architect.
- D. Specific reference in the specifications to any article, device, product, material, fixture or type of construction, etc., by proprietary name, make or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Substitutes may be used subject to compliance with requirements set forth in the General Requirements, Division 1, and as approved by the Architect.
- E. Submit cost implications to contract in bid when providing substitutes for specified equipment and for all alternatives requested in the construction documents.

1.6 MANUFACTURER'S SPECIFICATIONS

- A. Where the name of a concern or manufacturer is mentioned on the Drawings or in Specifications in reference to his required service or product, and no qualifications or specification of such is included, then the material gauges, details of manufacturer, finish, etc., shall be in accordance with his standard practice, directions or specifications. The Contractor shall be responsible for any infringement of patents, royalties, or copyrights which may be incurred thereby.
- B. Equipment scheduled on drawings was used to arrive at space, maintenance access, utility service and equipment supports. If other equipment is submitted and approved, take responsibility for maintaining these space, maintenance access, utility service requirements and any revisions required for installation such as equipment supports, roof curbs and access ladders. Take responsibility for the coordination and cost for any resulting changes including cost to change electrical service required by substituted equipment.
- C. All materials and equipment shall be new and first class in every respect. As far as is practical, similar products shall be by one manufacturer. Equipment designed to operate as a system such as outdoor condenser or heat pump units with indoor air handling units shall be from one manufacturer unless scheduled otherwise.

1.7 PRE-APPROVAL

- A. For equipment with specified manufacturer "or pre-approved equal", manufacturers of alternate equipment must be approved to bid via addendum, in writing by the specifying engineer, at least four weeks prior to bid time in order for their bid to be accepted. If the equipment is not pre-approved then under no circumstances will the Engineer invest time or money in receiving submittals or considering the equipment.
- B. Submittal for pre-approval shall include detailed line by line comparisons between submitted equipment and specified equipment to provide Engineer with design features, construction materials, capacities, performance characteristics, controls, electrical power requirements and accessories or components requiring field installation.
- C. Costs associated with dimensional, performance, or other deviations from the specified equipment, including engineering costs to evaluate such deviations, shall be paid by the contractor providing the equipment.
- D. Manufacturers not meeting all of the above criteria shall not be considered or accepted under any circumstances.

1.8 SUBMITTALS

- A. Submit shop drawings in accordance with the General Requirements, Division 1.
- B. Samples of insulation, diffusers, dampers or any other mechanical equipment or materials shall be submitted if requested by the Architect. If a sample is requested, have the sample delivered to the Architect or arrange for the Architect to examine it elsewhere. Failure to comply may be cause for rejection.
- C. Submit shop drawings or catalog data for the Architect's approval before purchasing or installing the following:
 - 1. Split-system compressor/condenser and heat pump units.
 - 2. Air handling units.
 - 3. Dedicated outside air A/C units.
 - 4. Ductless split systems.
 - 5. Kitchen hoods (including fire suppression system and certification of test).
 - 6. Kitchen hood supply/exhaust systems.
 - 7. Grilles, diffusers and registers.
 - 8. Duct shop drawing (where different from design drawing).
 - 9. Supply fans.
 - 10. Insulation.
 - 11. Controls and wiring diagrams.

1.9 PERFORMANCE DATA

- A. All performance data specified herein shall be considered actual performance of equipment as installed. Make suitable allowances if installation details are such that actual operating conditions unfavorably affect performance as compared to conditions under which the equipment was rated.

1.10 CATALOG, OPERATION AND MAINTENANCE DATA

- A. Provide four (4) complete sets of a compilation of catalog data of each manufactured item of equipment used in the Mechanical Work. In addition to the catalog data, installation, operating and maintenance data and bill of materials for all operating equipment shall be submitted. Each of the four sets of data shall be bound in loose leaf binders and submitted to the Architect before final payment is made. A complete double index shall be provided as follows:
 - 1. Listing the products alphabetically by name.
 - 2. Listing the names of manufacturers alphabetically by name together with their addresses and the names and addresses of local sales representatives.
- B. It is the intent of this catalog, operation and maintenance data to provide the Owner with complete instructions on the proper operation and use, lubrication and periodic maintenance, together with the source of replacement parts and service, for the items of equipment covered.

1.11 CONTRACTOR COORDINATION

- A. The Electrical Contractor will furnish, set and wire all disconnect devices and starters as required for all equipment except for those items furnished with integral disconnect devices and/or starters.
- B. Furnish detailed information to the Electrical Contractor on power wiring requirements for all mechanical equipment actually purchased as soon as practical. This shall include all diagrams and instructions necessary for the Electrical Contractor to make connections properly. If equipment actually purchased requires larger electrical service than equipment scheduled, arrange and pay for required electrical service change.
- C. Provide all air conditioning control devices, including thermostats and complete all control wiring, including final connections. Electrical Contractor will provide smoke detectors for installation by Mechanical Contractor.
- D. When the project scope includes installation of kitchen hoods, including hoods that are furnished by others, take responsibility to coordinate the hood installation with the General Contractor to make sure the wall construction meets the Building Code clearance requirements for the type of hood purchased.
- E. Coordinate location of equipment, piping, and duct work with Electrical Contractor, Fire Protection Contractor, and Plumbing Contractor to maintain clearance for equipment maintenance, prevent interference with duct and piping runs, and to prevent ducts and piping from being installed over electrical panels. If interference develops, the Architect will decide which equipment, conduit, duct, piping, etc., must be relocated regardless of installation order. Take responsibility for relocating Mechanical work, if so ordered, including all associated costs.
- F. Within 30 days following award of the contract, report to the Architect in writing, all real or potential errors, ambiguities and/or conflicts on the Mechanical Work or between the trades and obtain an agreement with the Architect on a solution. Those reported after 30 days, except as a result of unforeseen circumstances, shall be resolved at the discretion of the Architect. Report conflicts resulting from the progress of Work to the Architect immediately or accept the expense for corrective work caused by failure to report such a conflict.

1.12 CHANGES

- A. Do not make any changes in design without the written approval of the Architect. Changes in design means any change which will affect the capacity, reliability, operation or safety of the systems or any parts thereof, including changes which may be required to conform to local regulations or codes.

1.13 MECHANICAL CONTRACTOR'S WARRANTY

- A. Provide written warranties as specified in the General Requirements, Division 1, and provide a five year warranty for all refrigeration compressors against defects in materials and workmanship. Repair any defects becoming apparent within the warranty period as directed by the Architect.

1.14 PROTECTION OF MATERIALS AND EQUIPMENT

- A. Provide complete protection against weather, rain, windstorms, frost, ice, heat, and acts of vandalism, so as to maintain all materials and equipment free from injury or damage, including physical damage of any nature. At end of each workday, cover work as required to provide such protection. This shall include but not be limited to erection of all temporary shelters to protect adequately any materials and equipment stored on site, cribbing of any materials and equipment above the floor of the construction, and the covering of materials and equipment in the building under construction with protective covering.
- B. Provide dry storage facilities for materials and equipment; including but not limited to duct work, insulation, air handling units, controls, motor operated equipment, etc.; sensitive to damage by moisture. Outside, unprotected storage will not be accepted. Storage inside building being constructed will not be accepted until roof and walls are weather tight unless temporary protection is provided.
- C. Failure to comply shall be sufficient cause for rejection of damaged materials and equipment. Replace any damaged material or equipment and place the systems in perfect working condition.

PART 2 – PRODUCTS

2.1 SPLIT SYSTEM HEAT PUMPS

- A. Manufacturers: Basis of Design is Lennox. Approved equals meeting all specified criteria are: Carrier, Daikin AC, Trane and York.
- B. Capacity shall be as scheduled on the drawings and adjusted for line losses of refrigerant piping. Capacity shall be combined rating at actual conditions entering the evaporator and 95 degrees F outdoor ambient temperature.
- C. Unit shall have all operating components assembled on one common base. These shall include: compressor, condenser coil, condenser fan and motor, charging valves, all controls, and a holding charge of refrigerant. Units shall be designed for outdoor installation with all exterior surfaces factory painted with primer and enamel for weather protection. Drain holes shall be provided for elimination of rain. Provide removable panels for access to components.
- D. Condenser coil shall be of the continuous aluminum plate fin and copper tube type and shall be circuited for integral sub-cooler. The coil shall be tested with refrigerant and sealed with a holding charge of refrigerant.
- E. Compressor shall be 2 speed and shall be mounted on vibration isolators.
- F. Refrigeration circuit components shall include liquid line service valve, suction line service valve, and full charge of compressor oil and holding charge of refrigerant.
- G. Controls shall be mounted in separate panel on the side of the unit for installation and service access. Units shall be provided with controls specified on the drawings and all standard controls including the following even if not considered standard:
 - 1. Single point power connection.
 - 2. Compressor and fan contactors.
 - 3. Motor overload protection for ungrounded legs.
 - 4. High pressure cut-out.
 - 5. Auto reset low-pressure switch to stop compressor if refrigerant pressure drops below 7 psig.
 - 6. Compressor anti-cycling relays set between 3 and 5 minutes.
 - 7. Low-ambient controller down to 30° F. for winter operation.
 - 8. Evaporator freeze thermostat to stop unit operation if evaporator reaches freeze-up conditions.
 - 9. Indoor time delay relay to continue indoor blower motor after compressor cycles off.
 - 10. Adjustable outdoor thermostat to prevent supplemental electric heat from operating except during defrost mode or when outside air temperature is below set-point (40 F).
 - 11. Service alarm to signal compressor not operating during heating mode with indicating light on indoor thermostat.
 - 12. Low voltage and phase loss protective controls for all three phase motors.
- H. Provide condensing coil unit with E-coat or Luvata seacoast coating.

2.2 SPLIT SYSTEM HEAT COMPRESSOR & CONDENSER UNITS

- A. Manufacturers: Basis of Design is Lennox. Approved equals meeting all specified criteria are: Carrier, Daikin AC, Trane and York.
- B. Capacity shall be as scheduled on the drawings and adjusted for line losses of refrigerant piping. Capacity shall be combined rating at actual conditions entering the evaporator and 95 degrees F outdoor ambient temperature.
- C. Unit shall have all operating components assembled on one common base. These shall include: compressor, condenser coil, condenser fan and motor, charging valves, all controls, and a holding charge of refrigerant. Units shall be designed for outdoor installation with all exterior surfaces factory painted with primer and enamel for weather protection. Drain holes shall be provided for elimination of rain. Provide removable panels for access to components.
- D. Condenser coil shall be of the continuous copper plate fin and copper tube type and shall be circuited for integral sub-cooler. The coil shall be tested with refrigerant and sealed with a holding charge of refrigerant.
- E. Compressor shall be mounted on vibration isolators.

- F. Refrigeration circuit components shall include liquid line service valve, suction line service valve, and full charge of compressor oil and holding charge of refrigerant.
- G. Controls shall be mounted in separate panel on the side of the unit for installation and service access. Units shall be provided with controls specified on the drawings and all standard controls including the following even if not considered standard:
 - 1. Single point power connection.
 - 2. Compressor and fan contactors.
 - 3. Motor overload protection for ungrounded legs.
 - 4. Crankcase oil heater.
 - 5. High pressure cut-out.
 - 6. Auto reset low-pressure switch to stop compressor if refrigerant pressure drops below 7 psig.
 - 7. 24 volt transformer for unit controls.
 - 8. Compressor anti-cycling relays set between 3 and 5 minutes.
 - 9. Lockout on auto-reset safety until reset from thermostat.
 - 10. Low-ambient controller down to 30° F. for winter operation.
 - 11. Evaporator freeze thermostat to stop unit operation if evaporator reaches freeze-up conditions.
 - 12. Head pressure control.
 - 13. Indoor time delay relay to continue indoor blower motor after compressor cycles off.
 - 14. Refrigerant filter dryer (two-way for heat pumps).
 - 15. Low voltage and phase loss protective controls for all three phase motors.
 - 16. Thermostatic expansion valve kit.
- H. Capacity unloaders with built-in controls.
- I. Provide condensing coil unit with E-coat or Luvata seacoast coating.

2.3 AIR HANDLING UNITS

- A. Manufacturers: Basis of Design is Lennox. Approved equals meeting all specified criteria are: Carrier, Daikin AC, Trane and York.
- B. Air handling units shall be draw through type with 1" thick, standard size, disposable type filters and shall have DX cooling coils and electric heating coils as scheduled on drawings with minimum unit capacities as indicated and AHRI matched to the condensing unit of the same manufacture.
- C. Fan capacities shall be as scheduled on drawings. Fans shall be direct drive with variable speed motors. Fans and motors shall be mounted on vibration isolators.
- D. Casing shall be constructed of heavy duty, factory painted, galvanized sheet steel adequately reinforced with structural members. Units shall include plastic drain pan, with at least 1" thick insulation, extending under coil and fan sections with brass drain connection. Removable panels in front of unit shall provide access to all internal parts. Units shall have filter access panel and filter rack. All unit panels shall be internally insulated to meet requirements of the Florida Energy Code. All insulating materials shall meet the requirements of NFPA 90-A. Units shall be equipped with duct collars on intake and discharge of unit and single point power connection.
- E. Direct expansion cooling coils shall be of the continuous aluminum plate fin and copper tube type and shall have an equalizing type distributor. The coil shall be tested with refrigerant and sealed with a holding charge of nitrogen at 10 PSIG.
- F. Electric heating coil shall be factory installed and protected with air flow switch. Heaters over 10 KW shall have heating elements sequenced on and off in at least two stages and shall be wired for multiple stage operation. All heaters shall be equipped with manual reset thermal overload device, circuit breaker, current overload for heaters above 10 KW and required heating and cooling system controls including 60 va control circuit (24 v) transformer. Low-voltage connections shall be point-to-point on terminal board.
- G. Unit controls shall include but not be limited to solid-state interlock control board, control transformer, and evaporator freeze thermostat. Wall mounted humidistat and thermostat shall control fan speed.

- H. Unit shall be provided with dehumidification/reheat coil for enhanced Humiditrol dehumidification capability.
 - I. Provide with commercial programmable touch-screen thermostat.
- 2.1 DEDICATED OUTSIDE AIR A/C UNITS
- A. Manufacturers: Basis of Design is Modine Atherion. Approved equals meeting all specified criteria are: Carrier, Daikin AC, Trane and York.
 - B. Unit shall be fully assembled, charged, wired, and tested prior to shipment.
 - C. Cabinet:
 - 1. The casing shall be designed for outdoor application with a fully weatherproof cabinet. Roof shall have a standing roof seam for maximum roof rigidity and prevention of standing water and perimeter drip edges to prevent water from dripping into the access doors.
 - 2. Exterior casing parts shall be 18 gauge aluminized steel with an electrostatically applied polyester powdercoat paint finish Exterior Cabinet Finish: Paint color shall be standard Modine Commercial Gray Green.
 - 3. 2" internal Insulation shall be completely encased within standard 20 gauge galvanized steel liners. These liners shall provide double wall construction that complies with ASHRAE 62.1.
 - 4. Access to items needing periodic inspection or maintenance shall be through hinged access doors. Access doors shall have full length hinges and have full perimeter gasketing.
 - 5. Unit shall include a field assembled and installed inlet rainhood and a factory mounted inlet birdscreen. (optional)
 - D. Air Control Configuration:
 - 1. Unit airflow control configuration shall be fresh air dampers with no return air opening for 100% outside air applications.
 - 2. Dampers shall be constructed of extruded aluminum, hollow core, airfoil blades with rubber edge seals and aluminum end seals. Damper blades shall be designed to have no more than 4 CFM of leakage per sq. ft. of damper area when subjected to 1" w.g. air pressure differential across the damper.
 - 3. Fresh air direct drive damper actuator shall be spring return to close when not powered.
 - E. Refrigeration System:
 - 1. Compressor shall be Modulating Digital Scroll. Compressor shall be capable of system capacity modulation from 10%-100%.
 - 2. Unit shall be factory charged with R-410A refrigerant.
 - 3. Compressor shall be mounted in an isolated compartment to permit operation of the unit without affecting air flow when the compartment door is open.
 - 4. Compressor shall be mounted on the compressor manufacturer's recommended rubber vibration isolators to reduce transmission of vibration to the building structure.
 - 5. Compressor shall include Internal Overload Protection, Crankcase Heater, anti-short cycle delay timer, Modulating condenser fan speed control to allow operation down to 35°F, Ambient temperature compressor lockout, airflow proving switch, liquid line sight glass, Automatic reset low pressure and manual reset high pressure refrigerant controls, Schrader type valves on both the high pressure and low pressure sides, Refrigerant liquid line filter/drier.
 - 6. Evaporator coil shall be high capacity with copper tubes and mechanically bonded aluminum fins to include:
 - a. Electronic Expansion Valve: Evaporator Coil Drain Pan 316 Stainless Steel double sloped with a condensate drain pan float switch

- b. Evaporator Coil Coating: The evaporator coil will have a flexible epoxy polymer e-coat uniformly applied to all coil surface areas with no material bridging between fins.
 - 7. Hot Gas Reheat Coil: The unit shall include a hot gas reheat coil to allow the unit to have a dehumidification mode of operation.
 - 8. Gas Reheat Control: The unit shall include hot gas reheat modulating valves, electronic controller, and supply air temperature sensor, reheat coil located no less than 6" downstream of the evaporator coil to prevent condensate re-evaporation.
 - 9. Hot Gas Reheat Coil Coating: The hot gas reheat coil will have a flexible epoxy polymer e-coat uniformly applied to all coil surface areas with no material bridging between fins.
 - 10. Condenser Coil: The air-cooled condenser shall be a Modine Parallel Flow PF™ micro-channel aluminum fin/tube condenser coil.
 - 11. Condenser Fans with variable speed for condenser head pressure control.
 - 12. Condenser Coil Coating: The PF™ micro-channel aluminum fin/tube condenser coil will have a flexible epoxy polymer e-coat uniformly applied to all coil surface areas with no material bridging between fins.
- F. Heating System: The unit shall include an auxiliary electric complete with fuses, a high temperature limit switch, and include fully modulating SCR capacity control, airflow proving switch, high temperature limit switch, airflow proving switch.
 - G. Supply Air Fan And Motor: Supply Air Fan: The fan shall be a housed Backward Inclined Airfoil Plenum Fan belt to include an auto belt tensioner, premium efficiency motor inverter duty rated.
 - H. Filters: The unit shall include 2" thick primary filters MERV10, 4" thick secondary filters MERV13, with Dirty Filter Pressure Switch.
 - I. Electrical:
 - 1. Control Panel: The unit shall have an electrical control center where all high and low voltage connections are made and shall include single-point high voltage power supply connections, Factory Installed Deadfront Disconnect Switch, Access Door Interlock Switch, Phase Failure Relay, Convenience Outlet auxiliary contacts for external exhaust fan circuit.
 - 2. Microprocessor Controller shall be capable of independent stand-alone operation with with an integral user interface and remote user interface panel, with ability to communicate and integrate with BACNet® MS/TP communication networks.
 - 3. Damper shall be 2-position where the damper positions are either 100% closed or 100% open to the outside air.
 - 4. Supply Fan shall include variable frequency drive for constant volume airflow or variable airflow.
 - 5. Refrigeration Controls: The refrigeration controls subsystem shall be controlled by the microprocessor controller as follows:
 - a. Supply Air Temperature Control – The Carel controller shall monitor and control the supply air temperature to maintain the desired supply air temperature.
 - b. Supply Air Temperature Control with Room Temperature Reset or Supply Air Temperature Control with Outside Temperature Reset.
 - c. Hot gas reheat shall control the modulating hot gas reheat valve to maintain the desired supply air temperature setpoint and prevent temperature swings and overcooling of the space during dehumidification, the outside air enthalpy sensor will lockout each compressor at a preset adjustable enthalpy setpoint.
 - J. Roof Curb: The unit shall be supplied with a knocked down, field assembled and installed roof curb. The curb shall be constructed of 10 gauge galvanized steel and include wood nailing strips, fully insulated with 1 inch, 1-½ lb. density acoustical and thermal insulation.
 - K. System Startup:

1. Start-up units in accordance with manufacturer's start-up instructions. Test controls and demonstrate compliance with requirements. Replace damaged or malfunctioning controls and equipment.
2. Start-up and customer training for supplied equipment provided by Modine or their factory certified technician as follows:
 - a. Inspection of unit to ensure there is no shipping or installation damage.
 - b. Check that all clearances are per manufacturer's recommendations.
 - c. Check that all mechanical and electrical connections are secure.
 - d. Check that all duct connections to the unit are secure.
 - e. Check and adjust sheave alignment and belt tension.
 - f. Check that DX condensate drain is trapped correctly and primed (weather permitting).
 - g. Check that the high-efficiency condensing furnace condensate drain line is trapped correctly and primed.
 - h. Verify utilities are sufficient for proper operation in accordance with the serial plate information.
 - i. Verify proper operation of all unit controls and sequence of operation.
 - j. Measure and record unit operating characteristics (e.g. amps, voltages, pressures, direction of rotation, etc.).
 - k. Verify proper operation of options and accessories.
 - l. Provide training to owner's maintenance personnel to adjust, operate and maintain the unit.
 - m. Support basic integration of the equipment to the building control system.

2.2 DUCTLESS SPLIT SYSTEMS

- A. Manufacturers: Basis of Design is Mitsubishi. Approved equals meeting all specified criteria are: Daikin AC, EMI, Fujitsu, LG, and Sanyo.[delete the one picked]
- B. Capacity shall be as scheduled on the drawings and adjusted for line losses of refrigerant piping. Capacity shall be combined rating at actual conditions entering the evaporator and 95 degrees F outdoor ambient temperature.
- C. Air handling units shall be draw through type with 1" thick, standard size, disposable type filters and shall have DX cooling coils and electric heating coils as scheduled on drawings with minimum unit capacities as indicated. Fan capacities shall be as scheduled on drawings. Fans shall be direct drive with two or three speed motors or belt drive as scheduled. Fans and motors shall be mounted on vibration isolators. Casing shall be constructed of heavy duty, factory painted, galvanized sheet steel adequately reinforced with structural members. All unit panels shall be internally insulated to meet requirements of the Florida Energy Code. All insulating materials shall meet the requirements of NFPA 90-A. Units shall be equipped with single point power connection.
- D. The compressor shall be a direct current rotary and/or scroll compressor with Variable Compressor Speed Inverter Technology. The compressor shall be driven by inverter circuit to control compressor speed. The compressor speed shall dynamically vary to match the room load for significantly increasing the efficiency of the system which results in vast energy savings. The outdoor unit shall have an accumulator and high pressure safety switch. The compressor shall be mounted to avoid the transmission of vibration
- E. Condenser Unit shall have all operating components assembled on one common base. These shall include: compressor, condenser coil, condenser fan and motor, charging valves, all controls, and a holding charge of refrigerant. Units shall be designed for outdoor installation with all exterior surfaces factory painted with primer and enamel for weather protection. Drain holes shall be provided for elimination of rain. Provide removable panels for access to components.
- F. Refrigeration circuit components shall include liquid line service valve, suction line service valve, and full charge of compressor oil and holding charge of refrigerant.
- G. System shall be provided with controls specified on the drawings and all standard controls including the following even if not considered standard:
 1. Single point power connection.
 2. Compressor and fan contactors.

3. Motor overload protection for ungrounded legs.
4. Crankcase oil heater.
5. High pressure cut-out.
6. Auto reset low-pressure switch to stop compressor if refrigerant pressure drops below 7 psig.
7. 24 volt transformer for unit controls.
8. Compressor anti-cycling relays set between 3 and 5 minutes.
9. Low-ambient controller down to 0° F. for winter operation.
10. Evaporator freeze thermostat to stop unit operation if evaporator reaches freeze-up conditions.
11. Isolation relay to remove low-ambient controller out of condenser fan circuit during heating mode.
12. Indoor time delay relay to continue indoor blower motor after compressor cycles off.
13. Refrigerant filter dryer (two-way for heat pumps).
14. Adjustable outdoor thermostat to prevent supplemental electric heat from operating except during defrost mode or when outside air temperature is below set-point (40 F).
15. Thermostatic expansion valve kit.
16. Liquid solenoid valve to stop and start liquid refrigerant flow in response to compressor operation.
17. Service alarm to signal compressor not operating during heating mode with indicating light on indoor thermostat.
18. Dry Mode control operation for humidity control.
19. Condensate overflow switch to turn off unit in the event of condensate overflow.

2.2 KITCHEN HOOD

- A. Hood shall be compensating hood as manufactured by Captive-Aire Systems or pre-approved equal (see paragraph 1.7 PRE-APPROVAL). Unit shall be as shown on the Captive-Aire submittal.
- B. Hood shall be double wall type fabricated of Type 430 stainless steel with #3 or #4 polish finish on all exposed surfaces. All seams and joints shall be heliarc welded and polished to blend. Hood shall be provided with hanging angles on top of each side and end and intermediate hanging angles for hoods exceeding 12' in length. Construction shall be in accordance with U.L. (classification #91G6), U.L.C., N.F.P.A. #96, N.S.F. #1362, B.O.C.A. #86-48, S.B.C.C.I. #8675, and I.C.B.O. #4416.
- C. Provide following options:
 1. Utility Cabinet: Integral cabinet fabricated of same material and finish as hood to house pre-piped fire suppression system and UL listed, pre-wired electrical controls. Pre-wire package contains light switches, lighted fan control switches, and internal factory wiring components including starters, relays, etc. Terminal box shall consist of numbered terminal strip with all factory wiring color coded and numbered, wiring diagram and magnetic, track mounted, motor starters with adjustable overloads for each three phase fan.
 2. Exhaust Fire Damper: UL listed and installed in exhaust collar, activated by fusible link.
 3. Standoff: Integral 3" air space provided to meet NFPA 96 clearance requirements against limited combustible walls insulated air space provided to meet NFPA 96 clearance requirements against combustible walls.
 4. Enclosure Panels: Enclosure panels, factory fabricated of same material and finish as hood, and designed for field installation, sized to extend from top of hood to ceiling.
 5. End Panels: End panels, factory fabricated of same material and finish as hood.
- D. Hood lights shall be U.L. Listed suitable for grease hood applications and shall be supplied with plastic coated glass globes. Each light shall accommodate a single standard 100 watt bulb and shall be pre-wired to junction boxes on top of hood.
- E. Hood grease drain system shall consist of removable ½ pint cup grease collector and U.L. Classified, flame guard, stainless steel (Teflon coated), baffle type filters designed for easy removal and cleaning.

- F. Hood supply air plenum shall be completely lined with ½" thick insulation and metal liner to prevent condensation and shall contain perforated metal plates for even air distribution. Supply air riser on top of hood shall contain combination fire and volume damper. Volume damper shall be adjustable by means of 90 degree swivel handle and lock nut. Bottom of supply plenum shall contain full length access panel to facilitate cleaning.
- G. Hood shall contain liquid agent fire suppression system which shall be designed for the duct, plenum and equipment. Tank shall be contained in 12" deep fire protection cabinet which shall be an integral part of the hood canopy. Fire suppression system shall be completely factory pre-piped. Field hook-up and testing shall be completed by qualified fire system personnel after hood installation and shall be certified to meet applicable code requirements. Copy of certificate shall be provided to the Architect. System shall be capable of automatic detection and actuation and with local or remote manual actuation. System shall include an auxiliary contact (minimum 4 pole double throw switch) for connection to fire alarm system and to provide automatic shut-off for electric grille and frier.

2.3 KITCHEN SUPPLY/EXHAUST UNIT

- A. Kitchen supply/exhaust unit shall be roof mounted, pre-engineered combination exhaust and supply fan packages in sizes scheduled on drawings. Fan package assembly shall be complete system containing both exhaust and supply fans. Master control panel shall be prewired through disconnect switch, fused motor starter with factory selected overload heaters, designed to meet U.L. and N.E.C. codes.
- B. Supply fan shall be double inlet, forward curved centrifugal blower of capacity scheduled on drawings. Blower assembly shall be mounted on vibration isolators. Drives shall be sized for minimum of 150% of driven horsepower.
- C. Exhaust fan shall be up-blast centrifugal roof exhauster of capacity scheduled on drawings. Housing shall be spun aluminum construction and shall have drain at bottom. Fan shall be weather proof, backward inclined aluminum wheels, spark resistant, and nonoverloading.
- D. Rooftop unit shall include extended intake duct with cleanable mesh filters and removable bird screen. Intake duct shall be of adequate length to hold intake minimum of 10 feet from edge of exhaust fan. Duct shall be constructed of minimum 18 gage painted galvanized steel. Roof curb shall be fully welded, 18 gage galvanized steel construction and lined with 2" thick 3 lb density fiberglass insulation and shall have 18 gage galvanized curb cap. Roof curb shall be designed to compensate for roof slope such that top of curb is level in all directions. Entire assembly shall be factory painted.
- E. Approved Manufacturers: Captive-Air Systems, Inc. or pre-approved equal (see paragraph 1.7 PRE-APPROVAL).

2.3 EXHAUST FANS

- A. Manufacturers: Basis of Design is Loren Cook. Approved equals meeting all specified criteria are: Acme, Aerovent, American Coolair, Greenheck, Hartzell, Penn Ventilator, Swartwout, and Twin City.
- B. Fans shall be of size, type and capacity indicated on the drawings. Power supply shall be as scheduled. The complete units shall be approved by the Underwriters' Laboratories and be in full accordance with all provisions of the National Electric Code.
- C. Provide fan with internal integral thermal protector and unit mounted disconnect.
- D. Pre-wired, factory mounted speed controller for direct drive units.

2.4 ELECTRIC CABINET UNIT HEATERS

- A. Unit shall be blow-through with motor in air stream and shall be of the size and mounting type scheduled on drawings. Heaters shall be metal sheath fin tubes with built-in control contactor series wired with automatic reset overheat cutout, totally-enclosed motor, continuous fan duty, and complete with thermal overload protection.
- B. Casing shall be welded steel frame and panels with internal insulation for quiet operation and low surface temperature. Finish shall be baked enamel over phosphitized surface treatment. Filter

shall be 2" thick, standard size, disposable type, and shall be accessible through removable front access panel.

- C. Discharge grille shall continuous louver type. Recessed ceiling and wall models shall have front discharge and front inlet. Surface ceiling models shall have front discharge and bottom inlet. Surface wall or floor models shall have top discharge and front inlet.
- D. Integral thermostat control shall consist of built-in sensitive bulb and capillary type thermostat with tamper resistant adjustment thru discharge grille by Allen key. Selector switch shall permit two fan speeds and two heating selections. Provide unit mounted disconnect switch.
- E. Units shall be manufactured by Qmark or approved equal.

2.4 REFRIGERANT PIPING AND ACCESSORIES

- A. Piping shall be type "L" hard drawn copper with wrought copper, refrigerant grade fittings. All elbows shall be long radius.
- B. Moisture indicator shall be installed in the liquid line just before the refrigerant solenoid valve. Thermostatic expansion valves shall be provided for each evaporator circuit. Valves shall be equipped with external equalizer.

2.5 CONDENSATE DRAIN PIPING

- A. Condensate piping located outside building and in mechanical rooms shall be non-insulated copper. Condensate piping located above ceilings shall be insulated schedule 40 polyvinyl (PVC). Non-insulated piping located above ceilings, whether used for return or supply air plenums or not, will not be allowed.
- B. Condensate drain trap float switch shall be "EZ-TRAP" model EZT-225 or approved equal. (EZ TRAP 3 Kellogg Court, Unit 10, Edison, NJ 08817 phone 732-248-8066).

2.6 PIPE HANGERS

- A. Pipe hangers for refrigerant and condensate piping located inside building shall be non-metallic strap hangers designed to rigidly support piping without damage to pipe insulation.

2.7 SLEEVES AND ESCUTCHEONS

- A. Sleeves shall be 18 gauge galvanized steel or pre-formed plastic. Sleeves shall be sized to allow approximately 1/8" gap around the pipe or its insulation.
- B. Sleeves through floors or fire walls shall be galvanized steel pipe of proper size. Sleeves through floors shall extend 1/2" above the finished floor. Sleeves penetrating fire-rated walls, floors or ceilings shall be filled with fire-rated material capable of maintaining the fire-resistance rating of the wall, floor or ceiling.
- C. Escutcheon plates for finished spaces shall be nickel-plated.

2.8 EQUIPMENT SUPPORTS AND IDENTIFICATION

- A. Equipment supports shall be sized and designed to support the equipment and shall be fabricated from galvanized steel.
- B. Hangers for horizontal air handling units including in-line exhaust fans shall be sized for equipment load but shall not be less than 3/8" diameter steel rod and shall have spring isolators designed for 1" maximum deflection. Hanger straps and/or wire will not be accepted.
- C. Supports for vertical air handling units up thru 2,000 cfm shall be fabricated from galvanized steel angles designed to support the unit. Angles shall be at least 1-1/2" x 1-1/2" x 1/4" thick. Supports shall be designed to allow clearance for return air ducts or plenum.
- D. All identification legends shall be stenciled on pressure-sensitive labeling material approved by the Architect. Equipment labels shall be laminated, phenolic strips 1/16" thick and engraved to show black letters on white background not less than 1/4" high.

2.9 MOTORS

- A. Full Load Motor Efficiencies: All motors installed in equipment specified in these specifications shall be classified under the National Electric Manufacturers Association's Standard as "Energy Efficient" or shall otherwise meet the requirements of the Florida Energy Code.
- B. Except where otherwise specified, all motors shall be designed for continuous service and for regular starting on full-line voltage with normal starting current. The limits on service factor and temperature rise above 40° C. ambient at rated load shall be as follows:

Motor Enclosure	Service Factor	Temperature Rise
Drip-Proof	115%	40° C.
Totally Enclosed	None	55° C.

- C. The insulation portion of the motor leads between the lug and motor frame shall be at least 5" in length when four or less motor leads are used and at least 8" in length when more than four motor leads are used. When terminal type lugs are supplied, they shall be solderless, Burndy "Hy-Dent" type or approved equal.
- D. Motors shall be furnished for operation as specified or as noted on the drawings. All motors shall conform to IEEE, NEMA and ANSI standards.
- E. Motors furnished for indoor installation shall be of the open, drip-proof design. Motors furnished for installation in wet locations or outdoors shall be of the totally-enclosed design. Motors furnished for installation in hazardous locations shall be of the explosion-proof design.
- F. Motors for equipment scheduled or specified for variable frequency drives shall be designed for inverter duty and shall so state on motor nameplate. Variable frequency controller shall be a pulse width modulated design operating directly from 460 VAC +/- 10%, three-phase, 60 hertz utility power. Controller shall generate a sine coded, adjustable voltage/frequency three phase output for complete motor speed control. Controller shall not induce any voltage line notching distortion back to utility line and shall maintain power factor of 0.95 throughout speed range. Controller shall be provided with an engineered input reactor unit to effectively minimize voltage distortion back to utility line. Input reactor unit shall be engineered and manufactured by manufacturer of controller. Three contactor bypass with key operated drive-off-bypass selector switch shall be included with all variable frequency drives.

2.10 DUCT WORK

- A. Supply air, return air, outside conditioned air, and exhaust air (except kitchen hood exhaust) duct work, and return air plenums under vertical air handling units shall be galvanized sheet metal.
- B. Fabricate sheet metal duct work in accordance with latest edition of "HVAC Duct Construction Standards - Metal and Flexible" as published by SMACNA and to meet construction requirements for 1" W.G. minimum static pressure and seal class "C".
- C. Fabricate and seal duct joints and connections such that air leakage does not exceed five (5) percent of design air volume.
- D. Transfer air duct work shall be 1" thick Fibrous Glass Duct System.
- E. Ductwork located outside the building shall be equal to Kingspan's Koolduct system with 7/8" thick rigid phenolic insulation core faced on both sides with aluminum foil.
- F. Exhaust ducts for kitchen hoods shall be double wall, factory built grease duct for use with Type I kitchen hoods, which conforms to the requirements of NFPA-96. Products shall be ETL listed to UL-1978 and UL-2221 for venting air and grease vapors from commercial cooking operation. Double wall grease ducts are listed for a continuous internal temperature of 500 degrees F and intermittent temperatures of 2000 degrees F. The duct sections shall be constructed of an inner duct wall and an outer wall with insulation in between. The inner duct wall shall be constructed of 0.036 inch thick, 430 type stainless steel and be available in diameters 8" through 24". The outer wall shall be constructed of stainless steel at a minimum of 0.024 inch thickness. The duct, based on model number, shall include layers of Super Wool 607 Plus insulation between the inner and outer wall. Grease duct joints shall be held together by means of formed V clamps and sealed with 3M Fire Barrier 2000+. The duct wall assembly shall be tested and listed at 3/4" or zero inch clearance, according to classifications.

- G. Exhaust ducts for dish washer hoods shall be the same material as the hood. Dish washer hood exhaust ducts passing through multiple floors shall be stainless steel regardless of the hood material.
- H. Duct dimensions shown on drawings are finished inside dimensions. Increase duct sizes to allow for double wall construction, acoustic duct liner or fibrous glass duct system wall thickness where applicable.
- I. Changes in direction, including Tees, in square and rectangular duct work for both supply air, outside air, and return air shall be made with mitered elbows fitted with closely spaced full radius air foil type turning vanes constructed for maintaining constant velocity through elbow. Changes in direction in supply and return ducts may be made with radius elbows instead of mitered elbows and turning vanes if space limitations permit or if shown on drawings. Radius elbows in round duct work do not require turning vanes for either supply or return air.

2.11 A/C DUCT WORK ACCESSORIES

- A. Manual balance/volume dampers shall be opposed blade type and shall be 16 gauge minimum galvanized steel with zinc-plated hardware and bronze or nylon bearings. Blades shall not be over 8" wide nor less than 16 gage galvanized steel. Maximum leakage shall be less than 1% at static pressure of 4" W.G. Provide locking quadrant damper operators on manual dampers.
- B. Provide 24 V electric operators on automatic dampers. Electric operators shall be oil immersed gear train type with spring return and shall function proportionally or pulsed directly for position control and shall be compatible with DDC system.
- C. Turning vanes shall be factory fabricated full radius double thickness air foil type with 24 gauge rails and hollow vanes.
- D. Extractors at branch take-offs shall be adjustable push rod type with locking hardware. Extractors at sidewall supply grilles shall be adjustable by removing the grille face.
- E. Splitters shall be constructed of at least the same gauge galvanized steel as the duct wherein they are used and shall not be less than 24 gauge. Blades shall be formed in two thickness of metal to provide rounded nose to air flow.
- F. Access doors shall be factory fabricated, double wall insulated type of 24 gauge minimum galvanized steel. Doors shall be non-hinged, completely removable with hand operated adjustable tension catches and shall be completely gasketed around their perimeter. Doors shall be as large as the duct size will permit (within 1" of each duct edge) and large enough to permit access to fire dampers and other items requiring access. Doors larger than 12" shall have latches on all four sides.
- G. Flexible connectors shall meet requirements of UL 191 for Class 1 connectors.

2.12 FLEXIBLE DUCT

- A. Flexible duct shall be pre-insulated type, listed by Underwriters' Laboratories, Inc., Class 1 ducts, polymer film supported by helically wound, spring-steel wire; fibrous-glass insulation; aluminized vapor-barrier film and shall conform to NFPA Bulletin 90-A.
- B. Duct shall be designed for pressure rating of 4-inch W.G. positive and 0.5-inch W.G. negative. Maximum air velocity shall be 4000 fpm.
- C. Insulation shall be the required thickness and material to provide a minimum thermal resistance "R" of 4.2. Comply with ASHRAE/IESNA 90.1-2004.
- D. Flexible duct connectors shall be stainless-steel band with cadmium-plated hex screw to tighten band with a worm-gear action.

2.13 INSULATION – GENERAL

- A. All insulation materials and coatings shall meet flame spread and smoke developed ratings per NFPA Bulletin 90-A when tested in accordance with ASTM Standard E-84. Smoke developed less than or equal to 50, and flame spread less than or equal to 25. All coatings and mastics shall be nonflammable in wet state.

- B. Approved Manufacturers: Armstrong World Industries, CertainTeed Corp., Manville, IMCOA, NOMACO, Owens-Corning Fiberglas Corp., Pittsburg Corning Corp.

2.14 DUCT WORK INSULATION

- A. General: Duct insulation shall be the required thickness and material to provide a minimum thermal resistance "R" of 8 when duct is located outside building, "R" of 6.0 when duct is located in areas within the building but on the non-air conditioned side of the building insulation and 4.2 when located on the air conditioned side of the building insulation unless otherwise noted on the drawings. These R values are "as-installed" minimums. Insulation nominal thickness shall not exceed 2".
- B. Flexible external insulation shall be fiberglass and shall have an "as-packaged" R value not less than the required "as-installed" value and shall have all service jacket (ASJ) facing.
- C. Semi-rigid external insulation shall be fiberglass and shall have an "as-packaged" R value not less than the required "as-installed" value and shall have all service jacket (ASJ) facing.
- D. Aluminum Jacketing: 0.016" thick minimum with bands and seals of same material by Premetco International or approved equal.
- E. Vapor Barrier Jacket:
 - 1. ASTM C921, White kraft paper reinforced with glass fiber yarn and bonded to aluminized film.
 - 2. Moisture Vapor Transmission: ASTM E96; 0.02 perm inches.
 - 3. Secure with self sealing longitudinal laps and butt strips.
 - 4. Secure with outward clinch expanding staples and vapor barrier mastic.

2.15 REFRIGERANT SUCTION PIPING INSULATION

- A. Above grade piping inside building and when installed in PVC conduit: 1/2" thick, pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to IMCOA Imolock or NOMACO Nomalock, and installed in accordance with manufacturer's instructions.
- B. Exposed piping outside building: 3/4" thick, pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to IMCOA Imolock or NOMACO Nomalock, and installed in accordance with manufacturer's instructions and, in addition, provide banded aluminum jackets to floor or wall penetration. Install and secure aluminum jackets in accordance with manufacturer's instructions.

2.16 CONDENSATE DRAIN PIPING INSULATION

- A. PVC used for primary or secondary condensate piping located inside building above ceilings shall be insulated with 1/2", pre-formed, flame-retardant, elastomeric, polyethylene, pipe insulation similar to IMCOA Imolock and Armstrong Armaflex, or, in dry locations, 1/2" thick 3.5 pound density molded fiberglass with all-purpose, high density, white kraft bonded to aluminum foil, reinforced with fiberglass yarn jacket. Install pipe insulation in accordance with manufacturer's instructions.

2.17 PIPE INSULATION JACKETING, BANDING, AND TAPING

- A. All service jacketing: Kraft Paper aluminum foil/vinyl coating fire retardant construction by Lamtec Corp., Alpha Associates, or approved equal.
- B. Aluminum jacketing: 0.016" thick minimum with 1/2" wide bands and seals of same material by Premetco International or approved equal.
- C. PVC jacketing: 0.03" thick minimum with self sealing laps and heavy duty fitting covers of matching thickness by Proto Corp or approved equal. All PVC shall have flame and smoke rating of 25/50 or less and be UV resistant.
- D. PITTCOTE® 404 coating and PC® fabric 79 reinforcing by Pittsburgh Corning. No alternatives accepted.
- E. Fiber reinforced tape 3/4" wide Scotch Brand #8934 by 3M or approved equal.

2.18 AIR DISTRIBUTION EQUIPMENT

- A. Manufacturers: Basis of Design is Price. Approved equals meeting all specified criteria are: Acutherm, Anemostat, Krueger, Metalaire, Metal Industries, Nailor, Price, Seiho, Titus, and Tuttle & Bailey.
- B. Air distribution devices shall be as scheduled on the drawings. All supply diffusers shall be selected to deliver the indicated volume of supply air without exceeding the available throw and with an NC rating not to exceed 25, including half open damper. Submittal data shall clearly indicate performance of selected devices including air quantity, pattern, throw, pressure drop, sound level, finish, dimensions and construction of all air distribution devices.
- C. Refer to Architectural reflected ceiling plans for exact location of air distribution devices. All non-linear supply, return and exhaust diffusers, grilles and registers shall be steel construction unless scheduled otherwise and shall have thermoset Alkyd-Melamine painting system applied by an electro-deposition system that totally submerges the entire product in the paint followed by a baking process at 315° F.
- D. Ceiling surface and sidewall supply registers shall, unless otherwise scheduled, have opposed blade type key operated dampers with a detachable key. One (1) key shall be furnished for each register.
- E. Linear supply diffusers and return grilles shall be as scheduled on drawings. Material shall be aluminum. Finish shall be selected by the Architect.

2.19 EXHAUST AIR LOUVERS

- A. Wall louvers shall be drainable type with drain gutter in each blade and down-spouts in frame jambs and mullions. Frame and blade material to be anodized extruded aluminum construction, anodize color to be selected by the Architect. Frame shall contain integral caulking slots. Insect screen shall be installed on building side of louver. Insect screens on air intake louvers shall be made accessible from the building side of louver through access doors in duct work or from the outside through removable louver frame.
- B. Frame and blade material for louvers in soffit to be anodized extruded aluminum construction, anodize color to be selected by the Architect. Insect screen shall be installed on building side of louver. Insect screens on air intake louvers shall be accessible from the outside through a removable louver frame.
- C. Design shall incorporate structural supports required to withstand minimum wind load of 110 mph. Louver size shall be as scheduled on drawing.
- D. Published performance data must be submitted for approval prior to fabrication and must demonstrate pressure drop and water penetration equal to or less than unit scheduled on drawings.
- E. Approved Manufacturers: Arrow, Empco, Ruskin, Greenheck And United Air.

2.20 FIRE DAMPERS

- A. Fire dampers shall be of the guillotine type, spring loaded, fusible link, U.L. approved, and in accordance with NFPA Bulletin 90-A requirements. Construction shall be galvanized steel. Dampers shall be similar to Ruskin model DIBD2 STYLE B, or type detailed on drawings. Dampers shall be sizes as shown on drawings and shall stack out of air stream on all ducts.
- B. Fire dampers at ceiling diffusers shall be spring loaded, fusible link, U.L. approved, and in accordance with NFPA requirements. Dampers shall be similar to Ruskin model CFD2 as scheduled and of sizes shown for diffusers/grilles on the drawings.
- C. Approved Manufacturers: Airstream Balance, Inc., Metal Industries, Ruskin, United Air.

2.21 CORROSION PROTECTION FOR ALL CONDENSER/HEAT PUMP UNITS

- A. Provide corrosion protection for all condenser/heat pump units. Corrosion protection system shall be Bronze Glow, Heresite, Adsil, or pre-approved equal, applied only by applicators certified and/or licensed by system manufacturer.

2.22 CONTROLS

- A. Controls shall be direct digital control (DDC) system designed to provide for proper performance of equipment as specified "CONTROLS - SEQUENCE OF OPERATION" in PART 3 of these specifications. DDC system shall include all devices, controllers, interface components and data input connection required for a complete DDC system.
- B. Motor operated dampers shall have aluminum frames and aluminum air foil blades with synthetic elastomeric mechanically attached, field replaceable blade seals. Electric actuators shall be manufactured by Belimo and shall be selected for the required operating characteristics compatible with the control system.
- C. CO2 Transmitters: CO2 shall be sensed using a non-dispersive infrared technology. Transmitter shall be accurate to +/- 50 PPM and shall have a true 4 to 20 MA analog output directly proportional over a range of 0 to 2,500 PPM. Provide room or duct mounted units as appropriate. Transmitters shall be Texas Instruments, Inc., Automation Components Inc. or a pre-approved equal.
- D. Smoke detectors will be supplied by Electrical Contractor.
- E. Control wiring conduit shall be EMT. All control wiring run in plenum containing supply or return air shall be installed in conduit or be plenum rated wire.

2.23 ACCESS DOORS

- A. Access doors shall be as similar to those manufactured by Milcor Division of Inland-Ryerson of type as follows:

Door Location	Door Type
Drywall	Style "DW"
Masonry or Tile	Style "M-Stainless"
Acoustical Tile	Style "AT"
Plaster	Style "K"
Fire Rated Walls/Ceilings	Style "Fire Rated"

- B. Each door shall be equipped with two flush, screwdriver operated, cam latches and, other than Style "M", shall be finished to match adjacent surface. Door sizes shall be applicable to access required for normal service.

PART 3 – EXECUTION

3.1 INSTALLATION OF THE WORK

- A. Examine the site and all drawings before proceeding with the layout and installation of the Work.
- B. Arrange the Work essentially as shown, exact layout to be made on the job to suit actual conditions. Confer and cooperate with other trades on the job so all Work will be installed in proper relationship and coordinate precise location of parts with the Work of others.
- C. Arrange for required chases, slots and openings with the General Contractor including locations of required pipe sleeves through walls and foundations. Assume liability for cutting or patching made necessary by failure to make proper arrangements in this respect.
- D. Indicated equipment connections are necessarily based on equipment of a given manufacture. Assume responsibility for proper arrangement of pipes, ducts, etc. to connect approved equipment in a proper and approved manner. Follow equipment manufacturer's detailed instructions and recommendations in the installation and connection of all equipment. In case of conflict between manufacturer's instructions and the contract documents, notify the Architect before proceeding. No equipment installation or connections shall be made in a manner that voids the manufacturer's warranty.
- E. Duct work shown on drawings is designed to produce required air quantity at estimated pressure drop which is used for air handling unit air quantity, pressure, and motor horsepower. Actual field installation may result in lower or higher pressure drop at the design air quantity which may require adjustment of fan speed. Take responsibility for this adjustment including replacement of fan sheave, if required, to obtain required air quantity and maintain required duct static pressure.
- F. Install all Work in a neat and workmanlike manner, using only workmen thoroughly qualified in the trade or duties they are to perform. Rough Work will be rejected.

3.2 CONDENSATE DRAIN PIPE INSTALLATION

- A. Install condensate piping in a workmanlike manner, according to the best practice of the trade, properly pitched and vented to eliminate air pockets or traps, and to ensure rapid drainage from each unit. Cut pipe squarely to accurate length for full penetration into fittings. Remove burrs from ends of copper pipe, clean soldering surface thoroughly, flux, assemble and solder before surfaces oxidize. Use approved non-corrosive flux. Use sufficient heat for complete penetration of solder and wipe away excess flux and solder. Remove burrs from ends of PVC pipe, clean joining surfaces thoroughly and form all joints in accordance with the pipe manufacturer's recommendations.
- B. Provide a valve, female hose connection with hose thread cap and rubber washer, and 4" deep trap to prevent back suction into the air unit as detailed on drawings.
- C. Run condensate drain line from each A/C unit as noted on the drawings.
- D. Install condensate drain trap float switch, when approved by local municipal Authority having jurisdiction, to turn off unit if condensate backs up in trap.

3.3 REFRIGERANT PIPE INSTALLATION

- A. Size and install all refrigerant piping to complete the system connecting heat pumps/condensers to air handlers in accordance with the equipment manufacturer's instructions based on equipment size, route of piping, and good refrigeration system practice. Layout piping in most direct route to minimize amount of system refrigerant. Install refrigerant tube size to minimize pressure drop and provide for oil return to compressor. Braze all joints with 15% minimum silver alloy solder.
- B. Run horizontal piping above ceilings and vertical piping inside walls in finished spaces (not including mechanical rooms).
- C. After completion of entire system and before any pipe is covered, test the entire refrigerant circuit to assure that it is absolutely tight. Conduct low-side test at 150 psi; high-side at 300 psi.
- D. After completion of leak testing, evacuate and charge the system utilizing a procedure approved by air conditioning unit's manufacturer.
- E. Install all refrigerant lines located underground or under the building floor in PVC conduit sized to contain both the liquid and hot gas lines including required insulation. Seal space between piping and PVC conduit at each end of conduit to eliminate entry of water.

3.4 PIPE HANGER INSTALLATION

- A. Space hangers for horizontal refrigerant piping 6 feet on center.
- B. Space hangers for horizontal copper condensate piping 8 feet on center.
- C. Space hangers for horizontal PVC condensate piping 4 feet on center.

3.5 SLEEVE AND ESCUTCHEON INSTALLATION

- A. Accurately locate and set required sleeves. Where more than one pipe is necessarily passed through a single sleeve as to a unit piping enclosure or other conditions resulting in larger than 1/8" gap within the sleeve, tightly pack space with proper material to form a barrier against sound, vermin, fire, etc.
- B. Fill all spaces between piping and sleeves passing through fire-rated walls, floors, or ceilings with material capable of maintaining the fire-resistance rating of the wall, floor or ceiling.
- C. Provide properly fitted sheet metal flanges around sheet metal ducts entering exposed into finished spaces and/or to cover excessive gaps around ducts entering into non-finished spaces. In addition provide metal flashing around duct work penetrating exterior walls and seal to provide weather tight system.
- D. Provide escutcheons on all finished surfaces where exposed piping, bare or insulated, pass through floors, walls or ceilings, except in boiler, utility or equipment rooms. Fasten escutcheons securely to pipe or pipe covering.

3.6 HVAC DUCT WORK

- A. Install all duct work in accordance with SMACNA standards. Install extractors and air balance dampers in all branch take offs including take offs to supply diffusers. Paint inside of diffusers and duct visible through diffusers flat black.
- B. Support duct from building structure with straps, rods, or angles as detailed in "HVAC Duct Construction Standards - Metal and Flexible" as published by SMACNA. Horizontal and diagonal joist bridging shall not be considered part of building structure for duct supporting purposes. Where joist are located too far apart for duct support or duct runs are parallel to joist, provide angles between joist designed to support duct without sagging.
- C. Install flexible ducts with a minimum run and with a minimum of bends. No run shall exceed 12 feet for diffusers and bends shall have a minimum radius of 1-1/2 times the diameter of the duct measured from the center line. Seal all joints and connections. Connect flex duct to spin-in and air distribution fittings using metal clamps; nylon draw bands and wire straps will not be accepted. Support flexible duct from building structure. Do not lay on light fixtures or ceiling. Flexible duct sizes shall be as noted on drawings.
- D. Make all supply, return and outside air duct connections to air handling units, including rooftop units with flexible connectors specifically designed for equipment used.

3.7 FIRE DAMPERS

- A. Install fire dampers at all duct penetrations of floors and fire rated walls. Install fire dampers as shown on drawings and in accordance with manufacturer's instructions and details. Install fire damper to allow opening and resetting of fire damper shutter from the duct access door or opening.

3.8 BALANCE DAMPERS

- A. Install volume dampers at points on supply, return, and exhaust systems where branches extend from larger ducts and at other locations shown on drawings. Install balance dampers at all flex duct connections for return air grilles and supply air diffusers except where only one device is connected to a branch duct.
- B. Install automatic/motor operated volume dampers where shown on drawings and in accordance with manufacturer's instruction.

3.9 ACCESS DOORS

- A. Provide wall/ceiling access doors at dampers, valves, air vents, fire damper access doors, and like items requiring adjustment or maintenance accessibility if they cannot be located over lay-in type ceilings or in attic and mechanical rooms. Obtain approval from Architect for location of access doors.
- B. Provide access doors in ducts within arm-reach of fire dampers and located to permit opening and resetting fire damper shutter. Locate access doors over lay-in type ceilings. Provide ceiling access doors if duct access doors cannot be located over lay-in type ceilings. Provide access doors in walls behind which duct access doors are located. Obtain approval from Architect for location of access doors.
- C. Provide visible markers on finished side of lay-in type ceiling grid to indicate locations of duct access doors, valves, adjustable dampers, air vents, fire damper access doors, and like items. See Architect for marker type.

3.10 CONTROLS – GENERAL

- A. Furnish all controls and control wiring to provide for proper performance of equipment. Contractor responsible for control system installation shall provide support to HVAC system test and balance contractor to access control system to facilitate the TAB work.
- B. Install all high voltage (120 V or above) control wiring in EMT conduit. Install low voltage control wiring in conduit unless concealed in walls or above finished ceilings. Use plenum rated wire above ceilings when used as supply and return air plenums. Do not run low voltage control wiring in the same conduit as high voltage control or power wiring.
- C. Install room temperature sensors where shown on drawings and 48" above the floor unless otherwise noted on drawings.

- D. Install smoke detectors (supplied by Electrical Contractor) in supply air ducts and/or return ducts where shown on drawings and in accordance with manufacturer's instructions. Locate smoke detectors in supply ducts up-stream from first diffuser or branch duct connection. Locate smoke detectors in return ducts up-stream from outside air connection and down-stream from last return grille or branch duct connection. Connect smoke detectors to air handling units as required to turn off supply air fan and associated equipment when smoke is detected. Remote stations shall be flush mounted in 4" square box, and located in a normally occupied area generally as indicated on drawings.

3.11 CONTROLS - SEQUENCE OF OPERATION

- A. This section defines the manner and method by which controls function. Requirements for each type of control system operation are specified. The controls shall be designed to efficiently maintain temperatures between 68° F (heating) and 78° F (cooling) in all spaces supplied with conditioned air.
- B. See control drawing for control sequence diagrams.

3.12 EQUIPMENT SUPPORTS INSTALLATION

- A. Furnish, fabricate, shop paint, and erect all structural supports and platforms as required for all equipment installed in this Work, unless otherwise specified. Make these supports and platforms independent of all other equipment supports and suspend them from the building structural steel, inserts imbedded in concrete slabs, or support them on columns as required by the drawings. Attachments to steel bar joists shall be approved by the Architect and must only be at panel points. Do not, under any circumstances, burn, drill or weld either chord of steel bar joist.
- B. Install galvanized steel supports under vertical air handling units up to 2,000 cfm to allow installation of return air ducts and access to filters and unit access panels.
- C. Prepare and furnish drawing and templates indicating all concrete Work required for equipment furnished under this Work. All concrete required will be provided by the General Contractor. Provide, at the time concrete foundations, bases, or curbs are formed, all necessary anchor bolts as required for the various equipment in this Work. Grout all spaces between the equipment base and concrete supports.

3.13 EQUIPMENT INSTALLATION

- A. Install all equipment in accordance to equipment manufacturer's instructions. Install all equipment to permit removal of coils, fan shafts and wheels, filters, belt guards, sheaves and drives, and all other parts requiring periodic replacement or maintenance.
- B. Arrange equipment to permit ready access to valves, cocks, traps, starters, motors and control components, and to clear the openings of swinging and overhead doors and of access panels.
- C. Install neoprene inertia pads under floor-mounted air handling units with internal spring isolation.

3.14 DEDICATED OUTSIDE AIR VENTILATION SYSTEM

- A. Install dedicated outside air ventilation system as shown on the drawings and in accordance with the unit manufacturer's instructions including all controls required for proper operation of unit as required under CONTROLS - SEQUENCE OF OPERATION section of these specifications.

3.15 WALL LOUVERS

- A. Install outside air exhaust louvers where shown in Architectural drawings. Insect screens on air intake louvers shall be made accessible from the building side of louver through access doors in duct work or from the outside through removable louver frame. Seal all joints weather tight between wall and louver frame to prevent leakage.

3.16 KITCHEN HOOD EXHAUST AND SUPPLY SYSTEM

- A. Install hood exhaust and supply unit on roof where indicated on drawings and in accordance with equipment manufacturer's instructions.
- B. Install kitchen hoods where shown on kitchen plans. Connect exhaust and supply ducts to the kitchen hood in accordance with the hood manufacturer's instructions.

- C. Hook up and test liquid agent fire system including local or remote actuator. Provide test certificate to Architect.

3.17 IDENTIFICATION OF EQUIPMENT AND EQUIPMENT LOCATIONS

- A. Securely attach manufacturer's nameplate to all equipment giving data as to design and operating characteristics.
- B. Securely attach nameplates to all switches, starters, gauges, control devices, including thermostats, and similar items, giving the name and number of the item of equipment to which it is connected.
- C. Identify all air handling units, heat pump units, compressor/condenser units, fans, control devices and other items of machinery or apparatus by stenciled letters.
- D. Provide visible markers on finished side of lay-in type ceiling grid to indicate locations of duct access doors, valves, adjustable dampers, air vents, fire damper access doors, and like items. See Architect for marker type.

3.18 INSULATION – GENERAL

- A. Use application details in accordance with the insulating material supplier's recommendations except where a higher standard is specified herein. Clean exterior of all piping and duct work of foreign substances, including moisture, prior to application of insulation. Apply insulation to piping and duct work with all joints tightly fitted to eliminate voids. Replace broken or damaged insulation with new insulation and joint material.

3.19 REFRIGERANT PIPING INSULATION

- A. Run covering for piping unbroken through hangers. Cover all insulated refrigerant piping exterior to building with banded aluminum jackets. Install and secure all aluminum jackets in accordance with manufacturer's instructions.

3.20 CONDENSATE PIPE INSULATION

- A. Run covering for piping unbroken through hangers.

3.21 DUCT WORK INSULATION

- A. Insulate all sheet metal supply air, outside conditioned air, and return air duct work located in concealed spaces with flexible external insulation. Insulate backs and necks of all diffusers and return grilles with flexible external insulation.
- B. Insulate all sheet metal supply air, outside conditioned air, and return air duct work located in areas exposed to view whether areas are air conditioned or not, and return air plenum for vertical air handling units with semi-rigid external insulation.
- C. Insulate return air plenum on vertical air handling units with semi-rigid insulation.

3.22 AIR SYSTEM TEST AND BALANCE

- A. The Test and Balance (TAB) Agency, completely independent from Contractors installing work under this specification section, shall perform all test and balance work in accordance with the recommendations of the Associated Air Balance Council (AABC) or the National Environmental Balancing Bureau (NEBB), and after the entire mechanical system has been completed and is in full working order.
- B. TAB Agency shall contact the Architect and provide the schedule for TAB work at least one week prior to start of TAB work to afford the Architect the opportunity to visit the job site during the TAB work.
- C. TAB Agency shall make provisions in the contract to meet the Architect at the job site after the TAB report has been submitted to spot check at least 10% of the TAB tested points. TAB Agency shall furnish equipment and TAB technician to complete these spot checks in the presence of the Engineer.
- D. The organizations approved for Test and Balance work for this project shall be certified by AABC or NEBB.
- E. Take responsibility for the following:

1. Place all heating, ventilating, and air conditioning systems and equipment into full operation and maintain operation during each working day of the TAB Agency.
 2. Make any changes required for correct balance, as recommended by the TAB Agency, at no additional cost to the Owner. Such changes may encompass but are not limited to pulleys, belts, duct work, dampers, or the addition of dampers and access doors.
 3. Furnish TAB Agency with full set of applicable shop drawings, submittal data, and manufacturer's performance data.
 4. Provide assistance to TAB Agency for operation of control system during TAB work.
- F. TAB Agency shall complete all following specified work:
1. Mark all duct traverse points and other information on set of reproducible HVAC drawings. Assign ID numbers to all diffusers and grilles, note ID numbers on reproducible HVAC drawing, and use ID numbers in TAB report.
 2. Before commencing work, verify that systems are complete and operable. Ensure the following:
 - a. Equipment is operable and in a safe and normal condition.
 - b. Temperature control systems are installed complete and operable.
 - c. Proper thermal overload protection is in place for electrical equipment.
 - d. Final filters are clean and in place.
 - e. Correct fan rotation.
 - f. Duct systems are clean of debris.
 - g. Fire and volume dampers are in place and open.
 - h. Coil fins have been cleaned and combed.
 - i. Access doors are closed and duct end caps are in place.
 - j. Air outlets are installed and connected.
 - k. Duct system leakage has been minimized.
 3. Report any defects or deficiencies noted during performance of services to the Engineer. Promptly report abnormal conditions in mechanical systems or conditions which prevent system balance. Beginning of balance work means acceptance of existing conditions.
 4. Adjust all air systems to the design values.
 5. Test and record all actual motor currents and note corresponding nameplate full load amperes.
 6. Test and adjust rpm of all blowers, fans, and similar air handling devices to within 10% of design quantities. Make pitot tube traverses of all main exhaust, supply, and return ducts and obtain air flow of each fan. Test and record each system's starting pressure, suction and discharge. Test and adjust system for design recirculated and outside air flows.
 7. Test and adjust each diffuser, grille and register to within 5% of design requirements and identify and list each grille, diffuser and register. Use manufacturer's ratings on all equipment for required calculations.
 8. Recorded data shall represent actually measured or observed conditions.
 9. Permanently mark settings of dampers and other adjustment devices allowing settings to be restored. Set and lock memory stops.
 10. After adjustment, take measurements to verify balance has not been disrupted or that such disruption has been rectified.
 11. Leave systems in proper working order, replacing belt guards, closing access doors, closing doors to electrical switch boxes, and restoring thermostats to specified settings.
 12. Upon completion of test and balance work, insert all data, including copy of marked-up HVAC drawing, into a complete typewritten report and submit six (6) copies of this report to the Architect.

3.23 INSTRUCTION OF OWNER'S REPRESENTATIVE

- A. After final acceptance of all Work and occupancy of building, provide service to make system adjustments to suit conditions created by the occupancy; instruct Owner's operating personnel in operation adjustment and maintenance procedures of system components, acquaint them with locations and functions of valves, control devices, etc., in the system, and instruct them in the operation of the HVAC control system.

3.24 CLEANING AND RUBBISH

- A. During the Work, keep the premises clear of rubbish created as a result of the Work. Protect and prevent unnecessary induction of dirt and thoroughly clean all equipment used for temporary heat and/or ventilation.
- B. Use and maintain adequate filters in all fan coil equipment used for temporary heat and/or ventilation. Replace with new filters after construction and before units are placed in service. Close all air duct openings to effectively prevent the entrance of dust and construction debris during construction.
- C. On completion of the Work, remove all rubbish and debris resulting from the Work and dispose of same. Thoroughly clean and leave in a satisfactory condition for use all equipment, pipe, fixtures, duct work, etc.

3.25 RECORD DRAWINGS

- A. The Architect will furnish prints of the mechanical drawings as issued for this contract. Use these prints to indicate accurately and neatly any deviation in the actual installation from the drawings as issued. At the completion of the job, deliver the marked-up drawings to the Architect for a permanent record of the exact location of all equipment, pipe runs, etc. as incorporated in the job.

3.26 COMPLETE SYSTEMS

- A. Leave all systems completely operative in all details and in satisfactory working condition, as determined by the Architect. Furnish and install as part of this contract all apparatus and material obviously a part of the systems and necessary for their operation.
- B. Coordinate work specified herein and shown on mechanical drawings and insure completion in a timely and proper manner. Prior to requesting "Substantial Completion Inspection", provide the Architect with letter stating all requirements of this section have been met. Letter shall contain itemized list indicating each item has been personally checked by the Superintendent and that it is ready for inspection. With letter, provide reports, schedules, etc., as required. This section is intended as a checklist to insure items specified are properly installed and to insure against premature "Substantial Completion Inspection" requests.
- C. Check air distribution systems and insure systems are properly tested and balanced. Check filters and, if dirty, install new filters in units with disposable type filters and remove, wash and reinstall filters in units with permanent type filters. Dirty filters shall be defined as pressure drop exceeding 0.5" W.G. Provide one additional set of disposable and/or metal, washable, permanent, type filters as applicable for each unit. Lubricate fans, motors, and all other moving equipment requiring lubrication. Provide a maintenance schedule listing each piece of equipment requiring lubrication, points to be lubricated, product and device to be used, and frequency of lubrication required.
- D. Check and insure all equipment is properly installed, mounted as specified or shown and in accordance with manufacturer's recommendations. At equipment start-up, insure controls, power wiring, and interlocks are complete. Check alignment of motors and drives. Verify overload heaters are properly sized and installed. Check for proper motor rotation. Provide specified system identification.
- E. Provide for thorough cleaning of installation. Cleaning shall include removing temporary covers; removing adhesive applied stickers except those giving specific maintenance instructions which were intended to remain on equipment; removing cord and wire affixed tags; removing paint, coating and adhesive spatters; and vacuuming inside air handling unit plenums.
- F. Provide for touch-up painting of factory finished equipment. Touch-up painting is intended to cover minor dents, scratches, and scuff marks. Prepare surface by light sanding or remove rust with chemical compounds designed for application and coat surface with primer followed by

matching top coat. Where equipment has major surface damage and/or rusting, refinish entire equipment surfaces as directed by the Architect.

- G. Provide all specified operation and maintenance manuals. Obtain letter from Owner stating specified operating instructions have been completed.

END OF SECTION 230000

SECTION 260000

ELECTRICAL

PART 1 – GENERAL

1.1 DESCRIPTION OF WORK

- A. The General Provisions of the Contract, Division 1, including the General Requirements, Supplementary Conditions and Special Conditions, along with the General Requirements, are hereby made a part of this Section as if fully repeated herein.
- B. Scope of Work: Included under this section of these specifications shall include complete electrical systems as shown on the drawings and specified herein. This work shall include:
 - 1. Temporary electric service and distribution for construction purpose.
 - 2. Permanent building service entrance equipment and feeder distribution.
 - 3. Trench excavation, pumping, backfilling and compaction for all underground electrical work.
 - 4. Building panelboards and branch circuits to electrical devices, lighting fixtures, and other electrically operated equipment.
 - 5. Empty conduits and outlets for voice/data network cabling.
 - 6. Demolition.
 - 7. Coordination.
- C. Related work specified elsewhere:
 - 1. *Add other division 16 work as applicable.

1.2 EXISTING CONDITIONS:

- A. Contractor shall schedule power outage required for building electrical system addition indicated on drawings with both Owner and Architect. Contractor shall provide all necessary work required for electrical system addition after normal business hours (evening or weekends).

1.3 CODES, ORDINANCES AND PERMITS

- A. Comply with all codes applying to the Work of this contract including but not limited to the 2020 Florida Building Code, the National Electrical Code (NEC), National Electrical Safety Code, ADA and OSHA, and Florida Life Safety Code 2020 Edition. Obtain information on all code restrictions and requirements. In case of conflict between the contract documents and a governing code or ordinance, such conflict shall be immediately brought to the attention of the Architect for resolution. Extra payment will not be allowed for work required by code restrictions except through written agreement with the Owner.
- B. Apply for, obtain, and pay for all required permits and inspection certificates. Final payment is contingent upon delivery of such certificates to the Architect.
- C. Although not a State requirement, a minimum of one licensed Journeyman Electrician shall be present for every 5 electrical workers on the jobsite throughout the course of construction.
- D. Where applicable, all materials and equipment shall bear the Underwriters' Laboratories seal. Certificates to this effect shall be furnished to the Architect upon request.

1.4 SITE INSPECTION

- A. Visit the site and thoroughly inspect conditions affecting the work before submitting bid. Assume responsibility for meeting all existing conditions including access and work space limitations.

1.5 DRAWINGS AND SPECIFICATIONS.

- A. Refer to the general construction drawings which are bound with the drawings of this Work for construction details, elevations, etc. Architectural and structural drawings shall take precedence over Division 16 drawings (Electrical Drawings).
- B. It is the intent of the drawings and specifications to call for finished Work, tested, and ready for operation, and in complete conformance with all applicable codes, rules and regulations. Minor details not usually shown or specified, but manifestly necessary for the proper installation and operation of the various systems, shall be included in the Work and in the proposal, the same as if specified or shown on the drawings.
- C. Specifications and drawings shall be considered as supplementary to each other, requiring materials and labor indicated, specified, or implied by either specifications or drawings. If any departures from the drawings and specifications are deemed necessary, details of such departures and the reasons therefore shall be submitted to the Architect for approval. No departures shall be made without prior approval of the Architect.
- D. Specific reference in the specifications to any article, device, product, material, fixture or type of construction, etc., by proprietary name, make or catalog number shall be interpreted as establishing a standard of quality and shall not be construed as limiting competition. Substitutes may be used subject to compliance with requirements set forth herein, and in the General Requirements, Division 1, and as approved by the Architect.

1.6 SUBMITTALS

- A. Submit shop drawings, catalog sheets, or other descriptive data with sufficient information to establish design, quality and performance.
- B. Any submittal package which is submitted without specific model numbers for all equipment indicated will result in the entire package being rejected. Data shall describe apparatus, equipment, panels, fixtures, and other items requiring descriptive literature. Submittals shall include the following:
 - 1. Light fixtures
 - 2. Panelboards
 - 3. Safety switches
 - 4. Motor starters
 - 5. Wiring devices & plates
 - 6. Occupancy sensors
 - 7. Floor outlet boxes
 - 8. Time switches
 - 9. Lighting Control Systems
 - 10. Fire alarm system
 - 11. Surge Protective Devices (SPD)
- C. Review of the submittals does not grant the contractor leave to proceed in error. The requirements of the drawings and specifications must be followed and are not waived or superceded in any way by the submittal review.
- D. Submittal data may be submitted for review and 'revised and resubmitted' only two times without cost to the contractor. Each subsequent submittal shall be reviewed for a flat fee of \$100.00 payable to the reviewing engineer.

1.7 MAINTENANCE DATA

- A. Collect and neatly retain maintenance and service data supplied with equipment furnished and installed under this contract until job completion, at which time deliver to the Architect for inclusion in the Maintenance Manual. All such data must be properly identified as for equipment served.

- B. Keep one set of prints current of any changes or variations by marking prints in a legible manner; and upon completion of project, deliver prints to the Architect. Do not make changes without prior approval of the Architect.

1.8 TEMPORARY ELECTRIC SERVICE

- A. Provide complete temporary system of power and lighting wiring for use during construction and for testing of equipment. Comply with OSHA and NEC including personnel ground-fault protection requirements.

1.9 ELECTRIC SERVICE

- A. Building electrical service will be provided by local utility and arranged generally as indicated on drawings.
- B. Provide all labor, materials and equipment not provided by the utility in accordance with the utilities' installation policies, specifications and procedures without additional cost.
- C. The contractor shall contact the utility in advance and verify availability and arrangements for electrical service as indicated. Should a significant installation conflict occur, notify the Architect immediately for resolution before starting any work.

1.10 COORDINATION - GENERAL

- A. Drawings are generally diagrammatic. Review all project drawings and coordinate all work with general contractor and different trades prior to installing any work so that interferences between electrical work and ducts, piping, equipment, architectural and structural work will be avoided. Do not install conduits, boxes and fittings in spaces required for ductwork or piping.
- B. Furnish all necessary offsets in raceways, fittings, etc., required to properly install work so as to take up minimum space. Install all equipment to provide code required 'working space'. Furnish and install all materials required to accomplish this without additional cost.
- C. In case interference develops, the Architect will decide which trade work must be relocated regardless of which was installed first. Damage from interference or rework caused by inadequate coordination with other trades shall be rectified without additional cost.
- D. Within 30 days following award of contract, report to the Architect in writing all real or potential errors, ambiguities and/or conflicts on electrical work or between trades. Those reported after 30 days, except as a result of unforeseen circumstances, shall be resolved at the discretion of the Architect. Report conflicts resulting from progress of work to the Architect immediately.

1.11 COORDINATION - ELECTRICAL / MECHANICAL

- A. Unless specifically required otherwise, all motors, integral starters, control and monitoring devices, timers, relays, pilot devices and other required control components will be furnished under Division 15.
- B. Unless specifically required otherwise, furnish and install disconnect switches, fuses and power wiring connections to all equipment as indicated on drawings or as specifically required by the equipment manufacturer.
- C. The mechanical contractor shall furnish and install all heating, ventilation and air conditioning equipment, including all control devices and control wiring.
- D. Unless specifically required otherwise, make all power wiring connections to all water heaters, pumps, machinery, appliances and other electrically operated equipment as indicated on drawings or as required. Furnish and install disconnect switches and starters as indicated on drawings, except for items furnished with integral disconnect switches and/or starters.

- E. Install and connect all separate disconnect switches and line voltage control devices furnished with the equipment but not factory mounted and connected on the equipment.
- F. Review shop drawings and verify final electrical characteristics and wiring before rough-in of power feeds to any equipment to be provided. When electrical data on shop drawings differs from contemplated design, make necessary adjustments to wiring, disconnect, and branch-circuit protection for equipment actually installed.

1.12 WORKING CLEARANCES

- A. Working clearances around electrical equipment requiring service shall comply with NEC requirements. Coordinate and verify clearances from equipment and work furnished by other trades. Should there be any apparent violations of clearance requirements, notify the Architect before proceeding with connection or placement of equipment. Rework caused by inadequate coordination shall be rectified at no extra cost.

PART 2 – PRODUCTS

2.1 MATERIALS

- A. All materials used in this project shall be new, unless otherwise noted, and listed by the Underwriters' Laboratories, Inc. as conforming to its standards where such standards have been established. These materials shall bear the U.L. label.
- B. Where materials, equipment, apparatus or other products are specified by manufacturer, brand name, type or catalog number, such designation is to establish standards of desired design or quality and shall be basis of bid. Alternatives may be submitted to Architect for consideration.

2.2 FIRE ALARM SYSTEM

- A. The fire alarm system shall be sized appropriately for the devices required. Fire alarm system shall be an addressable type, totally supervised system with manual and automatic alarm initiating devices, voice audible/visual alarm notification devices, control panel, and other system components as shown on the drawings, as specified herein or as otherwise required by code for a complete system. The entire system arrangement, wiring and components shall conform to NFPA 70, 72, 90A and 101, ADA, local codes and Fire Marshall requirements. Fire alarm system wiring for notification devices shall be Class B Style B. (*Hospital/Military use Class A/Style Z, 6 wire)
- B. Fire alarm shall be provided with a remote annunciator panel
- C. The fire alarm system operation shall be as follows:
 - 1. Trouble: Trouble condition at any point in the system will cause appropriate visual and audible readout indication at the control panels. Visual indication will remain on until trouble is cleared and system is restored to normal.
 - 2. Alarm: Activation of any system alarm initiating device will cause appropriate visual and audible readout indication at the control panel and remote annunciator panel, all building alarm notification signals to actuate, all air handling units and exhaust and supply fans to shut off, auxiliary relays to actuate and fire communicator to initiate call to remote monitoring provider. Alarm signals may be silenced at the control panel. Alarm indications will remain on until system is cleared and restored to normal.
 - 3. The control panel shall contain the following components and functions:
 - a. Addressing readouts and controls.
 - b. Initiating and alarm circuit supervision.
 - c. System trouble visual and audible readouts.
 - d. Trouble and alarm silence controls.
 - e. Alarm reset/restore.

- f. Power on indicator.
 - g. Low battery indication.
 - h. Dual line digital fire communicator
 - i. Power supplies.
 - j. Battery back-up power supply.
 - k. Auxiliary contacts.
 - l. Remote alarm contacts.
4. Control panel shall be a surface mounted, enameled steel enclosure with lockable cabinet door.
- D. Remote annunciator panel shall be flush mounted. Wall mount 48" above floor.
- E. Telephone dialer shall be programmable type with integral three channel dialer mechanism capable of transmitting fifteen selectable transmission formats. On site programming shall be provided as required to interface with the local off-site monitoring facility for central or remote station compliance. Dialer shall be provided with audible non-alarm test function, dialer abort function, battery back-up and telephone line coupler devices as approved by local telephone company.
- F. Speaker/strobe units
- 1. All speakers shall operate on 25 VRMS or with field selectable output taps from 0.5 to 2.0 Watts.
 - 2. Speakers in corridors and public spaces shall produce a nominal sound output of 84 dBA at 10 feet (3m).
 - 3. Frequency response shall be a minimum of 400 HZ to 4000 HZ.
 - 4. The back of each speaker shall be sealed to protect the speaker cone from damage and dust.
 - 5. Strobe lights shall be field adjustable with a minimum of four (4) settings (15,30,75,110) and shall meet the requirements of the ADA, UL Standard 1971 and shall meet the following criteria:
 - 6. The maximum pulse duration shall be 2/10 of one second.
 - 7. Strobe intensity shall meet the requirements of UL 1971.
 - 8. The flash rate shall meet the requirements of UL 1971.
 - 9. Unit shall be wall mounted at 80" aff.
- G. Strobe lights
- 1. Strobe lights shall meet the requirements of the ADA, UL Standard 1971 and shall meet the following criteria:
 - 2. The maximum pulse duration shall be 2/10 of one second.
 - 3. Strobe intensity shall meet the requirements of UL 1971.
 - 4. The flash rate shall meet the requirements of UL 1971.
 - 5. Unit shall be wall mounted at 80" aff.
- H. Manual Fire Alarm Pull Stations
- 1. Manual fire alarm pull stations shall be non-code, non-breakglass type, equipped with key lock so that they may be tested without operating the handle.
 - 2. Stations must be designed such that after an actual activation, they cannot be restored to normal except by key reset.
 - 3. An operated station shall automatically condition itself so as to be visually detected, as operated, at a minimum distance of 100 feet, front or side.
 - 4. Manual stations shall be constructed of high impact Lexan, with operating instructions provided on the cover. The word FIRE shall appear on the manual station in letters one half inch in size or larger.
- I. Duct smoke detectors shall be addressable, duct mounted, modular ionization type complete with duct width inlet and return tubes and detector head assembly. Smoke detectors will be mounted in the duct by the mechanical contractor as indicated on the mechanical drawings. Provide all wiring connections to fire alarm system control panel. Provide wiring connections and relay as required to shut off AC unit fan motor upon activation of duct smoke detector. Coordinate all wiring connections with mechanical contractor. Detectors which are not readily accessible shall be provided with a remote test/indicator

station mounted on the wall/column or ceiling near the detector. Label each remote station with AC unit number.

- J. All fire alarm system wiring shall be in accordance with the manufacturers recommendations. All exposed wiring shall be installed in a dedicated conduit system
- K. Provide ground conductor and ground connections for all control panels and cabinets as recommended by the manufacturer.
- L. Provide wiring connections to sprinkler system flow and tamper switches provided under Division 15 as indicated on the drawings or as required. Connect flow switches for alarm initiation and tamper switches for trouble signal.
- M. The entire system shall be installed and tested under the supervision of a qualified manufacturers representative.
- N. The entire system shall be tested in accordance with manufacturers' recommendations to ensure proper operation of all components.
- O. Provide properly executed Fire Alarm System Certification to certify that system has been installed and tested in accordance with all applicable codes
- P. Manufacturer shall be Silent Knight, Fire Lite, Honeywell, Notifier, Edwards, or pre-approved equal.

2.3 DISTRIBUTION EQUIPMENT

- A. Main distribution panel (MDP) shall be free standing switchboard style, 3000A at 208/8120V, 3 phase, 4 wire, front accessible, with main disconnect, microprocessor monitoring/protective device, distribution section, copper busses and 100% neutral. Enclosure shall be NEMA-1 for interior locations. Main disconnect shall be a 100% rated at ampacity indicated, solid-state logic type circuit breaker. Microprocessor monitoring/protective device shall be solid-state type and include metering readouts for volts, amps, KW, KWH, VARS, PF and frequency. Distribution section breakers shall be molded case thermal-magnetic type. Switchboard busses and circuit breakers shall be rated for 65,000A fault current. Distribution breakers shall be current-limiting type or have equivalent series rating to properly limit fault-current to the fault-current rating of all downstream panelboard breakers. Label all circuit breakers to indicate load served.
 - 1. Main breakers rated 1200A or greater shall be provided with provisions for Arc Energy Reduction as required by the NEC.
- B. Where adjustable trip type circuit breaker Main breakers rated 1200A or greater shall be provided with provisions for Arc Energy Reduction as required by the NEC. s are utilized contractor shall perform a breaker coordination study to insure proper trip settings.
- C. Panelboards shall be molded case circuit breaker type with completely dead fronts enclosed in code gauge, galvanized sheet steel cabinets with adequate wiring gutters top, bottom and sides. Neutral bus bars shall be 100% rated, insulated for panelboards shown with neutral. 200% rated neutral busing shall be supplied for panels designated on drawings with oversized neutral conductors, and 100% neutral. Front trim shall contain hinged door with keyed lock and catch. Door shall be provided with plastic enclosed circuit directory. Upon completion of installation, circuit directory shall be typewritten indicating usage and location of circuits as indicated on drawings.
- D. Circuit breakers shall be single or multi-pole molded case, of common handle, common trip without handle ties, thermal magnetic, quick-make, quick-break, for manual and automatic operation. Refer to schedules on drawings for details regarding panel types, capacity, interrupting rating, mounting and other information. Circuit breakers which protect branch circuits which share a common neutral shall be multi-

pole type as required by code. Circuit breakers which are indicated to serve permanently connected appliances such as water heaters, dishwashers, etc., shall be capable of being locked in open position.

2.4 SAFETY SWITCHES

- A. Safety switches shall be quick-make, quick-break, general duty type in sheet steel enclosure, NEMA-1 for interior locations and NEMA-3R for exterior locations as required for rain tight installations, with door cover interlock. Fuse type and size shall be as indicated or as specifically required by the equipment manufacturer.
- B. Safety switches for disconnection of elevator equipment power shall be provided with built-in auxiliary electrical interlock switch and wiring connection to the elevator controller. Coordinate connections with the elevator contractor.

2.5 LIGHTING CONTACTORS

- A. Lighting contactors shall be totally enclosed, magnetic type, electrically held, with voltage rating, ampacity and number of poles indicated on drawings. Provide contactor control from *switch, photocell or time switch* as shown on drawing.
- B. Contactor enclosure shall be NEMA-1 type cabinet for interior and NEMA-3R for exterior locations.

2.6 CONDUIT

- A. Electrical metallic tubing (EMT) with set screw fittings shall generally be used for building interior, and all feeders and branch circuit homeruns, except where exposed to physical damage, unless otherwise indicated or specified herein.
- B. Rigid or intermediate metal conduit with galvanized fittings and hardware shall be used on building exterior where exposed to weather.
- C. Rigid nonmetallic conduit (schedule 40 PVC) shall be used underground and in concrete slabs. Minimum PVC size shall be 1". Floor penetrations shall be rigid galvanized ell's.
- D. Flexible conduit shall be used for final connections to motors, appliances and vibrating equipment.
- E. Metal-clad cable (Type MC) with approved fittings may used where totally concealed and as permitted by codes. Although not required by code, where type MC is utilized, all raceways shall contain an equipment grounding conductor, and in addition, one conductor more than shown on drawings.
- F. Electrical nonmetallic tubing (ENT) shall not be used.
- G. On existing concrete or solid masonry walls in finished spaces where conduits/boxes cannot be concealed, provide surface type 'Wiremold' metal raceway system and fittings of size and type required. The use of this type raceway system shall however be kept to a minimum. Surface raceways shall include all required accessories including outlet/service boxes, couplings, elbows, tees, covers, end plates and installation hardware. Surface raceways shall include all required accessories including outlet/service boxes, couplings, elbows, tees, covers, end plates and installation hardware.
- H. In locations where exterior devices are connected to an interior device via a common raceway, provide silicone sealant in conduit at junction box in interior and exterior locations after branch circuit wiring has been installed. Sealant shall be applied to inhibit air flow in raceway between interior and exterior device locations.
- I. For recessed panels, provide a minimum of five (5) empty ¾" EMT from panel to above accessible ceiling space.

- J. From main electrical room provide a minimum of five (5) empty 1" EMT conduit with pull wire to the nearest path outside the building, cap and mark both ends, flag location on exterior of building for future uses.

2.7 SURGE PROTECTIVE DEVICES (SPD)

- A. Surge protective devices shall be listed or comply with the most recent editions of: Underwriters Laboratories: UL1449 (*3rd Edition) and UL 1283, ANSI/IEEE C62.41.1-2002, C62.41.2-2002, C62.45-2002, UL96A (Lightning Protection Master Label Compliant), National Electrical Code: Article 285.
- B. Subject to compliance, the following manufacturers are acceptable:
 - 1. Advanced Protection Technologies/ASCO.
 - 2. Surge Suppression Incorporated.
- C. SPD shall be UL labeled with a 200kA Short Circuit Current Rating (SCCR), as a Type 1 device, and a 20kA nominal (I-n) rating. All modules shall be replaceable. The Minimum surge current capability (single pulse rated) per phase shall be a function of the application as follows:
 - 1. Service Entrance or Transfer Switch: 300kA
 - 2. Distribution panelboards & MCC: 200kA
 - 3. Branch panelboards: 100kA
- D. UL 1449 Listed Voltage Protection Ratings (VPRs) shall not exceed the following:

<u>System Voltage L-N</u>	<u>L-G</u>	<u>L-L</u>	<u>N-G</u>	<u>MCOV</u>	
208Y/120	700V	700V	1200V	700V	150V

- E. SPD shall include green visual LED diagnostic for each phase, and a built in surge counter.
- F. SPD shall have a minimum 10 year factory warranty. Provide all wiring/conduit connections in accordance with manufacturer's recommendations.
- G. Transient surge suppressors shall be provided for all fire alarm wiring entering/leaving building .

2.8 CONDUCTORS

- A. All conductors shall be copper and shall not be smaller than #12 except where otherwise noted. Conductors smaller than #8 shall be solid. Conductors #8 and larger shall be stranded.
- B. Conductor insulation shall generally be XHHW or THHN as required for dry, damp or wet locations per NEC. Conductors subjected to higher ambient temperatures shall be derated in accordance with NEC.

2.9 OUTLET BOXES

- A. All outlet boxes, extensions, and cover frames shall be galvanized sheet steel for concealed locations or cast metal for exposed locations unless otherwise noted. Boxes shall be 1 1/2" deep, minimum, and shall be sized to accommodate the installed conduit, conductors and device. Boxes to which fixtures are installed shall have studs and straps to support fixture weight. Where more than two switches are located side by side, outlet box shall be multi-ganged type as required for switches to be mounted under single cover plate. Provide divider plate between each device within multi-gang outlet.
- B. Boxes for installation in concrete block wall construction shall be gang type, 3 1/2" deep for switch devices and 4" square by 1 1/2" deep, with 1 1/4" single and two gang square corner extension covers for receptacle and junction purposes. Boxes for installation in brick wall construction shall be gang type, 3 1/2" deep. Boxes installed in plastered walls shall be 4" square by 1 1/2" deep, with 3/4" single and two gang plaster covers. All boxes shall have internal mounting ears or threaded tappings.

- C. Boxes for installation in fire rated walls or ceilings shall be 2"x4" or 4" round metal type. Spacing shall be a minimum of 24" apart. 4" square boxes shall be permitted provided they are equipped with a 2"x4" extension ring and spacing is a minimum of 24" on center. Aggregate area of the openings provided for the boxes shall not exceed 100 square inches per 100 square feet of wall space.
- D. Floor outlet boxes shall be fully adjustable, flush type, with top cover plates and matching carpet flange plates as required. Boxes for combination type floor outlets shall be multi-service ganged type with duplex receptacle and voice/data conduits as indicated, Wiremold RFB4 series.
- E. Combination poke thru floor boxes shall be equipped with prewired duplex receptacle and junction box for extension of 120V wiring as indicated. In addition, combination poke thru floor boxes shall be equipped with four cabling ports, and conduit adaptor for extension of data cabling conduit raceway from floor box to tenant space as indicated. Wiremold #RC4ATCBK/COM50 (4 cables/2 duplex).
- F. Floor outlet boxes for both combination type floor outlets single service floor outlets, and poke thru floor outlets shall be UL listed for scrub water exclusion test (UL514A and UL514C).

2.10 PULL AND JUNCTION BOXES

- A. Pull and junction boxes shall be constructed of code gauge galvanized sheet steel and fitted with screw covers held in place with corrosion resistant machine screws.
- B. Provide boxes where noted on drawings or where necessary to facilitate conductor pulling and splicing. Splicing of conductors is to be avoided as much as possible with continuous lengths being preferred. Box sizes shall conform to sizes required by NEC or as indicated on drawings.

2.11 WIRING DEVICES

- A. All wiring devices shall be commercial grade and product of one manufacturer throughout project except as otherwise noted. Device color shall *match existing. *be determined in shop drawing stage and shall be as directed by architect
- B. Wall switches shall be 20 ampere, 120-277V, A.C., toggle handle, quiet type, with side and back wiring terminals . Switches shall be single or multi-pole as indicated on drawings.
- C. Wall and ceiling occupancy sensors shall be dual technology, ultrasonic and passive infrared type. Wall occupancy sensors shall be provided with single/two pole/relay integral on/off manual switch. Manufacturer shall be Wattstopper or approved equal. Provide vandal resistant type in locations indicated on drawings. Open area and Corridor occupancy sensors shall be ceiling mounted in locations generally as shown. Ultrasonic sensing shall be volumetric in coverage with a frequency of 40 KHz. It shall utilize Advanced Signal Processing which automatically adjusts the detection threshold dynamically to compensate for constantly changing levels of activity and air flow throughout controlled space. Wall sensor shall be capable of corner mounting to a wall or ceiling in order to eliminate detection through open doorways and outside of controlled area. To provide superior small motion detection and immediate activation upon entry, coverage of both technologies must be complete and overlapping throughout the controlled area. The lens shall cover up to 2000 sq ft for walking motion when mounted at 10 ft and 1000 sq ft of desktop motion. Sensors shall have a time delay that is adjusted automatically (with the SmartSet setting) or shall have a fixed time delay of 5 to 30 minutes, set by DIP switch. Sensors shall feature a walk-through mode, where lights turn off 3 minutes after the area is initially occupied if no motion is detected after the first 30 seconds. Sensor shall have standard 5 year warranty and shall be UL and CUL listed. Contractor shall coordinate location in field to maintain 5' clear between ceiling mounted sensor and HVAC supply grilles.
- D. Duplex receptacles shall be straight blade, 20 ampere 125V, A.C., of grounding type, Corrosion-resistant, with plated steel strap locked into face and back body to resist pulling away from face/body assembly. .032 inch thick, brass, triple-wipe power contacts for lasting retention. Easily accessed break-off, line-contact connecting tab for fast, easy split-circuit wiring. Body and face shall be impact-resistant nylon, with thermoplastic back body. Terminal compartments shall be isolated.

- E. GFI type receptacles shall be 20 ampere, 125V, grounding type, equipped with integral safety mechanism to remove power from device upon GFI component failure (UL943 compliant) with 'test' and 'reset' buttons shall be provided where indicated. GFI type receptacles shall be provided where indicated on drawings, series wiring to enable GFI protection for non-GFI type receptacles shall not be allowed. Receptacles shall be mounted with grounding insert on bottom. Weatherproof covers shall be provided as indicated on drawings, and shall be weatherproof in use type.
- F. Dimmer switches shall be solid state linear slide type with on-off switch, and provided as required for fluorescent and LED dimming. Dimmer switches shall be listed for use with lamp(s) ballasts per fixture manufacturer. Wattage shall be as indicated on drawings or as required for total wattage of the connected lamps.
- G. Daylight harvesting sensors shall have automatic dimming control of all light fixtures within 15ft of exterior windows. Sensors shall be listed for use with specified fixtures which shall have a compatible dimming driver/ballast. Wattage shall be as indicated on drawings or as required for total wattage of the connected lamps. Manufacturer shall be Wattstopper, model #LS-301, or approved equal.
- H. Device plates shall be mar-proof, rugged self-extinguishing thermoplastic, nominal 0.07" thickness as manufactured by Pass & Seymour. Device color to be determined in shop drawing review, for all flush installed outlet boxes in finished spaces. Weatherproof devices shall be equipped with rain tight in use cover. Surface mounted device outlets shall be fitted with appropriate sheet steel or cast metal cover plates to match device and box. Neither nylon nor oversized cover plates are allowed.
- I. Special purpose outlets shall be as indicated on drawings and have matching cover plate.

2.12 LIGHTING FIXTURES

- A. Furnish and install all lighting fixtures as shown on drawings and specified in fixture schedule. The fixture schedule is intended as a guide for selection. Unless otherwise noted, fixtures of other manufacturers will be acceptable if of similar design and characteristics, subject to approval.
- B. Although not specifically shown or specified, all light fixtures shall be provided with all necessary optional accessories and mounting hardware for installation as indicated or required.
- C. Electronic ballasts for fluorescent fixtures shall be UL Listed Class P, Type 1, flicker-free, full light output type and meeting the applicable requirements of the FCC, IEEE and ANSI with power factor not less than 90%, crest factor 1.5 maximum, frequency not less than 25,000 hertz, THD less than 10% and sound rating Class A. Ballasts shall be specifically designed for use with the type lamps indicated. Ballasts for use with compact fluorescent lamps shall be provided with 'end of life' protection to prevent ballast operation upon lamp failure. Ballast warranty shall be 5 years minimum. All fluorescent fixtures shall be provided with integral disconnect which removes power to ballast.
- D. LED fixtures shall be UL listed and shall meet efficacy requirements for fixture application and shall be listed on Design Lighting Consortium Qualified Products List.

2.13 LAMPS

- A. Furnish and install one complete set of lamps for all installed fixtures as designated in fixture schedule, on drawings or specified herein. All lamps shall be of proper design to fit specific fixture indicated. To ensure uniform lighting and color, all lamps of the same type shall be provided by the same manufacturer.
- B. Fluorescent lamps shall be color and size as scheduled, and designed for operation with the fixture ballast. Energy efficient type lamps shall be specifically approved for operation with the specified ballast.

2.14 TIME SWITCHES

- A. Time switches shall be solid state digital type capable of permitting set points on independent (per pole) daily schedules through a 7 day time period. programmable features shall include to the minute programming with up to 99 'holidays' each of which can be independently controlled, fully automatic

daylight saving time adjustment with user selectable override, and automatic leap year adjustment. All programmable information shall be stored in non-volatile EEPROM memory. Time switch shall have 4 days of real time back-up via lithium battery or capacitor. Time switch poles shall be normally open type with quantities, or type of control as indicated on drawings, each rated 120/277v and 20 amperes. Time switch shall be rated for 120/277v control voltage input/output, and shall be installed in a lockable nema-1 surface enclosure. time switch shall be as manufactured by Tork #E-PB series or approved equal.

2.15 LIGHTNING PROTECTION SYSTEM (provide alternate price)

- A. Lightning protection systems shall be roof air terminals and grounding system designed and installed in accordance with NFPA 780.
- B. The entire system shall be designed and installed by certified lightning protection contractor. The system shall include protection for all roof equipment, appurtenances and bonding to the electrical system per UL requirements.
- C. All air terminals and roof conductors shall be aluminum. All ground conductors and ground rods shall be copper.
- D. Roof top HVAC equipment and enclosures shall not be used as conductors. All air terminals installed on roof top HVAC equipment shall be connected with conductors to the main lightning conductors.
- E. Contractor shall provide detailed design shop drawings for the complete system to indicate the location of air terminals, roof conductors, down conductors, ground rods and complete installation details.
- F. Completed system shall bear UL Master Label with all required certification and documentation.

PART 3 – EXECUTION

3.1 CUTTING AND PATCHING

- A. Place all sleeves, inserts, conduit hangers, etc. as construction progresses to avoid any unnecessary cutting of structural members. Cooperate with other contractors in location of electrical outlets that may conflict with location of other equipment.
- B. Obtain authorization from the Architect for any necessary cutting of building structure to facilitate installation of this work and do not proceed until authorization has been received. Limit necessary cutting and patching to the minimum size required for installation of conduit or apparatus.

3.2 TRENCH EXCAVATION, PUMPING, BACKFILLING AND COMPACTION

- A. Excavate, back-fill and compact all trenches required for underground electrical work. Maintain trenches free of water until installation is complete and provide all necessary shoring.
- B. Contractor shall field verify all existing underground utilities and avoid damage to same. Where existing utilities are damaged, the contractor shall be responsible for all repairs or replacement.
- C. Back-fill with loose, dry granular material in 6-inch lifts and thoroughly compact each lift. Dispose of all surplus material and rock as directed by the Architect. Grade the surface to a reasonable uniformity and leave the mounding in neat condition as approved by the Architect.
- D. Back-fill all trenches passing under foundations with concrete to the underside of the foundation and at a 2:1 slope away from each side of the foundation. Back-fill all trenches that are parallel and deeper than foundations with concrete to a point that will place the top of the concrete on a 2:1 slope away from the foundation bottom. Do not back-fill trenches until required inspections are completed.

- E. Repair or replace all topsoil, shrubbery, sod, sidewalks, streets, walls, etc. disturbed by the excavation, backfilling or pumping to the satisfaction of the Architect. Repair sidewalks in complete blocks; partial patching will not be accepted.
- F. Where interior saw cutting of trenches is required, provide extension of building's underfloor waterproof membrane as required to maintain a watertight condition.

3.3 GROUNDING AND BONDING

- A. Provide grounding electrode conductor for electric service equipment sized and connected in accordance with NEC.
- B. Bond equipment such as metallic housing and feeder metallic conduits to grounding conductor. Use grounding bushings, on service conduit and at other points where grounding continuity is broken.
- C. Although not specifically indicated or required by code, provide insulated green equipment grounding conductor for all feeders and branch circuits.
- D. Provide a bonding jumper for any equipment, motor, fixture or device to which current carrying conductors are connected that is not bonded directly to the grounded system. Connect bonding jumper to approved lugs and grounding conduit bushings or clamps. All non-metallic conduit shall contain an equipment grounding conductor.
- E. All grounding or bonding conductors shall be sized as required by NEC, or as herein specified, and shall be bare copper or TW insulated, with green coding.
- F. Provide #3/0 copper equipment grounding conductor between steel building members which are not continuous and/or connected.

3.4 RACEWAYS

- A. Follow routing for conduit installation described on drawings as nearly as possible. Routing layout, however, is diagrammatical and where changes are necessary as a result of structural conditions, apparatus, or other causes, routing will have to be changed to meet these conditions. Conduit risers and offsets are not indicated on drawings but are intended to be installed as required.
- B. Run conduit required to be exposed parallel or perpendicular to the walls, ceilings, or structural members and provide supports as required by NEC. In addition, install supports as required to form a secure and firm installation. Supports shall be galvanized pipe straps, hangers or wall brackets. Use of metal or plastic tie wires for conduit support is not allowed. Firmly support concealed conduit at the structure and install so as to prevent any vibration against structure, pipe or duct work.
- C. Fit conduit installed in concrete or secured to structural members that pass through expansion joints constructed in the building with expansion fittings, complete with copper bonding jumper.
- D. All metallic conduit terminating in outlet, junction or pull boxes and cabinets must terminate with bushing and double locknuts except exposed cast boxes, where they may be omitted. Conduit sizes 1 1/4" and above shall have insulating fiber bushings with double locknuts. Grounding type bushings must be used at points where grounding continuity is broken and at service equipment.
- E. Fit all empty conduit systems with suitable nylon pull-string and blank off to prevent entrance of foreign matter until conductors are installed.
- F. At motor connections, flexible connections, or connections subject to vibration, use flexible galvanized conduit with PVC outer jacket with grounding conductor.
- G. Conduit shall not be smaller than 1/2" trade size and must be sized to accept conductors indicated.
- H. Conduit penetrations through building floor shall be provided with raceway seals as required by code.

3.5 WIRING

- A. No wiring shall be installed until the required raceway system including junction, outlet and device boxes is completed. Install wiring before painting begins and protect against being painted.
- B. Branch circuit sizes are noted on drawings and must be continuous without reduction in size throughout their length except where connecting to fixtures or devices.
- C. Branch circuit wire sizes shall be increased as required where long runs will cause excessive voltage drop per NEC.
- D. Wire circuits as described or indicated on drawings to achieve a connected load as scheduled. Should any change be necessary, it must be brought to the Architect's attention.

3.6 BOXES

- A. The location of outlets on drawings is to be considered as approximate only inasmuch as outlets are to be centered in blocks, panels, or other modular units. Be familiar with requirements of other trades as well as the building in general to become aware of various materials and finished surfaces in which outlets are to be installed.
- B. Install boxes square and plumb with receptacle and junction boxes in a vertical position. Cover all boxes for future use or junction purposes with blank plates.
- C. Boxes in exterior locations shall be cast metal boxes with threaded conduit hubs. Securely fasten boxes to building surfaces.

3.7 PANELBOARDS

- A. Panelboards shall not be installed under any ducts, piping or other foreign equipment up to the structural ceiling as per code requirements. Where it appears that this condition will exist, the contractor shall notify the Architect immediately for resolution before proceeding with the installation. Any rework caused by the lack of timely notification and coordination shall be provided without additional cost.

3.8 ACCESS PANELS

- A. Provide ceiling access panels for equipment, devices, boxes and other like items requiring adjustment or maintenance accessibility if they are not located over lay-in type ceilings or are not otherwise accessible. Obtain approval from Architect for type and location of access panels.

3.9 WIRING DEVICES

- A. Where indicated, gang devices together in common boxes with device straps bonded to metallic system or separate grounding conductor.
- B. Wiring device mounting heights shall be as follows, unless otherwise noted or required:
 - 1. Light switches and controls- 48" above floor to top
 - 2. Receptacles- 15" above floor to bottom
 - 3. Voice/Data outlets- 15" above floor to bottom

3.10 IDENTIFICATION LABELS

- A. Provide identification labels for each motor controller, safety switch, panelboard, contactor, time switch, control device, and circuit breaker. Labels shall be laminated, phenolic strips 1/16" thick and engraved to show black letters on white background not less than 1/4" high. equipment and control device labels shall be provided per code on all emergency equipment. Labels shall consist of white letters on red background. Where brackets are not provided, labels shall be mounted with screws, or approved adhesive.

- B. Where control apparatus is installed on or immediately adjacent to equipment, labels are not required.
- C. Provide UL approved arc-flash hazard marking on front cover (or other clearly visible location) of all electrical equipment as required by the NEC 110.

3.11 LIGHTING FIXTURES

- A. All light fixtures shall be installed in accordance with the manufacturer's installation instructions or recommendations.
- B. Connect single-connected fixtures, surface or stem hung, with heat resistant fixture wire. Connect multiple-connected fluorescent fixtures, surface or stem hung, with type THHN heat resistant thermoplastic wire of a size indicated for branch circuit.
- C. Support fixtures to be recessed in readily removable tile ceilings (lay-in type) from the T-bar tile support and connect to remote mounted 4" square junction boxes with approved six foot long, 3/8" flexible conduit 'fixture whip' with grounding conductor bonded between conduit system and fixture.
- D. Lay-in type light fixtures installed in fire rated ceilings shall be independently supported per UL requirements.
- E. Upon project completion and just prior to delivering project to the Owner, clean all fixtures and remove all instruction tags.
- F. Exit signs shall not be mounted higher than 6'-8" above the top of any door opening (to bottom).
- G. No light fixture shall be installed without approved shop drawings signed off by the Engineer, Architect and General Contractor.

3.12 LAMPS

- A. Do not install full set of lamps until specific permission of the Architect has been obtained. Temporary lamps may be installed in permanent fixtures for construction purposes, but they must be replaced with new lamps when directed.

3.13 VOICE/DATA OUTLET CONDUIT SYSTEM

- A. Install conduits, outlet boxes and backboards as shown on drawings. Conduit shall be as previously specified, with 3/4" as the minimum size. Provide all conduits with pull-wire. Backboards shall be 3/4" plywood painted light gray with fire resistant paint.
- B. Wall outlets shall be 4" square by 1 1/2" deep with single gang extension covers and covered with blank specified plates. *Floor outlets shall be floor outlet boxes as previously specified.
- C. Provide 3/4" conduit from each elevator controller and elevator pit to the telephone backboard as indicated or required. Verify and coordinate conduit installation with elevator contractor.
- D. Coordinate with local telephone company and verify routing and termination point of building telephone service entry conduits.
- E. Provide telephone service entry conduits and backboard with receptacles and ground conductor in accordance with telephone company requirements.
- F. Provide #6 stranded, green insulated, ground conductor from backboard to the electrical service ground and/or other ground sources approved and verified by the telephone company.
- G. Provide grounding electrode conductor at telephone service entry sized and connected in accordance with NEC. Ground rod shall be minimum 10' in length and 3/4" in diameter.

3.14 EQUIPMENT CONNECTIONS

- A. Make all final power feed connections to starters and/or motorized equipment installed by heating and air conditioning and plumbing contractors as indicated or required. Refer to Electrical sections of the other contractors' specifications for further information.
- B. Contractor shall assume that all circuit breakers indicated for 'hermetic refrigerate motor-compressor' A/C equipment are the wrong size. The contractor shall field verify and provide 'HACR' type circuit breaker sized for 'maximum-overcurrent-protection' in accordance with the nameplate data for the equipment actually supplied.
- C. Verify all equipment for service and characteristics provided prior to rough-in and connection. Provide a grounding conductor for all equipment connected with flexible conduit and bond to conduit system and metallic frame of equipment.
- D. Be responsible for securing and installing proper insulated conductors required for equipment of higher temperature range beyond that of specified branch circuit type.

3.15 CLOSE OUT DOCUMENTATION

- A. Upon project completion Contractor shall provide all operation and maintenance manuals to Owner as a single bound set which includes manufacturers' make and model number of all installed equipment including but not limited to the following:
 - 1. All submittal data stating each piece of equipment rating and selected options for each piece of equipment.
 - 2. Operation manuals and maintenance manuals for each piece of equipment requiring maintenance. Required routine maintenance actions shall be clearly identified.
 - 3. Names and addresses for at least one qualified service agency.
- B. Within 30 days of project completion, Contractor shall provide record (as-built) drawings of the actual installation. These drawings shall contain (at a minimum):
 - 1. A single line diagram of the building electrical system with complete panel schedules.
 - 2. Floor plans indicating location and area served for all distribution.

END OF SECTION 26 0000

SECTION 311100

CLEARING AND GRUBBING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Removal of surface debris, paving and curbs
 - 2. Removal of plant life and grass.
 - 3. Grubbing roots.
 - 4. Topsoil excavation.

- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.
 - 2. Section 312300 - Excavation and Fill.

PART 2 PRODUCTS

Not used

PART 3 EXECUTION

3.1 SITE CLEARING

- A. Remove vegetation, debris, and obstructions from areas of structures, walks, paving, and planting beds.

- B. Apply herbicide to remaining stumps and plant life to inhibit growth.

- C. Strip existing topsoil from areas of structures, walks, and paving. Stockpile on site for reuse as specified in Section 312300.

- D. Grub out roots and underground obstructions to minimum depth of 12 inches.

- E. Remove waste material from site as it accumulates. Comply with applicable codes and ordinances regarding waste transportation and disposal.

END OF SECTION

SECTION 312300

EXCAVATION AND FILL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Excavating for structures and site components.
 - 2. Filling.
 - 3. Trenching.
 - 4. Backfilling.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SYSTEM DESCRIPTION

- A. Limits of Work: Do not extend earthwork beyond areas of excavation or construction shown on Drawings or reasonably necessary for performance of Work.
- B. Contractor is responsible for design of temporary earth retention systems.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Select Fill: Per Geotech Report.
- B. Common Fill: Per Geotech Report.

2.2 SOURCE QUALITY CONTROL

- A. Testing and Inspection Services: Test Engineered Fill prior to placement:
 - 1. Liquid limit, plastic limit, and plasticity index: Test to ASTM D4318.
 - 2. Moisture/density relationship: Test to ASTM D698.
 - 3. Provide soil description; determine compliance with gradation and quality requirements.

PART 3 EXECUTION

3.1 EXCAVATING

- A. Excavate to grades and subgrades indicated. Make excavations large enough to permit placing and inspection of work.
- B. Stockpile excavated materials that are suitable for reuse separately from subgrade material.
- C. Remove and dispose of excavated material that is unsuitable or not required for backfilling. Remove underground obstructions.
- D. Brace sides of excavations where necessary; maintain until permanent construction is in place. Remove temporary shoring and bracing as backfill is placed.
- E. Excavation for Structures:
 - 1. Form bottoms of excavations reasonably level.
 - 2. Maintain moisture level in excavations as near their natural level as possible.

- F. Correct over-excavation under footings by use of lean concrete. Correct other over-excavation by use of Select Fill, compacted to density of existing subgrade.
- G. Keep excavations free of water.

3.2 FILLING

- A. Prior to placing fill on existing subsoils, proofroll to detect soft or weak zones. Fill low areas with select fill.
- B. Fill low areas per Geotech Report.
- C. Do not fill over porous, wet, frozen, or soft subgrades.
- D. Bench fill into slopes.
- E. When moisture must be added to aid in compaction, uniformly apply water to surface, but do not flood. Free water shall not appear on surface during or after compaction operations.
- F. Scarify soil too wet for proper compaction and allow to dry. Replace and recompact.
- G. Uniformly grade areas to smooth surface at required grades and elevations. Adjust contours to eliminate water ponding and provide positive drainage. Make grade changes gradually. Blend slopes into level grades.
- H. Tolerances: Within plus or minus 1 inch of required subgrade elevation.

3.3 TRENCHING

- A. Cut trenches sufficiently wide to allow for installation of utilities and for inspection of work.
- B. Hand trim excavations; remove loose matter.
- C. Remove rocks and obstructions.
- D. Correct over-excavation by use of lean concrete or pipe bedding material.
- E. Keep trenches free of water.

3.4 BACKFILLING

- A. Backfill under structures per Geotech Report.

3.5 FIELD QUALITY CONTROL

- A. Testing and Inspection Services: Perform field in place density tests, ASTM D2922, at following rates; minimum of three tests for each lift or area:
 - 1. Under structures: One test for each 2,500 square feet, per lift.
 - 2. In the building area, test compaction to a depth of 1 foot at bottom of all column footings. Conduct one test for every 50 lineal feet of wall footing.
 - 3. Site grading areas where final slope will be four horizontal to one vertical or steeper and greater than five feet in height: One test for each 8,000 square feet, per lift.

3.6 CLEANING

- A. Remove surplus materials and those not suitable for reuse from site.

3.7 PROTECTION

- A. Protect graded areas from traffic and erosion; keep free of trash and debris.

END OF SECTION

SECTION 313116
TERMITE CONTROL

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Below grade soil treatment for termite control.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Application Procedures: Indicate locations for application, application rates, and application equipment.
 - 2. Warranty: Sample warranty form.
- B. Quality Control Submittals:
 - 1. Current EPA approval listing.
 - 2. Certificates of Compliance: Applicator's certification that termiticide was applied at specified concentrations and using specified methods and materials.

1.3 QUALITY ASSURANCE

- A. Applicator Qualifications: Licensed for termite control by authorities having jurisdiction.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Protect containers from accidental opening and use.

1.5 PROJECT CONDITIONS

- A. Do not apply termiticide when surface water is present.

1.6 SEQUENCING

- A. Apply termiticide:
 - 1. After completion of excavating, backfilling, and compaction.
 - 2. Prior to placing vapor retarder.

1.7 WARRANTIES

- A. Provide manufacturer's 5 year warranty against invasion or propagation of subterranean termites and damage to building caused by termites, including repairs to building.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Termiticide:
 - 1. Approved for termite treatment by Environmental Protection Agency and other authorities having jurisdiction.
 - 2. Water based solution, uniform in composition, synthetically dyed to permit visual identification of treated soil.

B. Signage: As required by authorities having jurisdiction.

2.2 MIXES

A. Mix materials in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.1 APPLICATION

A. Apply materials in accordance with manufacturer's instructions.

B. Apply treatment to following areas:

1. Outside and inside of building perimeter: Apply treatment to full depth of foundation or minimum 48 inches below grade as backfill is placed.
2. Floor slab penetrations: Apply treatment to full depth of penetration or minimum 48 inches below grade as backfill is placed.
3. Under floor slabs on grade: Apply treatment uniformly over prepared subgrade just prior to placement of vapor retarder.

C. Prevent spillage and runoff onto adjacent non treated areas.

D. Ensure complete coverage of treated areas.

E. Extend treatment onto adjacent construction and floor slab penetrations.

F. Reapply termiticide to treated soils that are disturbed after treatment.

G. Install signage as required by authorities having jurisdiction.

END OF SECTION

SECTION 321413

PRECAST CONCRETE UNIT PAVING

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interlocking precast concrete pavers.
 - 2. Sand bed.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Samples: Paver samples showing selected color.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Minimum 2 years experience in work of this Section.
- B. Mockup:
 - 1. Size: Minimum 4 x 8 feet.
 - 2. Show: Paver color and texture, maximum color range, paver pattern, and joint profile.
 - 3. Locate where directed.
 - 4. Approved mockup may remain as part of the Work.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on Belgard products by Oldcastle APG. (www.belgard.com)
- B. Other Acceptable Manufacturers:
 - 1. Artistic Pavers. (www.artisticpavers.com)
 - 2. Tremron. (www.tremron.com)
- C. Substitutions: Under provisions of Division 1.

2.2 MATERIALS

- A. Concrete Pavers - Front Entry, Rear Terrace, and Event Lawn:
 - 1. Source: Old Castle Coastal, Belgard
 - 2. Type: Oceanside pavers, with coquina and oyster shells.
 - 3. Physical requirements: Meet ASTM C936.
 - 4. Coloring admixture: ASTM C979, pure mineral oxide, alkali resistant, colorfast, water insoluble, chemically inert, and weather resistant.
 - 5. Size: 16"x16"x2 3/8" 60mm.
 - 6. Pattern: 1 piece running bond.
 - 7. Color: To be selected from manufacturer's full color range.
- B. Concrete Pavers - Cart Staging Area:
 - 1. Source: Old Castle Coastal, Belgard
 - 2. Type: Mega-Cambridge pavers, suitable for vehicular traffic
 - 3. Physical requirements: Meet ASTM C936.

4. Coloring admixture: ASTM C979, pure mineral oxide, alkali resistant, colorfast, water insoluble, chemically inert, and weather resistant.
5. Size: 3-piece modular 80 mm
6. Color: To be selected from manufacturer's full color range.

C. Bedding Sand: ASTM C33, normal weight sand, graded per ASTM C136:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
3/8 inch	100
No. 4	95 to 100
No. 8	85 to 100
No. 16	50 to 85
No. 30	25 to 60
No. 50	10 to 30
No. 100	2 to 10

D. Joint Sand: ASTM C144, normal weight sand, graded per ASTM C136:

<u>SIEVE SIZE</u>	<u>PERCENT PASSING</u>
No. 4	100
No. 8	95 to 100
No. 16	70 to 100
No. 30	40 to 75
No. 50	10 to 35
No. 100	2 to 15
No. 200	0

E. Polymer Modified Joint Sand:

1. ASTM C144, polymer modified joint sand produced specifically for placement in precast concrete paver joints.
2. Source: Joint-Lock Paver Finishing Sand by Package Pavement Co., Inc. (www.packagepavement.com) or approved substitute.
3. Color: To be selected from manufacturer's full color range.

2.3 ACCESSORIES

A. Masonry Cleaner: Type recommended by masonry manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Place bedding sand to minimum 1 inch uncompacted thickness. Screed off to true surface conforming to required line and grade.
- B. Place pavers in pattern indicated from straight reference line.
- C. Sequence laying to prevent placing pavers between previously placed units.
- D. Machine cut units at perimeter and around obstructions. Minimize units less than one-half normal size.
- E. Discard cracked, broken, chipped, stained, and otherwise damaged pavers.
- F. Vibrate to final level with plate type vibrator.
- G. After initial vibration, brush joint sand over surface and vibrate into joints.

- H. Place pavers with final surface 1/8 to 1/4 inch above drainage inlets, concrete collars, and drainage channels.
- I. Do not pass vibrator closer than 3 feet of unrestrained edges.
- J. Sweep off excess sand.
- K. Allowable Tolerances: Surfaces true to level or indicated slopes with plus or minus 3/8 inch in 10 feet tolerance.

3.2 CLEANING

- A. Protect adjacent and underlying surfaces.
- B. Apply masonry cleaner in accordance with manufacturer's instructions.
- C. Thoroughly rinse surfaces with clean water after completion of cleaning; remove all traces of cleaning solution.

END OF SECTION

SECTION 323223

SEGMENTAL UNIT MASONRY RETAINING WALLS

PART 1 GENERAL

1.1 SUMMARY

- A. Section Includes:
 - 1. Interlocking concrete block retaining wall.
 - 2. Drainage fill and filter fabric.
- B. Related Sections:
 - 1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 SUBMITTALS

- A. Submittals for Review:
 - 1. Shop Drawings:
 - a. Indicate retaining wall system design including wall heights, filter fabric, and drainage provisions.
 - b. Bear seal and signature of Professional Structural Engineer responsible for system design.
 - 2. Product Data: Manufacturer's printed product literature, including installation instructions.
 - 3. Samples:
 - a. Concrete block samples in specified color and face pattern.
 - b. 12 x 12 inch filter fabric samples.
- B. Quality Control Submittals:
 - 1. Test Reports: Indicate compressive strength and moisture absorption properties of retaining wall units.

1.3 QUALITY ASSURANCE

- A. Design retaining wall system under the direct supervision of a Professional Structural Engineer with minimum 2 years experience in the work of this Section and licensed in the State in which the Project is located.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Store units above ground on wood pallets or blocking.

PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Contract documents are based on Belgard products by Oldcastle APG. (www.belgard.com)
- B. Other Acceptable Manufacturers:
 - 1. Anchor Wall Systems, Inc. (www.anchorwall.com)
 - 2. Keystone Retaining Wall Systems. (www.keystonewalls.com)
 - 3. Pavestone Company. (www.pavestone.com)
 - 4. Versa-Lok Retaining Wall Systems. (www.versa-lok.com)
- C. Substitutions: Under provisions of Division 01.

2.2 MATERIALS

- A. Retaining Wall Units:

1. Source: Diamond 9D classic collection - concrete gravity retaining wall by Belgard by Oldcastle, or approved substitute.
 2. Description: High strength, high density concrete block units, freeze-thaw resistant, integral top locator lugs, 4 degree set back from plane with each course.
 3. Physical properties:
 - a. Meet ASTM C1372.
 - b. Conform to the following structural and geometric requirements measured in accordance with ASTM C140:
 - 1) Compressive strength: Minimum 3000 psi.
 - 2) Maximum water absorption: 8.0 percent.
 - 3) Dimensional tolerances: $\pm 1/8$ " from nominal unit dimensions not including rough split face.
 4. Provide capstone to match wall finish
 5. Color and texture: To be selected from manufacturer's standards.
- B. Geogrid Soil Reinforcement:
1. Geosynthetic reinforcement geogrids manufactured for soil reinforcement applications manufactured from high tenacity polyester yarn or high density polyethylene. Polyester geogrid shall be made from high tenacity polyester filament yarn with a molecular weight exceeded 25,000 g/m and with a carboxyl end group value less than 30. Polyester geogrid shall be coated with an impregnated PVC coating that resists peeling, cracking and stripping.
 2. T_a - Long Term Allowable Tensile Design Load. T_a of the geogrid material shall be determined as follows: $T_a = T_{ult}/(RF_{cr} * RF_d * RF_{id} * FS)$. T_a shall be evaluated based on a 75 year design life.
 - a. T_{ult} - Short Term Ultimate Tensile Strength. T_{ult} shall be determined in accordance with ASTM D4595 or ASTM D6637. T_{ult} is based on the minimum average roll values (MARV).
 - b. RF_{cr} - Reduction Factor for Long Term Tension Creep. RF_{cr} shall be determined from 10,000 hour creep testing performed in accordance with ASTM D5262. $RF_{cr} = 1.45$ minimum.
 - c. RF_d - Reduction Factor for Durability. RF_d shall be determined from polymer specific durability testing covering the range of expected soil environments. $RF_d = 1.10$ minimum.
 - d. RF_{id} - Reduction Factor for Installation Damage. RF_{id} shall be determined from product specific construction damage testing performed in accordance with ASTM D5818. Test results shall be provided for each product to be used with project specific or more severe soil types. $RF_{id} = 1.05$ minimum.
 - e. FS - Overall Design Factor of Safety. FS shall be 1.5 unless noted for the maximum allowable working stress calculation.
 3. The maximum design tensile load of the geogrid shall not exceed the laboratory tested ultimate strength of the geogrid/facing unit connection divided by a factor of safety of 1.5. The connection strength testing and computation procedures shall be in accordance with ASTM D6638 Connection Strength between Geosynthetic Reinforcement and Segmental Concrete Units.
 4. C_i - Coefficient of Soil Interaction. C_i values shall be determined per ASTM D6706 at a maximum 0.75 inch (19 mm) displacement.
 5. The geogrid manufacturer shall have a Manufacturing Quality Control program that includes QC testing by an independent laboratory. The QC testing shall include Tensile Strength testing, Melt Flow Index testing for HDPE geogrids and Molecular Weight testing for polyester geogrids.
- C. Filter Fabric: When required, geotextile filter fabric shall be a needle-punched nonwoven fabric that meets the requirements of AASHTO M288.
- D. Drainage Pipe: If required, drainage pipe shall be perforated or slotted PVC pipe manufactured in accordance with ASTM D3034 or corrugated HDPE pipe manufactured in accordance with AASHTO M252.
- E. Pins: Retaining wall manufacturer's standard product.
- F. Unit Drainage Fill:
1. Clean 1 inch minus crushed stone or crushed gravel meeting the following gradation tested in accordance with ASTM D-422:

Sieve Size	Percent Passing
1 inch	100
3/4-inch	75 - 100
No. 4	0 - 10
No. 50	0 - 5

- Place drainage fill within the cores of, between and behind the units as indicated on Drawings.

G. Reinforced Backfill:

- Free of debris and meet following gradation tested in accordance with ASTM D-422:

Sieve Size	Percent Passing
1 1/2 inch	100
3/4-inch	75 - 100
No. 40	0 - 60
No. 200	0 - 35

- Plasticity Index (PI) < 15 and Liquid Limit < 40, per ASTM D4318
- Maximum aggregate size: 3/4 inch, unless installation damage tests have been performed to evaluate potential strength reductions to geogrid design due to increased installation damage during construction.
- Material can be site-excavated soils where above requirements can be met. Soils not meeting the above criteria, including highly plastic clays and organic soils, shall not be used in the backfill or reinforced backfill soil mass.
- Contractor shall submit reinforced fill sample and laboratory test results to Architect/Engineer for approval, prior to the use of any proposed reinforced backfill material.

- H. Adhesive: Type recommended by retaining wall unit manufacturer.

PART 3 EXECUTION

3.1 EXCAVATION

- Excavate to lines and grades shown on Drawings. The Owner or Contractors QA/QC representative shall inspect excavation and test the foundation soils and approve prior to placement of the leveling pad material or fill soils. Any over-excavation required to remove unsuitable soils shall be oversized from the front of the leveling pad and back of the geogrid reinforcement.
- Over-excavation and replacement of unsuitable soils and replacement with approved compacted fill will be compensated as agreed upon with the Owner.

3.2 BASE LEVELING PAD

- Place leveling pad material to lines and grades shown on Drawings, to a minimum thickness of 6 inches and extend laterally a minimum of 6 inches in front and behind the segmental wall unit.
- Compact soil leveling pad to a minimum of 95% of Standard Proctor density per ASTM D697 or 92% Modified Proctor density per ASTM D1557.
- Prepare leveling pad to ensure full contact with base surface of concrete units.

3.3 SEGMENTED UNIT MASONRY INSTALLATION

- Place first course of units on leveling pad at appropriate line and grade. Check alignment and level in all directions and ensure that units are in full contact with base and properly seated.
- Place front of units side-by-side. Do not leave gaps between adjacent units. Layout corners and curves in accordance with manufacturer's recommendations.
- Place and compact drainage fill within and behind wall units. Place and compact reinforced backfill soil behind drainage fill.

- D. Do not exceed three courses of stacked vertical height of wall units, prior to drainage fill and backfill placement and compaction.

3.4 STRUCTURAL GEOGRID INSTALLATION

- A. Install geogrid with highest strength direction perpendicular to wall alignment.
- B. Place geogrid reinforcement at strengths, lengths and elevations shown on Drawings, or as directed by Engineer.
- C. Lay geogrid horizontally on compacted backfill within 1 inch of face of units. Place next course of concrete units over geogrid. Pull geogrid taut and anchor prior to backfill placement on geogrid.
- D. Geogrid reinforcements shall be continuous throughout their embedment lengths and placed side-by-side to provide 100% coverage at each level. Spliced connections between shorter pieces of geogrid or gaps greater than 2 inches between adjacent pieces of geogrid are not permitted.

3.5 REINFORCED BACKFILL PLACEMENT

- A. Place, spread, and compact reinforced backfill in such a manner that minimizes the development of slack in the geogrid and installation damage to the geogrid.
- B. Place and compact reinforced backfill in lifts not to exceed 6 inches where hand operated compaction equipment is used, or 8 - 10 inches where heavy compaction equipment is used. Decrease lift thickness to achieve required density, as needed.
- C. Compact reinforced backfill to a minimum of 95% of Standard Proctor density per ASTM D697 or 92% Modified Proctor density per ASTM D1557. The moisture content of the reinforced backfill material during compaction shall be uniformly distributed throughout each layer and shall be dry of optimum by 0 to 3 percentage points of moisture.
- D. Only hand operated compaction equipment shall be allowed within 3 feet from back of concrete units.
- E. Do not operate tracked construction equipment directly upon geogrid reinforcement. A minimum fill thickness of 6 inches is required prior to operation of tracked vehicles over geogrid. Keep tracked vehicle turning to a minimum to prevent tracks from displacing fill and damaging or displacing concrete units or geogrid.
- F. Rubber tired equipment may pass over geogrid reinforcement at slow speeds, less than 10 MPH. Avoid sudden braking and turning.
- G. At the end of each day's operation, slope last lift of reinforced backfill away from wall units to direct runoff away from wall face. Do not allow surface runoff from adjacent areas to enter wall construction site.

3.6 CAP INSTALLATION

- A. Prior to placement of cap units, clean soil and other material from upper surface of top course of wall units.
- B. Glue cap units to the underlying wall units with adhesive.

3.7 AS-BUILT CONSTRUCTION TOLERANCES

- A. Vertical alignment: ± 1.5 inches over any 10 foot distance.
- B. Wall batter: Within 2 degrees of design batter. Overall wall batter shall be greater than or equal to 0 degrees.
- C. Horizontal alignment: ± 1.5 inches over any 10 foot distance.

- D. Corners and curves: \pm 1 foot to theoretical location.
- E. Maximum horizontal gap between erected units shall be less than or equal to 1/2 inch.

3.8 FIELD QUALITY CONTROL

- A. Quality Assurance - Owner may engage inspection and testing services, including independent laboratories, to provide quality assurance and testing services during construction. This does not relieve Contractor from securing necessary construction quality control testing.
- B. Quality assurance should include foundation soil inspection and testing and verification of geotechnical design parameters and verification that Contractor's quality control testing is adequate as a minimum. Quality assurance shall also include observation of construction for general compliance with the design drawings and project specifications. Quality assurance is usually best performed by site geotechnical engineer.
- C. Quality Control - Contractor shall engage independent inspection and testing services to perform minimum quality control testing described in the retaining wall design plans and specifications. Only qualified and experienced technicians and engineers shall perform quality control testing and inspection services.
- D. Quality control testing shall include soil and backfill testing to verify soil types and strengths, compaction and moisture conditions and verification that retaining wall is being constructed in accordance with the design plans and specifications.

END OF SECTION