

“Leading the Way for a Safer Pinellas”



Pinellas County Upgrade Jail Campus Infrastructure

Phase 1 Design Criteria

Volume 4 - Book 1 - Project Specifications
March 19, 2014



George F. Young, Inc.



TLC Engineering for Architecture



Schwartz, Schwartz and Associates





Project Specifications

VOLUME 4 – BOOK 1 - TABLE OF CONTENTS

EXHIBIT J Documents

Procurement and Contracting

Requirements DIVISION 00

Hazardous Material Investigation.....00 31 26

Geotechnical Data Investigation00 31 32

General Requirements DIVISION 01

Allowances01 21 00

Unit Prices.....01 22 00

Contract Modification Procedures.....01 26 00

Payment Procedures01 29 00

Project Management and Coordination.....01 31 00

Construction Progress Documentation01 32 00

Photographic Documentation01 32 33

Submittal Procedures01 33 00

Special Project Procedures for

Detention Facilities01 35 13

Quality Requirements01 40 00

Temporary Facilities and Controls01 50 00

Product Requirements.....01 60 00

Execution01 73 00

Construction Waste Management.....01 74 19

Closeout Procedures01 77 00

Operations and Maintenance Data01 78 23

Project Record Documents.....01 78 39

Demonstration and Training01 79 00

Sustainable Design Requirements.....01 81 13

General Commissioning Requirements01 91 13

EXISTING CONDITIONS DIVISION 02

Structure Demolition02 41 16

Selective Demolition02 41 19

CONCRETE DIVISION 03

Concrete (Site Work)03 00 00

Cast-In-Place Concrete03 30 00

Precast Structural Concrete.....03 41 00

Concrete Topping03 53 00

Project Specifications

MASONRY DIVISION 04

Masonry	04 20 00
Concrete Unit Masonry	04 22 00

METALS DIVISION 05

Structural Steel Framing	05 12 00
Cold-Formed Metal Framing	05 40 00
Miscellaneous Metal Fabrication.....	05 50 13
Metal Railings.....	05 52 00
Metal Gratings	05 53 00

WOODS, PLASTICS, and COMPOSITES DIVISION 06

Rough Carpentry	06 10 00
Laminate Clad Architectural Casework	06 41 16
Solid Polymer (Solid Surfacing) Fabrications ...	06 61 16

THERMAL and MOISTURE PROTECTION... DIVISION 07

Elastomeric Sheet Waterproofing	07 13 53
Board and Block Insulation	07 21 13
Roof and Deck Insulation.....	07 22 00
Direct Applied Exterior and Finish Systems	07 24 00
Metal Wall Panels	07 42 13
Styrene-Butadiene-Styrene (SBS) Modified Bituminous Membrane Roofing.....	07 52 16
Flashing and Sheet Metal	07 60 00
Firestopping.....	07 84 00
Joint Sealants.....	07 92 00
Security Joint Sealants	07 92 22

OPENINGS DIVISION 08

Steel Doors and Frames.....	08 11 13
Overhead Coiling Doors	08 33 23
Door Hardware	08 71 00
Glazing	08 81 00
Security Glazing	08 88 53
Metal Wall Louvers	08 91 00

FINISHES DIVISION 09

Supports for Plaster and Gypsum Board	09 22 00
Gypsum Board	09 29 00
Acoustical Ceilings	09 51 00
Resilient Flooring.....	09 65 00
Paints and Coatings	09 90 00



Project Specifications

High-Performance Coatings	09 96 00
Seamless Epoxy System	09 98 00

SPECIALTIES..... DIVISION 10

Visual communications Specialties	10 10 00
Folding Panel Partitions.....	10 22 39
Wall and Corner Guards	10 26 13
Toilet Accessories	10 28 13
Fire Extinguishers.....	10 44 16

EQUIPMENT..... DIVISION 11

Commercial Laundry Equipment.....	11 10 00
Dock Levelers.....	11 13 10
General Provisions for Detention Work	11 19 00
Detention Hollow Metal Doors and Frames.....	11 19 13
Detention Enclosures	11 19 43
Detention Hardware.....	11 19 53
Detention Sliding Door Locking Devices	11 19 56
Detention Furnishings and Equipment	11 19 63
Security Ceiling Systems	11 19 65
Tamper-Proof Metal Fasteners	11 19 93
Food Service Equipment	11 40 00

FURNISHINGS DIVISION 12

Roller Window Shades	12 24 13
----------------------------	----------

CONVEYING EQUIPMENT..... DIVISION 14

Electric Traction Freight Elevators	14 21 13
---	----------



Specifications

00 31 26 - HAZARDOUS MATERIAL INVESTIGATION

1.1 HAZARDOUS MATERIAL INVESTIGATION

- A. The Design Builder shall be responsible at its cost for any and all work, expense or special precautions caused or required by work identified, required or committed to for this RFP. The Design Builder shall have the sole responsibility of satisfying itself concerning the nature and location of the Work and the general and local conditions including nature and quantity of existing materials.
- B. The Design Build proposer shall visit the site and become familiar with existing conditions during the RFP phase. The Design Build proposer shall carefully examine the proposed project site(s) and all of the proposal requirements. The Design Build proposer acknowledges and fully understands the character, quality and quantity of surfaces and subsurface materials or obstacles, both above and below grade, to be encountered insofar as this information is reasonably ascertainable from and inspection of the site by qualified personnel. Failure by the Design Build proposer to acquaint himself with applicable conditions will not relieve the Design Build proposer of its responsibility for properly estimating the level of difficulty or cost of successfully performing the work, nor shall it be the basis for consideration for any claim for additional time or compensation.
- C. If, during the RFP phase, the Design Build proposer wishes to perform site investigation(s), the Design Build proposer must notify the County in writing, and submit supporting information including type of investigation proposed, testing agency involved, schedules, arrangements, etc., to the County for review and approval before proceeding.
- D. The Design Build proposer is required to include the following:
 - 1. An existing asbestos investigation and report.
 - 2. Construction documents, including drawings and specifications, for abatement of asbestos required for the completion of the project.
 - 3. Asbestos abatement by compliant personnel and procedures.
- E. Provide Owner copies of all reports and documents including clearance.

END OF DOCUMENT 00 31 26

00 31 32 - GEOTECHNICAL DATA INVESTIGATION**1.1 GEOTECHNICAL DATA INVESTIGATION**

- A. The Design-Builder shall be responsible at its cost for any and all work, expense or special precautions caused or required by work identified, required or committed to for this RFP. The Design-Builder shall have the sole responsibility of satisfying itself concerning the nature and location of the Work and the general and local conditions including subsurface conditions.
- B. The Design-Build proposer shall visit the site and become familiar with existing conditions during the RFP phase. The Design-Build proposer shall carefully examine the proposed project site(s) and all of the proposal requirements. The Design-Build proposer acknowledges and fully understands the character, quality and quantity of surfaces and subsurface materials or obstacles, both above and below grade, to be encountered insofar as this information is reasonably ascertainable from and inspection of the site by qualified personnel. Failure by the Design-Build proposer to acquaint himself with applicable conditions will not relieve the Design-Build proposer of its responsibility for properly estimating the level of difficulty or cost of successfully performing the work, nor shall it be the basis for consideration for any claim for additional time or compensation.
- C. If, during the RFP phase, the Design-Build proposer wishes to perform site investigation(s), the Design-Build proposer must notify the County in writing, and submit supporting information including type of investigation proposed, testing agency involved, schedules, arrangements, etc., to the County for review and approval before proceeding.
- D. The Design-Build proposer is required to include the following:
 - 1. A geotechnical data investigation and report.
 - 2. Sealed, engineered construction documents incorporating geotechnical data and mitigation requirements.
 - 3. Soil testing and compaction testing confirming compliance.
- E. Provide Owner copies of all reports and documents including all test results.

END OF DOCUMENT 00 31 32

01 21 00 - ALLOWANCES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS****A. The following applies to this Section:**

1. Contracting Requirements.
2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
3. Appendices.
4. Concept Drawings

B. Review these documents for coordination with additional requirements and information that apply to work under this Section.**1.2 SUMMARY****A. Section includes administrative and procedural requirements governing allowances.**

1. The Lump Sum Price may include Allowances with respect to the Work. Certain items are specified in the Contract Documents by allowances. Allowances have been established in lieu of additional requirements and to defer selection of actual materials and equipment to a later date when direction will be provided to Design Builder. If necessary, additional requirements will be issued by Change Order.

B. Types of allowances include the following:

1. Lump-sum allowances.
2. Unit-cost allowances.
3. Quantity allowances.
4. Contingency allowances.

1.3 SELECTION AND PURCHASE

- A. At the earliest practical date after award of the Contract, advise Owner of the date when final selection and purchase of each product or system described by an allowance must be completed to avoid delaying the Work.**
- B. At Owner's request, obtain proposals for each allowance for use in making final selections. Include recommendations that are relevant to performing the Work.**
- C. Purchase products and systems selected by Owner from the designated supplier.**

Specifications

1.4 ACTION SUBMITTALS

- A. Submit proposals for purchase of products or systems included in allowances, in the form specified for Change Orders.

1.5 INFORMATIONAL SUBMITTALS

- A. Submit invoices or delivery slips to show actual quantities of materials delivered to the site for use in fulfillment of each allowance.
- B. Submit time sheets and other documentation to show labor time and cost for installation of allowance items that include installation as part of the allowance.
- C. Coordinate and process submittals for allowance items in same manner as for other portions of the Work.

1.6 COORDINATION

- A. Coordinate allowance items with other portions of the Work. Furnish templates as required to coordinate installation.

1.7 LUMP-SUM, UNIT-COST, AND QUANTITY ALLOWANCES

- A. Allowance shall include cost to Design Builder of specific products and materials selected by Owner under allowance and shall include taxes, freight, and delivery to Project site.
- B. Unless otherwise indicated, Design Builder's costs for receiving and handling at Project site, labor, installation, overhead and profit, and similar costs related to products and materials selected by Owner under allowance shall be included as part of the Contract Sum and not part of the allowance.
- C. Unused Materials: Return unused materials purchased under an allowance to manufacturer or supplier for credit to Owner, after installation has been completed and accepted.
 - 1. If requested by Owner, retain and prepare unused material for storage by Owner. Deliver unused material to Owner's storage space as directed.

1.8 CONTINGENCY ALLOWANCES

- A. Use the contingency allowance only as directed by Owner and only by Change Orders that indicate amounts to be charged to the allowance.
- B. Design Builder's overhead, profit, and related costs for products and equipment ordered by Owner under the contingency allowance are included in the allowance and are not part of the Contract Sum. These costs include delivery, installation, taxes, insurance, equipment rental, and similar costs.
- C. Change Orders authorizing use of funds from the contingency allowance will include Design Builder's related costs and reasonable overhead and profit margins.

Specifications

- D. At Project closeout, credit unused amounts remaining in the contingency allowance to Owner by Change Order.

1.9 ADJUSTMENT OF ALLOWANCES

- A. Allowance Adjustment: To adjust allowance amounts, prepare a Change Order proposal based on the difference between purchase amount and the allowance, multiplied by final measurement of work-in-place where applicable. If applicable, include reasonable allowances for cutting losses, tolerances, mixing wastes, normal product imperfections, and similar margins.
1. Include installation costs in purchase amount only where indicated as part of the allowance.
 2. If requested, prepare explanation and documentation to substantiate distribution of overhead costs and other margins claimed.
 3. Submit substantiation of a change in scope of work, if any, claimed in Change Orders related to unit-cost allowances.
 4. Owner reserves the right to establish the quantity of work-in-place by independent quantity survey, measure, or count.
- B. Submit claims for increased costs because of a change in scope or nature of the allowance described in the Contract Documents, whether for the purchase order amount or Design Builder's handling, labor, installation, overhead, and profit.
1. Do not include Design Builder's or subcontractor's indirect expense in the Change Order cost amount unless it is clearly shown that the nature or extent of work has changed from what could have been foreseen from information in the Contract Documents.
 2. No change to Design Builder's indirect expense is permitted for selection of higher- or lower-priced materials or systems of the same scope and nature as originally indicated.
- C. Design Builder shall not proceed with any portion of the Work associated with the Allowances without first obtaining Owner's express written authorization to proceed with said Allowance Work.

PART 2 - PRODUCTS (Not Used)**PART 3 - EXECUTION****3.1 EXAMINATION**

- A. Examine products covered by an allowance promptly on delivery for damage or defects. Return damaged or defective products to manufacturer for replacement.

3.2 PREPARATION

- A. Coordinate materials and their installation for each allowance with related materials and installations to ensure that each allowance item is completely integrated and interfaced with related work.

END OF SECTION 012100

01 22 00 - UNIT PRICES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for unit prices.

1.3 DEFINITIONS

- A. Unit price is an amount incorporated in the Agreement, applicable during the duration of the Work as a price per unit of measurement for materials, equipment, or services, or a portion of the Work, added to or deducted from the Contract Sum by appropriate modification, if the scope of Work or estimated quantities of Work required by the Contract Documents are increased or decreased.

1.4 PROCEDURES

- A. Unit prices include all necessary material, plus cost for delivery, installation, insurance, applicable taxes, overhead, and profit.
- B. Measurement and Payment: See individual Specification Sections for work that requires establishment of unit prices. Methods of measurement and payment for unit prices are specified in those Sections.
- C. Owner reserves the right to reject Design Builder's measurement of work-in-place that involves use of established unit prices and to have this work measured, at Owner's expense, by an independent surveyor acceptable to Design Builder.



Specifications

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 012200

01 26 00 - CONTRACT MODIFICATION PROCEDURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS****A. The following applies to this Section:**

1. Contracting Requirements.
2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
3. Appendices.
4. Concept Drawings

B. Review these documents for coordination with additional requirements and information that apply to work under this Section.**1.2 SUMMARY****A. Section includes administrative and procedural requirements for handling and processing Contract modifications.****B. Related Requirements:**

1. Section 01 33 00 "Submittal Procedures" for administrative procedures for handling requests for substitutions.

1.3 MINOR CHANGES IN THE WORK**A. Owner will issue supplemental instructions authorizing minor changes in the Work, not involving adjustment to the Contract Sum or the Contract Time.****1.4 PROPOSAL REQUESTS****A. Owner-Initiated Proposal Requests: Owner will issue a detailed description of proposed changes in the Work that may require adjustment to the Contract Sum or the Contract Time.**

1. Work Change Proposal Requests issued by Owner are not instructions either to stop work in progress or to execute the proposed change.
2. Within 10 days after receipt of Proposal Request, submit a quotation estimating cost adjustments to the Contract Sum and the Contract Time necessary to execute the change.

Specifications

-
- a. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - b. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - c. Include costs of labor and supervision directly attributable to the change.
 - d. Include an updated Design Builder's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - e. Quotation Form: Use forms provided by Owner. Sample copies are included in Project Manual.
 - B. Design Builder-Initiated Proposals: If latent or changed conditions require modifications to the Contract, Design Builder may initiate a claim by submitting a request for a change to Owner.
 - 1. Include a statement outlining reasons for the change and the effect of the change on the Work. Provide a complete description of the proposed change. Indicate the effect of the proposed change on the Contract Sum and the Contract Time.
 - 2. Include a list of quantities of products required or eliminated and unit costs, with total amount of purchases and credits to be made. If requested, furnish survey data to substantiate quantities.
 - 3. Indicate applicable taxes, delivery charges, equipment rental, and amounts of trade discounts.
 - 4. Include costs of labor and supervision directly attributable to the change.
 - 5. Include an updated Design Builder's construction schedule that indicates the effect of the change, including, but not limited to, changes in activity duration, start and finish times, and activity relationship. Use available total float before requesting an extension of the Contract Time.
 - 6. Comply with requirements in "General Terms and Conditions" of the Contract if the proposed change requires substitution of one product or system for product or system specified.
 - 7. Proposal Request Form: Use Change Order form provided by Owner. Sample copy is included in Project Manual.
- 1.5 ADMINISTRATIVE CHANGE ORDERS
- A. Allowance Adjustment: See Section 01 21 00 "Allowances" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect actual costs of allowances.
 - B. Unit-Price Adjustment: See Section 01 22 00 "Unit Prices" for administrative procedures for preparation of Change Order Proposal for adjusting the Contract Sum to reflect measured scope of unit-price work.
- 1.6 CONSTRUCTION CHANGE DIRECTIVE
- A. Construction Change Directive: Owner may issue a Construction Change Directive. Construction Change Directive instructs Design Builder to proceed with a change in the Work, for subsequent inclusion in a Change Order.
 - 1. Construction Change Directive contains a complete description of change in the Work. It also designates method to be followed to determine change in the Contract Sum or the Contract Time.
 - 2. If required by Construction Change Directive, maintain detailed records on a time and material basis of work required by the Construction Change Directive. After completion of change, submit



Specifications

an itemized account and supporting data necessary to substantiate cost and time adjustments to the Contract.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 26 00

01 29 00 - PAYMENT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements necessary to prepare and process Applications for Payment.
- B. Related Requirements:
 - 1. Design/Build Agreement.
 - 2. Section 01 21 00 "Allowances" for procedural requirements governing the handling and processing of allowances.
 - 3. Section 01 22 00 "Unit Prices" for administrative requirements governing the use of unit prices.
 - 4. Section 01 26 00 "Contract Modification Procedures" for administrative procedures for handling changes to the Contract.
 - 5. Section 01 31 00 Project Management and Coordination
 - 6. Section 01 32 00 "Construction Progress Documentation" for administrative requirements governing the preparation and submittal of the Design Builder's construction schedule.
 - 7. Section 01 78 39 "Project Record Documents."
 - 8. Section 01 74 19 "Construction Waste Management."
 - 9. Section 01 81 13 "Sustainable Design Requirements" for administrative requirements governing submittal of cost breakdown information required for LEED documentation.

1.3 DEFINITIONS

- A. Schedule of Values: A statement furnished by Design Builder allocating portions of the Contract Sum to various portions of the Work and used as the basis for reviewing Design Builder's Applications for Payment.

1.4 SCHEDULE OF VALUES

- A. Coordination: Coordinate preparation of the schedule of values with preparation of Design Builder's construction schedule.
1. Coordinate line items in the schedule of values with other required administrative forms and schedules, including the following:
 - a. Application for Payment forms with continuation sheets.
 - b. Submittal schedule.
 - c. Items required to be indicated as separate activities in Design Builder's construction schedule.
- B. Progress payments will be computed based upon the Schedule of Values and Schedule developed in accordance with Section 01 32 00. Draft and Final versions of the Schedules of Values will be based upon the Preliminary and Final Baseline Design/Construction Schedule.
1. No line items or activity listed on the Schedule of Values, exclusive of Material or Equipment, will exceed \$100,000. Activities or components valued at greater than \$100,000 must be broken down until the line item is less than or equal to \$100,000.
 2. Identify allowance items; refer to Section 3.B of the Agreement, Exhibit N – Lump Sum Amendment Agreement Form, and Attachment 6 to Exhibit N. Cost documentation satisfactory to the County representative will be required for payment of allowance items.
 3. Subschedules for Phased Work: Where the Work is separated into phases requiring separately phased payments, provide subschedules showing values coordinated with each phase of payment.
- C. Format and Content: Use Project Manual table of contents as a guide to establish line items for the schedule of values. Provide at least one line item for each Specification Section.
1. Identification: Include the following Project identification on the schedule of values:
 - a. Project name and location.
 - b. Name of Owner.
 - c. Owner's project number.
 - d. Design Builder's name and address.
 - e. Date of submittal.
 2. Arrange schedule of values consistent with format of AIA Document G703.
 3. Arrange the schedule of values in tabular form with separate columns to indicate the following for each item listed:
 - a. Related Specification Section or Division.
 - b. Description of the Work.
 - c. Name of subcontractor.
 - d. Name of manufacturer or fabricator.
 - e. Name of supplier.
 - f. Change Orders (numbers) that affect value.
 - g. Dollar value of the following, as a percentage of the Contract Sum to nearest one-hundredth percent, adjusted to total 100 percent.
 - 1) Labor.
 - 2) Materials.

Specifications

3) Equipment.

4. Provide a breakdown of the Contract Sum in enough detail to facilitate continued evaluation of Applications for Payment and progress reports. Coordinate with Project Manual table of contents. Provide multiple line items for principal subcontract amounts in excess of Five percent of the Contract Sum.
 - a. Include separate line items under Design Builder and principal subcontracts for LEED documentation and other Project closeout requirements in an amount totaling five percent of the Contract Sum and subcontract amount.
5. Round amounts to nearest whole dollar; total shall equal the Contract Sum.
6. Provide a separate line item in the schedule of values for each part of the Work where Applications for Payment may include materials or equipment purchased or fabricated and stored, but not yet installed.
 - a. Differentiate between items stored on-site and items stored off-site. If required, include evidence of insurance.
7. Provide separate line items in the schedule of values for initial cost of materials, for each subsequent stage of completion, and for total installed value of that part of the Work.
8. Allowances: Provide a separate line item in the schedule of values for each allowance.
9. Each item in the schedule of values and Applications for Payment shall be complete.
 - a. Temporary facilities and other major cost items that are not direct cost of actual work-in-place may be shown either as separate line items in the schedule of values or as general overhead expense, at Design Builder's option.
10. Schedule Updating: Update and resubmit the schedule of values each month with the next Applications for Payment, include Change Orders or Construction Change Directives.

1.5 APPLICATIONS FOR PAYMENT

- A. Comply with General Terms and Conditions Section 4 Progress Payments, Section 5 Payments Withheld, and Section 6 Final Payment. Procedures must be confirmed prior to the first payment application.
- B. Each Application for Payment following the initial Application for Payment shall be consistent with previous applications and payments as certified and paid by the County.
 1. Initial Application for Payment, Application for Payment at time of Substantial Completion, and final Application for Payment involve additional requirements.
- C. Payment Application Times: Submit Application for Payment to the County monthly in accordance with time frame established by County at Preconstruction Meeting. The period covered by each Application for Payment is one month.
 1. Submit draft copy of Application for Payment prior to due date for review by County, in time frame established by County.
- D. Application for Payment Forms: Use form attached to the Agreement for Phase 1; sample copy is included in sample Agreement. Use AIA Document G702 and AIA Document G703 as form for Applications for Payment for Phase 2.

Specifications

- E. Application Preparation: Complete every entry on form. Notarize and execute by a person authorized to sign legal documents on behalf of Design Builder. County will return incomplete applications without action.
 - 1. Entries shall match data on the schedule of values and Design Builder's construction schedule.
 - 2. Include amounts for work completed following previous Application for Payment, whether or not payment has been received. Include only amounts for work completed at time of Application for Payment.
 - 3. Include amounts of Change Orders and Construction Change Directives issued before last day of construction period covered by application.
 - 4. Indicate separate amounts for work being carried out under Owner-requested project acceleration.
 - 5. Application to be based on reviewed and agreed to pencil copy.
- F. Prior to each Payment Application review, the Design Builder will provide required documentation and other information such as the updated Project Record Documents for the County's review. Payment Applications will not be processed until Project Record Documents are brought up to date.
- G. Stored Materials: Only upon advanced written approval by Owner, include in Application for Payment amounts applied for materials or equipment purchased or fabricated and stored, but not yet installed. Differentiate between items stored on-site and items stored off-site.
 - 1. For stored materials, provide certificate of insurance, evidence of transfer of title to Owner, consent of surety to payment, and supporting documentation indicated in the General Terms and Conditions and as required by the Owner..
 - 2. Provide summary documentation for stored materials indicating the following:
 - a. Value of materials previously stored and remaining stored as of date of previous Applications for Payment.
 - b. Value of previously stored materials put in place after date of previous Application for Payment and on or before date of current Application for Payment.
 - c. Value of materials stored since date of previous Application for Payment and remaining stored as of date of current Application for Payment.
- H. Transmittal: Submit three signed and notarized original copies of each Application for Payment to the County by a method ensuring receipt within 24 hours. One copy shall include waivers of lien and similar attachments.
 - 1. Transmit with a transmittal form listing attachments and recording appropriate information about application.
- I. Waivers of Mechanic's Lien: With each Application for Payment, submit waivers of mechanic's liens from subcontractors, sub-subcontractors, and suppliers for construction period covered by the previous application. Comply with all County requirements.
 - 1. Submit partial waivers on each item for amount requested in previous application, after deduction for retainage, on each item.
 - 2. When an application shows completion of an item, submit conditional final or full waivers.
 - 3. Owner reserves the right to designate which entities involved in the Work must submit waivers.
 - 4. Submit final Application for Payment with or preceded by conditional final waivers from every entity involved with performance of the Work covered by the application who is lawfully entitled to a lien.

Specifications

5. Waiver Forms: Submit executed waivers of lien on forms provided by Owner. A copy of the form is included as Exhibit C in the sample Agreement.
- J. Initial Application for Payment: Administrative actions and submittals that must precede or coincide with submittal of first Application for Payment include the following:
1. List of subcontractors.
 2. Schedule of values.
 3. LEED submittal for project materials cost data.
 4. Design Builder's construction schedule (preliminary if not final).
 5. Products list (preliminary if not final).
 6. LEED action plans.
 7. Schedule of unit prices.
 8. Submittal schedule (preliminary if not final).
 9. List of Design Builder's staff assignments.
 10. List of Design Builder's principal consultants.
 11. Copies of building permits.
 12. Copies of authorizations and licenses from authorities having jurisdiction for performance of the Work.
 13. Initial progress report.
 14. Report of preconstruction conference.
 15. Certificates of insurance and insurance policies.
 16. Performance and payment bonds.
 17. Data needed to acquire Owner's insurance.
- K. Application for Payment at Substantial Completion: After the County issues the Certificate of Substantial Completion, submit an Application for Payment showing 100 percent completion for portion of the Work claimed as substantially complete.
1. Include documentation supporting claim that the Work is substantially complete and a statement showing an accounting of changes to the Contract Sum.
 2. This application shall reflect Certificate(s) of Substantial Completion issued previously for Owner occupancy of designated portions of the Work.
- L. Final Payment Application: After completing Project closeout requirements, submit final Application for Payment with releases and supporting documentation not previously submitted and accepted, including, but not limited, to the following:
1. Evidence of completion of Project closeout requirements.
 2. Insurance certificates for products and completed operations where required and proof that taxes, fees, and similar obligations were paid.
 3. Updated final statement, accounting for final changes to the Contract Sum.
 4. Owner's Release and Affidavit Form. Copy is included as Exhibit C to the sample Agreement.
 5. AIA Document G706A, "Contractor's Affidavit of Release of Liens."
 6. AIA Document G707, "Consent of Surety to Final Payment."
 7. Evidence that claims have been settled.
 8. Final meter readings for utilities, a measured record of stored fuel, and similar data as of date of Substantial Completion or when Owner took possession of and assumed responsibility for corresponding elements of the Work.
 9. Final liquidated damages settlement statement.



Specifications

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 29 00

01 31 00 - PROJECT MANAGEMENT AND COORDINATION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative provisions for coordinating construction operations on Project including, but not limited to, the following:
 - 1. General coordination procedures.
 - 2. Design phase responsibilities.
 - 3. Construction phase responsibilities.
 - 4. Informational submittals.
 - 5. Coordination drawings.
 - 6. Requests for Information (RFIs).
 - 7. Project meetings.
 - 8. Coordination with existing facility operations and work under separate agreements.
- B. Related Requirements:
 - 1. The following applies to this Section:
 - a. Proposal Requirements.
 - b. Contracting Requirements.
 - c. Performance Criteria
 - 1) Project Narratives.
 - 2) Project Specifications
 - d. Appendices.
 - e. Project Drawings

Specifications

2. Section 01 32 00 "Construction Progress Documentation" for preparing and submitting Contractor's construction schedule.
3. Section 01 32 32 "Photographic Documentation".
4. Section 01 33 00 "Submittal Procedures".
5. Section 01 35 13 "Special Project Procedures for Detention Facilities".
6. Section 01 40 00 "Quality Requirements".
7. Section 01 73 00 "Execution" for procedures for coordinating general installation and field-engineering services, including establishment of benchmarks and control points.
8. Section 01 77 00 "Closeout" for coordinating closeout of the Contract.
9. Section 01 81 13 "Sustainable Design Requirements"
10. Section 01 91 00 "General Commissioning Requirements."

1.3 DEFINITIONS

- A. RFI: Request from Owner, Criteria Architect, or Design Builder seeking information required by or clarifications of the Contract Documents.

1.4 GENERAL COORDINATION PROCEDURES

- A. Coordination: Design Builder will coordinate construction operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work. Coordinate construction operations, included in different Sections, that depend on each other for proper installation, connection, and operation.
 1. Design Builder will schedule construction operations in sequence required to obtain the best results where installation of one part of the Work depends on installation of other components, before or after its own installation.
 2. Design Builder will coordinate installation of different components to ensure maximum performance and accessibility for required maintenance, service, and repair of all components, including mechanical and electrical.
 3. Design Builder must make adequate provisions to accommodate items scheduled for later installation.
 4. Design Builder will proactively coordinate the Owner Furnished/Contractor Installed items with the County as early as possible to ensure timely and efficient installation, connection, and operations.
- B. Prepare memoranda for distribution to each party involved, outlining special procedures required for coordination. Include such items as required notices, reports, and list of attendees at meetings.
 1. Prepare similar memoranda for Owner and separate contractors if coordination of their Work is required.
- C. Administrative Procedures: Design Builder shall coordinate scheduling and timing of required administrative procedures with other construction activities and activities of other contractors to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to, the following:
 1. Preparation of Design Builder's Design/Construction construction schedule.
 2. Preparation of the schedule of values.
 3. Installation and removal of temporary facilities and controls.
 4. Delivery and processing of submittals.

Specifications

5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.
9. Payment Application Review Meetings

- D. Conservation: Design Builder will coordinate construction activities to ensure that operations are carried out with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste.

1. Design Builder must salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. Refer to Section 01 74 19 for disposition of construction waste. See other Sections for disposition of salvaged materials that are designated as Owner's property.

1.5 DESIGN PHASE RESPONSIBILITIES (PHASE 1 SERVICES)

- A. The Design Phase Responsibilities herein reflect The County's concepts for finalizing the project design. The goal is to achieve the maximum degree of flexibility, efficiency, and participation among project participants, while meeting the functional, quality, cost, and schedule objectives of this new Facility. These concepts are presented as proposals to be evaluated and discussed, with a final version to be developed and published as mutually agreed by both the Design Builder and The County Team.

- B. Scope of Phase 1 Design Services: Refer to Exhibit O of the Agreement for Phase 1 Design Services including:

1. Program verification.
2. Schematic Design.
3. Design Development Phase.
4. 50% Construction Documents.
5. Development of Lump Sum Price proposal.

- C. Deviations:

1. As deviations from the Criteria Documents are resolved, Design Builder will note resulting deviations in a log and in an annotated record copy of the original Design Criteria.

- D. Milestones and Deliverables: Refer to Exhibit L of the Agreement:

1. Design Builder shall furnish documents in type, format, version and quantities required to comply with Scope of Services requirements and as further documented in the Final Program. Provide reproducible copies and electronic copies.

1.6 CONSTRUCTION PHASE RESPONSIBILITIES (PHASE 2 SERVICES)

- A. The Design Builder will provide all labor, materials, equipment, temporary utility services and facilities necessary to construct the entire Project as required by the Design-Build Agreement Documents.

1. Competitively bid all work not performed by the Design Builder in accordance with all local, state, and federal directives, orders, and laws including but not limited to Equal Employment Opportunity (EEO), minority Business Enterprise (MBE), and OSHA.

Specifications

-
- 2. Comply with Section 34 “Market Analysis and Solicitation of Bids” of the General Terms and Conditions.
 - B. Scope of Phase 2 Construction Services: Refer to Exhibit P of the Agreement for Phase 2 Construction Services including:
 - 1. Completion of Construction Documents.
 - 2. Building Permit Phase.
 - 3. Construction.
 - C. Deviations:
 - 1. As deviations from the approved Construction Documents are resolved, Design Builder will note resulting deviations in a log and in an annotated record copy of the original Construction Documents (As-Built).
 - D. Milestones and Deliverables: Refer to Exhibit L of the Agreement:
 - 1. Design Builder shall furnish documents in type, format, version and quantities required to comply with Scope of Services requirements and as further documented in the Final Program. Provide reproducible copies and electronic copies.
- 1.7 INFORMATIONAL SUBMITTALS
- A. Subcontract List: Prepare a written summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment fabricated to a special design. Include the following information in tabular form:
 - 1. Name, address, and telephone number of entity performing subcontract or supplying products.
 - 2. Number and title of related Specification Section(s) covered by subcontract.
 - 3. Drawing number and detail references, as appropriate, covered by subcontract.
 - 4. Contract amount.
 - B. Key Personnel Names: Within 10 days of starting construction operations, submit a list of key personnel assignments, including superintendent and other personnel in attendance at Project site. Use form provided by Owner. A copy is included as Exhibit S to the Agreement. In addition to the Exhibit S list, provide a roster of companies list that identifies key individuals and their duties and responsibilities; list addresses and telephone numbers, including office and cellular telephone numbers and e-mail addresses. Provide names, addresses, and telephone numbers of individuals assigned as alternates in the absence of individuals assigned to Project.
 - 1. Post copies of list in project meeting room, in temporary field office, and by each temporary telephone. Keep list current at all times.
 - C. Daily Construction Reports:
 - 1. Prepare a daily construction report recording information required by Section 8 of the General Terms and Conditions and the following information concerning events at Project site:
 - a. List of subcontractors at Project site.
 - b. List of separate Contractors at Project site.
 - c. Accidents.

Specifications

- d. Meetings and significant decisions.
 - e. Stoppages, delays, shortages, and losses.
 - f. Meter readings and similar recordings.
 - g. Emergency Procedures.
 - h. Orders and requests of authorities having jurisdiction.
 - i. Change Orders received and implemented.
 - j. Construction Change Directives received and implemented.
 - k. Services connected and disconnected.
 - l. Equipment or system tests and startups.
 - m. Partial Completions and occupancies.
 - n. Completions authorized.
 - 2. Submit two (2) copies at weekly intervals.
- D. Field Condition Reports:
- 1. Immediately upon discovery of a difference between field conditions and the Construction Documents, prepare and submit two (2) copies of a detailed report at time of discovery of differing conditions.
 - 2. Submit report with a request for interpretation. Include a detailed description of the differing conditions, together with recommendations for changing the Construction Documents.
- E. Special Reports:
- 1. General:
 - a. Prepare and submit two (2) copies of special reports directly to the County within one day of an occurrence. Distribute copies of report to parties affected by the occurrence.
 - 2. Reporting Unusual Events:
 - a. When an event of an unusual and significant nature occurs at Project site, whether or not related directly to the Work, prepare and submit two (2) copies of a special report. List chain of events, persons participating, and response by Design Builder's personnel, evaluation of results or effects, and similar pertinent information. Advise the County in advance when these events are known or predictable.
- F. Logs:
- 1. Establish and maintain the following logs:
 - a. Requests for Proposal Log
 - b. Submittals Log
 - c. Requests for Information Log
 - d. Change Order Log
 - e. Potential Change Order Log
 - f. Insurance status
 - 2. Form of Logs:
 - a. Record items on a serial number basis.
 - b. Assign individual numbers, in serial order, to each entry.
 - c. Begin serial order with No. 1 and continue numerically uninterrupted.

Specifications

- d. Review status of the above documentation in the Progress Meetings using the logs.
 - e. Update logs after each meeting.
- G. Monthly Summary Reports: Design Builder shall prepare monthly written reports to comply with Exhibit I "Supplemental Terms and Conditions" of the Agreement.

1.8 COORDINATION DRAWINGS

- A. Coordination Drawings, General: Design Builder will prepare coordination drawings for the County's review and approval for circumstances including but not limited to:
- 1. According to requirements in individual Sections.
 - 2. Maximum utilization of space with limited space availability.
 - 3. Space utilization for the efficient installation of different components.
 - 4. Where installation is not completely shown on Shop Drawings.
 - 5. Where coordination is required to facilitate integration of products and materials fabricated or installed by more than one entity.
- B. Content: Project-specific information, drawn accurately to a scale large enough to indicate and resolve conflicts. Do not base coordination drawings on standard printed data. Include the following information, as applicable:
- 1. Use applicable Drawings as a basis for preparation of coordination drawings. Prepare sections, elevations, and details as needed to describe relationship of various systems and components.
 - 2. Coordinate the addition of trade-specific information to the coordination drawings by multiple contractors in a sequence that best provides for coordination of the information and resolution of conflicts between installed components before submitting for review.
 - 3. Indicate functional and spatial relationships of components of architectural, structural, civil, mechanical, and electrical systems.
 - 4. Indicate space requirements for routine maintenance and for anticipated replacement of components during the life of the installation.
 - 5. Show location and size of access doors required for access to concealed dampers, valves, and other controls.
 - 6. Indicate required installation sequences.
 - 7. Indicate dimensions shown on the Drawings. Specifically note dimensions that appear to be in conflict with submitted equipment and minimum clearance requirements. Provide alternate sketches to County indicating proposed resolution of such conflicts. Dimension changes and difficult installations will not be considered changes to the Design-Build Agreement.
- C. Sheet Size: At least 8-1/2 by 11 inches but no larger than 30 by 42 inches.
- 1. Number of Copies: Unless noted otherwise, Design Builder must submit six (6) opaque copies of each submittal. The County will return two copies.
 - a. When Coordination Drawings are required for operation and maintenance manuals, submit six (6) copies of Coordination Drawings. The County will retain four copies and the remainder will be returned. Retain one returned copy as a Project Record Drawing.

Specifications

1.9 REQUESTS FOR INFORMATION (RFIs)

- A. General: Prepare, reproduce and distribute supplemental drawings, specifications and interpretations in response to requests for information or clarification by Owner or Subcontractors. Comply with requirements of Exhibit P of the Agreement.
1. Architect will return RFIs submitted to Architect by other entities controlled by Contractor with no response.
 2. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors.
- B. RFI Log: Prepare, maintain, and submit a tabular log of RFIs organized by the RFI number.
1. Project name.
 2. RFI number including RFIs that were returned without action or withdrawn.
 3. RFI description.
 4. Date the RFI was submitted.
 5. Date response was issued by Design Builder.

1.10 PROJECT MEETINGS

- A. General: Schedule and conduct meetings and conferences at Project site unless otherwise indicated.
1. Attendees: Design Builder to inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify of scheduled meeting dates and times.
 2. Agenda: Prepare the meeting agenda. Distribute the agenda to all invited attendees.
 3. Minutes: Record significant discussions and agreements achieved. Distribute the meeting minutes to everyone concerned, including Owner, within three days of the meeting.
 4. Comply with General Terms and Conditions Sections 8 and 29 and Exhibit P of the Agreement.
- B. Preconstruction Conference: Schedule and conduct a preconstruction conference before starting construction, at a time convenient to Owner but no later than 10 working days after execution of the Agreement. Comply with General Terms and Conditions Sections 8 and 29 and Exhibit P of the Agreement.
1. Conduct the conference to review responsibilities and personnel assignments.
 2. Attendees: Authorized representatives of Owner, Design Builder and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 3. Agenda: Discuss items of significance that could affect progress, including the following:
 - a. Tentative construction schedule.
 - b. Phasing.
 - c. Critical work sequencing and long-lead items.
 - d. Designation of key personnel and their duties.
 - e. Lines of communications.
 - f. Procedures for processing field decisions and Change Orders.
 - g. Procedures for RFIs.
 - h. Procedures for testing and inspecting.
 - i. Procedures for processing Applications for Payment.

Specifications

-
- j. Distribution of the Contract Documents.
 - k. Submittal procedures.
 - l. Sustainable design requirements.
 - m. Preparation of record documents.
 - n. Use of the premises and existing building.
 - o. Work restrictions.
 - p. Working hours.
 - q. Owner's occupancy requirements.
 - r. Responsibility for temporary facilities and controls.
 - s. Procedures for moisture and mold control.
 - t. Procedures for disruptions and shutdowns.
 - u. Construction waste management and recycling.
 - v. Parking availability.
 - w. Office, work, and storage areas.
 - x. Equipment deliveries and priorities.
 - y. First aid.
 - z. Security.
 - aa. Progress cleaning.
 - 4. Minutes: Record and distribute meeting minutes within 3 business days.
- C. LEED Coordination Conference: Design Builder will schedule and conduct a LEED coordination conference before starting construction, at a time convenient to Owner.
- 1. Attendees: Authorized representatives of Owner; Contractor and its superintendent and LEED coordinator; major subcontractors; suppliers; and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 2. Agenda: Discuss items of significance that could affect meeting requirements for LEED certification, including the following:
 - a. LEED Project Checklist.
 - b. General requirements for LEED-related procurement and documentation.
 - c. Project closeout requirements and LEED certification procedures.
 - d. Role of LEED coordinator.
 - e. Construction waste management.
 - f. Construction operations and LEED requirements and restrictions.
 - 3. Minutes: Entity responsible for conducting meeting will record and distribute meeting minutes.
- D. Preinstallation Conferences: Conduct a preinstallation conference at Project site before each construction activity that requires coordination with other construction.
- 1. Attendees: Installer and representatives of manufacturers and fabricators involved in or affected by the installation and its coordination or integration with other materials and installations that have preceded or will follow, shall attend the meeting. Advise Owner of scheduled meeting dates.
 - 2. Agenda: Review progress of other construction activities and preparations for the particular activity under consideration, including requirements for the following:
 - a. Contract Documents.
 - b. Options.
 - c. Related RFIs.

Specifications

-
- d. Related Change Orders.
 - e. Purchases.
 - f. Deliveries.
 - g. Submittals.
 - h. Sustainable design requirements.
 - i. Review of mockups.
 - j. Possible conflicts.
 - k. Compatibility requirements.
 - l. Time schedules.
 - m. Weather limitations.
 - n. Manufacturer's written instructions.
 - o. Warranty requirements.
 - p. Compatibility of materials.
 - q. Acceptability of substrates.
 - r. Temporary facilities and controls.
 - s. Space and access limitations.
 - t. Regulations of authorities having jurisdiction.
 - u. Testing and inspecting requirements.
 - v. Installation procedures.
 - w. Coordination with other work.
 - x. Required performance results.
 - y. Protection of adjacent work.
 - z. Protection of construction and personnel.
- 3. Record significant conference discussions, agreements, and disagreements, including required corrective measures and actions.
 - 4. Reporting: Distribute minutes of the meeting to each party present and to other parties requiring information.
 - 5. Do not proceed with installation if the conference cannot be successfully concluded. Initiate whatever actions are necessary to resolve impediments to performance of the Work and reconvene the conference at earliest feasible date.
- E. Progress/Coordination Meetings: Design Builder to conduct progress/coordination meetings at weekly intervals.
- 1. Coordinate dates of meetings with preparation of payment requests.
 - 2. Attendees: In addition to representatives of Owner, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Review and correct or approve minutes of previous progress meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project.
 - a. Design Builder's Construction Schedule: Review progress since the last meeting. Determine whether each activity is on time, ahead of schedule, or behind schedule, in relation to Design Builder's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time.
 - 1) Review schedule for next period.

Specifications

-
- b. Review present and future needs of each entity present, including the following:
 - 1) Interface requirements.
 - 2) Sequence of operations.
 - 3) Status of submittals.
 - 4) Status of sustainable design documentation.
 - 5) Deliveries.
 - 6) Off-site fabrication.
 - 7) Access.
 - 8) Site utilization.
 - 9) Work hours.
 - 10) Hazards and risks.
 - 11) Temporary facilities and controls.
 - 12) Progress cleaning.
 - 13) Quality and work standards.
 - 14) Status of correction of deficient items.
 - 15) Field observations.
 - 16) Status of RFIs.
 - 17) Status of proposal requests.
 - 18) Pending changes.
 - 19) Status of Change Orders.
 - 20) Pending claims and disputes.
 - 21) Documentation of information for payment requests.
 - 4. Minutes: Record and distribute the meeting minutes to each party present and to parties requiring information.
 - a. Schedule Updating: Revise Design Builder's construction schedule after each progress meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with the report of each meeting.
 - F. Owner Activation / Transition Meeting(s).
 - 1. The objective of these meetings is to proactively and collaboratively address the Owner's transition requirements and issues. In concert with the County, the Design Builder will arrange Activation / Transition Meetings scheduled sufficiently prior to occupancy to facilitate an efficient and timely occupancy. Attendees will include appropriate members of the Design Builder, the County's Project team, and others as appropriate. Prepare and distribute the agenda and meeting minutes. Meeting minutes must be distributed no later than 3 business days after such meeting is held.
 - G. Project Closeout Conference: Design Builder will schedule and conduct a project closeout conference, at a time convenient to Owner, but no later than 90 days prior to the scheduled date of Substantial Completion.
 - 1. Conduct the conference to review requirements and responsibilities related to Project closeout.
 - 2. Attendees: Authorized representatives of Owner; Design Builder and its superintendent; major subcontractors; suppliers; and other concerned parties shall attend the meeting. Participants at the meeting shall be familiar with Project and authorized to conclude matters relating to the Work.
 - 3. Agenda: Discuss items of significance that could affect or delay Project closeout, including the following:

Specifications

- a. Preparation of record documents.
 - b. Procedures required prior to inspection for Substantial Completion and for final inspection for acceptance.
 - c. Submittal of written warranties.
 - d. Requirements for completing sustainable design documentation.
 - e. Requirements for preparing operations and maintenance data.
 - f. Requirements for delivery of material samples, attic stock, and spare parts.
 - g. Requirements for demonstration and training.
 - h. Preparation of Contractor's punch list.
 - i. Procedures for processing Applications for Payment at Substantial Completion and for final payment.
 - j. Submittal procedures.
 - k. Coordination of separate contracts.
 - l. Owner's partial occupancy requirements.
 - m. Installation of Owner's furniture, fixtures, and equipment.
 - n. Responsibility for removing temporary facilities and controls.
4. Minutes: Record and distribute meeting minutes.

1.11 COORDINATION WITH EXISTING FACILITY OPERATIONS AND WORK UNDER SEPARATE AGREEMENTS

- A. Among other issues, scheduling, procurement, and site logistics coordination between the Design Builder, the County, the County's other Vendors, and the existing PCJ facility is required for successful completion of the Project.
1. The Design Builder, the PCJ, and the County's other Vendors will develop (with input from the County's Representative) and submit a Joint Coordination Plan and Schedule describing how all coordination issues will be managed on site (including methods of resolving unforeseen coordination needs), and which tasks the Design Builder is responsible for.
 2. The Joint Coordination Plan and Schedule will be first drafted by the Design Builder for the Project. The draft plan will be revised accordingly after coordination with the Owner, Users, and Owner's Vendors. The first Joint Coordination Plan and Schedule must be submitted no later than 60 days after the Notice to Proceed for the Project. It must be revised as needed throughout the Project duration.
 3. The Joint Coordination Plan will reflect the Design Builder's coordination with the Regulatory Authorities having Jurisdiction.
 4. Joint coordination meetings including the County's Representative will be held regularly to anticipate coordination needs and assess coordination performance.
- B. A partial list of components requiring close cooperation between the Design Builder and the PCJ is provided below.
1. Security/Detention building components
 - a. All new security/detention doors, frames, hardware, glazing, and window frames will be furnished and installed by the Design Builder; however elements, such as door hardware, must be compatible with the existing facility. The Design Builder must coordinate equipment, installation, finishing, and scheduling.

Specifications

2. Low voltage systems
 - a. All security electronics, low voltage systems and phone and data systems will tie into some existing PCJ systems. The Design Builder must coordinate equipment ordering, installation, finishing, and commissioning.
3. Utility points of connection
 - a. All utility points of connection that will affect the everyday operation of the PCJ and the Design Builder must be coordinated with all the affected parties. Utility service to active functions of the PCJ buildings and common areas (including but not limited to sewer collection, water distribution, fire protection, power, gas, communications, and other essential utilities) shall not be disrupted without prior arrangements and communication.
4. Commissioning
 - a. Once all buildings are connected and the Central Plant is up and running, integrated commissioning may commence. This will require the active participation of Design Builder with the third-party Commissioning Agent.
5. Site access
 - a. Access to the site will be through areas under control by the PCJ. The Design Builder must coordinate access with the PCJ. The Design Builder must ensure PCJ access requirements are maintained at all times. Should off-hour access be required by the Design Builder, costs if any incurred to manage the off-hour access, shall be borne by the Design Builder requiring such access.
6. Site Access Control
 - a. The Design Builder will coordinate the site's controlled access system with the PCJ and the County, and will track any necessary distribution of gate entry devices (e.g., key fobs) to every authorized employee of every contractor on site. The Design Builder will coordinate access to the Site to avoid negative impacts to PCJ Operations. For all of its employees, subcontractors and consultants on site, The Design Builder will furnish to the PCJ all required personnel data. The Design Builder and the PCJ will jointly implement a procedure for supervising gated access points and routing delivery traffic.
 - b. Delivery traffic will need to be routed efficiently to the correct destination.
7. Site Housekeeping and Maintenance
 - a. Design Builder must participate in the maintenance of site roads and parking lot(s) utilized by Design Builder.
8. Secure Perimeter Fence
 - a. Major openings may be necessary in the perimeter fencing system to enable completion of work within the perimeter. The locations, configurations, and scheduling of these openings must be carefully coordinated with the PCJ and the Owner.

Specifications

9. Safety

- a. The Design Builder should consider a coordinated safety program for the site, first responder procedures, etc.

10. Fire Alarm Components

- a. The Design Builder will coordinate fire alarm system devices and equipment with the existing facility systems to ensure proper operation.

C. Stormwater control work must be coordinated by the Design Builder as follows:

- 1. All stormwater control work on the site is permitted by the Southwest Florida Water Management District (SWFWMD) and Pinellas County pursuant to the original permit documents for the Pinella county Jail Intake Facility and the Health Care Facility. The permit numbers for the site are referenced in Section 7.1.D. The Design Builder will be required to obtain a modification of this permit for the proposed improvements.
- 2. The Design Builder shall prepare, implement, and maintain the Stormwater Pollution Prevention Control Plan during the life of the project and shall maintain records of Plan modifications and Discharge Monitoring Reports on site
- 3. For all site development implementation activities, the Design Builder shall provide a Water Pollution Control Manager to provide ongoing monitoring events and complete and maintain the Discharge Monitoring Reports in accordance with Title 40: Protection of the Environment, Chapter 122 EPA Administered Permit Programs: The National Pollutant Discharge Elimination System for construction activities.
- 4. The County reserves the right to have employees or consultants inspect site stormwater control provisions at any time.
- 5. The Design Builder will pay any penalties, fines, or damages assessed against the County by the EPA, or the State of Florida delegated authority, Florida Department of Environmental Protection or civil suits for non-compliance events arising in their respective work areas.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 013100

01 32 00 - CONSTRUCTION PROGRESS DOCUMENTATION

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for documenting the progress of construction during performance of the Work, including the following:
 - 1. Design Builder's Design/Construction schedule.
- B. Related Requirements:
 - 1. Section 01 29 00, Payment Procedures
 - 2. Section 01 31 00, Project Management and Coordination
 - 3. Section 01 32 32, Photographic Documentation
 - 4. Section 01 33 00 "Submittal Procedures" for submitting schedules and reports.
 - 5. Section 01 40 00 "Quality Requirements" for submitting a schedule of tests and inspections.

1.3 DEFINITIONS

- A. Activity: A discrete part of a project that can be identified for planning, scheduling, monitoring, and controlling the construction project. Activities included in a construction schedule consume time and resources.
 - 1. Critical Activity: An activity on the critical path that must start and finish on the planned early start and finish times.
 - 2. Predecessor Activity: An activity that precedes another activity in the network.
 - 3. Successor Activity: An activity that follows another activity in the network.
- B. CPM: Critical path method, which is a method of planning and scheduling a construction project where activities are arranged based on activity relationships. Network calculations determine when activities can be performed and the critical path of Project.

Specifications

- C. Critical Path: The longest connected chain of interdependent activities through the network schedule that establishes the minimum overall Project duration and contains no float.
- D. Event: The starting or ending point of an activity.
- E. Float: The measure of leeway in starting and completing an activity.
 - 1. Float time is not for the exclusive use or benefit of either Owner or Design Builder, but is a jointly owned, expiring Project resource available to both parties as needed to meet schedule milestones and Contract completion date.
 - 2. Free float is the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.
 - 3. Total float is the measure of leeway in starting or completing an activity without adversely affecting the planned Project completion date.
- F. Fragnet: A partial or fragmentary network that breaks down activities into smaller activities for greater detail.
- G. Major Area: A story of construction, a separate building, or a similar significant construction element.
- H. Milestone: A key or critical point in time for reference or measurement.
- I. Network Diagram: A graphic diagram of a network schedule, showing activities and activity relationships.
- J. Resource Loading: The allocation of manpower and equipment necessary for the completion of an activity as scheduled.

1.4 INFORMATIONAL SUBMITTALS

- A. Format for Submittals: Submit required submittals in the following format:
 - 1. PDF electronic file.
 - 2. Two paper copies.
- B. Startup Network Diagram: Of size required to display entire network for entire construction period. Show logic ties for activities.
- C. Design Builder's Construction Schedule: Initial schedule, of size required to display entire schedule for entire construction period.
- D. CPM Reports: Concurrent with CPM schedule, submit each of the following reports. Format for each activity in reports shall contain activity number, activity description, original duration, remaining duration, early start date, early finish date, late start date, late finish date, and total float in calendar days.
 - 1. Activity Report: List of all activities sorted by activity number and then early start date, or actual start date if known.
 - 2. Logic Report: List of preceding and succeeding activities for all activities, sorted in ascending order by activity number and then early start date, or actual start date if known.
 - 3. Total Float Report: List of all activities sorted in ascending order of total float.

Specifications

- E. Construction Schedule Updating Reports: Submit with Applications for Payment.
- F. Qualification Data: For scheduling consultant.

1.5 QUALITY ASSURANCE

- A. Scheduling Consultant Qualifications: An experienced specialist in CPM scheduling and reporting, with capability of producing CPM reports and diagrams within 24 hours of Owner's request.
- B. Prescheduling Conference: Conduct conference at Project site to comply with requirements in Section 013100 "Project Management and Coordination." Review methods and procedures related to the preliminary construction schedule and Design Builder's construction schedule, including, but not limited to, the following:
 - 1. Review software limitations and content and format for reports.
 - 2. Verify availability of qualified personnel needed to develop and update schedule.
 - 3. Discuss constraints, including phasing, work stages, area separation, interim milestones, and partial Owner occupancy.
 - 4. Review delivery dates for Owner-furnished products.
 - 5. Review time to acquire, set up and occupy the field office(s).
 - 6. Review dates established in the Project milestone schedule and other milestone of important events.
 - 7. Review dates detailing the planned design schedule, including submittals and reviews.
 - 8. Review schedule for work of Owner's separate contracts.
 - 9. Review submittal requirements and procedures.
 - 10. Review time required for review of submittals and resubmittals.
 - 11. Review requirements for tests and inspections by independent testing and inspecting agencies.
 - 12. Review time required for Project closeout and Owner startup procedures, including commissioning activities.
 - 13. Review and finalize list of construction activities to be included in schedule.
 - 14. Review submittal requirements and procedures.
 - 15. Review procedures for updating schedule.

1.6 COORDINATION

- A. Coordinate Design Builder's construction schedule with the schedule of values, list of subcontracts, submittal schedule, progress reports, payment requests, and other required schedules and reports.
 - 1. Secure time commitments for performing critical elements of the Work from entities involved.
 - 2. Coordinate each construction activity in the network with other activities and schedule them in proper sequence.

1.7 GENERAL SCHEDULING REQUIREMENTS

- A. The Design Builder will develop and maintain the Design/Construction Schedule for the scope of work contained in the Agreement. The purpose of the Design/Construction Schedule will be to:
 - 1. Assure adequate planning, scheduling, and reporting during execution of the design and construction and related activities so they may be prosecuted in an orderly and expeditious manner, within the Agreement Time and the Milestones stipulated by the Agreement;

Specifications

2. Assure coordination of the work of the Design Builder and the various subcontractors and suppliers at all tiers;
 3. Assist in the preparation and evaluation of the Design Builder's monthly progress payments;
 4. Assist in monitoring the progress of the work and evaluating proposed changes to the Agreement and the Design/Construction Schedule; and,
 5. Assist in detecting problems for the purpose of taking corrective action and to provide a mechanism or tool for determining and monitoring such corrective actions.
- B. The Work will be prosecuted such that it will insure meeting the specified Agreement Time. By execution of the Agreement, the Design Builder represents that he has analyzed the work, the materials and methods involved, the systems of the building, availability of qualified labor, restrictions of the site, constraints imposed, their own workload and capacity to perform the work, and agrees that the specified times are reasonable considering the existing conditions prevailing in the locality of the work, including weather conditions, and other factors, with reasonable allowance for variations from average or ideal conditions.
- C. The work under this Agreement will be planned, scheduled, executed and reported using the Precedence Diagramming Technique of the Critical Path Method (hereinafter referred to as CPM).
- D. The Design Builder must employ the services of at least one Scheduling Manager fully qualified in critical path scheduling of projects of similar size and scope for the duration of the Agreement.
- E. Any and all milestones listed in these specifications, or elsewhere in the Agreement Documents, represent only the major items of construction work. The milestone completion dates indicated are considered essential to the satisfactory performance of this Agreement and to the coordination of all work on the Project. The County reserves the right to require the Design Builder to prosecute the work in accordance with the specified milestone dates.

PART 2 - PRODUCTS

2.1 DESIGN BUILDER'S CONSTRUCTION SCHEDULE (CPM SCHEDULE)

- A. Procedures: Comply with procedures contained herein and in the Agreement, General Terms and Conditions, and Supplemental Terms and Conditions.
- B. Submit schedule within 10 days of date established for the Notice to Proceed. This schedule must show the general plan for all portions of the design and construction of the Work. Indicate each significant activity separately and identify the first workday of each week with a continuous vertical line.
- C. Time Frame: Extend schedule from date established for the Notice to Proceed to date of final completion.
1. Contract completion date shall not be changed by submission of a schedule that shows an early completion date, unless specifically authorized by Change Order.
- D. CPM Schedule: Prepare Design Builder's construction schedule using a time-scaled CPM network analysis diagram for the Work.

Specifications

1. Failure to include any work item required for performance of this Contract shall not excuse Design Builder from completing all work within applicable completion dates, regardless of Owner's approval of the schedule.
 2. Conduct educational workshops to train and inform key Project personnel, including subcontractors' personnel, in proper methods of providing data and using CPM schedule information.
 3. Establish procedures for monitoring and updating CPM schedule and for reporting progress. Coordinate procedures with progress meeting and payment request dates.
 4. Use "one workday" as the unit of time for individual activities. Indicate nonworking days and holidays incorporated into the schedule in order to coordinate with the Contract Time.
- E. CPM Schedule Preparation: Prepare a list of all activities required to complete the Work. Using the startup network diagram, prepare a skeleton network to identify probable critical paths.
- F. Activities: Comply with the following:
1. Activities: Treat each story or separate area as a separate numbered activity for each main element of the Work. Indicate the estimated time duration, sequence requirements, and relationship of each activity in relation to other activities. Include estimated time frames for the following activities:
 - a. Design/Construction Activities: Activity durations must be in units of whole working days and must be limited to a maximum of fifteen (15) working days twenty-one (21) calendar days for each activity.
 - b. Preparation and processing of submittals. Include review and resubmittal times indicated in Section 013300 "Submittal Procedures" in schedule. Coordinate submittal review times in Design Builder's construction schedule with submittal schedule.
 - c. Procurement Activities: Procurement activities must include mobilization, major shop drawing and sample submittals and the fabrication and delivery of key and long lead procurement elements and must indicate intended submittal, review and approval, and realistic delivery dates for fabrication and delivery activities.
 - d. Mobilization and demobilization.
 - e. Purchase of materials.
 - f. Delivery.
 - g. Fabrication.
 - h. Utility interruptions.
 - i. Temporary facilities.
 - j. Installation.
 - k. Work by Owner that may affect or be affected by Design Builder's activities.
 - l. Startup, Testing, and commissioning. Include no fewer than 10 days for startup and testing.
 - m. Substantial Completion: Indicate completion in advance of date established for Substantial Completion, and allow time for County's administrative procedures necessary for certification of Substantial Completion.
 - n. Punch List and Final Completion: Include not more than 30 days for completion of punch list items and final completion.
 - o. Activities occurring following final completion.
 2. Critical Path Activities: Identify critical path activities, including those for interim completion dates. Scheduled start and completion dates shall be consistent with Contract milestone dates.
 3. Processing: Process data to produce output data on a computer-drawn, time-scaled network. Revise data, reorganize activity sequences, and reproduce as often as necessary to produce the CPM schedule within the limitations of the Contract Time.

Specifications

-
4. Format: Mark the critical path. Locate the critical path near center of network; locate paths with most float near the edges.
 - a. Subnetworks on separate sheets are permissible for activities clearly off the critical path.
 5. Prepare network diagram from a sorted activity list. Identify critical activities. Prepare tabulated reports showing the following:
 - a. Design Builder or subcontractor and the Work or activity.
 - b. Description of activity.
 - c. Main events of activity.
 - d. Immediate preceding and succeeding activities.
 - e. Early and late start dates.
 - f. Early and late finish dates.
 - g. Activity duration in workdays.
 - h. Total float or slack time.
 - i. Average size of workforce.
 6. Activity Duration: Define activities so no activity is longer than 15 days, unless specifically allowed by Owner.
 7. Procurement Activities: Include procurement process activities for long lead items and major items, requiring a cycle of more than 60 days, as separate activities in schedule. Procurement cycle activities include, but are not limited to, submittals, approvals, purchasing, fabrication, and delivery.
- G. Constraints: Include constraints and work restrictions indicated in the Contract Documents and as follows in schedule, and show how the sequence of the Work is affected.
1. Phasing: Arrange list of activities on schedule by phase. Include the major phasing required such as Design and Construction Phases with sub-phases of work below them
 2. Work by Owner: Include a separate activity for each portion of the Work performed by Owner, or work by Owner's other contractors.
 3. Products Ordered in Advance: Include a separate activity for each product. Include delivery date.
 4. Owner-Furnished Products: Include a separate activity for each product. Include delivery date.
 5. Work Restrictions: Show the effect of the following items on the schedule:
 - a. Coordination with existing construction.
 - b. Limitations of continued occupancies.
 - c. Uninterruptible services.
 - d. Partial occupancy before Substantial Completion.
 - e. Use of premises restrictions.
 - f. Provisions for future construction.
 - g. Seasonal variations.
 - h. Environmental control.
 - i. Other restrictions identified by Design Builder.
- H. Work Stages: Indicate important stages of construction for each major portion of the Work, including, but not limited to, the following:
1. Subcontract awards.
 2. Submittals.
 3. Purchases.
 4. Mockups.

Specifications

5. Fabrication.
 6. Sample testing.
 7. Deliveries.
 8. Installation.
 9. Tests and inspections.
 10. Adjusting.
 11. Curing.
 12. Building flush-out.
 13. Startup and placement into final use and operation.
- I. Construction Areas: Identify each major area of construction for each major portion of the Work. Indicate where each construction activity within a major area must be sequenced or integrated with other construction activities to provide for the following:
1. Structural completion.
 2. Temporary enclosure and space conditioning.
 3. Permanent space enclosure.
 4. Completion of mechanical installation.
 5. Completion of electrical installation.
 6. Substantial Completion.
- J. Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, the Notice to Proceed, Substantial Completion, and final completion, and the following interim milestones:
1. Temporary enclosure and space conditioning.
 2. Design Presentations.
- K. Upcoming Work Summary: Prepare summary report indicating activities scheduled to occur or commence prior to submittal of next schedule update. Summarize the following issues:
1. Unresolved issues.
 2. Unanswered Requests for Information.
 3. Rejected or unreturned submittals.
 4. Notations on returned submittals.
 5. Pending modifications affecting the Work and Contract Time.
- L. Recovery Schedule: When periodic update indicates the Work is 15 or more calendar days behind the current approved schedule, submit a separate recovery schedule indicating means by which Design Builder intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, and equipment required to achieve compliance, and date by which recovery will be accomplished.
- M. Computer Scheduling Software: Prepare schedules using current version of a program that has been developed specifically to manage construction schedules.
- N. Schedule Updating: Concurrent with making revisions to schedule, prepare tabulated reports showing the following:
1. Identification of activities that have changed.
 2. Changes in early and late start dates.
 3. Changes in early and late finish dates.
 4. Changes in activity durations in workdays.



Specifications

5. Changes in the critical path.
6. Changes in total float or slack time.
7. Changes in the Contract Time.

PART 3 - EXECUTION (Not Used)

END OF SECTION 013200

01 32 33 - PHOTOGRAPHIC DOCUMENTATION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Preconstruction photographs and video recording.
 - 2. Periodic construction photographs and video recording.
 - 3. Final completion construction photographs and video recording.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting photographic documentation.
 - 2. Section 02 41 16 "Structure Demolition" for photographic documentation before building demolition operations commence.
 - 3. Section 02 41 19 "Selective Structure Demolition" for photographic documentation before selective demolition operations commence.

1.3 INFORMATIONAL SUBMITTALS

- A. Key Plan: Submit key plan of Project site and building with notation of vantage points marked for location and direction of each photograph. Indicate elevation or story of construction. Include same information as corresponding photographic documentation.
- B. Digital Photographs: Submit image files in conformance with County requirements.
- C. Construction Photographs: Submit prints and/or images in conformance with County requirements.
- D. Video Recordings: Submit video recordings in conformance with County requirements.



Specifications

- E. Periodic Construction Digital Images: Submit prints and/or images in conformance with County requirements.

1.4 COORDINATION

- A. Coordinate photographic requirements and procedures with the County. Do not take photographs or videos without Owner permission.

1.5 USAGE RIGHTS

- A. Obtain and transfer copyright usage rights from photographer to Owner for unlimited reproduction of photographic documentation.

PART 2 - PRODUCTS

2.1 PHOTOGRAPHIC MEDIA

- A. Digital Images: Provide images in format acceptable to County.
- B. Digital Video Recordings: Provide high-resolution, digital video disc in format acceptable to County. Quality must be adequate to create photographic prints to be made from individual frames.

PART 3 - EXECUTION

3.1 PHOTOGRAPHS

- A. General: Comply with County and PCJ requirements and regulations.
 - 1. Take photographs using the maximum range of depth of field, and that are in focus, to clearly show the Work. Photographs with blurry or out-of-focus areas will not be accepted.
 - 2. Maintain key plan with each set of construction photographs that identifies each photographic location.
 - 3. Digital Images: Submit digital images exactly as originally recorded in the digital camera, without alteration, manipulation, editing, or modifications using image-editing software.

3.2 CONSTRUCTION VIDEO RECORDINGS

- A. Video Recording: Comply with County and PCJ requirements and regulations.

END OF SECTION 01 32 33

01 33 00 - SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes requirements for the submittal schedule and administrative and procedural requirements for submitting Shop Drawings, Product Data, Samples, and other submittals.
- B. Related Requirements:
 - 1. Section 01 29 00 "Payment Procedures" for submitting Applications for Payment and the schedule of values.
 - 2. Section 01 31 00 Project Management and Coordination
 - 3. Section 01 32 00 "Construction Progress Documentation" for submitting schedules and reports, including Contractor's construction schedule.
 - 4. Section 01 40 00 Quality Requirements
 - 5. Section 01 74 19 Construction Waste Management
 - 6. Section 01 77 00 Closeout Procedures
 - 7. Section 01 78 23 "Operation and Maintenance Data" for submitting operation and maintenance manuals.
 - 8. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
 - 9. Section 01 79 00 "Demonstration and Training" for submitting video recordings of demonstration of equipment and training of Owner's personnel.
 - 10. Section 01 81 13 "Sustainability Design Requirements."

1.3 DEFINITIONS

- A. Action Submittals: Written and graphic information and physical samples that require County's responsive action. Action submittals are those submittals indicated in individual Specification Sections as "action submittals."

Specifications

- B. Informational Submittals: Written and graphic information and physical samples that do not require County's responsive action. Submittals may be rejected for not complying with requirements. Informational submittals are those submittals indicated in individual Specification Sections as "informational submittals."

1.4 SUBMITTAL ADMINISTRATIVE REQUIREMENTS

- A. General: Comply with Section 7 of the General Terms and Conditions and Exhibit P of the Agreement.
1. During Phase 1, Design Builder shall prepare and submit to Owner, for Owner's approval, procedures for Design Builder's handling and processing of submittals.
 2. Submittal Schedule: Submit a schedule of submittals, arranged in chronological order by dates required by construction schedule. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by County and additional time for handling and reviewing submittals required by those corrections.
 - a. Sequential Review: Identify where sequential review of submittals is required.
- B. Coordination: Coordinate preparation and processing of submittals with performance of construction activities.
1. Coordinate each submittal with fabrication, purchasing, testing, delivery, other submittals, and related activities that require sequential activity.
 2. Coordinate multi-discipline design phase submittals and construction documents prepared by Design Builder's design professionals of record.
 3. Coordinate transmittal of different types of submittals for related parts of the Work so processing will not be delayed because of need to review submittals concurrently for coordination.
 - a. County reserves the right to withhold action on a submittal requiring coordination with other submittals until related submittals are received.
- C. Options: Identify options requiring selection by County.
- D. Distribution: Furnish copies of final submittals to manufacturers, subcontractors, suppliers, fabricators, installers, authorities having jurisdiction, and others as necessary for performance of construction activities. Show distribution on transmittal forms.
- E. Use for Construction: Retain complete copies of submittals on Project site. Use only final action submittals that are marked with approval notation from Owner.
- F. Record Documents: Submit a complete set of final copy of all submittals as a Project Record Document in electronic format on CD.

PART 2 - PRODUCTS

2.1 SUBMITTAL PROCEDURES

- A. General Submittal Procedure Requirements: Prepare and submit submittals required by individual Specification Sections. Types of submittals are indicated in individual Specification Sections.
- B. Certificates and Certifications Submittals: Provide a statement that includes signature of entity responsible for preparing certification. Certificates and certifications shall be signed by an officer or other individual authorized to sign documents on behalf of that entity.
- C. Product Data: Mark each copy of each submittal to show which products and options are applicable.
- D. Shop Drawings:
 - 1. Preparation: Fully illustrate requirements in the Contract Documents. Include the following information, as applicable:
 - a. Dimensions.
 - b. Identification of products.
 - c. Fabrication and installation drawings.
 - d. Roughing-in and setting diagrams.
 - e. Wiring diagrams showing field-installed wiring, including power, signal, and control wiring.
 - f. Shop work manufacturing instructions.
 - g. Templates and patterns.
 - h. Schedules.
 - i. Design calculations.
 - j. Compliance with specified standards.
 - k. Notation of coordination requirements.
 - l. Notation of dimensions established by field measurement.
 - m. Relationship and attachment to adjoining construction clearly indicated.
 - n. Seal and signature of professional engineer if specified.
- E. Samples: Submit Samples for review of kind, color, pattern, and texture for a check of these characteristics with other elements and for a comparison of these characteristics between submittal and actual component as delivered and installed.
 - 1. Disposition: Maintain sets of approved Samples at Project site, available for quality-control comparisons throughout the course of construction activity. Sample sets may be used to determine final acceptance of construction associated with each set.
 - 2. Samples for Initial Selection: Submit manufacturer's color charts consisting of units or sections of units showing the full range of colors, textures, and patterns available.
 - 3. Samples for Verification: Submit full-size units or Samples of size indicated, prepared from same material to be used for the Work, cured and finished in manner specified, and physically identical with material or product proposed for use, and that show full range of color and texture variations expected. Samples include, but are not limited to, the following: partial sections of manufactured or fabricated components; small cuts or containers of materials; complete units of repetitively used materials; swatches showing color, texture, and pattern; color range sets; and components used for independent testing and inspection.

Specifications

4. Where size of samples is not specified, office samples should be of sufficient size and quantity to clearly illustrate:
 - a. Functional characteristics of product or material, with integrally related parts and attachment devices.
 - b. After review, samples may be used in construction of Project.
5. Field Samples and Mockups:
 - a. Erect at Project site at location acceptable to County.
 - b. Construct each sample or mockup complete, including work of all trades required in finished work.
- F. Coordination Drawing Submittals: Comply with requirements specified in Section 013100 "Project Management and Coordination."
- G. Contractor's Construction Schedule: Comply with requirements specified in Section 013200 "Construction Progress Documentation."
- H. Application for Payment and Schedule of Values: Comply with requirements specified in Section 012900 "Payment Procedures."
- I. Test and Inspection Reports and Schedule of Tests and Inspections Submittals: Comply with requirements specified in Section 014000 "Quality Requirements."
- J. Closeout Submittals and Maintenance Material Submittals: Comply with requirements specified in Section 017700 "Closeout Procedures."
- K. Maintenance Data: Comply with requirements specified in Section 017823 "Operation and Maintenance Data."
- L. LEED Submittals: Comply with requirements specified in Section 018113 "Sustainable Design Requirements."
- M. Qualification Data: Prepare written information that demonstrates capabilities and experience of firm or person. Include lists of completed projects with project names and addresses, contact information of architects and owners, and other information specified.
- N. Welding Certificates: Prepare written certification that welding procedures and personnel comply with requirements in the Contract Documents. Submit record of Welding Procedure Specification and Procedure Qualification Record on AWS forms. Include names of firms and personnel certified.
- O. Installer Certificates: Submit written statements on manufacturer's letterhead certifying that Installer complies with requirements in the Contract Documents and, where required, is authorized by manufacturer for this specific Project.
- P. Manufacturer Certificates: Submit written statements on manufacturer's letterhead certifying that manufacturer complies with requirements in the Contract Documents. Include evidence of manufacturing experience where required.
- Q. Product Certificates: Submit written statements on manufacturer's letterhead certifying that product complies with requirements in the Contract Documents.

Specifications

- R. Material Certificates: Submit written statements on manufacturer's letterhead certifying that material complies with requirements in the Contract Documents.
- S. Material Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting test results of material for compliance with requirements in the Contract Documents.
- T. Product Test Reports: Submit written reports indicating that current product produced by manufacturer complies with requirements in the Contract Documents. Base reports on evaluation of tests performed by manufacturer and witnessed by a qualified testing agency, or on comprehensive tests performed by a qualified testing agency.
- U. Research Reports: Submit written evidence, from a model code organization acceptable to authorities having jurisdiction, that product complies with building code in effect for Project. Include the following information:
 - 1. Name of evaluation organization.
 - 2. Date of evaluation.
 - 3. Time period when report is in effect.
 - 4. Product and manufacturers' names.
 - 5. Description of product.
 - 6. Test procedures and results.
 - 7. Limitations of use.
- V. Schedule of Tests and Inspections: Reference Section 01 40 00 Quality Requirements and other relevant sections.
- W. Preconstruction Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of tests performed before installation of product, for compliance with performance requirements in the Contract Documents.
- X. Compatibility Test Reports: Submit reports written by a qualified testing agency, on testing agency's standard form, indicating and interpreting results of compatibility tests performed before installation of product. Include written recommendations for primers and substrate preparation needed for adhesion.
- Y. Field Test Reports: Submit written reports indicating and interpreting results of field tests performed either during installation of product or after product is installed in its final location, for compliance with requirements in the Contract Documents.
- Z. Design Data: Prepare and submit written and graphic information, including, but not limited to, performance and design criteria, list of applicable codes and regulations, and calculations. Include list of assumptions and other performance and design criteria and a summary of loads. Include load diagrams if applicable. Provide name and version of software, if any, used for calculations. Include page numbers.
- AA. Manufacturer's Instructions: Prepare written or published information that documents manufacturer's recommendations, guidelines, and procedures for installing or operating a product or equipment. Include name of product and name, address, and telephone number of manufacturer. Include the following, as applicable:
 - 1. Preparation of substrates.
 - 2. Required substrate tolerances.
 - 3. Sequence of installation or erection.
 - 4. Required installation tolerances.

Specifications

5. Required adjustments.
6. Recommendations for cleaning and protection.

BB. Manufacturer's Field Reports: Prepare written information documenting factory-authorized service representative's tests and inspections. Include the following, as applicable:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement on whether conditions, products, and installation will affect warranty.
7. Other required items required in individual Performance Specification Sections.

CC. Construction Photographs and Digital Recordings (DVD's): Reference Section 01 32 32 Photographic Documentation and other relevant sections.

2.2 DELEGATED-DESIGN SERVICES

- A. Performance and Design Criteria: Where professional design services or certifications by a design professional are specifically required of Design Builder by the Contract Documents, provide products and systems complying with specific performance and design criteria indicated.
- B. Delegated-Design Services Certification: In addition to Shop Drawings, Product Data, and other required submittals, submit copies of certificate, signed and sealed by the responsible design professional, for each product and system specifically assigned to Design Builder to be designed or certified by a design professional.
1. Indicate that products and systems comply with performance and design criteria in the Contract Documents. Include list of codes, loads, and other factors used in performing these services.

2.3 SUBSTITUTIONS

- A. General: Comply with Section 7 of the General Terms and Conditions..
1. The Design-Build Agreement is based on materials, equipment and methods described in Criteria Documents.
 2. County will consider proposals for alternative materials, equipment and methods only when such proposals are accompanied by full and complete technical data and all other information required by County to evaluate proposed substitution.
 3. Do not order, install, or utilize alternative materials, equipment or methods unless such substitution has been specifically accepted in writing for this work by the County.
 4. Refer also to Design-Build Agreement and Section 01 60 00, Product Requirements for additional requirements and additional related information.
 5. The County will be the sole judge of the acceptability of proposed substitutions.
 6. To the extent possible, proposed substitutions must be submitted prior to the execution of the Lump Sum Amendment, unless mutually agreed in writing by Owner and Design Builder.

Specifications

- B. Coordination: Acceptance of substitution will not relieve Design Builder from responsibility for compliance with all requirements of the Design Requirements and Performance Specifications, and Design Builder will be responsible, at Design Builder's own expense, for changes in other parts of Design Builder's work or work of others which may be caused by acceptance of substitution.
- C. Submit separate request for each product and support each request with:
 - 1. Product identification.
 - 2. Manufacturer's representative name, address and contact information.
 - 3. Manufacturer's literature.
 - 4. Samples, as applicable.
 - 5. Detailed comparison of proposed product with specified product.
 - 6. Name, address, and scope of correctional facilities projects on which product has been used, and date of installation.
 - 7. Data relating to changes in construction schedule, if any.
 - 8. Data regarding difference in cost, if any, between specified item and proposed substitute item.
 - 9. Historical reliability and maintenance data.
 - 10. Life-cycle value compared to specified product.
 - 11. Warranty comparison to specified product.
 - 12. Other information as required by Owner.

PART 3 - EXECUTION

3.1 DESIGN BUILDER'S REVIEW

- A. General: Review each submittal and check for coordination with other Work of the Agreement and for compliance with the Agreement Documents. Note corrections and field dimensions. Mark with approval stamp before submitting to the County.
- B. Approval Stamp: Stamp each submittal with a uniform, approval stamp. Include Project name and location, submittal number, Specification Section title and number, name of reviewer, date of Design Builder's approval, and Statement certifying that submittal has been reviewed, checked, and approved for compliance with the Agreement Documents.

END OF SECTION 013300

01 35 13 - SPECIAL PROJECT PROCEDURES FOR DETENTION FACILITIES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. The work under this contract will be performed on the premises of a Security Facility. The Facility shall provide and maintain the security to safeguard workers during the construction. Prior to the beginning of any work, the Design Builder shall consult with the Superintendent of the Facility and his staff to be advised on the rules and regulations required for complete security of the Facility. Design Builder shall instruct all subordinates and subcontractors of security requirements before they begin their portions of the work.
- B. Comply with the security program for secured institutions. The Facility may require additional security provisions to the ones listed in this section. These additional security provisions are to become part of this contract just as if they were listed herein. In case of conflict, the Owner shall determine requirement to be followed.
- C. Detention work required by, but not specified in, this Section includes but is not limited to the following:
 - 1. Section 07 92 22 "Security Joint Sealants."
 - 2. Section 08 88 53 "Detention Glazing."
 - 3. Section 09 57 53 "Security Ceiling Assemblies."
 - 4. Section 11 19 00 "General provisions for Detention Work."
 - 5. Section 11 19 13 "Detention Hollow Metal."
 - 6. Section 11 19 43 "Detention Enclosures."
 - 7. Section 11 19 53 "Detention Hardware."
 - 8. Section 11 19 56 "Detention Sliding Door Devices."
 - 9. Section 11 19 63 "Detention Furnishings and Equipment."
 - 10. Section 11 19 93 "Tamper Proof Fasteners."
 - 11. Section 22 46 00 "Security Plumbing Fixtures."
 - 12. Section 32 31 13.53 "High-Security Chain Link Fences and Gates."

Specifications

1.3 ADMINISTRATIVE PROCEDURES

- A. Notifications: Prepare memoranda for distribution to each party involved with detention work, outlining special procedures required for coordination of detention work. Include such items as required notices, reports, and attendance at meetings.

1.4 EMPLOYEE IDENTIFICATION

- A. The Design Builder shall provide the County and the Facility with a complete list of all persons duly authorized to perform work on the project, and only those persons will be admitted onto the Facility. All construction workers may be fingerprinted. The Facility may issue temporary identification cards, which will be kept by the security personnel at the Facility entrance. Each worker may be required to sign an in and out card upon entering or leaving the facility.

1.5 SEARCHES

- A. No contraband such as liquor, controlled substances, firearms, ammunition, tobacco products, or similar items may be brought onto the site or into the Facility. The County may require a worker who violates the prohibition on contraband to be removed from the site and not permitted to return. If this occurs, the County may find the Design Builder to be in Breach of Contract.

1.6 REMOVAL OF WORKER

- A. The Facility may, with cause, require the Design Builder to remove any worker from the project.

1.7 VEHICLE USE

- A. The Design Builder is to coordinate with the County regarding a designated area for personal vehicles. All cars, trucks and other vehicles shall be locked at all times, including ignition, gasoline filler cap, trunk and all doors. All contraband shall be removed. The speed limit within the Facility is posted and will be strictly enforced. Trucks shall be immediately loaded or unloaded by the Design Builder and removed. Heavy-duty equipment left within the Facility at night shall be securely locked and every precaution taken to prevent it from being started.

1.8 CONTACT WITH INMATES

- A. A worker shall at no time talk to, signal, whistle, or in any way attract the attention of any inmate and shall restrict his/her movements to the project area. Workers shall not come to the job under the influence of intoxicants or drugs. Nothing shall be taken from or given to an inmate. Inmates are not to help in any way. It will be the worker's responsibility to notify their superior or a Facility official of all unusual happenings pertaining to the inmates.

1.9 EMERGENCY AID

- A. The Facility is not expected to furnish medical aid or treatment to workers, but in the event of an emergency, the Facility may give every possible aid.



Specifications

1.10 SMOKING BAN

- A. There is a total smoking ban in force at all DOC facilities. This ban includes all Design Builder personnel. Smoking is prohibited anywhere within the bounds of the Facility. No one is permitted to have smoking materials of any type on their person at any time. Smoking materials discovered will be confiscated. Repeat offenders will be removed.

1.11 DESIGN BUILDER TOOL CONTROL

- A. The Design Builder shall coordinate with the Facility and County regarding tool control requirements.
- B. While in the Facility, tools will be locked in gang boxes and secured at all times when not in use. Workers must report to the Facility security staff immediately if any tools or equipment are missing.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 35 13

01 40 00 - QUALITY REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for quality assurance and quality control. Comply with requirements in General Terms and Conditions and Exhibit P of the Agreement.
- B. Testing and inspecting services are required to verify compliance with requirements specified or indicated. These services do not relieve Design Builder of responsibility for compliance with the Contract Document requirements.
 - 1. Specific quality-assurance and -control requirements for individual construction activities are specified in the Sections that specify those activities. Requirements in those Sections may also cover production of standard products.
 - 2. Specified tests, inspections, and related actions do not limit Design Builder's other quality-assurance and -control procedures that facilitate compliance with the Contract Document requirements.
 - 3. Requirements for Design Builder to provide quality-assurance and -control services required by Owner, Commissioning Authority, or authorities having jurisdiction are not limited by provisions of this Section.
 - 4. Specific test and inspection requirements are not specified in this Section.
- C. Related Requirements:
 - 1. Section 01 32 00 Construction Progress Documentation.
 - 2. Section 01 33 00 Submittal Procedures.
 - 3. Section 01 78 39 Project Record Documents.
 - 4. Section 01 79 00 Demonstration and Training.
 - 5. Section 01 81 13 Sustainable Design Requirements.

Specifications

1.3 DEFINITIONS

- A. Quality-Assurance Services: Activities, actions, and procedures performed before and during execution of the Work to guard against defects and deficiencies and substantiate that proposed construction will comply with requirements.
- B. Quality-Control Services: Tests, inspections, procedures, and related actions during and after execution of the Work to evaluate that actual products incorporated into the Work and completed construction comply with requirements.
- C. Mockups: Full-size physical assemblies that are constructed on-site. Mockups are constructed to verify selections made under Sample submittals; to demonstrate aesthetic effects and, where indicated, qualities of materials and execution; to review coordination, testing, or operation; to show interface between dissimilar materials; and to demonstrate compliance with specified installation tolerances. Mockups are not Samples. Unless otherwise indicated, approved mockups establish the standard by which the Work will be judged.
 - 1. Laboratory Mockups: Full-size physical assemblies constructed at testing facility to verify performance characteristics.
 - 2. Integrated Exterior Mockups: Mockups of the exterior envelope erected separately from the building but on Project site, consisting of multiple products, assemblies, and subassemblies.
 - 3. Room Mockups: Mockups of typical interior spaces complete with wall, floor, and ceiling finishes, doors, windows, millwork, casework, specialties, furnishings and equipment, and lighting.
- D. Preconstruction Testing: Tests and inspections performed specifically for Project before products and materials are incorporated into the Work, to verify performance or compliance with specified criteria.
- E. Product Testing: Tests and inspections that are performed by an NRTL, an NVLAP, or a testing agency qualified to conduct product testing and acceptable to authorities having jurisdiction, to establish product performance and compliance with specified requirements.
- F. Source Quality-Control Testing: Tests and inspections that are performed at the source, e.g., plant, mill, factory, or shop.
- G. Field Quality-Control Testing: Tests and inspections that are performed on-site for installation of the Work and for completed Work.
- H. Testing Agency: An entity engaged to perform specific tests, inspections, or both. Testing laboratory shall mean the same as testing agency.
- I. Installer/Applicator/Erector: Design Builder or another entity engaged by Design Builder as an employee, Subcontractor, or Sub-subcontractor, to perform a particular construction operation, including installation, erection, application, and similar operations.
 - 1. Use of trade-specific terminology in referring to a trade or entity does not require that certain construction activities be performed by accredited or unionized individuals, or that requirements specified apply exclusively to specific trade(s).

1.4 REGULATORY REQUIREMENTS

- A. General: All applicable federal, State and local requirements will govern the construction and completion of the Work; all must be current enforced editions.

Specifications

- B. Enforcement: References in the Contract Documents to "code" or to "building code" not otherwise identified will mean the foregoing specified codes, together with the additions, changes, amendments and interpretations adopted by the enforcing agency, and in effect on the date the Design-Build Agreement is executed.
1. Nothing on the Contract Documents will be interpreted as requiring or permitting work that is contrary to these rules, regulations and codes.
 2. Where other codes or standards are referenced in the Contract Documents, the affected work must meet or exceed the applicable requirements of such codes and standards.
 3. The code, specification or standard referred to will have full force and effect as though printed in the Contract Documents, except as modified.
 4. Where the Contract Documents call for or describe materials, work quality or construction of a better quality, higher standard or larger size than is required by said laws, codes, rules and regulations, the provisions of the Contract Documents will take precedence over said laws, codes, rules and regulations.
- C. Other Applicable Laws and Regulations: Applicable federal, state, and local laws, and the rules and regulations of governing utility districts and the various other authorities having jurisdiction over the construction and completion of Project, will apply to the Contract Documents throughout, and they will be deemed to be included in the Contract Documents the same as though printed in the Contract Documents.
1. If laws, ordinances, rules, regulations or orders of public agency having jurisdiction require work to be inspected, tested or approved by some authority other than the Owner or Design Builder, the Design Builder must give required notices and make arrangements, deliver to the Owner the certificates of inspection, test, or approval of such public agency, and pay costs therefore unless otherwise provided in the Contract Documents.

1.5 CONFLICTING REQUIREMENTS

- A. Referenced Standards: If compliance with two or more standards is specified and the standards establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Owner for a decision before proceeding.
- B. Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Owner for a decision before proceeding.

1.6 VERIFICATION OF CONDITIONS

- A. Prior to installing any portion of the Work, Design Builder must inspect the work already in place to receive the work to be installed and arrange for correction of defects in the existing workmanship, material or conditions that may adversely affect work to be installed. Such inspections must include test applications of the materials to be installed as required to establish the correct condition of surfaces involved. Where the specifications require a material to be installed under the supervision or inspection of the material manufacturer or its representative, Design Builder must ensure that the manufacturer or its representative also inspects the work in place and issues a letter of approval to the County.

Specifications

1.7 REFERENCES

- A. The publications listed below form a minimum part of this specification to the extent referenced. The current editions of the publications are referred to in the text by the basic designation only.
1. ASTM A 880 - Criteria for Use in Evaluation of Testing Laboratories and Organizations for Examination and Inspection of Steel, Stainless Steel, and Related Alloys
 2. ASTM C 1077 Laboratories Testing Concrete and Concrete Aggregates for Use In Construction and Criteria for Laboratory Evaluation
 3. ASTM D 3666 (Rev. A) - Evaluating and Qualifying Agencies Testing and Inspecting Bituminous Paving Materials
 4. ASTM D 3740 - Evaluation of Agencies Engaged in the Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction
 5. ASTM E 329 - Evaluation of Testing and Inspection Agencies as Used in Construction
 6. ASTM E 543 (Rev. A) - Determining the Qualification of Non-Destructive Testing Agencies
 7. ASHRAE – American Society of Heating, Refrigeration, and Air Conditioning Engineers
 8. AWS – American Welding Society
 9. SMACNA – Sheet Metal and Air Conditioning Contractors National Association
 10. ACI – American Concrete Institute
 11. AABC – American Air Balance Council
 12. NETA – International Electrical Test and Acceptance Association
 13. IEEE – Institute of Electrical and Electronic Engineers
 14. All other standards as referenced throughout this set of specifications

1.8 ACTION SUBMITTALS

- A. Shop Drawings: For integrated exterior and laboratory mockups, provide plans, sections, and elevations, indicating materials and size of mockup construction.
1. Indicate manufacturer and model number of individual components.
 2. Provide axonometric drawings for conditions difficult to illustrate in two dimensions.

1.9 INFORMATIONAL SUBMITTALS

- A. Design Builder's Quality-Control Plan: For quality-assurance and quality-control activities and responsibilities.
- B. Qualification Data: For Design Builder's quality-control personnel.
- C. Design Builder's Statement of Responsibility: When required by authorities having jurisdiction, submit copy of written statement of responsibility sent to authorities having jurisdiction before starting work on the following systems:
1. Main wind-force-resisting system or a wind-resisting component listed in the wind-force-resisting system quality-assurance plan.
- D. Schedule of Tests and Inspections: Prepare in tabular form and include the following:
1. Specification Section number and title.
 2. Entity responsible for performing tests and inspections.
 3. Description of test and inspection.

Specifications

4. Identification of applicable standards.
5. Identification of test and inspection methods.
6. Number of tests and inspections required.
7. Time schedule or time span for tests and inspections.
8. Requirements for obtaining samples.
9. Unique characteristics of each quality-control service.

1.10 DESIGN BUILDER'S QUALITY-CONTROL PLAN

- A. Quality-Control Plan, General: Submit quality-control plan within 10 days of Notice to Proceed, and not less than five days prior to preconstruction conference. Submit in format acceptable to Owner. Identify personnel, procedures, controls, instructions, tests, records, and forms to be used to carry out Design Builder's quality-assurance and quality-control responsibilities. Coordinate with Design Builder's construction schedule.
- B. Quality-Control Personnel Qualifications: Engage qualified full-time personnel trained and experienced in managing and executing quality-assurance and quality-control procedures similar in nature and extent to those required for Project.
 1. Project quality-control manager shall not have other Project responsibilities.
- C. Submittal Procedure: Describe procedures for ensuring compliance with requirements through review and management of submittal process. Indicate qualifications of personnel responsible for submittal review.
- D. Testing and Inspection: In quality-control plan, include a comprehensive schedule of Work requiring testing or inspection, including the following:
 1. Design Builder-performed tests and inspections including subcontractor-performed tests and inspections. Include required tests and inspections and Design Builder-elected tests and inspections.
 2. Special inspections required by authorities having jurisdiction.
 3. Tests and inspections indicated to be performed by the Commissioning Authority.
- E. Continuous Inspection of Workmanship: Describe process for continuous inspection during construction to identify and correct deficiencies in workmanship in addition to testing and inspection specified. Indicate types of corrective actions to be required to bring work into compliance with standards of workmanship established by Contract requirements and approved mockups.
- F. Monitoring and Documentation: Maintain testing and inspection reports including log of approved and rejected results. Include work Owner has indicated as nonconforming or defective. Indicate corrective actions taken to bring nonconforming work into compliance with requirements. Comply with requirements of authorities having jurisdiction.

1.11 REPORTS AND DOCUMENTS

- A. Test and Inspection Reports: Prepare and submit certified written reports specified in other Sections. Include the following:
 1. Date of issue.
 2. Project title and number.

Specifications

3. Name, address, and telephone number of testing agency.
4. Dates and locations of samples and tests or inspections.
5. Names of individuals making tests and inspections.
6. Description of the Work and test and inspection method.
7. Identification of product and Specification Section.
8. Complete test or inspection data.
9. Test and inspection results and an interpretation of test results.
10. Record of temperature and weather conditions at time of sample taking and testing and inspecting.
11. Comments or professional opinion on whether tested or inspected Work complies with the Contract Document requirements.
12. Name and signature of laboratory inspector.
13. Recommendations on retesting and reinspecting.

B. **Manufacturer's Technical Representative's Field Reports:** Prepare written information documenting manufacturer's technical representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of technical representative making report.
2. Statement on condition of substrates and their acceptability for installation of product.
3. Statement that products at Project site comply with requirements.
4. Summary of installation procedures being followed, whether they comply with requirements and, if not, what corrective action was taken.
5. Results of operational and other tests and a statement of whether observed performance complies with requirements.
6. Statement whether conditions, products, and installation will affect warranty.
7. Other required items indicated in individual Specification Sections.

C. **Factory-Authorized Service Representative's Reports:** Prepare written information documenting manufacturer's factory-authorized service representative's tests and inspections specified in other Sections. Include the following:

1. Name, address, and telephone number of factory-authorized service representative making report.
2. Statement that equipment complies with requirements.
3. Results of operational and other tests and a statement of whether observed performance complies with requirements.
4. Statement whether conditions, products, and installation will affect warranty.
5. Other required items indicated in individual Specification Sections.

D. **Permits, Licenses, and Certificates:** For Owner's records, submit copies of permits, licenses, certifications, inspection reports, releases, jurisdictional settlements, notices, receipts for fee payments, judgments, correspondence, records, and similar documents, established for compliance with standards and regulations bearing on performance of the Work.

1.12 QUALITY ASSURANCE

A. **General:** Qualifications paragraphs in this article establish the minimum qualification levels required; individual Specification Sections specify additional requirements.

Specifications

- B. Manufacturer Qualifications: A firm experienced in manufacturing products or systems similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- C. Fabricator Qualifications: A firm experienced in producing products similar to those indicated for this Project and with a record of successful in-service performance, as well as sufficient production capacity to produce required units.
- D. Installer Qualifications: A firm or individual experienced in installing, erecting, or assembling work similar in material, design, and extent to that indicated for this Project, whose work has resulted in construction with a record of successful in-service performance.
- E. Professional Architect/Engineer Qualifications: A professional Architect/Engineer who is legally qualified and licensed to practice in jurisdiction where Project is located and who is experienced in providing Architecture and Engineering services of the kind indicated. Architect/Engineering services are defined as those performed for design or installations of the system, assembly, or product that are similar to those indicated for this Project in material, design, and extent.
- F. Testing Agency Qualifications: An NRTL, an NVLAP, or an independent agency with the experience and capability to conduct testing and inspecting indicated, as documented according to ASTM E 329; and with additional qualifications specified in individual Sections; and, where required by authorities having jurisdiction, that is acceptable to authorities.
 - 1. NRTL: A nationally recognized testing laboratory according to 29 CFR 1910.7.
 - 2. NVLAP: A testing agency accredited according to NIST's National Voluntary Laboratory Accreditation Program.
- G. Manufacturer's Technical Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to observe and inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- H. Factory-Authorized Service Representative Qualifications: An authorized representative of manufacturer who is trained and approved by manufacturer to inspect installation of manufacturer's products that are similar in material, design, and extent to those indicated for this Project.
- I. Preconstruction Testing: Where testing agency is indicated to perform preconstruction testing for compliance with specified requirements for performance and test methods, comply with the following:
 - 1. Design Builder responsibilities include the following:
 - a. Provide test specimens representative of proposed products and construction.
 - b. Submit specimens in a timely manner with sufficient time for testing and analyzing results to prevent delaying the Work.
 - c. Provide sizes and configurations of test assemblies, mockups, and laboratory mockups to adequately demonstrate capability of products to comply with performance requirements.
 - d. Build site-assembled test assemblies and mockups using installers who will perform same tasks for Project.
 - e. Build laboratory mockups at testing facility using personnel, products, and methods of construction indicated for the completed Work.
 - f. When testing is complete, remove test specimens, assemblies, and mockups, and laboratory mockups; do not reuse products on Project.

Specifications

- J. Testing Agency Responsibilities: Submit a certified written report of each test, inspection, and similar quality-assurance service to Owner and Commissioning Authority, with copy to Design Builder. Interpret tests and inspections and state in each report whether tested and inspected work complies with or deviates from the Contract Documents.
- K. Mockups: Before installing portions of the Work requiring mockups, build mockups for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work:
 - 1. Build mockups in location and of size indicated or, if not indicated, as approved by Owner.
 - 2. Employ workers that will be employed during the construction at Project.
 - 3. Demonstrate the proposed range of aesthetic effects and workmanship.
 - 4. Obtain Owner's approval of mockups before starting work, fabrication, or construction.
 - a. Allow seven days for initial review and each re-review of each mockup.
 - 5. Maintain mockups during construction in an undisturbed condition as a standard for judging the completed Work.
 - 6. Demolish and remove mockups when directed unless otherwise indicated.
- L. Integrated Exterior Mockups: Construct integrated exterior mockup according to approved Shop Drawings. Coordinate installation of exterior envelope materials and products for which mockups are required in individual Specification Sections, along with supporting materials.
- M. Room Mockups: Construct room mockups incorporating required materials and assemblies, finished according to requirements. Provide required lighting and additional lighting where required to enable Owner to evaluate quality of the Work.
- N. Laboratory Mockups: Comply with requirements of preconstruction testing and those specified in individual Specification Sections.

1.13 QUALITY CONTROL

- A. Testing Responsibility: Employ and pay for services of an independent testing laboratory to perform specified testing, and any other testing specifically indicated in the Project Contract Documents.
 - 1. Design Builder must cooperate with laboratory to facilitate execution of its required services.
 - 2. Perform additional quality-control activities required to verify that the Work complies with requirements, whether specified or not.
 - 3. Unless otherwise indicated, provide quality-control services specified and those required by authorities having jurisdiction. Perform quality-control services required of Design Builder by authorities having jurisdiction, whether specified or not.
 - 4. Submit a certified written report, in duplicate, of each quality-control service.
 - 5. Testing and inspecting requested by Design Builder and not required by the Contract Documents are Design Builder's responsibility.
 - 6. Submit additional copies of each written report directly to authorities having jurisdiction, when they so direct.

Specifications

-
- B. Required Tests and Inspection: Testing and inspection services are required to verify compliance with the Contract Documents. These services will, in no way, relieve the Design Builder from its obligations to perform the work of the Design Build Agreement.
1. Required testing and inspection services for specific construction and/or material production activities are referenced in individual Sections, as applicable.
 2. Specified tests, inspections, and related activities do not preclude Design Builder's quality control procedures that facilitate compliance with the Contract Document requirements.
- C. Design Builder's Responsibilities
1. Cooperate with laboratory personnel and County representative; provide access to work and to manufacturer's operations.
 2. Provide laboratory with adequate quantities of representational samples of materials proposed to be used which require testing.
 3. Provide to laboratory preliminary design mix proposed to be used for concrete and other material mixes which require control by testing laboratory.
 4. Furnish copies of products tests reports as required.
 5. Furnish incidental labor and facilities:
 - a. To provide access to work to be tested.
 - b. To obtain and handle samples at the Project site or at source of product to be tested.
 - c. To facilitate inspections and tests.
 - d. For storage and curing of test samples.
 6. Retesting or additional inspection required due to nonconformance with the Contract Documents must be performed by the independent testing laboratory at the Design Builder's expense.
- D. Manufacturer's Field Services: Where indicated, engage a factory-authorized service representative to inspect field-assembled components and equipment installation, including service connections. Report results in writing as specified in Section 01 33 00 "Submittal Procedures."
- E. Manufacturer's Technical Services: Where indicated, engage a manufacturer's technical representative to observe and inspect the Work. Manufacturer's technical representative's services include participation in preinstallation conferences, examination of substrates and conditions, verification of materials, observation of Installer activities, inspection of completed portions of the Work, and submittal of written reports.
- F. Associated Services: Cooperate with agencies performing required tests, inspections, and similar quality-control services, and provide reasonable auxiliary services as requested. Notify agency sufficiently in advance of operations to permit assignment of personnel. Provide the following:
1. Access to the Work.
 2. Incidental labor and facilities necessary to facilitate tests and inspections.
 3. Adequate quantities of representative samples of materials that require testing and inspecting. Assist agency in obtaining samples.
 4. Facilities for storage and field curing of test samples.
 5. Delivery of samples to testing agencies.
 6. Preliminary design mix proposed for use for material mixes that require control by testing agency.
 7. Security and protection for samples and for testing and inspecting equipment at Project site.

Specifications

- G. Coordination: Coordinate sequence of activities to accommodate required quality-assurance and -control services with a minimum of delay and to avoid necessity of removing and replacing construction to accommodate testing and inspecting.
 - 1. Schedule times for tests, inspections, obtaining samples, and similar activities.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 TEST AND INSPECTION LOG

- A. Test and Inspection Log: Prepare a record of tests and inspections. Include the following:
 - 1. Date test or inspection was conducted.
 - 2. Description of the Work tested or inspected.
 - 3. Date test or inspection results were transmitted to Owner.
 - 4. Identification of testing agency or special inspector conducting test or inspection.
- B. Maintain log at Project site. Post changes and revisions as they occur. Provide access to test and inspection log for Owner's and Commissioning Authority's reference during normal working hours.

3.2 REPAIR AND PROTECTION

- A. General: On completion of testing, inspecting, sample taking, and similar services, repair damaged construction and restore substrates and finishes.
 - 1. Provide materials and comply with installation requirements specified in other Specification Sections or matching existing substrates and finishes. Restore patched areas and extend restoration into adjoining areas with durable seams that are as invisible as possible. Comply with the Contract Document requirements for cutting and patching in Section 01 73 00 "Execution.
- B. Protect construction exposed by or for quality-control service activities.
- C. Repair and protection are Design Builder's responsibility, regardless of the assignment of responsibility for quality-control services.

END OF SECTION 014000

01 50 00 - TEMPORARY FACILITIES AND CONTROLS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Related Requirements:
 - 1. Section 01 33 00, Submittal Procedures.
 - 2. Section 32 12 16 "Asphalt Paving" for construction and maintenance of asphalt pavement for temporary roads and paved areas.

1.3 USE CHARGES

- A. General: Installation and removal of and use charges for temporary facilities shall be paid by the Design-Builder. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owner, testing agencies, and authorities having jurisdiction.
- B. Sewer Service: Pay sewer-service use charges for sewer usage by all entities for construction operations.
- C. Water Service: Pay water-service use charges for water used by all entities for construction operations.
- D. Electric Power Service: Pay electric-power-service use charges for electricity used by all entities for construction operations.
- E. Telephone and High Speed Internet Service (broadband): Provide telephone and high speed internet (broadband) services to support the Design/Builder's needs.

Specifications

1.4 INFORMATIONAL SUBMITTALS

- A. Site Plan: Show temporary facilities, utility hookups, staging areas, and parking areas for construction personnel.
- B. Fire-Safety Program: Show compliance with requirements of NFPA 241 and authorities having jurisdiction. Indicate Design Builder personnel responsible for management of fire-prevention program.
- C. Moisture-Protection Plan: Describe procedures and controls for protecting materials and construction from water absorption and damage.
 - 1. Describe delivery, handling, and storage provisions for materials subject to water absorption or water damage.
 - 2. Indicate procedures for discarding water-damaged materials, protocols for mitigating water intrusion into completed Work, and replacing water-damaged Work.
 - 3. Indicate sequencing of work that requires water, such as sprayed fire-resistive materials, plastering, and terrazzo grinding, and describe plans for dealing with water from these operations. Show procedures for verifying that wet construction has dried sufficiently to permit installation of finish materials.
- D. Dust- and HVAC-Control Plan: Submit coordination drawing and narrative that indicates the dust- and HVAC-control measures proposed for use, proposed locations, and proposed time frame for their operation. Identify further options if proposed measures are later determined to be inadequate. Include the following:
 - 1. Locations of dust-control partitions at each phase of work.
 - 2. HVAC system isolation schematic drawing.
 - 3. Location of proposed air-filtration system discharge.
 - 4. Waste handling procedures.
 - 5. Other dust-control measures.

1.5 QUALITY ASSURANCE

- A. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70.
- B. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.

1.6 PROJECT CONDITIONS

- A. Temporary Use of Permanent Facilities: Engage Installer of each permanent service to assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities.

Specifications

1.7 SECURITY AND SITE REGULATIONS

- A. Confer with the Using Agency's representative and obtain full knowledge of all site rules and regulations affecting work. Refer to Section 01 35 13 "Special Project Procedures for Detention Facilities" for additional information.
- B. Provide control of all persons and vehicles entering and leaving project site. Reasonable proof of identification and signature to the visitor's log shall be required of the visitors by the Design Builder's site superintendent.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top rails.
- B. Portable Chain-Link Fencing: Minimum 2-inch (50-mm), 0.148-inch- (3.8-mm-) thick, galvanized-steel, chain-link fabric fencing; minimum 6 feet (1.8 m) high with galvanized-steel pipe posts; minimum 2-3/8-inch- (60-mm-) OD line posts and 2-7/8-inch- (73-mm-) OD corner and pull posts, with 1-5/8-inch- (42-mm-) OD top and bottom rails. Provide galvanized-steel bases for supporting posts. Portable Chain-Link fencing must be secured so as to prevent toppling over due to outside forces such as weather, and wind. Do not lean items against fence panels.
- C. Provide double security fencing for separation of construction area from end of existing facility as shown on the drawings and in compliance with DOC standards.
- D. Polyethylene Sheet: Reinforced, fire-resistive sheet, 10-mil (0.25-mm) minimum thickness, with flame-spread rating of 15 or less per ASTM E 84 and passing NFPA 701 Test Method 2.
- E. Dust-Control Adhesive-Surface Walk-off Mats: Provide mats minimum 36 by 60 inches (914 by 1624 mm).
- F. Lumber and Plywood: Use Construction Grade Material suitable for its intended use.

2.2 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.
- B. Common-Use Field Office: Of sufficient size to accommodate needs of Owner and construction personnel office activities and to accommodate Project meetings specified in other Division 01 Sections. Keep office clean and orderly. Furnish and equip offices as follows:
 - 1. Furniture required for Project-site documents including file cabinets, plan tables, plan racks, and bookcases.

Specifications

2. Conference room of sufficient size to accommodate meetings. Provide electrical power service and 120-V ac duplex receptacles, with no fewer than one receptacle on each wall. Furnish room with conference table, chairs, and 4-foot- (1.2-m-) square tack and marker boards.
 3. Drinking water.
 4. Heating and cooling equipment necessary to maintain a uniform indoor temperature of 68 to 72 deg F (20 to 22 deg C).
 5. Lighting fixtures capable of maintaining average illumination of 20 fc (215 lx) at desk height.
 6. All temporary installations must be removed by the Design-Builder as a condition precedent to final completion, and surfaces restored to original.
 7. Provide Logistics Plan for discussion and coordination with County and any other impacted parties. Logistics Plan shall at a minimum, show locations of temporary offices, storage areas and parking, vehicular, pedestrian and emergency access and egress routes, areas for material laydown, preconstruction/assembly, locations of cranes and other major pieces of equipment, and locations of fencing.
- C. Storage and Fabrication Sheds: Provide sheds sized, furnished, and equipped to accommodate materials and equipment for construction operations.

2.3 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC Equipment: Unless Owner authorizes use of permanent HVAC system, provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.

PART 3 - EXECUTION

3.1 INSTALLATION, GENERAL

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.
 1. Locate facilities to limit site disturbance.
 2. Store combustible materials apart from buildings.
- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully as required to support construction operations.

Specifications

- C. Water Service: Install water service and distribution piping in sizes and pressures adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with requirements of authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities.
- E. Heating and Cooling: Provide temporary heating and cooling required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed.
- F. Isolation of Work Areas in Occupied Facilities: Prevent dust, fumes, and odors from entering occupied areas. Provide secure separation where required.
 - 1. Prior to commencing work, isolate the HVAC system in area where work is to be performed according to coordination drawings.
 - a. Disconnect supply and return ductwork in work area from HVAC systems servicing occupied areas.
 - b. Maintain negative air pressure within work area using HEPA-equipped air-filtration units, starting with commencement of temporary partition construction, and continuing until removal of temporary partitions is complete.
 - 2. Maintain dust partitions during the Work. Use vacuum collection attachments on dust-producing equipment. Isolate limited work within occupied areas using portable dust-containment devices.
 - 3. Perform daily construction cleanup and final cleanup using approved, HEPA-filter-equipped vacuum equipment.
- G. Ventilation and Humidity Control: Provide temporary ventilation required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed. Coordinate ventilation requirements to produce ambient condition required and minimize energy consumption.
 - 1. Provide dehumidification systems when required to reduce substrate moisture levels to level required to allow installation or application of finishes.
- H. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations.
- I. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions.
 - 1. Install and operate temporary lighting that fulfills security and protection requirements without operating entire system.
- J. Electronic Communication Service: Provide a desktop computer in the primary field office adequate for use by Owner to access Project electronic documents and maintain electronic communications. Equip computer with not less than the following:
 - 1. Internet Service: Broadband modem, router and ISP, equipped with hardware firewall.

Specifications

2. Internet Security: Integrated software, providing software firewall, virus, spyware, phishing, and spam protection in a combined application.

3.3 SUPPORT FACILITIES INSTALLATION

A. General: Comply with the following:

1. Provide construction for temporary offices, shops, and sheds located within construction area or within 30 feet (9 m) of building lines that is noncombustible according to ASTM E 136. Comply with NFPA 241.
2. Maintain support facilities until Owner schedules Substantial Completion inspection. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.

B. Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations.

1. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

C. Traffic Controls: Comply with requirements of authorities having jurisdiction.

1. Protect existing site improvements to remain including curbs, pavement, and utilities.
2. Maintain access for fire-fighting equipment and access to fire hydrants.

D. Parking: Provide temporary parking areas for construction personnel.

1. Parking of personal vehicles of visitors, Design Builder's and Subcontractor's personnel must be limited to designated areas specified or approved by Owner's Project Manager.
2. Parking of construction equipment must be limited to designated areas approved by Owner's Project Manager.

E. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction.

F. Maintain Project site, excavations, and construction free of water.

1. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities.
2. Comply with Storm Water Pollution Prevention Plan for all such drainage.

G. Project Signs: Provide Project signs as approved by Owner. Unauthorized signs are not permitted.

1. Identification Signs: Provide Project identification signs.
2. Temporary Signs: Provide other signs as indicated and as required to inform public and individuals seeking entrance to Project.
 - a. Provide temporary, directional signs for construction personnel and visitors.
 - b. No signs will be posted without the written approval of the County. Submit shop drawings of the proposed sign graphics and lettering for the County's approval.
3. Maintain and touchup signs so they are legible at all times.

Specifications

- H. Waste Disposal Facilities: Comply with requirements specified in Section 017419 "Construction Waste Management and Disposal."
- I. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
- J. Temporary Stairs: Until permanent stairs are available, provide temporary stairs where ladders are not adequate.
- K. Temporary Use of Permanent Stairs: Use of new stairs for construction traffic will be permitted, provided stairs are protected and finishes restored to new condition at time of Substantial Completion.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities.
 - 1. Existing Improvements in Sidewalks and Streets: Existing street signs, electroliers, traffic signals, fire hydrants, underground valves and meter boxes, manholes, trees and other items occurring in sidewalk areas or in streets adjacent to the site must be left undisturbed, unobstructed, and easily accessible at all times during construction, except as otherwise indicated or agreed to between Design Builder and County and utility companies.
- B. Protection of Existing Utilities.
 - 1. Utility service lines found entering site and not indicated to remain or to be incorporated in new work, must be plugged, capped, or otherwise abandoned by Design-Builder in manner satisfactory to the municipality or Utility Companies whose services are involved, except as otherwise required.
 - 2. Protect from damage, existing utility lines not specified to be altered by work of this Agreement; any such features damaged must be repaired or replaced to condition equal to that existing prior to commencing work of this Agreement.
- C. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- D. Stormwater Control: Comply with requirements of authorities having jurisdiction. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains.
- E. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Perform control operations lawfully, using environmentally safe materials.
- F. Site Enclosure Fence: Furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates.
 - 1. Extent of Fence: As required to enclose entire Project site or portion determined sufficient to accommodate construction operations.

Specifications

- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting.
- H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weathertight enclosure for building exterior.
 - 1. Where heating or cooling is needed and permanent enclosure is incomplete, insulate temporary enclosures.
- I. Temporary Partitions: Provide floor-to-ceiling dustproof partitions to limit dust and dirt migration and to separate occupied areas from fumes and noise. Provide security partitions where required.
- J. Temporary Fire Protection: Install and maintain temporary fire-protection facilities of types needed to protect against reasonably predictable and controllable fire losses. Comply with NFPA 241; manage fire-prevention program.
 - 1. Prohibit smoking in construction areas.
 - 2. Supervise welding operations, combustion-type temporary heating units, and similar sources of fire ignition according to requirements of authorities having jurisdiction.
 - 3. Develop and supervise an overall fire-prevention and -protection program for personnel at Project site. Review needs with local fire department and establish procedures to be followed. Instruct personnel in methods and procedures. Post warnings and information.
 - 4. Provide temporary standpipes and hoses for fire protection. Hang hoses with a warning sign stating that hoses are for fire-protection purposes only and are not to be removed. Match hose size with outlet size and equip with suitable nozzles.

3.5 MOISTURE AND MOLD CONTROL

- A. Design Builder's Moisture-Protection: Avoid trapping water in finished work. Document visible signs of mold that may appear during construction.
- B. Exposed Construction Phase: Before installation of weather barriers, when materials are subject to wetting and exposure and to airborne mold spores, protect as follows:
 - 1. Protect porous materials from water damage.
 - 2. Protect stored and installed material from flowing or standing water.
 - 3. Keep porous and organic materials from coming into prolonged contact with concrete.
 - 4. Remove standing water from decks.
 - 5. Keep deck openings covered or dammed.
- C. Partially Enclosed Construction Phase: After installation of weather barriers but before full enclosure and conditioning of building, when installed materials are still subject to infiltration of moisture and ambient mold spores, protect as follows:
 - 1. Do not load or install drywall or other porous materials or components, or items with high organic content, into partially enclosed building.
 - 2. Keep interior spaces reasonably clean and protected from water damage.
 - 3. Periodically collect and remove waste containing cellulose or other organic matter.
 - 4. Discard or replace water-damaged material.
 - 5. Do not install material that is wet.

Specifications

6. Discard, replace, or clean stored or installed material that begins to grow mold.
7. Perform work in a sequence that allows any wet materials adequate time to dry before enclosing the material in drywall or other interior finishes.

D. Controlled Construction Phase of Construction: After completing and sealing of the building enclosure but prior to the full operation of permanent HVAC systems, maintain as follows:

1. Control moisture and humidity inside building by maintaining effective dry-in conditions.
2. Use permanent HVAC system to control humidity.
3. Comply with manufacturer's written instructions for temperature, relative humidity, and exposure to water limits.
 - a. Hygroscopic materials that may support mold growth, including wood and gypsum-based products, that become wet during the course of construction are considered defective.
 - b. Measure moisture content of materials that have been exposed to moisture during construction operations or after installation. Record readings beginning at time of exposure and continuing daily for 48 hours. Remove and replace materials containing moisture levels higher than allowed. Report findings in writing to Owner.

3.6 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal.
1. Maintain operation of temporary enclosures, heating, cooling, humidity control, ventilation, and similar facilities on a 24-hour basis where required to achieve indicated results and to avoid possibility of damage.
 2. Comply with all fugitive dust suppression measures that may be required by authorities having jurisdiction.
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion.
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired.
1. Materials and facilities that constitute temporary facilities are property of Design Builder. Owner reserves right to take possession of Project identification signs.
 2. Remove temporary roads and paved areas not intended for or acceptable for integration into permanent construction. Where area is intended for landscape development, remove soil and aggregate fill that do not comply with requirements for fill or subsoil. Remove materials contaminated with road oil, asphalt and other petrochemical compounds, and other substances that might impair growth of plant materials or lawns. Repair or replace street paving, curbs, and sidewalks at temporary entrances, as required by authorities having jurisdiction.



Specifications

3. At Substantial Completion, repair, renovate, and clean permanent facilities used during construction period. Comply with final cleaning requirements specified in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 50 00

01 60 00 - PRODUCT REQUIREMENTS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS****A. The following applies to this Section:**

1. Contracting Requirements.
2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
3. Appendices.
4. Concept Drawings

B. Review these documents for coordination with additional requirements and information that apply to work under this Section.**1.2 SUMMARY****A. Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; and comparable products.****B. Related Requirements:**

1. Section 01 33 00 "Submittal Procedures" for submittals and substitutions.
2. Section 01 35 13 "Special Project Procedures for Detention Facilities."
3. Section 01 77 00 "Closeout Procedures."

1.3 DEFINITIONS**A. Specified Products and Proposed Products:**

1. The products specified in the Criteria Documents are industry standard products, including finishes, standards, performance specifications, testing and other specified characteristics including installation, which are given to establish the required quality of the Work.
 - a. Select products as applicable to Project complying with the requirements in the Criteria Documents.
2. Changes in materials, equipment, and methods of construction from those required by the Criteria Documents may be proposed by Design-Builder and may be incorporated in the Work when approved by the County. Reference Design-Build Agreement and 01 33 00 for further substitution requirements.

Specifications

- B. Products: Items obtained for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents.
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products.
 - 3. Comparable Product: Product that is demonstrated and approved through submittal process to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product.
- C. Basis-of-Design Product Specification: A specification in which a specific manufacturer's product is named and accompanied by the words "basis-of-design product," including make or model number or other designation, to establish the significant qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics for purposes of evaluating comparable products of additional manufacturers named in the specification.

1.4 ACTION SUBMITTALS

- A. Comparable Product Requests: Submit request for consideration of each comparable product. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles.
 - 1. Include data to indicate compliance with the requirements specified in "Comparable Products" Article.
 - 2. Owner's Action: If necessary, Owner will request additional information or documentation for evaluation of a comparable product request.
 - a. Use product specified if Owner does not issue a decision on use of a comparable product request.

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Design Builder is given option of selecting between two or more products for use on Project, select product compatible with products previously selected, even if previously selected products were also options.
 - 1. Design Builder is responsible for providing products and construction methods compatible with products and construction methods of all subcontractors.
 - 2. If a dispute arises between subcontractors over concurrently selectable but incompatible products, Owner will determine which products shall be used.

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

Specifications

B. Delivery and Handling:

1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces.
2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses.
3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing.
4. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

C. Storage:

1. Store products to allow for inspection and measurement of quantity or counting of units.
2. Store materials in a manner that will not endanger Project structure.
3. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation.
4. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
5. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
6. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Design Builder of obligations under requirements of the Contract Documents.

1. Manufacturer's Warranty: Written warranty furnished by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner.
2. Special Warranty: Written warranty required by the Contract Documents to provide specific rights for Owner.

B. Special Warranties: Prepare a written document that contains appropriate terms and identification, ready for execution.

1. Manufacturer's Standard Form: Modified to include Project-specific information and properly executed.
2. Specified Form: When specified forms are included with the Specifications, prepare a written document using indicated form properly executed.
3. See other Sections for specific content requirements and particular requirements for submitting special warranties.

C. Submittal Time: Comply with requirements in Section 01 77 00 "Closeout Procedures."

PART 2 - PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Criteria Documents, are undamaged and, unless otherwise indicated, are new at time of installation.
 - 1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect.
 - 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects.
 - 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents.
 - 4. Where products are accompanied by the term "as selected," Owner will make selection.
 - 5. Descriptive, performance, and reference standard requirements in the Specifications establish salient characteristics of products.
 - 6. Or Equal: For products specified by name and accompanied by the term "or equal," or "or approved equal," or "or approved," comply with requirements in "Comparable Products" Article to obtain approval for use of an unnamed product.
- B. Visual Selection Specification: Where Specifications include the phrase "as selected by Owner from manufacturer's full range" or similar phrase, select a product that complies with requirements. Owner will select color, gloss, pattern, density, or texture from manufacturer's product line that includes both standard and premium items.

2.2 COMPARABLE PRODUCTS

- A. Conditions for Consideration: Owner will consider Design Builder's request for comparable product when the following conditions are satisfied.
 - 1. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated.
 - 2. Evidence that proposed product provides specified warranty.
 - 3. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested.
 - 4. Samples, if requested.

2.3 COUNTY-FURNISHED PRODUCTS AND SERVICES

- A. General: The Design Builder must coordinate the relocation of miscellaneous items into the new facility. These must include items from the existing facility and or items replacing existing items. The Design Builder must take inventory with the County to identify these items.
- B. County will furnish limited items to the Design Builder for incorporation in the Work. The Work includes providing support systems to receive the County's new and existing equipment and making plumbing, mechanical, and electrical connections for new and existing products furnished by the County.

Specifications

- C. County will furnish Design Builder the earliest possible delivery date for County furnished products. Using County furnished earliest possible delivery dates, Design Builder must designate delivery dates of County furnished items in Design Builder's Construction Schedule.
- D. County will arrange for and deliver Shop Drawings, Product Data, and Samples to Design Builder for any products to be provided by the County to the Design Builder for installation or application. Design Builder must review Shop Drawings, Product Data, and Samples and return them to County noting discrepancies or anticipated problems in use of product.
- E. County will arrange and pay for delivery of County furnished items according to Design Builder's Construction Schedule. Design Builder is responsible for receiving, unloading, handling, and installing County furnished items at Project site.
- F. After delivery, County will inspect delivered items for damage. Design Builder must be present for and assist in County's inspection. If County furnished items are damaged, defective, or missing, County will arrange for replacement.
- G. Design Builder is responsible for protecting County furnished items from damage during storage and handling, including damage from exposure to the elements. If County -furnished items are damaged as a result of Design Builder's operations, Design Builder must repair or replace them to the satisfaction of the County.
- H. Design Builder must install and otherwise incorporate County furnished items into the Work.
- I. County will arrange for manufacturer's field services and for delivery of manufacturer's warranties to Design Builder.

2.4 GENERAL INSTALLATION REQUIREMENTS OF ITEMS FURNISHED BY OTHERS

- A. Examination of Conditions: Before installation is scheduled to begin, require the Installer of each item of work under separate work, including furniture, furnishing, and equipment, to examine both the substrate and the conditions under which their work is to be performed to ensure conditions are satisfactory at time of installation.
- B. Cleaning and Protecting: Clean and protect installations in progress and adjoining materials in place, during handling and installation. Apply protective covering where required to ensure protection from damage or deterioration of Work at Completion.
 - 1. Clean and provide maintenance in completed installation as frequently as necessary through remainder of installation period.
 - 2. Limiting Exposures: Supervise installation operations to ensure that no part of the installation completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure, including theft and vandalism, during the installation period.

2.5 DELIVERY, HANDLING, AND STORAGE OF PRODUCTS FURNISHED BY OTHERS AND EXTRA MATERIALS

- A. General: Deliver and handle products according to manufacturer's recommendations, using means and methods that will prevent damage, deterioration, and loss.
 - 1. Inspect goods on delivery to ensure compliance with the Construction Documents and to ensure goods are undamaged and protected against damage.



Specifications

2. Store and protect goods according to manufacturer's recommendations and in a manner that will facilitate inspection and measurement of quantity or counting of units. Store goods using means and methods that will prevent damage, deterioration, and theft or other loss.
3. Store heavy goods in a manner that will not endanger building structure.
4. Maintain temperature and humidity in areas where goods are stored within the range required by manufacturer's written instructions.

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 60 00

01 73 00 - EXECUTION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes general administrative and procedural requirements governing execution of the Work including, but not limited to, the following:
 - 1. Construction layout.
 - 2. Field engineering and surveying.
 - 3. Installation of the Work.
 - 4. Cutting and patching.
 - 5. Coordination of Owner-installed products.
 - 6. Progress cleaning.
 - 7. Starting and adjusting.
 - 8. Protection of installed construction.
 - 9. Correction of the Work.
- B. Related Requirements:
 - 1. Section 01 31 00 "Project Management and Coordination."
 - 2. Section 01 33 00 "Submittal Procedures" for submitting surveys.
 - 3. Section 01 77 00 "Closeout Procedures" for submitting final property survey with Project Record Documents, recording of Owner-accepted deviations from indicated lines and levels, and final cleaning.
 - 4. Section 01 78 39 "Project Record Documents."
 - 5. Section 02 41 16 "Structure Demolition" for demolition and removal of entire building.
 - 6. Section 02 41 19 "Selective Demolition" for demolition and removal of selected portions of the building.

Specifications

1.3 DEFINITIONS

- A. Cutting: Removal of in-place construction necessary to permit installation or performance of other work.
- B. Patching: Fitting and repair work required to restore construction to original conditions after installation of other work.

1.4 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For land surveyor.
- B. Certificates: Submit certificate signed by land surveyor certifying that location and elevation of improvements comply with requirements.
- C. Certified Surveys: Submit two copies signed by land surveyor.
- D. Final Property Survey: Showing the Work performed and record survey data.

1.5 QUALITY ASSURANCE

- A. Land Surveyor Qualifications: A professional land surveyor who is legally qualified to practice in jurisdiction where Project is located and who is experienced in providing land-surveying services of the kind indicated.
- B. Cutting and Patching: Comply with requirements for and limitations on cutting and patching of construction elements. Modifications to structural, operational, or miscellaneous elements require design and approval by the Design Builder's respective Engineer prior to modification.
 - 1. Structural Elements: When cutting and patching structural elements, notify Owner of locations and details of cutting. Shore, brace, and support structural elements during cutting and patching. Do not cut and patch structural elements in a manner that could change their load-carrying capacity or increase deflection
 - 2. Operational Elements: Do not cut and patch operating elements and related components in a manner that results in reducing their capacity to perform as intended or that results in increased maintenance or decreased operational life or safety. Operational elements include but is not limited to the following:
 - a. Primary operational systems and equipment.
 - b. Fire separation assemblies.
 - c. Air or smoke barriers.
 - d. Fire-suppression systems.
 - e. Mechanical systems piping and ducts.
 - f. Control systems.
 - g. Communication systems.
 - h. Fire-detection and -alarm systems.
 - i. Conveying systems.
 - j. Electrical wiring systems.
 - k. Operating systems of special construction.

Specifications

3. Other Construction Elements: Do not cut and patch other construction elements or components in a manner that could change their load-carrying capacity, that results in reducing their capacity to perform as intended, or that results in increased maintenance or decreased operational life or safety. Other construction elements include but are not limited to the following:
 - a. Water, moisture, or vapor barriers.
 - b. Membranes and flashings.
 - c. Exterior curtain-wall construction.
 - d. Sprayed fire-resistive material.
 - e. Equipment supports.
 - f. Piping, ductwork, vessels, and equipment.
 - g. Noise- and vibration-control elements and systems.
 4. Visual Elements: Do not cut and patch construction in a manner that results in visual evidence of cutting and patching. Do not cut and patch exposed construction in a manner that would, in Owner's opinion, reduce the building's aesthetic qualities. Remove and replace construction that has been cut and patched in a visually unsatisfactory manner.
- C. Manufacturer's Installation Instructions: Obtain and maintain on-site manufacturer's written recommendations and instructions for installation of products and equipment.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. General: Comply with requirements specified in other Sections.
1. For projects requiring compliance with sustainable design and construction practices and procedures, use products for patching that comply with requirements in Section 01 81 13 "Sustainable Design Requirements."
- B. In-Place Materials: Use materials for patching identical to in-place materials. For exposed surfaces, use materials that visually match in-place adjacent surfaces to the fullest extent possible.
1. If identical materials are unavailable or cannot be used, use materials that, when installed, will provide a match acceptable to Owner for the visual and functional performance of in-place materials.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, and other construction affecting the Work.
1. Design-Builder must conduct an engineering field survey of all existing conditions inside and outside of the Project site to the extent permitted by Owner. Survey and measure existing

Specifications

- conditions. Verify, identify and tag all existing mechanical, electrical equipment, systems, piping, wiring and controls. Document existing conditions and prepare field as-built drawings as required and necessary for Design-Builder and Design-Builder's subcontractor design professionals to prepare complete demolition plans, phasing plans and construction documents.
 2. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services, and other utilities.
 3. Furnish location data for work related to Project that must be performed by public utilities serving Project site.
- B. Examination and Acceptance of Conditions: Before proceeding with each component of the work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations.
1. Examine roughing-in for mechanical and electrical systems to verify actual locations of connections before equipment and fixture installation.
 2. Examine walls, floors, and roofs for suitable conditions where products and systems are to be installed.
 3. Verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Written Report: Where a written report listing conditions detrimental to performance of the Work is required by other Sections, include the following:
1. Description of the Work.
 2. List of detrimental conditions, including substrates.
 3. List of unacceptable installation tolerances.
 4. Recommended corrections.
- D. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

3.2 PREPARATION

- A. Existing Utility Information: Furnish information to Owner for approval that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Upon Owner's approval, furnish information to and coordinate work with local utility Owner and Coordinate with authorities having jurisdiction.
- B. Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.
- C. Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

Specifications

3.3 CONSTRUCTION LAYOUT

- A. General: Engage a land surveyor to lay out the Work using accepted surveying practices.
1. Establish benchmarks and control points to set lines and levels at each story of construction and elsewhere as needed to locate each element of Project.
 2. Establish limits on use of Project site.
 3. Establish dimensions within tolerances indicated. Do not scale Drawings to obtain required dimensions.
 4. Inform installers of lines and levels to which they must comply.
 5. Check the location, level and plumb, of every major element as the Work progresses.
 6. Notify Owner when deviations from required lines and levels exceed allowable tolerances.
 7. Close site surveys with an error of closure equal to or less than the standard established by authorities having jurisdiction.
- B. Site Improvements: Locate and lay out site improvements, including pavements, grading, fill and topsoil placement, utility slopes, and rim and invert elevations.
- C. Building Lines and Levels: Locate and lay out control lines and levels for structures, building foundations, column grids, and floor levels, including those required for mechanical and electrical work. Transfer survey markings and elevations for use with control lines and levels. Level foundations and piers from two or more locations.
- D. Record Log: Maintain a log of layout control work. Record deviations from required lines and levels. Include beginning and ending dates and times of surveys, weather conditions, name and duty of each survey party member, and types of instruments and tapes used. Make the log available for reference by Owner.

3.4 FIELD ENGINEERING

- A. Reference Points: Locate existing permanent benchmarks, control points, and similar reference points before beginning the Work. Preserve and protect permanent benchmarks and control points during construction operations.
1. Do not change or relocate existing benchmarks or control points without prior written approval of Owner. Report lost or destroyed permanent benchmarks or control points promptly. Report the need to relocate permanent benchmarks or control points to Owner before proceeding.
 2. Replace lost or destroyed permanent benchmarks and control points promptly. Base replacements on the original survey control points.
- B. Benchmarks: Establish and maintain permanent benchmarks on Project site, referenced to data established by survey control points. Comply with authorities having jurisdiction for type and size of benchmark.
1. Record benchmark locations, with horizontal and vertical data, on Project Record Documents.
 2. Where the actual location or elevation of layout points cannot be marked, provide temporary reference points sufficient to locate the Work.
 3. Remove temporary reference points when no longer needed. Restore marked construction to its original condition.

Specifications

- C. Final Property Survey: Engage a land surveyor to prepare a final property survey showing significant features (real property) for Project. Include on the survey a certification, signed by land surveyor, that principal metes, bounds, lines, and levels of Project are accurately positioned as shown on the survey.
 - 1. Show boundary lines, monuments, streets, site improvements and utilities, existing improvements and significant vegetation, adjoining properties, acreage, grade contours, and the distance and bearing from a site corner to a legal point.

3.5 INSTALLATION

- A. General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated.
 - 1. Make vertical work plumb and make horizontal work level.
 - 2. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement.
 - 3. Conceal pipes, ducts, and wiring in finished areas unless otherwise indicated.
- B. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated.
- C. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion.
- D. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy.
- E. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.
- F. Tools and Equipment: Do not use tools or equipment that produce harmful noise levels.
- G. Templates: Obtain and distribute to the parties involved templates for work specified to be factory prepared and field installed. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing products to comply with indicated requirements.
- H. Attachment: Provide blocking and attachment plates and anchors and fasteners of adequate size and number to securely anchor each component in place, accurately located and aligned with other portions of the Work. Where size and type of attachments are not indicated, verify size and type required for load conditions.
 - 1. Mounting Heights: Where mounting heights are not indicated, mount components at heights directed by Owner.
 - 2. Allow for building movement, including thermal expansion and contraction.
 - 3. Coordinate installation of anchorages. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
- I. Joints: Make joints of uniform width. Where joint locations in exposed work are not indicated, arrange joints for the best visual effect. Fit exposed connections together to form hairline joints.

Specifications

- J. Hazardous Materials: Use products, cleaners, and installation materials that are not considered hazardous.

3.6 CUTTING AND PATCHING

- A. Cutting and Patching, General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay.
1. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.
- B. Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.
- C. Temporary Support: Provide temporary support of work to be cut.
- D. Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.
- E. Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to prevent interruption to occupied areas. Verify, identify and tag all existing systems, equipment, piping, electrical and controls wiring before removal or relocation. Remove all unused or abandoned systems, equipment, piping or electrical.
1. Do not at any time reduce the existing mechanical and electrical system reliability and equipment redundancy without equivalent or improved replacement for the systems, equipment, piping and electrical in place and operational.
- F. Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations.
1. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use.
 2. Finished Surfaces: Cut or drill from the exposed or finished side into concealed surfaces.
 3. Concrete and Masonry: Cut using a cutting machine, such as an abrasive saw or a diamond-core drill.
 4. Excavating and Backfilling: Comply with requirements in applicable Sections where required by cutting and patching operations.
 5. Mechanical and Electrical Services: Cut off pipe or conduit in walls or partitions to be removed. Cap, valve, or plug and seal remaining portion of pipe or conduit to prevent entrance of moisture or other foreign matter after cutting.
 6. Proceed with patching after construction operations requiring cutting are complete.

Specifications

- G. Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable.
1. Inspection: Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation.
 2. Exposed Finishes: Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing. Extend finish restoration corner to corner if required by Owner to minimize evidence of patching and refinishing.
 - a. Clean piping, conduit, and similar features before applying paint or other finishing materials.
 - b. Restore damaged pipe covering to its original condition.
 3. Floors and Walls: Where walls or partitions that are removed extend one finished area into another, patch and repair floor and wall surfaces in the new space. Provide an even surface of uniform finish, color, texture, and appearance. Remove in-place floor and wall coverings and replace with new materials, if necessary, to achieve uniform color and appearance as judged by the Owner.
 - a. Where patching occurs in a painted surface, prepare substrate and apply primer and intermediate paint coats appropriate for substrate over the patch, and apply final paint coat over entire unbroken surface containing the patch. Provide additional coats until patch blends with adjacent surfaces.
 4. Ceilings: Patch, repair, or rehang in-place ceilings as necessary to provide an even-plane surface of uniform appearance.
 5. Exterior Building Enclosure: Patch components in a manner that restores enclosure to a weathertight condition and ensures thermal and moisture integrity of building enclosure.
- H. Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

3.7 OWNER-INSTALLED PRODUCTS

- A. Site Access: Provide access to Project site for Owner's other contractors.
- B. Coordination: Coordinate construction and operations of the Work with work performed by Owner's other contractors.
1. Construction Schedule: Inform Owner of Contractor's preferred construction schedule for work by Owner's other contractors. Adjust construction schedule based on a mutually agreeable timetable. Notify Owner if changes to schedule are required due to differences in actual construction progress.
 2. Preinstallation Conferences: Include Owner's other contractors at preinstallation conferences covering portions of the Work that are to receive work by Owner's other contractors. Attend preinstallation conferences conducted by Owner's other contractors if portions of the Work depend on work by Owner's other contractors.

Specifications

3.8 PROGRESS CLEANING

- A. General: Clean Project site and work areas daily, including common areas. Enforce requirements strictly. Dispose of materials lawfully.
 - 1. Design Builder must at all times keep premises free from accumulations of waste material or rubbish caused by Design Builder's employees or work, or employees or work of subcontractors, and must remove rubbish from and about areas of Work and Design Builder's and subcontractors' tools, scaffolding and surplus materials and must leave the Work "broom clean", or its equivalent, except as hereinafter specified.
 - 2. At all times, Project working area and site must be kept clean and orderly. Dirt, debris, waste, rubbish and disused implements and equipment must be removed frequently and not allowed to accumulate more than 24 hours. Flammable and toxic materials must not be stored in structures.
 - 3. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris.
 - 4. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F (27 deg C).
 - 5. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations.
 - a. Use containers intended for holding waste materials of type to be stored.
- B. Site: Maintain Project site free of waste materials and debris.
- C. Work Areas: Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.
 - 1. Remove liquid spills promptly.
 - 2. Where dust would impair proper execution of the Work, broom-clean or vacuum the entire work area, as appropriate.
- D. Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.
- E. Concealed Spaces: Remove debris from concealed spaces before enclosing the space.
- F. Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.
- G. Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."
- H. During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.
- I. Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

Specifications

- J. Limiting Exposures: Supervise construction operations to assure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

3.9 STARTING AND ADJUSTING

- A. Coordinate startup and adjusting of equipment and operating components with requirements in Section 01 91 13 "General Commissioning Requirements."
- B. Start equipment and operating components to confirm proper operation. Remove malfunctioning units, replace with new units, and retest.
- C. Adjust equipment for proper operation. Adjust operating components for proper operation without binding.
- D. Test each piece of equipment to verify proper operation. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.
- E. Manufacturer's Field Service: Comply with qualification requirements in Section 01 40 00 "Quality Requirements."
- F. Comply with commissioning requirements.

3.10 PROTECTION OF INSTALLED CONSTRUCTION

- A. Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.
- B. Comply with manufacturer's written instructions for temperature and relative humidity.

3.11 CORRECTION OF THE WORK

- 1. General: Repair or remove and replace defective construction. Restore damaged substrates and finishes. Comply with requirements in Section 01 77 00 "Closeout Procedures."

END OF SECTION 01 73 00

01 74 19 - CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for the following:
 - 1. Salvaging nonhazardous demolition and construction waste.
 - 2. Recycling nonhazardous demolition and construction waste.
 - 3. Disposing of nonhazardous demolition and construction waste.
- B. Related Requirements:
 - 1. Section 01 31 00 - Project Management
 - 2. Section 01 50 00 - Temporary Facilities and Controls.
 - 3. Section 024116 "Structure Demolition" for disposition of waste resulting from demolition of buildings, structures, and site improvements.
 - 4. Section 024119 "Selective Demolition" for disposition of waste resulting from partial demolition of buildings, structures, and site improvements.
 - 5. Section 042000 "Unit Masonry" for disposal requirements for masonry waste.
 - 6. Section 311000 "Site Clearing" for disposition of waste resulting from site clearing and removal of above- and below-grade improvements.

1.3 DEFINITIONS

- A. Class III Landfill: A landfill that accepts non-hazardous waste such as household, commercial, and industrial waste, including construction, remodeling, repair, and demolition operations.
- B. Chemical Waste: Includes petroleum products, bituminous materials, salts, acids, alkalis, herbicides, pesticides, organic chemicals and inorganic wastes, and other similar materials.

Specifications

- C. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or similar.
- D. Construction Waste: Building and site improvement materials and other solid waste resulting from construction, remodeling, renovation, or repair operations. Construction waste includes packaging.
- E. Debris: Includes both combustible and noncombustible wastes, such as leaves and tree trimmings that result from construction or maintenance and repair work, and other similar materials.
- F. Deconstruction: The process of removing existing building materials from renovation and demolition projects for the purposes of reuse and recycling in as an efficient and safe manner as possible.
- G. Demolition Waste: Building and site improvement materials resulting from demolition or selective demolition operations.
- H. Disposal: Removal off-site of demolition and construction waste and subsequent sale, recycling, reuse, or deposit in landfill or incinerator acceptable to authorities having jurisdiction.
- I. Divert: Using material for any purpose other than disposal in a landfill.
- J. Recycle: Recovery of demolition or construction waste for subsequent processing in preparation for reuse.
- K. Rubbish: Includes both combustible and noncombustible wastes, such as paper, boxes, glass, crockery, metal and lumber scrap, tin cans, bones, and other similar materials.
- L. Salvage: Recovery of demolition or construction waste and subsequent sale or reuse in another facility.
- M. Salvage and Reuse: Recovery of demolition or construction waste and subsequent incorporation into the Work.
- N. Sanitary Wastes
 - 1. Garbage: Refuse and scraps resulting from preparation, cooking, distribution, or consumption of food, or other similar materials.
 - 2. Sewage: Domestic sanitary sewage.

1.4 PERFORMANCE REQUIREMENTS

- A. Salvage/Recycle: Owner's goal is to salvage and recycle as much nonhazardous demolition and construction waste as possible including the following materials:
 - 1. Demolition Waste:
 - a. Asphalt paving.
 - b. Concrete.
 - c. Concrete reinforcing steel.
 - d. Brick.
 - e. Concrete masonry units.
 - f. Wood studs.
 - g. Wood joists.
 - h. Plywood and oriented strand board.

Specifications

- i. Wood paneling.
 - j. Wood trim.
 - k. Structural and miscellaneous steel.
 - l. Rough hardware.
 - m. Roofing.
 - n. Insulation.
 - o. Doors and frames.
 - p. Door hardware.
 - q. Windows.
 - r. Glazing.
 - s. Metal studs.
 - t. Gypsum board.
 - u. Acoustical tile and panels.
 - v. Carpet.
 - w. Carpet pad.
 - x. Demountable partitions.
 - y. Equipment.
 - z. Cabinets.
 - aa. Plumbing fixtures.
 - bb. Piping.
 - cc. Supports and hangers.
 - dd. Valves.
 - ee. Sprinklers.
 - ff. Mechanical equipment.
 - gg. Refrigerants.
 - hh. Electrical conduit.
 - ii. Copper wiring.
 - jj. Lighting fixtures.
 - kk. Lamps.
 - ll. Ballasts.
 - mm. Electrical devices.
 - nn. Switchgear and panelboards.
 - oo. Transformers.
2. Construction Waste:
- a. Masonry and CMU.
 - b. Lumber.
 - c. Wood sheet materials.
 - d. Wood trim.
 - e. Metals.
 - f. Roofing.
 - g. Insulation.
 - h. Carpet and pad.
 - i. Gypsum board.
 - j. Piping.
 - k. Electrical conduit.
 - l. Wiring.
 - m. Packaging: Regardless of salvage/recycle goal indicated in "General" Paragraph above, salvage or recycle 100 percent of the following uncontaminated packaging materials:
 - 1) Paper.

Specifications

- 2) Cardboard.
- 3) Boxes.
- 4) Plastic sheet and film.
- 5) Polystyrene packaging.
- 6) Wood crates.
- 7) Plastic pails.

1.5 ACTION SUBMITTALS

- A. Waste Management Plan: Submit plan within 10 days of date established for the Notice to Proceed.

1.6 INFORMATIONAL SUBMITTALS

- A. Waste Reduction Progress Reports: Submit report concurrent with each Application for Payment. Include the following information:
 1. Material category.
 2. Generation point of waste.
 3. Total quantity of waste in tons.
 4. Quantity of waste salvaged, both estimated and actual in tons.
 5. Quantity of waste recycled, both estimated and actual in tons.
 6. Total quantity of waste recovered (salvaged plus recycled) in tons.
 7. Total quantity of waste recovered (salvaged plus recycled) as a percentage of total waste.
 8. A copy of monthly reports from recycler(s).
- B. Waste Reduction Calculations: Before request for Substantial Completion, submit calculated end-of-Project rates for salvage, recycling, and disposal as a percentage of total waste generated by the Work.
- C. Records of Donations: Indicate receipt and acceptance of salvageable waste donated to individuals and organizations. Indicate whether organization is tax exempt.
- D. Records of Sales: Indicate receipt and acceptance of salvageable waste sold to individuals and organizations. Indicate whether organization is tax exempt.
- E. Recycling and Processing Facility Records: Indicate receipt and acceptance of recyclable waste by recycling and processing facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- F. Landfill and Incinerator Disposal Records: Indicate receipt and acceptance of waste by landfills and incinerator facilities licensed to accept them. Include manifests, weight tickets, receipts, and invoices.
- G. LEED Submittal: LEED letter template for Credit MR 2, signed by Design Builder, tabulating total waste material, quantities diverted and means by which it is diverted, and statement that requirements for the credit have been met.
- H. Qualification Data: For refrigerant recovery technician.
- I. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed

Specifications

according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.7 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.
- B. Regulatory Requirements: Comply with hauling and disposal regulations of authorities having jurisdiction.

1.8 WASTE MANAGEMENT PLAN

- A. General: Develop a waste management plan according to ASTM E 1609 and requirements in this Section. Plan shall consist of waste identification, waste reduction work plan, and cost/revenue analysis. Distinguish between demolition and construction waste. Indicate quantities by weight or volume, but use same units of measure throughout waste management plan.
- B. Waste Identification: Indicate anticipated types and quantities of demolition, site-clearing, and construction waste generated by the Work. Include estimated quantities and assumptions for estimates.
- C. Waste Reduction Work Plan: List each type of waste and whether it will be salvaged, recycled, or disposed of in landfill or incinerator. Include points of waste generation, total quantity of each type of waste, quantity for each means of recovery, and handling and transportation procedures.
 - 1. Salvaged Materials for Reuse: For materials that will be salvaged and reused in this Project, describe methods for preparing salvaged materials before incorporation into the Work.
 - 2. Salvaged Materials for Sale: For materials that will be sold to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 3. Salvaged Materials for Donation: For materials that will be donated to individuals and organizations, include list of their names, addresses, and telephone numbers.
 - 4. Recycled Materials: Include list of local receivers and processors and type of recycled materials each will accept. Include names, addresses, and telephone numbers.
 - 5. Disposed Materials: Indicate how and where materials will be disposed of. Include name, address, and telephone number of each landfill and incinerator facility.
 - 6. Handling and Transportation Procedures: Include method that will be used for separating recyclable waste including sizes of containers, container labeling, and designated location where materials separation will be performed.
- D. Cost/Revenue Analysis: Indicate total cost of waste disposal as if there was no waste management plan and net additional cost or net savings resulting from implementing waste management plan. Include the following:
 - 1. Total quantity of waste.
 - 2. Estimated cost of disposal (cost per unit). Include hauling and tipping fees and cost of collection containers for each type of waste.
 - 3. Total cost of disposal (with no waste management).
 - 4. Revenue from salvaged materials.
 - 5. Revenue from recycled materials.
 - 6. Savings in hauling and tipping fees by donating materials.
 - 7. Savings in hauling and tipping fees that are avoided.

Specifications

8. Handling and transportation costs. Include cost of collection containers for each type of waste.
9. Net additional cost or net savings from waste management plan.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 PLAN IMPLEMENTATION

- A. General: Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract.
 1. Comply with operation, termination, and removal requirements in Section 015000 "Temporary Facilities and Controls."
- B. Training: Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.
 1. Distribute waste management plan to everyone concerned within three days of submittal return.
 2. Distribute waste management plan to entities when they first begin work on-site. Review plan procedures and locations established for salvage, recycling, and disposal.
 3. Provide information and training updates throughout the construction process as needed to facilitate understanding and participation.
- C. Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 1. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged, recycled, reused, donated, and sold.
 2. Comply with Section 015000 "Temporary Facilities and Controls" for controlling dust and dirt, environmental protection, and noise control.

3.2 SALVAGING DEMOLITION WASTE

- A. Salvaged Items for Reuse in the Work: Salvage items for reuse and handle as follows:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 3. Store items in a secure area until installation.
 4. Protect items from damage during transport and storage.
 5. Install salvaged items to comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make items functional for use indicated.
- B. Salvaged Items for Sale and Donation: Not permitted on Project site. Coordinate efforts and requirements with County.

Specifications

-
- C. Salvaged Items for Owner's Use: Salvage items for Owner's use and handle as indicated by Owner. Coordinate items to be salvaged with Owner prior to demolition work.
 - 1. Clean salvaged items.
 - 2. Pack or crate items after cleaning. Identify contents of containers with label indicating elements, date of removal, quantity, and location where removed.
 - 3. Store items in a secure area until delivery to Owner.
 - 4. Protect items from damage during transport and storage.
 - D. Doors and Hardware: Brace open end of door frames. Except for removing door closers, leave door hardware attached to doors.
 - E. Equipment: Drain tanks, piping, and fixtures. Seal openings with caps or plugs. Protect equipment from exposure to weather.
 - F. Plumbing Fixtures: Separate by type and size.
 - G. Lighting Fixtures: Separate lamps by type and protect from breakage.
 - H. Electrical Devices: Separate switches, receptacles, switchgear, transformers, meters, panelboards, circuit breakers, and other devices by type.
- 3.3 RECYCLING DEMOLITION AND CONSTRUCTION WASTE, GENERAL
- A. General: Recycle paper and beverage containers used by on-site workers.
 - B. Recycling Incentives: Revenues, savings, rebates, tax credits, and other incentives received for recycling waste materials shall accrue to Owner.
 - C. Preparation of Waste: Prepare and maintain recyclable waste materials according to recycling or reuse facility requirements. Maintain materials free of dirt, adhesives, solvents, petroleum contamination, and other substances deleterious to the recycling process.
 - D. Procedures: Separate recyclable waste from other waste materials, trash, and debris. Separate recyclable waste by type at Project site to the maximum extent practical according to approved construction waste management plan. Recyclable waste may be co-mingled if allow by recycling facility.
 - 1. Provide appropriately marked containers or bins for controlling recyclable waste until removed from Project site. Include list of acceptable and unacceptable materials at each container and bin.
 - a. Inspect containers and bins for contamination and remove contaminated materials if found.
 - 2. Stockpile processed materials on-site without intermixing with other materials. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust.
 - 3. Stockpile materials away from construction area. Do not store within drip line of remaining trees.
 - 4. Store components off the ground and protect from the weather.
 - 5. Remove recyclable waste from Owner's property and transport to recycling receiver or processor.

Specifications

3.4 RECYCLING DEMOLITION WASTE

- A. Asphalt Paving: Break up and transport paving to asphalt-recycling facility.
- B. Concrete: Remove reinforcement and other metals from concrete and sort with other metals.
 - 1. Crush concrete and screen to comply with requirements in Section 312000 "Earth Moving" for use as satisfactory soil for fill or subbase.
- C. Masonry: Remove metal reinforcement, anchors, and ties from masonry and sort with other metals.
 - 1. Crush masonry and screen to comply with requirements in Section 312000 "Earth Moving" for use as satisfactory soil for fill or subbase.
 - 2. Clean and stack undamaged, whole masonry units on wood pallets.
- D. Wood Materials: Sort and stack members according to size, type, and length. Separate lumber, engineered wood products, panel products, and treated wood materials.
- E. Metals: Separate metals by type.
 - 1. Structural Steel: Stack members according to size, type of member, and length.
 - 2. Remove and dispose of bolts, nuts, washers, and other rough hardware.
- F. Asphalt Shingle Roofing: Separate organic and glass-fiber asphalt shingles and felts. Remove and dispose of nails, staples, and accessories.
- G. Gypsum Board: Stack large clean pieces on wood pallets or in container and store in a dry location. Remove edge trim and sort with other metals. Remove and dispose of fasteners.
- H. Acoustical Ceiling Panels and Tile: Stack large clean pieces on wood pallets and store in a dry location.
- I. Metal Suspension System: Separate metal members including trim, and other metals from acoustical panels and tile and sort with other metals.
- J. Carpet and Pad: Roll large pieces tightly after removing debris, trash, adhesive, and tack strips.
 - 1. Store clean, dry carpet and pad in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- K. Carpet Tile: Remove debris, trash, and adhesive.
 - 1. Stack tile on pallet and store clean, dry carpet in a closed container or trailer provided by Carpet Reclamation Agency or carpet recycler.
- L. Piping: Reduce piping to straight lengths and store by type and size. Separate supports, hangers, valves, sprinklers, and other components by type and size.
- M. Conduit: Reduce conduit to straight lengths and store by type and size.

Specifications

3.5 RECYCLING CONSTRUCTION WASTE

A. Packaging:

1. Cardboard and Boxes: Break down packaging into flat sheets. Bundle and store in a dry location.
2. Polystyrene Packaging: Separate and bag materials.
3. Pallets: As much as possible, require deliveries using pallets to remove pallets from Project site. For pallets that remain on-site, break down pallets into component wood pieces and comply with requirements for recycling wood.
4. Crates: Break down crates into component wood pieces and comply with requirements for recycling wood.

B. Site-Clearing Wastes:

1. Chip brush, branches, and trees off site.

C. Wood Materials:

1. Clean Cut-Offs of Lumber: Grind or chip into small pieces.
2. Clean Sawdust: Bag sawdust that does not contain painted or treated wood.

D. Gypsum Board: Recycle or dispose as appropriate. Stack large clean pieces on wood pallets or in container and store in a dry location.

3.6 DISPOSAL OF WASTE

A. General: Except for items or materials to be salvaged, recycled, or otherwise reused, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction.

1. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.

B. Burning: Do not burn waste materials.

C. Disposal: Remove waste materials from Owner's property and legally dispose of them.

END OF SECTION 01 74 19

01 77 00 - CLOSEOUT PROCEDURES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following applies to this Section:

1. Contracting Requirements.
2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
3. Appendices.
4. Concept Drawings

B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

A. Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:

1. Substantial Completion procedures.
2. Final completion procedures.
3. Warranties.
4. Final cleaning.
5. Repair of the Work.

B. Related Requirements:

1. Section 01 29 00 Payment Procedures
2. Section 01 32 33 "Photographic Documentation" for submitting final completion construction photographic documentation.
3. Section 01 73 00 "Execution" for progress cleaning of Project site.
4. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.
5. Section 01 78 39 "Project Record Documents" for submitting record Drawings, record Specifications, and record Product Data.
6. Section 01 78 23 Operation and Maintenance Data
7. Section 01 7 900 "Demonstration and Training" for requirements for instructing Owner's personnel.
8. Section 01 91 00 General Commissioning Requirements

Specifications

1.3 ACTION SUBMITTALS

- A. Product Data: For cleaning agents.
- B. Design Builder's List of Incomplete Items: Initial submittal at Substantial Completion.
- C. Certified List of Incomplete Items: Final submittal at Final Completion.

1.4 CLOSEOUT SUBMITTALS

- A. Certificates of Release: From authorities having jurisdiction.
- B. Field Report: For pest control inspection.

1.5 MAINTENANCE MATERIAL SUBMITTALS

- A. Schedule of Maintenance Material Items: For maintenance material submittal items specified in other Sections.

1.6 SUBSTANTIAL COMPLETION PROCEDURES

- A. Substantial Completion: Pursuant to the provisions of Paragraph 23.1 of the General Terms and Conditions, notify Owner in writing when the Work or designated portions thereof are ready for the Substantial Completion inspections. From the punch lists of incomplete or unsatisfactory items prepared by Design Builder and reviewed and supplemented by Owner, prepare a schedule for their completion indicating completion dates for Owner's review and approval. At Substantial Completion, Design Builder will provide a certification from itself and its Design Professional that the building was constructed in accordance with the approved Construction Documents.
- B. Design Builder's List of Incomplete Items: Prepare and submit a list of items to be completed and corrected (Design Builder's punch list), indicating the value of each item on the list. Declare the Work is complete prior to requesting punchlist inspection by the County.
 - 1. Punchlist must identify items noted by each of the Design-Builder's engineering and architectural disciplines.
 - 2. Organize list of spaces in sequential order, include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas disturbed by Design-Builder that are outside the limits of construction.
 - 3. Organize items applying to each space by major element, including categories for ceiling, individual walls, floors, equipment, and building systems.
 - 4. Include the following information at the top of each page:
 - a. Project name.
 - b. Date.
 - c. Name of Design Builder.
 - d. Page number, of total pages.

Specifications

- C. Submittals Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Certificates of Release: Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 2. Submit closeout submittals specified in other Division 01 Sections, including project record documents, complete master file of all submittals, operation and maintenance manuals, final completion construction photographic documentation, damage or settlement surveys, property surveys, and similar final record information. Refer to Agreement for additional submittals required.
 3. Submit closeout submittals specified in individual Sections, including specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 4. Submit maintenance material submittals specified in individual Sections, including tools, spare parts, extra materials, and similar items, and deliver to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - a. Schedule of Maintenance Material Items: Prepare and submit schedule of maintenance material submittal items, including name and quantity of each item and name and number of related Specification Section. Obtain Owner's signature for receipt of submittals.
 - b. Submittal of Section 01 79 00 Demonstration and Training Manuals and copies of attendance certificates.
 5. Submit test/adjust/balance records.
 6. Submit Daily Inspection Reports.
 7. Submit Independent Laboratory's Test and Inspection Reports.
 8. Submit Product Manufacturers Inspection Reports.
 9. Submit Public Utility Acceptance Reports.
 10. Submit Inspection Reports, including Acceptance by the State Fire Marshal.
 11. Submit sustainable design submittals required in Section 018113 "Sustainable Design Requirements" and in individual Sections.
 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 13. Submittal of commissioning and functional testing logs.
 14. Submittal of pest-control inspection report and warranty.
 15. Submittal of section 01 74 19 Construction Waste Management Report.
 16. Submittal of Section 01 32 32 Photographic Documentation.
- D. Procedures Prior to Substantial Completion: Complete the following a minimum of 10 days prior to requesting inspection for determining date of Substantial Completion. List items below that are incomplete at time of request.
1. Advise Owner of pending insurance changeover requirements.
 2. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 3. Complete startup and testing of systems and equipment.
 4. Perform preventive maintenance on equipment used prior to Substantial Completion.
 5. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
 6. Advise Owner of changeover in heat and other utilities.
 7. Advise Owner of changeover in security provisions.

Specifications

8. Participate with Owner in conducting inspection and walkthrough with local emergency responders.
 9. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 10. Complete final cleaning requirements, including touchup painting.
 11. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- E. Inspection: Submit a written request for inspection to determine Substantial Completion a minimum of 10 days prior to date the work will be completed and ready for inspection and tests. On receipt of request, Owner will either proceed with inspection or notify Design Builder of unfulfilled requirements. Owner will prepare the Certificate of Substantial Completion after inspection or will notify Design Builder of items, either on Design Builder's list or additional items identified by Owner, that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.
 2. Upon completion of reinspection, the County will prepare a Certificate of Acceptance, or advise the Design Builder of work that is incomplete or of obligations that have not been fulfilled but are required for Acceptance.
 3. If necessary, reinspection will be repeated.
 4. Complete work within time frame established in Agreement.
 5. Results of completed inspection will form the basis of requirements for Completion.

1.7 FINAL COMPLETION PROCEDURES

- A. Submittals Prior to Final Completion: Before requesting final inspection for determining final completion, complete the following:
1. Submit a final Application for Payment according to Section 012900 "Payment Procedures."
 2. Certified List of Incomplete Items: Submit certified copy of Owner's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Design Builder. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Advise Owner of pending insurance changeover requirements.
 4. Submit final meter readings for utilities, a measured record of stored fuel, and similar data as of the date of Completion, or when the County took possession of and responsibility for corresponding portions of the Work.
 5. Submit consent of surety to final payment.
 6. Submit a final liquidated damages settlement statement, when applicable.
 7. Submit pest-control final inspection report.
 8. Complete final clean-up. Deficient cleaning operations, as determined by the County, must be immediately corrected as directed.
 9. Touch-up, including touch-up painting and otherwise repair and restore marred exposed finishes.
- B. Inspection: Submit a written request for final inspection to determine acceptance a minimum of 10 days prior to date the work will be completed and ready for final inspection and tests. On receipt of request, Owner will either proceed with inspection or notify Design Builder of unfulfilled requirements. Owner will process final Certificate for Payment after inspection or will notify Design Builder of construction that must be completed or corrected before certificate will be issued.
1. Reinspection: Request reinspection when the Work identified in previous inspections as incomplete is completed or corrected.

Specifications

1.8 SUBMITTAL OF PROJECT WARRANTIES

- A. Time of Submittal: Submit written warranties on request of Owner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated, or when delay in submittal of warranties might limit Owner's rights under warranty.
- B. Organize warranty documents into an orderly sequence based on the table of contents of Project Manual.
 - 1. Bind warranties and bonds in heavy-duty, three-ring, vinyl-covered, loose-leaf binders, thickness as necessary to accommodate contents, and sized to receive 8-1/2-by-11-inch (215-by-280-mm) paper.
 - 2. Provide heavy paper dividers with plastic-covered tabs for each separate warranty. Mark tab to identify the product or installation. Provide a typed description of the product or installation, including the name of the product and the name, address, and telephone number of Installer.
 - 3. Identify each binder on the front and spine with the typed or printed title "WARRANTIES," Project name, and name of Design Builder.
 - 4. Warranty Electronic File: Scan warranties and bonds and assemble complete warranty and bond submittal package into a single indexed electronic PDF file with links enabling navigation to each item. Provide bookmarked table of contents at beginning of document.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.
- D. Provide project warranty as required by Agreement and General Terms and Conditions.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially hazardous to health or property or that might damage finished surfaces.
 - 1. Use cleaning products that comply with Green Seal's GS-37.

PART 3 - EXECUTION

3.1 FINAL CLEANING

- A. General: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.
- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturer's written instructions.
 - 1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

Specifications

-
- a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Dust, dirt, stains, hand marks, paint spots, and like defects must be completely removed from surfaces. Metal surfaces must be cleaned, using only non-corrosive and non-abrasive materials.
 - h. Clean roofs, gutters, downspouts and drainage systems.
 - i. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - j. Sweep concrete floors broom clean in unoccupied spaces.
 - k. Vacuum carpet and similar soft surfaces, removing debris and excess nap; clean according to manufacturer's recommendations if visible soil or stains remain.
 - l. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Polish mirrors and glass, taking care not to scratch surfaces. Clean interior and exterior of all glass.
 - m. Remove labels that are not permanent.
 - n. Wipe surfaces of mechanical and electrical equipment, elevator equipment, and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - o. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - p. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - q. Clean ducts, blowers, and coils if units were operated without filters during construction or that display contamination with particulate matter on inspection.
 - r. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
 - s. Leave Project clean and ready for occupancy.
- C. Construction Waste Disposal: Comply with waste disposal requirements in Section 01 74 19 "Construction Waste Management and Disposal."

3.2 REPAIR OF THE WORK

- A. Complete repair and restoration operations before requesting inspection for determination of Substantial Completion.
- B. Repair or remove and replace defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Repair components that do not operate properly. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

Specifications

1. Remove and replace chipped, scratched, and broken glass, reflective surfaces, and other damaged transparent materials.
2. Touch up and otherwise repair and restore marred or exposed finishes and surfaces. Replace finishes and surfaces that already show evidence of repair or restoration. Remove and replace damaged surfaces that are exposed to view if surfaces cannot be repaired without visible evidence of repair.
 - a. Do not paint over "UL" and other required labels and identification, including mechanical and electrical nameplates. Remove paint applied to required labels and identification.
3. Replace parts subject to operating conditions during construction that may impede operation or reduce longevity.
4. Replace burned-out bulbs, bulbs noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.

END OF SECTION 017700

01 78 23 - OPERATION AND MAINTENANCE DATA

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for preparing operation and maintenance manuals, including the following:
 - 1. Operation and maintenance documentation directory.
 - 2. Emergency manuals.
 - 3. Operation manuals for systems, subsystems, and equipment.
 - 4. Product maintenance manuals.
 - 5. Systems and equipment maintenance manuals.
- B. Related Requirements:
 - 1. Section 01 33 00 "Submittal Procedures" for submitting copies of submittals for operation and maintenance manuals.
 - 2. Section 01 77 00, Closeout Procedures
 - 3. Section 01 78 39, Project Record Documents
 - 4. Section 01 91 13 "General Commissioning Requirements" for verification and compilation of data into operation and maintenance manuals.

1.3 DEFINITIONS

- A. System: An organized collection of parts, equipment, or subsystems united by regular interaction.
- B. Subsystem: A portion of a system with characteristics similar to a system.

Specifications

1.4 CLOSEOUT SUBMITTALS

- A. Manual Content: Operations and maintenance manual content is detailed here and specified in individual Specification Sections. Submit reviewed manual content formatted and organized as required by this Section.
 - 1. Owner and Commissioning Authority will comment on whether content of operations and maintenance submittals are acceptable.
 - 2. Where applicable, clarify and update reviewed manual content to correspond to revisions and field conditions.
- B. Format: Submit operations and maintenance manuals in the following format:
 - 1. Paper copies in quantity indicated in attachments to the Agreement. Include a complete operation and maintenance directory. Enclose title pages and directories in clear plastic sleeves.
- C. Initial Manual Submittal: Submit draft copy of each manual at least 60 days before commencing demonstration and training. Owner and Commissioning Authority will comment on whether general scope and content of manual are acceptable.
- D. Final Manual Submittal: Submit each manual in final form prior to requesting inspection for Substantial Completion and at least 20 days before commencing demonstration and training. Owner and Commissioning Authority will return copy with comments, if any.
 - 1. Correct or revise each manual to comply with Owner's and Commissioning Authority's comments. Submit copies of each corrected manual prior to commencing demonstration and training.

1.5 COORDINATION

- A. General: Where operation and maintenance documentation includes information on installations by more than one factory-authorized service representative, assemble and coordinate information furnished by representatives and prepare manuals.

PART 2 - PRODUCTS

2.1 OPERATION AND MAINTENANCE DOCUMENTATION DIRECTORY

- A. Directory: Prepare a single, comprehensive directory of emergency, operation, and maintenance data and materials, listing items and their location to facilitate ready access to desired information. Include a section in the directory for each of the following:
 - 1. List of documents.
 - 2. List of systems.
 - 3. List of equipment.
 - 4. Table of contents.
- B. List of Systems and Subsystems: List systems alphabetically. Include references to operation and maintenance manuals that contain information about each system.

Specifications

- C. List of Equipment: List equipment for each system, organized alphabetically by system. For pieces of equipment not part of system, list alphabetically in separate list.
- D. Tables of Contents: Include a table of contents for each emergency, operation, and maintenance manual.
- E. Identification: In the documentation directory and in each operation and maintenance manual, identify each system, subsystem, and piece of equipment with same designation used in the Contract Documents. If no designation exists, assign a designation according to ASHRAE Guideline 4, "Preparation of Operating and Maintenance Documentation for Building Systems."

2.2 REQUIREMENTS FOR EMERGENCY, OPERATION, AND MAINTENANCE MANUALS

- A. Organization: Unless otherwise indicated, organize each manual into a separate section for each system and subsystem, and a separate section for each piece of equipment not part of a system. Each manual shall contain the following materials, in the order listed:
 - 1. Title page.
 - 2. Table of contents.
 - 3. Manual contents.
- B. Title Page: Include the following information:
 - 1. Subject matter included in manual.
 - 2. Name and address of Project.
 - 3. Name and address of Owner.
 - 4. Date of submittal.
 - 5. Name and contact information for Design Builder and subcontractors.
 - 6. Name and contact information for Commissioning Authority.
 - 7. Names and contact information for major consultants to the Design Builder that designed the systems contained in the manuals.
 - 8. Cross-reference to related systems in other operation and maintenance manuals.
- C. Table of Contents: List each product included in manual, identified by product name, indexed to the content of the volume, and cross-referenced to Specification Section number in Project Manual.
 - 1. If operation or maintenance documentation requires more than one volume to accommodate data, include comprehensive table of contents for all volumes in each volume of the set.
- D. Manual Contents: Organize into sets of manageable size. Arrange contents alphabetically by system, subsystem, and equipment. If possible, assemble instructions for subsystems, equipment, and components of one system into a single binder. Include:
- E. Manuals, Paper Copy: Submit manuals in the form of hard copy, bound and labeled volumes.
 - 1. Binders: Heavy-duty, three-ring, vinyl-covered, loose-leaf binders, in thickness necessary to accommodate contents, sized to hold 8-1/2-by-11-inch (215-by-280-mm) paper; with clear plastic sleeve on spine to hold label describing contents and with pockets inside covers to hold folded oversize sheets.
 - a. If two or more binders are necessary to accommodate data of a system, organize data in each binder into groupings by subsystem and related components. Cross-reference other

Specifications

-
- binders if necessary to provide essential information for proper operation or maintenance of equipment or system.
- b. Identify each binder on front and spine, with printed title "OPERATION AND MAINTENANCE MANUAL," Project title or name, and subject matter of contents. Indicate volume number for multiple-volume sets.
2. Dividers: Heavy-paper dividers with plastic-covered tabs for each section of the manual. Mark each tab to indicate contents. Include typed list of products and major components of equipment included in the section on each divider, cross-referenced to Specification Section number and title of Project Manual.
 3. Protective Plastic Sleeves: Transparent plastic sleeves designed to enclose diagnostic software storage media for computerized electronic equipment.
 4. Supplementary Text: Prepared on 8-1/2-by-11-inch (215-by-280-mm) white bond paper.
 5. Drawings: Attach reinforced, punched binder tabs on drawings and bind with text.
 - a. If oversize drawings are necessary, fold drawings to same size as text pages and use as foldouts.
 - b. If drawings are too large to be used as foldouts, fold and place drawings in labeled envelopes and bind envelopes in rear of manual. At appropriate locations in manual, insert typewritten pages indicating drawing titles, descriptions of contents, and drawing locations.
- 2.3 EMERGENCY MANUALS
- A. Content: Organize manual into a separate section for each of the following:
 1. Type of emergency.
 2. Emergency instructions.
 3. Emergency procedures.
 - B. Type of Emergency: Where applicable for each type of emergency indicated below, include instructions and procedures for each system, subsystem, piece of equipment, and component:
 1. Fire.
 2. Flood.
 3. Gas leak.
 4. Water leak.
 5. Power failure.
 6. Water outage.
 7. System, subsystem, or equipment failure.
 8. Chemical release or spill.
 - C. Emergency Instructions: Describe and explain warnings, trouble indications, error messages, and similar codes and signals. Include responsibilities of Owner's operating personnel for notification of Installer, supplier, and manufacturer to maintain warranties.
 - D. Emergency Procedures: Include the following, as applicable:
 1. Instructions on stopping.
 2. Shutdown instructions for each type of emergency.
 3. Operating instructions for conditions outside normal operating limits.
 4. Required sequences for electric or electronic systems.
 5. Special operating instructions and procedures.

Specifications

2.4 OPERATION MANUALS

- A. Content: In addition to requirements in this Section, include operation data required in individual Specification Sections and the following information:
1. System, subsystem, and equipment descriptions. Use designations for systems and equipment indicated on Contract Documents.
 2. The Basis of Design narrative prepared by the Design Builder, updated to as-built status by the Design Builder.
 3. Performance and design criteria if Design Builder has delegated design responsibility.
 4. Simplified, professionally-drawn, single-line system diagrams on 8 ½" x 11" or 11" x 17" sheets. These must include chillers, water system, condenser water system, heating system, supply air systems, exhaust systems etc. These must show major pieces of equipment such as pumps, chillers, boilers, control valves, expansion tanks, coils, service valves, electrical distribution and controls systems, etc.
 5. Operating standards.
 6. Operating procedures.
 7. Operating logs.
 8. Wiring diagrams.
 9. Control diagrams.
 10. Piped system diagrams.
 11. Precautions against improper use.
 12. License requirements including inspection and renewal dates.
- B. Descriptions: Include the following:
1. Product name and model number. Use designations for products indicated on Contract Documents.
 2. Manufacturer's name.
 3. Equipment identification with serial number of each component.
 4. Equipment function.
 5. Operating characteristics.
 6. Limiting conditions.
 7. Performance curves.
 8. Engineering data and tests.
 9. Complete nomenclature and number of replacement parts.
- C. Operating Procedures: Include the following, as applicable:
1. Startup procedures.
 2. Equipment or system break-in procedures.
 3. Routine and normal operating instructions.
 4. Regulation and control procedures.
 5. Instructions on stopping.
 6. Normal shutdown instructions.
 7. Seasonal and weekend operating instructions.
 8. Required sequences for electric or electronic systems.
 9. Special operating instructions and procedures.
- D. Systems and Equipment Controls: Describe the sequence of operation, and diagram controls as installed.
- E. Piped Systems: Diagram piping as installed, and identify color-coding where required for identification.

Specifications

2.5 PRODUCT MAINTENANCE MANUALS

- A. Content: Organize manual into a separate section for each product, material, and finish. Include source information, product information, maintenance procedures, repair materials and sources, and warranties and bonds, as described below.
- B. Source Information: List each product included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Product Information: Include the following, as applicable:
 - 1. Product name and model number.
 - 2. Manufacturer's name.
 - 3. Color, pattern, and texture.
 - 4. Material and chemical composition.
 - 5. Reordering information for specially manufactured products.
- D. Maintenance Procedures: Include manufacturer's written recommendations and the following:
 - 1. Inspection procedures.
 - 2. Types of cleaning agents to be used and methods of cleaning.
 - 3. List of cleaning agents and methods of cleaning detrimental to product.
 - 4. Schedule for routine cleaning and maintenance.
 - 5. Repair instructions.
- E. Repair Materials and Sources: Include lists of materials and local sources of materials and related services.
- F. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
 - 1. Include procedures to follow and required notifications for warranty claims.

2.6 SYSTEMS AND EQUIPMENT MAINTENANCE MANUALS

- A. Content: For each system, subsystem, and piece of equipment not part of a system, include source information, manufacturers' maintenance documentation, maintenance procedures, maintenance and service schedules, spare parts list and source information, maintenance service contracts, and warranty and bond information, as described below.
- B. Source Information: List each system, subsystem, and piece of equipment included in manual, identified by product name and arranged to match manual's table of contents. For each product, list name, address, and telephone number of Installer or supplier and maintenance service agent, and cross-reference Specification Section number and title in Project Manual and drawing or schedule designation or identifier where applicable.
- C. Manufacturers' Maintenance Documentation: Manufacturers' maintenance documentation including the following information for each component part or piece of equipment:
 - 1. Standard maintenance instructions and bulletins.

Specifications

-
2. Drawings, diagrams, and instructions required for maintenance, including disassembly and component removal, replacement, and assembly.
 3. Identification and nomenclature of parts and components.
 4. List of items recommended to be stocked as spare parts.
- D. Maintenance Procedures: Include the following information and items that detail essential maintenance procedures:
1. Test and inspection instructions.
 2. Troubleshooting guide.
 3. Precautions against improper maintenance.
 4. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 5. Aligning, adjusting, and checking instructions.
 6. Demonstration and training video recording, if available.
- E. Maintenance and Service Schedules: Include service and lubrication requirements, list of required lubricants for equipment, and separate schedules for preventive and routine maintenance and service with standard time allotment.
1. Scheduled Maintenance and Service: Tabulate actions for daily, weekly, monthly, quarterly, semiannual, and annual frequencies.
 2. Maintenance and Service Record: Include manufacturers' forms for recording maintenance.
- F. Spare Parts List and Source Information: Include lists of replacement and repair parts, with parts identified and cross-referenced to manufacturers' maintenance documentation and local sources of maintenance materials and related services.
- G. Maintenance Service Contracts: Include copies of maintenance agreements with name and telephone number of service agent.
- H. Warranties and Bonds: Include copies of warranties and bonds and lists of circumstances and conditions that would affect validity of warranties or bonds.
1. Include procedures to follow and required notifications for warranty claims.

PART 3 - EXECUTION

3.1 MANUAL PREPARATION

- A. Operation and Maintenance Documentation Directory: Prepare a separate manual that provides an organized reference to emergency, operation, and maintenance manuals.
- B. Emergency Manual: Assemble a complete set of emergency information indicating procedures for use by emergency personnel and by Owner's operating personnel for types of emergencies indicated.
- C. Product Maintenance Manual: Assemble a complete set of maintenance data indicating care and maintenance of each product, material, and finish incorporated into the Work.
- D. Operation and Maintenance Manuals: Assemble a complete set of operation and maintenance data indicating operation and maintenance of each system, subsystem, and piece of equipment not part of a system.

Specifications

1. Engage a factory-authorized service representative to assemble and prepare information for each system, subsystem, and piece of equipment not part of a system.
 2. Prepare a separate manual for each system and subsystem, in the form of an instructional manual for use by Owner's operating personnel.
 3. Prepare a recommended general overall preventative maintenance manual and include a schedule for use by the County.
- E. Manufacturers' Data: Where manuals contain manufacturers' standard printed data, include only sheets pertinent to product or component installed. Mark each sheet to identify each product or component incorporated into the Work. If data include more than one item in a tabular format, identify each item using appropriate references from the Contract Documents. Identify data applicable to the Work and delete references to information not applicable.
1. Prepare supplementary text if manufacturers' standard printed data are not available and where the information is necessary for proper operation and maintenance of equipment or systems.
- F. Drawings: Prepare drawings supplementing manufacturers' printed data to illustrate the relationship of component parts of equipment and systems and to illustrate control sequence and flow diagrams. Coordinate these drawings with information contained in record Drawings to ensure correct illustration of completed installation.
- G. Comply with Section 017700 "Closeout Procedures" for schedule for submitting operation and maintenance documentation.

END OF SECTION 017823

01 78 39 - PROJECT RECORD DOCUMENTS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS****A. The following applies to this Section:**

1. Contracting Requirements.
2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
3. Appendices.
4. Concept Drawings

B. Review these documents for coordination with additional requirements and information that apply to work under this Section.**1.2 SUMMARY****A. Section includes administrative and procedural requirements for project record documents, including the following:**

1. Record Documents
2. Record Drawings.
3. Record Specifications.
4. Record Product Data.
5. Miscellaneous record submittals.

B. Related Requirements:

1. Section 01 29 00 Payment Procedures
2. Section 01 32 32 Photographic Documentation
3. Section 01 73 00 "Execution" for final property survey.
4. Section 01 77 00 "Closeout Procedures" for general closeout procedures.
5. Section 01 78 23 "Operation and Maintenance Data" for operation and maintenance manual requirements.

1.3 CLOSEOUT SUBMITTALS**A. Record Documents: Comply with the following:**

1. Number of Copies: Submit record documents as required by the General Terms and Conditions and Exhibit P of the Agreement.
2. Record Documents include:
3. Record Drawings.

Specifications

4. Record Specifications: Including addenda and contract modifications.
5. Record Product Data: Submit copies of each submittal.
 - a. Where record Product Data are required as part of operation and maintenance manuals, submit duplicate marked-up Product Data as a component of manual.
6. Miscellaneous Record Submittals: See other Specification Sections and Agreement for miscellaneous record-keeping requirements and submittals in connection with various construction activities.

PART 2 - PRODUCTS

2.1 RECORD DOCUMENTS

- A. Record Documents: Maintain one set of marked-up paper copies of the Contract Documents in accordance with Section 8 of the General Terms and Conditions and as specified in this sections.

2.2 RECORD DRAWINGS

- A. Record Prints: Incorporate new and revised drawings as modifications are issued.
 1. Preparation: Mark record prints to show the actual installation where installation varies from that shown originally. Require individual or entity who obtained record data, whether individual or entity is Installer, subcontractor, or similar entity, to provide information for preparation of corresponding marked-up record prints.
 - a. Give particular attention to information on concealed elements that would be difficult to identify or measure and record later.
 - b. Accurately record information in an acceptable drawing technique.
 - c. Record data as soon as possible after obtaining it.
 - d. Record and check the markup before enclosing concealed installations.
 2. Content: Types of items requiring marking include, but are not limited to, the following:
 - a. Dimensional changes to Drawings.
 - b. Revisions to details shown on Drawings.
 - c. Depths of foundations below first floor.
 - d. Locations and depths of underground utilities.
 - e. Revisions to routing of piping and conduits.
 - f. Revisions to electrical circuitry.
 - g. Actual equipment locations.
 - h. Duct size and routing.
 - i. Locations of concealed internal utilities.
 - j. Changes made by Change Order or Construction Change Directive.
 - k. Details not on the original Contract Drawings.
 - l. Field records for variable and concealed conditions.
 - m. Record information on the Work that is shown only schematically.
 3. Mark the Contract Drawings and Shop Drawings completely and accurately. Use personnel proficient at recording graphic information in production of marked-up record prints.

Specifications

4. Mark record sets with erasable, red-colored pencil. Use other colors to distinguish between changes for different categories of the Work at same location.
 5. Mark important additional information that was either shown schematically or omitted from original Drawings.
 6. Note Construction Change Directive numbers, alternate numbers, Change Order numbers, and similar identification, where applicable.
- B. Record Digital Data Files: When authorized, prepare a full set of corrected digital data files of the Contract Drawings, as follows:
1. Format: As required by Exhibit P of the Agreement.
 2. Incorporate changes and additional information previously marked on record prints. Delete, redraw, and add details and notations where applicable.
- C. Format: Identify and date each record Drawing; include the designation "PROJECT RECORD DRAWING" in a prominent location.
1. Record Prints: Organize record prints into manageable sets. Bind each set with durable paper cover sheets. Include identification on cover sheets.
 2. Record Digital Data Files: Organize digital data information into separate electronic files that correspond to each sheet of the Contract Drawings. Name each file with the sheet identification. Include identification in each digital data file.
 3. Identification: As follows:
 - a. Project name.
 - b. Date.
 - c. Designation "PROJECT RECORD DRAWINGS."
 - d. Name of Design Bulider.

2.3 RECORD SPECIFICATIONS

- A. Preparation: Mark Specifications to indicate the actual product installation where installation varies from that indicated in Specifications, addenda, and contract modifications.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Note related Change Orders and record Drawings where applicable.

2.4 RECORD PRODUCT DATA

- A. Preparation: Mark Product Data to indicate the actual product installation where installation varies substantially from that indicated in Product Data submittal.
1. Give particular attention to information on concealed products and installations that cannot be readily identified and recorded later.
 2. Include significant changes in the product delivered to Project site and changes in manufacturer's written instructions for installation.
 3. Note related Change Orders, record Specifications, and record Drawings where applicable.

Specifications

2.5 MISCELLANEOUS RECORD SUBMITTALS

- A. Assemble miscellaneous records required by other Specification Sections for miscellaneous record keeping and submittal in connection with actual performance of the Work. Bind or file miscellaneous records and identify each, ready for continued use and reference.

PART 3 - EXECUTION

3.1 RECORDING AND MAINTENANCE

- A. Recording: Maintain one copy of each submittal during the construction period for project record document purposes. Post changes and revisions to project record documents as they occur; do not wait until end of Project.
- B. Maintenance of Record Documents and Samples: Store record documents and Samples in the field office apart from the Contract Documents used for construction. Do not use project record documents for construction purposes. Maintain record documents in good order and in a clean, dry, legible condition, protected from deterioration and loss. Provide access to project record documents for Owner's reference during normal working hours.
- C. Record Documents may be reviewed monthly by Owner for recording of all construction and design activities that occurred since the last review as a part of the Owner's review of the Design Builder's Payment Application.

END OF SECTION 01 78 39

01 79 00 - DEMONSTRATION AND TRAINING

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes administrative and procedural requirements for instructing Owner's personnel, including the following:
 - 1. Demonstration of operation of systems, subsystems, and equipment.
 - 2. Training in operation and maintenance of systems, subsystems, and equipment.
 - 3. Demonstration and training video recordings.
- B. Related Sections:
 - 1. Section 01 31 00, Project Management and Coordination
 - 2. Section 01 91 00, General Commissioning Requirements
 - 3. Other Divisions and Sections for specific requirements for demonstration and training for products in those Sections.

1.3 INFORMATIONAL SUBMITTALS

- A. Instruction Program: Submit outline of instructional program for demonstration and training, including a list of training modules and a schedule of proposed dates, times, length of instruction time, and instructors' names for each training module. Include learning objective and outline for each training module. Each training submittal must be provided a minimum of three weeks before the proposed training date.
 - 1. Indicate proposed training modules using manufacturer-produced demonstration and training video recordings for systems, equipment, and products.
- B. Attendance Record: For each training module, submit list of participants and length of instruction time.

Specifications

1.4 QUALITY ASSURANCE

- A. Facilitator Qualifications: A firm or individual experienced in training or educating maintenance personnel in a training program similar in content and extent to that indicated for this Project, and whose work has resulted in training or education with a record of successful learning performance.
- B. Instructor Qualifications: A factory-authorized service representative, complying with requirements in Section 014000 "Quality Requirements," experienced in operation and maintenance procedures and training.

1.5 COORDINATION

- A. Coordinate instruction schedule with Owner's operations. Adjust schedule as required to accommodate Owner's operations and to ensure availability of Owner's personnel.
- B. Coordinate instructors, including providing notification of dates, times, length of instruction time, and course content.
- C. Coordinate content of training modules with content of approved emergency, operation, and maintenance manuals. Do not submit instruction program until operation and maintenance data has been reviewed and approved by Owner.

PART 2 - PRODUCTS

2.1 INSTRUCTION PROGRAM

- A. Program Structure: Develop an instruction program that includes individual training modules for each system and for equipment not part of a system, as required by individual Specification Sections, and as applicable to the Project as follows:
 - 1. Motorized doors, including overhead coiling doors overhead coiling grilles and automatic entrance doors.
 - 2. Equipment, including video screens, loading dock equipment, waste compactors, service equipment, and other equipment as applicable to Project.
 - 3. Fire-protection systems, including fire alarm, fire pumps, and fire-extinguishing systems.
 - 4. Security systems.
 - 5. Conveying systems.
 - 6. Refrigeration systems, including chillers, cooling towers, condensers, pumps, thermal energy storage and distribution piping.
 - 7. Steam plant systems, including boilers, deaerators, Feedwater pumps, condensate return system
 - 8. HVAC systems, including air-handling equipment, air distribution systems, and terminal equipment and devices.
 - 9. EMCS, HVAC instrumentation and controls.
 - 10. Electrical service and distribution, including transformers, switchboards, panelboards, uninterruptible power supplies, and motor controls.
 - 11. Packaged engine generators, including transfer switches.
 - a. Black start generators
 - b. Emergency generators

Specifications

12. Lighting equipment and controls.
 13. Communication systems, including intercommunication, surveillance, clocks and programming, voice and data, and television equipment.
 14. Generator system and equipment
 15. Power monitoring, control system and UPS
 16. Other systems and equipment as applicable to Project.
- B. Training Modules: Develop a learning objective and teaching outline for each module. Include a description of specific skills and knowledge that participant is expected to master. For each module, include instruction for the following as applicable to the system, equipment, or component:
1. Basis of System Design, Operational Requirements, and Criteria: Include the following:
 - a. System, subsystem, and equipment descriptions.
 - b. Performance and design criteria if Design Builder is delegated design responsibility.
 - c. Operating standards.
 - d. Regulatory requirements.
 - e. Equipment function.
 - f. Operating characteristics.
 - g. Limiting conditions.
 - h. Performance curves.
 2. Documentation: Review the following items in detail:
 - a. Emergency manuals.
 - b. Operations manuals.
 - c. Maintenance manuals.
 - d. Project record documents.
 - e. Identification systems.
 - f. Warranties and bonds.
 - g. Maintenance service agreements and similar continuing commitments.
 3. Emergencies: Include the following, as applicable:
 - a. Instructions on meaning of warnings, trouble indications, and error messages.
 - b. Instructions on stopping.
 - c. Shutdown instructions for each type of emergency.
 - d. Operating instructions for conditions outside of normal operating limits.
 - e. Sequences for electric or electronic systems.
 - f. Special operating instructions and procedures.
 4. Operations: Include the following, as applicable:
 - a. Startup procedures.
 - b. Equipment or system break-in procedures.
 - c. Routine and normal operating instructions.
 - d. Regulation and control procedures.
 - e. Control sequences.
 - f. Safety procedures.
 - g. Instructions on stopping.
 - h. Normal shutdown instructions.
 - i. Operating procedures for system, subsystem, or equipment failure.
 - j. Seasonal and weekend operating instructions.

Specifications

-
- k. Required sequences for electric or electronic systems.
 - l. Special operating instructions and procedures.
 - 5. Adjustments: Include the following:
 - a. Alignments.
 - b. Checking adjustments.
 - c. Noise and vibration adjustments.
 - d. Economy and efficiency adjustments.
 - 6. Troubleshooting: Include the following:
 - a. Diagnostic instructions.
 - b. Test and inspection procedures.
 - 7. Maintenance: Include the following:
 - a. Inspection procedures.
 - b. Types of cleaning agents to be used and methods of cleaning.
 - c. List of cleaning agents and methods of cleaning detrimental to product.
 - d. Procedures for routine cleaning
 - e. Procedures for preventive maintenance.
 - f. Procedures for routine maintenance.
 - g. Instruction on use of special tools.
 - 8. Repairs: Include the following:
 - a. Diagnosis instructions.
 - b. Repair instructions.
 - c. Disassembly; component removal, repair, and replacement; and reassembly instructions.
 - d. Instructions for identifying parts and components.
 - e. Review of spare parts needed for operation and maintenance.

PART 3 - EXECUTION

3.1 PREPARATION

- A. Assemble educational materials necessary for instruction, including documentation and training module. Assemble training modules into a training manual organized in coordination with requirements for operation and maintenance manuals as specified in Section 017823 "Operation and Maintenance Data."
- B. Set up instructional equipment at instruction location.

3.2 INSTRUCTION

- A. Facilitator: Engage a qualified facilitator to prepare instruction program and training modules, to coordinate instructors, and to coordinate between Design Builder and Owner for number of participants, instruction times, and location.

Specifications

- B. Engage qualified instructors to instruct Owner's personnel to adjust, operate, and maintain systems, subsystems, and equipment not part of a system.
 - 1. Design Builder to furnish an instructor to describe basis of system design, operational requirements, criteria, and regulatory requirements.
 - 2. Owner will furnish personnel to describe Owner's operational philosophy.
 - 3. Owner will furnish Design Builder with names and positions of participants.
- C. Scheduling: Provide instruction at mutually agreed on times. For equipment that requires seasonal operation, provide similar instruction at start of each season.
 - 1. Schedule training with Owner.
- D. Training Location and Reference Material: Conduct training on-site in the completed and fully operational facility using the actual equipment in-place. Conduct training using final operation and maintenance data submittals.
- E. Cleanup: Collect used and leftover educational materials and give to Owner. Remove instructional equipment. Restore systems and equipment to condition existing before initial training use.

3.3 DEMONSTRATION AND TRAINING VIDEO RECORDINGS

- A. The training may be videotaped by the Owner. Cooperate with the Owner when training is videotaped.
 - 1. Organize segments with multiple pieces of equipment to follow order of Project Manual table of contents.
 - 2. Where a training session on a particular piece of equipment exceeds 15 minutes, stop and pause training session. Begin training session again upon commencement of new filming segment.
 - 3. Provide raw transcript to the Owner for marking of the video for any training identified by Owner to be videotaped.

3.4 SPECIAL TRAINING REQUIREMENTS FOR MECHANICAL EQUIPMENT

- A. Training Responsibilities: Require that the mechanical subcontractor be responsible for mechanical training coordination, scheduling and ultimately to ensure that training is completed.
 - 1. Provide designated County personnel with a comprehensive training plan for mechanical equipment two months before the planned training.
 - 2. Provide the County with comprehensive orientation and training in the understanding of the systems and the operation and maintenance of each piece of mechanical equipment including, but not limited to, chillers, boilers, pumps, air handling units, fans, terminal units and controls systems, etc.
- B. Start training with classroom sessions followed by hands-on training on each piece of equipment, which must illustrate the various modes of operation, including startup, shutdown, fire/smoke alarm, power failure, etc.
- C. If during demonstration the system fails to perform in accordance with the requirements of the O&M manual or sequence of operations, repair or adjust the system as necessary and repeat the demonstration.

Specifications

- D. Engage the appropriate trade or manufacturer's representative to provide the instructions on each major piece of equipment. This person may be the start-up technician for the piece of equipment, the installing subcontractor or manufacturer's representative. Practical building operating expertise as well as in- depth knowledge of all modes of operation of the specific piece of equipment is required. More than one party may be required to execute the training.
- E. The controls subcontractor must attend sessions other than the controls training, as requested, to discuss the interaction of the controls system as it relates to the equipment being discussed.
- F. The training sessions must with the operation and maintenance manual and illustrate whenever possible the use of the O&M manuals for reference.
- G. Training must include:
 - 1. Use of the printed installation, operation and maintenance instruction material included in the O&M manuals. This material must be submitted and approved prior to being used in training.
 - 2. A review of the written O&M instructions emphasizing safe and proper operating requirements, preventative maintenance, special tools needed and spare parts inventory suggestions. The training must include start-up, operation in all modes possible, shut-down, seasonal changeover and any emergency procedures.
 - 3. Discussion of relevant health and safety issues and concerns.
 - 4. Discussion of warranties and guarantees.
 - 5. Common troubleshooting problems and solutions.
 - 6. Explanatory information included in the O&M manuals and the location of all plans and manuals in the facility.
 - 7. Discussion of any peculiarities of equipment installation or operation.
 - 8. The format and training agenda in "The Commissioning Process," ASHRAE Guideline 2005 is recommended.
 - 9. Hands-on training must include start-up, operation in all modes possible, including manual, shut-down and any emergency procedures and preventative maintenance for all pieces of equipment.
 - 10. The mechanical subcontractor must fully explain and demonstrate the operation, function and overrides of any local packaged controls, not controlled by the central control system.
 - 11. Training must occur after functional testing is complete, unless approved otherwise by the Owner.
 - 12. Require the mechanical subcontractor to provide training on each piece of equipment according to the requirements identified in the Performance Specifications.

END OF SECTION 01 79 00

01 81 13 - SUSTAINABLE DESIGN REQUIREMENTS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. The entire project shall comply with the United States Green Building Council (USGBC) requirements to certify the project under LEED Version 3. The goal for this project would be base certification. Advanced commissioning is not required.
- B. Section includes general requirements and procedures for compliance with certain USGBC LEED prerequisites and credits needed for Project to obtain LEED-Certified certification based on USGBC's "LEED 2009 for New Construction & Major Renovations."
 - 1. Other LEED prerequisites and credits needed to obtain LEED certification depend on product selections and may not be specifically identified as LEED requirements. Compliance with requirements needed to obtain LEED prerequisites and credits may be used as one criterion to evaluate substitution requests and comparable product requests.
 - 2. Additional LEED prerequisites and credits needed to obtain the indicated LEED certification depend on Design Builder's design and other aspects of Project that are not part of the Work of the Contract.
 - 3. Refer to Project Criteria for LEED for additional requirements.

Specifications

1.3 DEFINITIONS

- A. Chain-of-Custody Certificates: Certificates signed by manufacturers certifying that wood used to make products was obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship." Certificates shall include evidence that manufacturer is certified for chain of custody by an FSC-accredited certification body.
- B. Regional Materials: Materials that have been extracted, harvested, or recovered, as well as manufactured, within 500 miles (800 km) of Project site. If only a fraction of a product or material is extracted/harvested/recovered and manufactured locally, then only that percentage (by weight) shall contribute to the regional value.
- C. Recycled Content: The recycled content value of a material assembly shall be determined by weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value.
 - 1. "Post-consumer" material is defined as waste material generated by households or by commercial, industrial, and institutional facilities in their role as end users of the product, which can no longer be used for its intended purpose.
 - 2. "Pre-consumer" material is defined as material diverted from the waste stream during the manufacturing process. Excluded is reutilization of materials such as rework, regrind, or scrap generated in a process and capable of being reclaimed within the same process that generated it.

1.4 ADMINISTRATIVE REQUIREMENTS

- A. Documentation for LEED prerequisites and credit must be submitted by Design Builder in the format required by the USGBC for review using LEED-Online. Including all required credit audit documentation, completion of LEED calculators, and LEED credit templates.
- B. Respond to questions and requests from Owner and the USGBC regarding LEED credits that are the responsibility of the Design Builder, that depend on product selection or product qualities, or that depend on Design Builder's procedures until the USGBC has made its determination on the project's LEED certification application. Document responses as informational submittals.

1.5 ACTION SUBMITTALS

- A. General: Submit additional LEED submittals required by other Specification Sections.
- B. LEED submittals are in addition to other submittals. If submitted item is identical to that submitted to comply with other requirements, submit duplicate copies as a separate submittal to verify compliance with indicated LEED requirements.
- C. LEED Documentation Submittals:
 - 1. Credit EA 5: Product data and wiring diagrams for sensors and data collection system used to provide continuous metering of building energy-consumption performance.
 - 2. Credit MR 2: Comply with Section 01 74 19 "Construction Waste Management and Disposal."
 - 3. Credit MR 3: Receipts for salvaged and refurbished materials used for Project, indicating sources and costs for salvaged and refurbished materials.

Specifications

4. Credit MR 4: Product data and certification letter from product manufacturers indicating percentages by weight of post-consumer and pre-consumer recycled content for products having recycled content. Include statement indicating material cost for each product having recycled content.
5. Credit MR 5: Product data for regional materials indicating location and distance from Project of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating cost for each regional material and the fraction by weight that is considered regional.
6. Credit MR 7: Product data and chain-of-custody certificates for products containing certified wood. Include statement indicating cost for each certified wood product.
7. Credit IEQ 3.1:
 - a. Construction indoor-air-quality management plan.
 - b. Product data for temporary filtration media.
 - c. Product data for filtration media used during occupancy.
 - d. Construction Documentation: Six photographs at three different times during the construction period, along with a brief description of the SMACNA approach employed, documenting implementation of the indoor-air-quality management measures, such as protection of ducts and on-site stored or installed absorptive materials.
8. Credit IEQ 3.2:
 - a. Signed statement describing the building air flush-out procedures including the dates when flush-out was begun and completed and statement that filtration media was replaced after flush-out.
 - b. Product data for filtration media used during flush-out and during occupancy.
 - c. Report from testing and inspecting agency indicating results of indoor-air-quality testing and documentation showing compliance with indoor-air-quality testing procedures and requirements.
9. Credit IEQ 4.1: Product data for adhesives and sealants used inside the weatherproofing system indicating VOC content of each product used.
10. Credit IEQ 4.2: Product data for paints and coatings used inside the weatherproofing system indicating VOC content of each product used.
11. Credit IEQ 4.4: Product data for products containing composite wood or agrifiber products or wood glues indicating that they do not contain urea-formaldehyde resin.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For LEED coordinator.
- B. Project Materials Cost Data: Provide statement indicating total cost for materials used for Project. Costs exclude labor, overhead, and profit. Include breakout of costs for the following categories of items:
 1. Furniture.
 2. Plumbing.
 3. Mechanical.
 4. Electrical.
 5. Specialty items such as elevators and equipment.
 6. Wood-based construction materials.

Specifications

- C. LEED Action Plans: Design-Builder shall prepare and submit with the Lump Sum Amendment during the Phase 1 Services, a LEED Compliance Plan for determining compliance of this Project with base certification. The Plan will include a LEED Credit matrix and a discussion accompanying and/or associated with each and every intended/selected credit point describing how the project will comply with that specific credit requirement. Revise, update, and resubmit LEED Action plan as project progresses. Indicating how the following will be met:
1. The definition and applied requirement of each credit in the design and/or construction of the project (the design documents, the several management plans, the organization for intended application) – how it will be planned or designed, including but not limited to the following:
 - a. Credit MR 2: Waste management plan complying with Section 01 74 19 "Construction Waste Management and Disposal."
 - b. Credit MR 3: List of proposed salvaged, refurbished, and reused materials. Identify each material that will be salvaged, refurbished, or reused, including its source, cost, and replacement cost if the item was to be purchased new.
 - c. Credit MR 4: List of proposed materials with recycled content. Indicate cost, post-consumer recycled content, and pre-consumer recycled content for each product having recycled content.
 - d. Credit MR 5: List of proposed regional materials. Identify each regional material, including its source, cost, and the fraction by weight that is considered regional.
 - e. Credit MR 7: List of proposed certified wood products. Indicate each product containing certified wood, including its source and cost of certified wood products.
 - f. Credit IEQ 3.1: Construction indoor-air-quality management plan.
 2. The implementation of that credit into the actual work of the project (the logistics, the submittals, the installation) – how it actually will take place.
 3. The expected compilation of the required credit submittal documents for each goal (the documents, the proofs, and the template letters) – how the credit paperwork will come together.
 4. The date of submission of all the required documentations.
 5. The expected time period for corrections and resubmissions.
- D. LEED Progress Reports: Concurrent with each Application for Payment, submit reports comparing actual construction and purchasing activities with LEED action plans for the following:
1. Credit MR 2: Waste reduction progress reports complying with Section 017419 "Construction Waste Management and Disposal."
 2. Credit MR 3: Salvaged, refurbished, and reused materials.
 3. Credit MR 4: Recycled content.
 4. Credit MR 5: Regional materials.
 5. Credit MR 7: Certified wood products.

1.7 QUALITY ASSURANCE

- A. LEED Coordinator: Engage an experienced LEED-Accredited Professional to coordinate LEED requirements. LEED coordinator may also serve as waste management coordinator.

Specifications

PART 2 - PRODUCTS

2.1 MATERIALS, GENERAL

- A. Provide products and procedures necessary to obtain LEED credits required in this Section. Although other Sections may specify some requirements that contribute to LEED credits, the Design Builder shall determine additional materials and procedures necessary to obtain LEED credits required.

2.2 SALVAGED, REFURBISHED, OR REUSED MATERIALS

- A. Credit MR 3: Not less than 5 pr 10 percent of building materials (by cost) shall be salvaged, refurbished, or reused materials.

2.3 RECYCLED CONTENT OF MATERIALS

- A. Credit MR 4: Building materials shall have recycled content such that post-consumer recycled content plus one-half of pre-consumer recycled content for Project constitutes a minimum of 10 or 20 percent of cost of materials used for Project.
 - 1. Cost of post-consumer recycled content plus one-half of pre-consumer recycled content of an item shall be determined by dividing weight of post-consumer recycled content plus one-half of pre-consumer recycled content in the item by total weight of the item and multiplying by cost of the item.
 - 2. Do not include plumbing, mechanical and electrical components, and specialty items such as elevators and equipment in the calculation.

2.4 REGIONAL MATERIALS

- A. Credit MR 5: Not less than 10 or 20 percent of building materials (by cost) shall be regional materials.

2.5 CERTIFIED WOOD

- A. Credit MR 7: Not less than 50 percent (by cost) of wood-based materials shall be produced from wood obtained from forests certified by an FSC-accredited certification body to comply with FSC STD-01-001, "FSC Principles and Criteria for Forest Stewardship."
 - 1. Wood-based materials include, but are not limited to, the following materials when made from wood, engineered wood products, or wood-based panel products:
 - a. Rough carpentry.
 - b. Miscellaneous carpentry.
 - c. Heavy timber construction.
 - d. Wood decking.
 - e. Metal-plate-connected wood trusses.
 - f. Structural glued-laminated timber.
 - g. Finish carpentry.
 - h. Architectural woodwork.
 - i. Wood paneling.
 - j. Wood veneer wall covering.
 - k. Wood flooring.

Specifications

- l. Wood lockers.
- m. Wood cabinets.
- n. Furniture.

2.6 LOW-EMITTING MATERIALS

- A. Credit IEQ 4.1: For field applications that are inside the weatherproofing system, adhesives and sealants shall comply with the following VOC content limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):

1. Wood Glues: 30 g/L.
2. Metal-to-Metal Adhesives: 30 g/L.
3. Adhesives for Porous Materials (Except Wood): 50 g/L.
4. Subfloor Adhesives: 50 g/L.
5. Plastic Foam Adhesives: 50 g/L.
6. Carpet Adhesives: 50 g/L.
7. Carpet Pad Adhesives: 50 g/L.
8. VCT and Asphalt Tile Adhesives: 50 g/L.
9. Cove Base Adhesives: 50 g/L.
10. Gypsum Board and Panel Adhesives: 50 g/L.
11. Rubber Floor Adhesives: 60 g/L.
12. Ceramic Tile Adhesives: 65 g/L.
13. Multipurpose Construction Adhesives: 70 g/L.
14. Fiberglass Adhesives: 80 g/L.
15. Contact Adhesive: 80 g/L.
16. Structural Glazing Adhesives: 100 g/L.
17. Wood Flooring Adhesive: 100 g/L.
18. Structural Wood Member Adhesive: 140 g/L.
19. Single-Ply Roof Membrane Adhesive: 250 g/L.
20. Special-Purpose Contact Adhesive (contact adhesive that is used to bond melamine-covered board, metal, unsupported vinyl, rubber, or wood veneer 1/16 inch or less in thickness to any surface): 250 g/L.
21. Top and Trim Adhesive: 250 g/L.
22. Plastic Cement Welding Compounds: 250 g/L.
23. ABS Welding Compounds: 325 g/L.
24. CPVC Welding Compounds: 490 g/L.
25. PVC Welding Compounds: 510 g/L.
26. Adhesive Primer for Plastic: 550 g/L.
27. Sheet-Applied Rubber Lining Adhesive: 850 g/L.
28. Aerosol Adhesive, General-Purpose Mist Spray: 65 percent by weight.
29. Aerosol Adhesive, General-Purpose Web Spray: 55 percent by weight.
30. Special-Purpose Aerosol Adhesive (All Types): 70 percent by weight.
31. Other Adhesives: 250 g/L.
32. Architectural Sealants: 250 g/L.
33. Nonmembrane Roof Sealants: 300 g/L.
34. Single-Ply Roof Membrane Sealants: 450 g/L.
35. Other Sealants: 420 g/L.
36. Sealant Primers for Nonporous Substrates: 250 g/L.
37. Sealant Primers for Porous Substrates: 775 g/L.
38. Modified Bituminous Sealant Primers: 500 g/L.
39. Other Sealant Primers: 750 g/L.

Specifications

- B. Credit IEQ 4.2: For field applications that are inside the weatherproofing system, paints and coatings shall comply with the following VOC content limits when calculated according to 40 CFR 59, Subpart D (EPA Method 24):
 - 1. Flat Paints and Coatings: VOC not more than 50 g/L.
 - 2. Nonflat Paints and Coatings: VOC not more than 150 g/L.
 - 3. Dry-Fog Coatings: VOC not more than 400 g/L.
 - 4. Primers, Sealers, and Undercoaters: VOC not more than 200 g/L.
 - 5. Anticorrosive and Antirust Paints Applied to Ferrous Metals: VOC not more than 250 g/L.
 - 6. Zinc-Rich Industrial Maintenance Primers: VOC not more than 340 g/L.
 - 7. Pretreatment Wash Primers: VOC not more than 420 g/L.
 - 8. Clear Wood Finishes, Varnishes: VOC not more than 350 g/L.
 - 9. Clear Wood Finishes, Lacquers: VOC not more than 550 g/L.
 - 10. Floor Coatings: VOC not more than 100 g/L.
 - 11. Shellacs, Clear: VOC not more than 730 g/L.
 - 12. Shellacs, Pigmented: VOC not more than 550 g/L.
 - 13. Stains: VOC not more than 250 g/L.
- C. Credit IEQ 4.4: Composite wood, agrifiber products, and adhesives shall not contain urea-formaldehyde resin.

PART 3 - EXECUTION

3.1 REFRIGERANT AND CLEAN-AGENT FIRE-EXTINGUISHING-AGENT REMOVAL

- A. Prerequisite EA 3: Remove CFC-based refrigerants from existing HVAC&R equipment indicated to remain and replace with refrigerants that are not CFC based. Replace or adjust existing equipment to accommodate new refrigerant as described in HVAC Sections.
- B. Credit EA 4: Remove clean-agent fire-extinguishing agents that contain HCFCs or halons and replace with agent that does not contain HCFCs or halons. See Section 212200 "Clean-Agent Fire-Extinguishing Systems" for additional requirements.

3.2 MEASUREMENT AND VERIFICATION

- A. Credit EA 5: Implement measurement and verification plan consistent with Option B: Energy Conservation Measure Isolation or Option D: Calibrated Simulation, Savings Estimation Method 2 in the EVO's "International Performance Measurement and Verification Protocol (IPMVP), Volume III: Concepts and Options for Determining Energy Savings in New Construction."
- B. If not already in place, install metering equipment to measure energy usage. Monitor, record, and trend log measurements.
- C. Evaluate energy performance and efficiency by comparing actual to predicted performance.
- D. Measurement and verification period shall cover at least one year of postconstruction occupancy.

Specifications

3.3 CONSTRUCTION WASTE MANAGEMENT

- A. Credit MR 2: Comply with Section 01 74 19 "Construction Waste Management and Disposal."

3.4 CONSTRUCTION INDOOR-AIR-QUALITY MANAGEMENT

- A. Credit IEQ 3.1: Comply with SMACNA's "SMACNA IAQ Guideline for Occupied Buildings under Construction."

1. If Owner authorizes use of permanent heating, cooling, and ventilating systems during construction period as specified in Section 01 50 00 "Temporary Facilities and Controls," install filter media having a MERV 8 according to ASHRAE 52.2 at each return-air inlet for the air-handling system used during construction.
2. Replace all air filters immediately prior to occupancy.

- B. Credit IEQ 3.2: Indicate operating procedure for each HVAC system and piece of equipment and the operating duration required for flush-out. Comply with one of the following requirements:

1. After construction ends, prior to occupancy and with all interior finishes installed, perform a building flush-out by supplying a total volume of 14000 cu. ft. (4 300 000 L) of outdoor air per sq. ft. (sq. m) of floor area while maintaining an internal temperature of at least 60 deg F (16 deg C) and a relative humidity no higher than 60 percent.
2. If occupancy is desired prior to flush-out completion, the space may be occupied following delivery of a minimum of 3500 cu. ft. (1 070 000 L) of outdoor air per sq. ft. (sq. m) of floor area to the space. Once a space is occupied, it shall be ventilated at a minimum rate of 0.30 cfm per sq. ft. (1.52 L/s per sq. m) of outside air or the design minimum outside air rate determined in Prerequisite IEQ 1, whichever is greater. During each day of the flush-out period, ventilation shall begin a minimum of three hours prior to occupancy and continue during occupancy. These conditions shall be maintained until a total of 14000 cu. ft./sq. ft. (4 300 000 L/sq. m) of outside air has been delivered to the space.

3. Air-Quality Testing:

- a. Conduct baseline indoor-air-quality testing, after construction ends and prior to occupancy, using testing protocols consistent with the EPA's "Compendium of Methods for the Determination of Air Pollutants in Indoor Air," and as additionally detailed in the USGBC's "Green Building Design and Construction Reference Guide."
- b. Demonstrate that the contaminant maximum concentrations listed below are not exceeded:
 - 1) Formaldehyde: 27 ppb.
 - 2) Particulates (PM10): 50 micrograms/cu. m.
 - 3) Total Volatile Organic Compounds (TVOC): 500 micrograms/cu. m.
 - 4) 4-Phenylcyclohexene (4-PH): 6.5 micrograms/cu. m.
 - 5) Carbon Monoxide: 9 ppm and no greater than 2 ppm above outdoor levels.
- c. For each sampling point where the maximum concentration limits are exceeded, conduct additional flush-out with outside air and retest the specific parameter(s) exceeded to indicate the requirements are achieved. Repeat procedure until all requirements have been met. When retesting noncomplying building areas, take samples from same locations as in the first test.
- d. Air-sample testing shall be conducted as follows:

Specifications

- 1) All measurements shall be conducted prior to occupancy but during normal occupied hours, and with building ventilation system starting at the normal daily start time and operated at the minimum outside air flow rate for the occupied mode throughout the duration of the air testing.
- 2) Building shall have all interior finishes installed including, but not limited to, millwork, doors, paint, carpet, and acoustic tiles. Nonfixed furnishings such as workstations and partitions are encouraged, but not required, to be in place for the testing.
- 3) Number of sampling locations varies depending on the size of building and number of ventilation systems. For each portion of building served by a separate ventilation system, the number of sampling points shall not be less than one per 25,000 sq. ft. (2300 sq. m) or for each contiguous floor area, whichever is larger, and shall include areas with the least ventilation and greatest presumed source strength.
- 4) Air samples shall be collected between 3 and 6 feet (0.9 and 1.8 m) from the floor to represent the breathing zone of occupants, and over a minimum four-hour period.

END OF SECTION 01 81 13

01 91 13 - GENERAL COMMISSIONING REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section includes general requirements that apply to implementation of commissioning without regard to specific systems, assemblies, or components.
- B. Related Sections:
 - 1. Section 22 08 00 "Commissioning of Plumbing" for commissioning process activities for plumbing systems.
 - 2. Section 23 08 00 "Commissioning of HVAC Systems" for commissioning process activities for HVAC&R systems, assemblies, equipment, and components.
 - 3. Section 26 08 00 "Commissioning of Electrical Systems" for commissioning process activities for electrical systems.

1.3 DEFINITIONS

- A. BoD: Basis of Design. A document that records concepts, calculations, decisions, and product selections used to meet the OPR and to satisfy applicable regulatory requirements, standards, and guidelines. The document includes both narrative descriptions and lists of individual items that support the design process.
- B. Commissioning Plan: A document that outlines the organization, schedule, allocation of resources, and documentation requirements of the commissioning process.
- C. CxA: Commissioning Authority.

Specifications

- D. OPR: Owner's Project Requirements. A document that details the functional requirements of a project and the expectations of how it will be used and operated. These include Project goals, measurable performance criteria, cost considerations, benchmarks, success criteria, and supporting information.
- E. Systems, Subsystems, Equipment, and Components: Where these terms are used together or separately, they shall mean "as-built" systems, subsystems, equipment, and components.

1.4 COMMISSIONING TEAM

- A. Members Appointed by Design Builder: Individuals, each having the authority to act on behalf of the entity he or she represents, explicitly organized to implement the commissioning process through coordinated action. The commissioning team shall consist of, but not be limited to, Project superintendent, Design Builder's Architect and engineering design professionals, representatives of each major subcontractor, including installers, suppliers, and specialists deemed appropriate by the Owner.
 - 1. CxA: The designated third-party person, company, or entity that plans, schedules, and coordinates the commissioning team to implement the commissioning process. Design Builder's third-party CxA to be approved by Owner before being engaged.
- B. Members Appointed by Owner:
 - 1. Representatives of the facility user and operation and maintenance personnel.

1.5 OWNER'S RESPONSIBILITIES

- A. Provide the OPR documentation to the CxA and Design Builder for information and use.
- B. Assign operation and maintenance personnel and schedule them to participate in commissioning team activities.

1.6 DESIGN BUILDER'S RESPONSIBILITIES

- A. Provide the BoD documentation, prepared by Design Builder's Architect and approved by Owner, to the CxA for use in developing the commissioning plan, systems manual, and operation and maintenance training plan.
- B. Design Builder shall assign representatives with expertise and authority to act on its behalf and shall schedule them to participate in and perform commissioning process activities including, but not limited to, the following:
 - 1. Evaluate performance deficiencies identified in test reports and, in collaboration with entity responsible for system and equipment installation, recommend corrective action.
 - 2. Cooperate with the CxA for resolution of issues recorded in the Issues Log.
 - 3. Attend commissioning team meetings.
 - 4. Integrate and coordinate commissioning process activities with construction schedule.
 - 5. Review and accept construction checklists provided by the CxA.
 - 6. Complete construction checklists as Work is completed and provide to the Commissioning Authority.



Specifications

7. Review and accept commissioning process test procedures provided by the Commissioning Authority.
8. Complete commissioning process test procedures.

1.7 CxA'S RESPONSIBILITIES

- A. Organize and lead the commissioning team.
- B. Provide commissioning plan.
- C. Convene commissioning team meetings.
- D. Provide Project-specific construction checklists and commissioning process test procedures.
- E. Verify the execution of commissioning process activities using random sampling. The sampling rate may vary from 1 to 100 percent. Verification will include, but is not limited to, equipment submittals, construction checklists, training, operating and maintenance data, tests, and test reports to verify compliance with the OPR. When a random sample does not meet the requirement, the CxA will report the failure in the Issues Log.
- F. Prepare and maintain the Issues Log.
- G. Prepare and maintain completed construction checklist log.
- H. Witness systems, assemblies, equipment, and component startup.
- I. Compile test data, inspection reports, and certificates; include them in the systems manual and commissioning process report.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 91 13

02 41 16 - STRUCTURE DEMOLITION**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of buildings and site improvements.
 - 2. Removing below-grade construction.
 - 3. Disconnecting, capping or sealing, and removing site utilities.
 - 4. Salvaging items for reuse.
- B. Related Requirements:
 - 1. Section 01 32 00 "Construction Progress Documentation" for preconstruction photographs taken before building demolition.
 - 2. Section 02 41 19 "Selective Demolition" for partial demolition of buildings, structures, and site improvements.
 - 3. Section 31 10 00 "Site Clearing" for site clearing and removal of above- and below-grade site improvements not part of building demolition.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage. Include fasteners or brackets needed for reattachment elsewhere.

Specifications

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Design Builder.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be demolished.
 - 2. Review structural load limitations of existing structures.
 - 3. Review and finalize building demolition schedule and verify availability of demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review and finalize protection requirements.
 - 5. Review procedures for noise control and dust control.
 - 6. Review procedures for protection of adjacent buildings.
 - 7. Review items to be salvaged and returned to Owner.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.
 - 1. Adjacent Buildings: Detail special measures proposed to protect adjacent buildings to remain.
- D. Schedule of Building Demolition Activities: Indicate the following:
 - 1. Detailed sequence of demolition work, with starting and ending dates for each activity.
 - 2. Temporary interruption of utility services.
 - 3. Shutoff and capping or re-routing of utility services.
- E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.



Specifications

1.8 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by EPA-approved certification program.

1.9 FIELD CONDITIONS

- A. Buildings to be demolished will be vacated and their use discontinued before start of the Work.
- B. Buildings immediately adjacent to demolition area will be occupied. Conduct building demolition so operations of occupied buildings will not be disrupted.
 - 1. Provide not less than 72 hours' notice of activities that will affect operations of adjacent occupied buildings.
 - 2. Maintain access to existing walkways, exits, and other facilities used by occupants of adjacent buildings.
 - a. Do not close or obstruct walkways, exits, or other facilities used by occupants of adjacent buildings without written permission from authorities having jurisdiction.
- C. Hazardous Materials: Present in buildings and structures to be demolished. Comply with Section 00 31 26 "Hazardous Material Investigation" for preparing a report on the presence of hazardous materials.
 - 1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- D. On-site storage or sale of removed items or materials is not permitted.

1.10 COORDINATION

- A. Arrange demolition schedule so as not to interfere with Owner's on-site operations or operations of adjacent occupied buildings.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

2.2 SOIL MATERIALS

- A. Satisfactory Soils: Comply with requirements in Section 31 20 00 "Earth Moving."

Specifications

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Verify that utilities have been disconnected and capped before starting demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.
- C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during building demolition operations.
- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Inventory and record the condition of items to be removed and salvaged. Provide photographs or video in compliance with Section 01 32 33 "Photographic Documentation."

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.
- B. Salvaged Items: Comply with the following:
 - 1. Clean salvaged items of dirt and demolition debris.
 - 2. Pack or crate items after cleaning. Identify contents of containers.
 - 3. Store items in a secure area .
 - 4. Transport items to storage area.
 - 5. Protect items from damage during transport and storage.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Utilities to be Disconnected: Locate, identify, disconnect, and seal or cap off utilities serving buildings and structures to be demolished.
 - 1. Arrange to shut off utilities with utility companies, coordinate with Owner.
 - 2. If removal, relocation, or abandonment of utility services will affect adjacent occupied buildings, then provide temporary utilities that bypass buildings and structures to be demolished and that maintain continuity of service to other buildings and structures.
 - 3. Do not start demolition work until utility disconnecting and sealing have been completed and verified in writing.

Specifications

3.4 PROTECTION

- A. Existing Facilities: Protect adjacent walkways, loading docks, building entries, and other building facilities during demolition operations. Maintain exits from existing buildings.
- B. Temporary Shoring: Provide and maintain interior and exterior shoring, bracing, or structural support to preserve stability and prevent unexpected movement or collapse of construction being demolished.
- C. Existing Utilities to Remain: Maintain utility services to remain and protect from damage during demolition operations.
 - 1. Do not interrupt existing utilities serving adjacent occupied or operating facilities unless authorized in writing by Owner and authorities having jurisdiction.
 - 2. Provide temporary services during interruptions to existing utilities, as acceptable to Owner and authorities having jurisdiction.
 - a. Provide at least 72 hours' notice to occupants of affected buildings if shutdown of service is required during changeover.
- D. Temporary Protection: Erect temporary protection, such as walks, fences, railings, canopies, and covered passageways, where required by authorities having jurisdiction and as indicated. Comply with requirements in Section 01 50 00 "Temporary Facilities and Controls."
 - 1. Protect adjacent buildings and facilities from damage due to demolition activities.
 - 2. Protect existing site improvements, appurtenances, and landscaping to remain.
 - 3. Erect a plainly visible fence around drip line of individual trees or around perimeter drip line of groups of trees to remain.
 - 4. Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 5. Provide protection to ensure safe passage of people around building demolition area and to and from occupied portions of adjacent buildings and structures.
 - 6. Protect walls, windows, roofs, and other adjacent exterior construction that are to remain and that are exposed to building demolition operations.
 - 7. Erect and maintain dustproof partitions and temporary enclosures to limit dust, noise, and dirt migration to occupied portions of adjacent buildings.
- E. Remove temporary barriers and protections where hazards no longer exist. Where open excavations or other hazardous conditions remain, leave temporary barriers and protections in place.

3.5 DEMOLITION, GENERAL

- A. General: Demolish indicated buildings and site improvements completely. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Do not use cutting torches until work area is cleared of flammable materials. Maintain portable fire-suppression devices during flame-cutting operations.
 - 2. Maintain fire watch during and after flame-cutting operations.
 - 3. Maintain adequate ventilation when using cutting torches.
 - 4. Locate building demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

Specifications

- B. Site Access and Temporary Controls: Conduct building demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - 1. Do not close or obstruct streets, walks, walkways, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by authorities having jurisdiction.
 - 2. Use water mist and other suitable methods to limit spread of dust and dirt. Comply with governing environmental-protection regulations. Do not use water when it may damage adjacent construction or create hazardous or objectionable conditions, such as ice, flooding, and pollution.
- C. Explosives: Use of explosives is not permitted.

3.6 DEMOLITION BY MECHANICAL MEANS

- A. Proceed with demolition of structural framing members systematically, from higher to lower level. Complete building demolition operations above each floor or tier before disturbing supporting members on the next lower level.
- B. Remove debris from elevated portions of the building by chute, hoist, or other device that will convey debris to grade level in a controlled descent.
 - 1. Remove structural framing members and lower to ground by method suitable to minimize ground impact and dust generation.
- C. Below-Grade Construction: Demolish foundation walls and other below-grade construction.
 - 1. Remove below-grade construction, including basements, foundation walls, and footings, completely.
- D. Existing Utilities: Where indicated, abandon existing utilities and below-grade utility structures. Cut utilities flush with grade.
- E. Existing Utilities: Where indicated, demolish and remove existing utilities and below-grade utility structures.
 - 1. Fill abandoned utility structures with satisfactory soil materials according to backfill requirements in Section 31 20 00 "Earth Moving."

3.7 SITE RESTORATION

- A. Below-Grade Areas: Completely fill below-grade areas and voids resulting from building demolition operations with satisfactory soil materials or recycled pulverized masonry according to backfill requirements in Section 31 20 00 "Earth Moving."
- B. Site Grading: Uniformly rough grade area of demolished construction to a smooth surface, free from irregular surface changes. Provide a smooth transition between adjacent existing grades and new grades.



Specifications

3.8 REPAIRS

- A. Promptly repair damage to adjacent buildings caused by demolition operations.

3.9 DISPOSAL OF DEMOLISHED MATERIALS

- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 017419 "Construction Waste Management and Disposal."
 - 1. Do not allow demolished materials to accumulate on-site.
 - 2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
- B. Do not burn demolished materials.

3.10 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by building demolition operations. Return adjacent areas to condition existing before building demolition operations began.
 - 1. Clean roadways of debris caused by debris transport.

END OF SECTION 02 41 16

02 41 19 - SELECTIVE DEMOLITION

1.1 RELATED DOCUMENTS

- A. The following applies to this Section:
 - 1. Contracting Requirements.
 - 2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
 - 3. Appendices.
 - 4. Concept Drawings
- B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Demolition and removal of selected portions of building or structure.
 - 2. Demolition and removal of selected site elements.
 - 3. Salvage of existing items to be reused or recycled.
- B. Related Requirements:
 - 1. Section 01 73 00 "Execution" for cutting and patching procedures.
 - 2. Section 31 10 00 "Site Clearing" for site clearing and removal of above- and below-grade improvements not part of selective demolition.

1.3 DEFINITIONS

- A. Remove: Detach items from existing construction and dispose of them off-site unless indicated to be salvaged or reinstalled.
- B. Remove and Salvage: Detach items from existing construction, in a manner to prevent damage.
- C. Remove and Reinstall: Detach items from existing construction, in a manner to prevent damage, prepare for reuse, and reinstall where indicated.
- D. Existing to Remain: Leave existing items that are not to be removed and that are not otherwise indicated to be salvaged or reinstalled.
- E. Dismantle: To remove by disassembling or detaching an item from a surface, using gentle methods and equipment to prevent damage to the item and surfaces; disposing of items unless indicated to be salvaged or reinstalled.



Specifications

1.4 MATERIALS OWNERSHIP

- A. Unless otherwise indicated, demolition waste becomes property of Design Builder.
- B. Historic items, relics, antiques, and similar objects including, but not limited to, cornerstones and their contents, commemorative plaques and tablets, and other items of interest or value to Owner that may be uncovered during demolition remain the property of Owner.
 - 1. Carefully salvage in a manner to prevent damage and promptly return to Owner.

1.5 PREINSTALLATION MEETINGS

- A. Predemolition Conference: Conduct conference at Project site.
 - 1. Inspect and discuss condition of construction to be selectively demolished.
 - 2. Review structural load limitations of existing structure.
 - 3. Review and finalize selective demolition schedule and verify availability of materials, demolition personnel, equipment, and facilities needed to make progress and avoid delays.
 - 4. Review requirements of work performed by other trades that rely on substrates exposed by selective demolition operations.
 - 5. Review areas where existing construction is to remain and requires protection.

1.6 INFORMATIONAL SUBMITTALS

- A. Qualification Data: For refrigerant recovery technician.
- B. Engineering Survey: Submit engineering survey of condition of building.
- C. Proposed Protection Measures: Submit report, including Drawings, that indicates the measures proposed for protecting individuals and property. Indicate proposed locations and construction of barriers.
- D. Schedule of Selective Demolition Activities: Indicate the following:
 - 1. Detailed sequence of selective demolition and removal work, with starting and ending dates for each activity. Ensure Owner's on-site operations are uninterrupted.
 - 2. Interruption of utility services. Indicate how long utility services will be interrupted.
 - 3. Coordination for shutoff, capping, and continuation of utility services.
 - 4. Coordination of Owner's continuing occupancy of portions of existing building and of Owner's partial occupancy of completed Work.
- E. Statement of Refrigerant Recovery: Signed by refrigerant recovery technician responsible for recovering refrigerant, stating that all refrigerant that was present was recovered and that recovery was performed according to EPA regulations. Include name and address of technician and date refrigerant was recovered.

1.7 CLOSEOUT SUBMITTALS

- A. Inventory: Submit a list of items that have been removed and salvaged.



Specifications

1.8 QUALITY ASSURANCE

- A. Refrigerant Recovery Technician Qualifications: Certified by an EPA-approved certification program.

1.9 FIELD CONDITIONS

- A. Owner will occupy portions of building immediately adjacent to selective demolition area. Conduct selective demolition so Owner's operations will not be disrupted.
- B. Hazardous Materials: Present in buildings and structures to be selectively demolished. Comply with Section 00 31 26 "Hazardous Material Investigation" for preparing a report on the presence of hazardous materials.
 - 1. Do not disturb hazardous materials or items suspected of containing hazardous materials except under procedures specified elsewhere in the Contract Documents.
- C. Storage or sale of removed items or materials on-site is not permitted.
- D. Utility Service: Maintain existing utilities indicated to remain in service and protect them against damage during selective demolition operations.
 - 1. Maintain fire-protection facilities in service during selective demolition operations.

1.10 COORDINATION

- A. Arrange selective demolition schedule so as not to interfere with Owner's operations.

PART 2 - PRODUCTS

2.1 PERFORMANCE REQUIREMENTS

- A. Regulatory Requirements: Comply with governing EPA notification regulations before beginning selective demolition. Comply with hauling and disposal regulations of authorities having jurisdiction.
- B. Standards: Comply with ASSE A10.6 and NFPA 241.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Verify that utilities have been disconnected and capped before starting selective demolition operations.
- B. Review Project Record Documents of existing construction or other existing condition and hazardous material information. Owner does not guarantee that existing conditions are same as those indicated in Project Record Documents.

Specifications

- C. Perform an engineering survey of condition of building to determine whether removing any element might result in structural deficiency or unplanned collapse of any portion of structure or adjacent structures during selective building demolition operations.
 - 1. Perform surveys as the Work progresses to detect hazards resulting from selective demolition activities.
- D. Verify that hazardous materials have been remediated before proceeding with building demolition operations.
- E. Survey of Existing Conditions: Record existing conditions. Provide photographs or video in compliance with Section 01 32 33 "Photographic Documentation."

3.2 PREPARATION

- A. Refrigerant: Before starting demolition, remove refrigerant from mechanical equipment according to 40 CFR 82 and regulations of authorities having jurisdiction.

3.3 UTILITY SERVICES AND MECHANICAL/ELECTRICAL SYSTEMS

- A. Existing Services/Systems to Remain: Maintain services/systems indicated to remain and protect them against damage.
- B. Existing Services/Systems to Be Removed, Relocated, or Abandoned: Locate, identify, disconnect, and seal or cap off utility services and mechanical/electrical systems serving areas to be selectively demolished.
 - 1. Arrange to shut off utilities with utility companies, coordinate with Owner.
 - 2. If services/systems are required to be removed, relocated, or abandoned, provide temporary services/systems that bypass area of selective demolition and that maintain continuity of services/systems to other parts of building.
 - 3. Disconnect, demolish, and remove fire-suppression systems, plumbing, and HVAC systems, equipment, and components indicated to be removed.
 - a. Piping to Be Removed: Remove portion of piping indicated to be removed and cap or plug remaining piping with same or compatible piping material.
 - b. Piping to Be Abandoned in Place: Drain piping and cap or plug piping with same or compatible piping material and leave in place.
 - c. Equipment to Be Removed: Disconnect and cap services and remove equipment.
 - d. Equipment to Be Removed and Reinstalled: Disconnect and cap services and remove, clean, and store equipment; when appropriate, reinstall, reconnect, and make equipment operational.
 - e. Equipment to Be Removed and Salvaged: Disconnect and cap services and remove equipment and deliver to Owner.
 - f. Ducts to Be Removed: Remove portion of ducts indicated to be removed and plug remaining ducts with same or compatible ductwork material.
 - g. Ducts to Be Abandoned in Place: Cap or plug ducts with same or compatible ductwork material and leave in place.

Specifications

3.4 PROTECTION

- A. Temporary Protection: Provide temporary barricades and other protection required to prevent injury to people and damage to adjacent buildings and facilities to remain.
 - 1. Provide protection to ensure safe passage of people around selective demolition area and to and from occupied portions of building.
 - 2. Provide temporary weather protection, during interval between selective demolition of existing construction on exterior surfaces and new construction, to prevent water leakage and damage to structure and interior areas.
 - 3. Protect walls, ceilings, floors, and other existing finish work that are to remain or that are exposed during selective demolition operations.
 - 4. Cover and protect furniture, furnishings, and equipment that have not been removed.
 - 5. Comply with requirements for temporary enclosures, dust control, heating, and cooling specified in Section 01 50 00 "Temporary Facilities and Controls."
- B. Temporary Shoring: Design, provide, and maintain shoring, bracing, and structural supports as required to preserve stability and prevent movement, settlement, or collapse of construction and finishes to remain, and to prevent unexpected or uncontrolled movement or collapse of construction being demolished.
- C. Remove temporary barricades and protections where hazards no longer exist.

3.5 SELECTIVE DEMOLITION, GENERAL

- A. General: Demolish and remove existing construction only to the extent required by new construction and as indicated. Use methods required to complete the Work within limitations of governing regulations and as follows:
 - 1. Proceed with selective demolition systematically, from higher to lower level. Complete selective demolition operations above each floor or tier before disturbing supporting members on the next lower level.
 - 2. Neatly cut openings and holes plumb, square, and true to dimensions required. Use cutting methods least likely to damage construction to remain or adjoining construction. Use hand tools or small power tools designed for sawing or grinding, not hammering and chopping. Temporarily cover openings to remain.
 - 3. Cut or drill from the exposed or finished side into concealed surfaces to avoid marring existing finished surfaces.
 - 4. Do not use cutting torches until work area is cleared of flammable materials. At concealed spaces, such as duct and pipe interiors, verify condition and contents of hidden space before starting flame-cutting operations. Maintain portable fire-suppression devices during flame-cutting operations.
 - 5. Maintain fire watch during and after flame-cutting operations.
 - 6. Maintain adequate ventilation when using cutting torches.
 - 7. Remove decayed, vermin-infested, or otherwise dangerous or unsuitable materials and promptly dispose of off-site.
 - 8. Remove structural framing members and lower to ground by method suitable to avoid free fall and to prevent ground impact or dust generation.
 - 9. Locate selective demolition equipment and remove debris and materials so as not to impose excessive loads on supporting walls, floors, or framing.

Specifications

10. Dispose of demolished items and materials promptly. Comply with requirements in Section 01 74 19 "Construction Waste Management and Disposal."
 - B. Site Access and Temporary Controls: Conduct selective demolition and debris-removal operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities.
 - C. Removed and Salvaged Items:
 1. Clean salvaged items.
 2. Pack or crate items after cleaning. Identify contents of containers.
 3. Store items in a secure area.
 4. Transport items to Owner's storage area.
 5. Protect items from damage during transport and storage.
 - D. Removed and Reinstalled Items:
 1. Clean and repair items to functional condition adequate for intended reuse.
 2. Pack or crate items after cleaning and repairing. Identify contents of containers.
 3. Protect items from damage during transport and storage.
 4. Reinstall items in locations indicated. Comply with installation requirements for new materials and equipment. Provide connections, supports, and miscellaneous materials necessary to make item functional for use indicated.
 - E. Existing Items to Remain: Protect construction indicated to remain against damage and soiling during selective demolition. When permitted by Owner, items may be removed to a suitable, protected storage location during selective demolition and cleaned and reinstalled in their original locations after selective demolition operations are complete.
- 3.6 SELECTIVE DEMOLITION PROCEDURES FOR SPECIFIC MATERIALS
- A. Concrete: Demolish in sections. Cut concrete full depth at junctures with construction to remain and at regular intervals using power-driven saw, and then remove concrete between saw cuts.
 - B. Masonry: Demolish in small sections. Cut masonry at junctures with construction to remain, using power-driven saw, and then remove masonry between saw cuts.
 - C. Concrete Slabs-on-Grade: Saw-cut perimeter of area to be demolished, and then break up and remove.
 - D. Resilient Floor Coverings: Remove floor coverings and adhesive according to recommendations in RFCI's "Recommended Work Practices for the Removal of Resilient Floor Coverings." Do not use methods requiring solvent-based adhesive strippers.
 - E. Roofing: Remove no more existing roofing than what can be covered in one day by new roofing and so that building interior remains watertight and weathertight.
- 3.7 DISPOSAL OF DEMOLISHED MATERIALS
- A. Remove demolition waste materials from Project site and recycle or dispose of them according to Section 01 74 19 "Construction Waste Management and Disposal."

Specifications

1. Do not allow demolished materials to accumulate on-site.
2. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas.
3. Comply with requirements specified in Section 01 74 19 "Construction Waste Management and Disposal."

B. Burning: Do not burn demolished materials.

3.8 CLEANING

- A. Clean adjacent structures and improvements of dust, dirt, and debris caused by selective demolition operations. Return adjacent areas to condition existing before selective demolition operations began.

END OF SECTION 02 41 19

03 00 00 – CONCRETE (SITE WORK)

PART 1 - GENERAL

1.1 SECTION INCLUDES

- A. This section consists of furnishing all materials, forms, transportation and equipment, and performing all necessary labor to do all the plain and reinforced concrete work shown on the Drawings, or incidental to the proper execution of the work, or as herein specified.
- B. Concrete shall be composed of cement, fine aggregate, coarse aggregate, and water, so proportioned and mixed as to produce a plastic workable mixture in accordance with all requirements under this section suitable to the specific conditions of placement.

1.2 SUBMITTALS

- A. All materials specified shall be certified by the producer or manufacturer that the furnished materials meets the specific requirements of the specifications.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Cement:
 - 1. Cement: Cement for all concrete shall be domestic Portland cement that conforms to the requirements of ASTM Designation C 150, Type I, Type II or Type III. Type III cement for high early strength concrete shall be used only for special locations and only with the approval of the Architect. Type II cement shall be used in the construction of sanitary sewer manholes, wet wells and pump stations.
 - 2. Only one brand of cement shall be used in any individual structure unless approved by the Architect. Cement which has become damaged, partially set, lumpy or caked shall not be used and the entire contents of the sack or container which contains such cement will be rejected. No salvaged or reclaimed cement shall be used.
- B. Fine Aggregate: Fine aggregate shall conform to the requirements of Section 902, Article 902-1 of the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", latest edition.
- C. Coarse Aggregate: Coarse aggregate shall conform to the requirements of Section 901 of the Florida Department of Transportation "Standard Specifications for Road and Bridge Construction", latest edition, except that slag shall not be used and the gradation shall be grade 57 as approved by the Architect.
- D. Water: Water shall be taken from a potable water supply and shall be fresh, clean and free from injurious amounts of oil, acid, alkali or organic matter.
- E. Admixtures: No admixtures shall be used except by specific approval of the Architect. When approved, admixtures shall meet the following minimum standards.
 - 1. Air entraining agent: ASTM C 260.
 - 2. Water Reducing and Retarding Admixture: ASTM C 94, Type D and free of chlorides.
- F. Membrane Curing Compound: Membrane curing compound shall conform to the requirements of AASHTO Designation M 148, Type 1-clear, or Type 2-white pigmented.

Specifications

- G. Expansion Joint Filler:
1. Preformed expansion joint filler shall be of the non-extruding and resilient bituminous type and conform to the requirements of AASHTO Designation M 213.
 2. Expansion joint filler shall be gray neoprene sponge rubber that conforms to AASHTO Designation M 153, Type I.
- H. Separation Board: Separation board shall be closed cell, non-extruding, PVC foam Grade #327 as manufactured by AC Horn, Inc., with a 20 psi maximum compressive strength to compress to 75% of thickness.
- I. Membrane: Membrane shall be a 6 mil polyethylene film.
- J. Reinforcing Steel:
1. Reinforcing steel shall conform to the requirements of ASTM Designation A 615, Deformed Grade 60, except where otherwise indicated.
 - a. The name of the manufacturer of the reinforcing steel shall be called out in the shop drawings together with a sketch showing the pattern of the deformation, including the mill mark.
 - b. Bar reinforcement shall be accurately fabricated in accordance with the latest CRSI Manual of Standard Practice. The Contractor shall have prepared and shall submit to the Architect in sextuplicate, necessary shop drawings and bar lists. The Contractor shall be responsible for errors made in shop drawings even though approved by the Architect.
 2. Welded wire fabric for concrete reinforcement shall conform to the requirements of ASTM Designation A 185 and shall be formed with smooth cold-drawn wire.
 3. Cold-drawn wire for spirals shall be plain and shall conform to the requirements of ASTM Designation A 82 with a minimum yield strength of 70,000 psi.
 4. Bar Supports:
 - a. Bar supports for reinforcing steel shall conform to the requirements of CRSI Manual of Standard Practice, Chapter 3 and shall be of a height to furnish the concrete cover called for on Drawings. High chairs shall be furnished for bent or top bars in solid slabs. Bar supports to be in contact with exterior surfaces of concrete shall be Class C with plastic caps at least 1-inch in length on the leg tips, or Class E with stainless steel legs. Bar supports shall be spaced not more than 100 times the diameter of the bars to be supported, with not more than 1/4 spacing from the end of the supported bars to the first chair.
 - b. Bar supports for slabs on grade shall be plain concrete blocks, 3-inches high by 4-inches square with tie wires embedded in support. Concrete strength shall be at 3,000 psi at time of use.
- K. Forms: Forms shall be of wood, steel or other approved materials. The sheeting for all exposed surfaces shall be 5-ply plywood, unless otherwise specifically authorized. Forms of like character shall be used for similarly exposed surfaces in order to produce a uniform appearance. Forming for exposed exterior concrete from 1-foot below finished exterior grade to top of structure shall be carefully fabricated so as to provide a smooth finish without defects. The type, size, shape, quality and strength of all materials of which the forms are made shall be subject to the approval of the Architect. If it is his opinion that the interior surfaces of the forms are too irregular to produce the specified finish, they shall be lined with smooth, dense, moisture resistant hardboard or other material of which he approves.
- L. Non-shrink Grout: Non-shrink grout shall be nonmetallic, pre-mixed type and shall be Sauereisen F-100 Level Fill, Master Builders Masterflow 713, Burke Non-Ferrous, Non-Shrink Grout or approved equal.

Specifications

2.2 CLASSIFICATION AND STRENGTH OF CONCRETE

- A. Class and minimum strength requirements for concrete shall be as tabulated below. Unless otherwise specified, Class B concrete shall be used.
- B. Strength Requirements: Concrete class and strength shall meet the minimum compressive strength requirements at the age of 7 and 28 days as shown in the following table. The compressive strengths shall be as determined by standard laboratory cylinder tests in accordance with the procedure set forth in ASTM Designation C 31 and C 39.

i. Compressive Strength in Pounds Per Square Inch

For Design Class	Purposes	3 Consecutive Cylinder Avg.			Low Cylinder	
		<u>7 Days</u>	<u>28 Days</u>	<u>7 Days</u>	<u>28 Days</u>	
A	4000	2950		4250	2600	3750
B	3000	2100		3200	1850	2800
C	2500	1800		2700	1550	2300

PART 3 - EXECUTION

3.1 PREPARATION

- A. Concrete Mixing:
 - 1. The concrete shall be ready-mixed and the equipment shall conform to the applicable requirements of ASTM Designation C 94.
 - 2. Equipment necessary to positively determine and control the actual amounts of all materials entering the concrete shall be provided by the Contractor or the concrete manufacturer. All materials shall be measured by weight, except that water may be measured by volume. A bag of cement weighs 94 pounds.

3.2 INSTALLATION

- A. Forms shall be built true to line and grade, and shall be mortartight and sufficiently rigid to prevent displacement or sagging between supports. Particular attention shall be given to adequacy of supports and shoring, which is the Contractor's responsibility. The surfaces of forms used for permanently exposed surfaces shall be smooth and free from irregularities, dents, sags, or holes. Forms for surfaces to receive stucco finish shall be suitable for its application.
- B. Bolts and rods used for internal ties shall be so arranged that, when the forms are removed, all metal is at least 1 1/2-inch from any concrete surface. Form ties shall be removed immediately after removal of forms, and holes shall be thoroughly plugged with grout within 24 hours after form removal and kept damp for 4 days to prevent shrinking.
- C. Wire ties will not be permitted. All forms shall be so constructed that they can be removed without hammering or prying against the concrete. Unless otherwise indicated, suitable moldings shall be placed to bevel or round exposed edges at expansion joints or at any other corners that are to remain. Beams below grade shall have forms at both sides.
- D. Coating: Prior to the placing of steel reinforcement or concrete, forms for exposed surfaces shall be coated with a nonstaining paraffin base oil or mineral oil. Forms for unexposed surfaces may be thoroughly wetted in lieu of oiling, immediately before the placing of concrete.
- E. Removal: Forms and/or form supports shall not be removed from any concrete until it has obtained sufficient strength to support itself and any live loads it may be subjected to, and then only with the approval of the Architect.

Specifications

- F. Reinforcing Steel: When placed in the forms, reinforcement shall be clean and free of all rust, scale, dust, dirt, paint, oil or other foreign material and shall be accurately and securely positioned in the forms as shown on the Drawings before the placing of concrete. Reinforcing steel shall be wired or otherwise fastened together at intersections and shall be supported by concrete or metal supports, spacers or hangers. Bar supports, where adjacent to the ground, shall be set on precast concrete pads compressed into the subgrade. The Contractor shall obtain the Architect's approval before fastening reinforcing steel at intersections by welding methods.
1. Splicing of reinforcement shall be placed at points of minimum stress. Bars shall be lapped at splices a minimum of 24 bar diameters unless otherwise shown on the Drawings or directed by the Architect, and shall be rigidly wired or clamped.
 2. Wire fabric shall be straightened before placing and shall overlap one full space of mesh at ends and edges and shall be securely fastened. Fabric shall be supported so as to occupy its proper location in the concrete as shown on the Drawings. Fabric shall not cross any expansion joints.
- G. Embedded Items: In addition to steel reinforcement, pipes, inserts and other metal objects as shown, specified or ordered shall be built into, set in, or attached to the concrete. All necessary precautions shall be taken to prevent these objects from being displaced, broken or deformed. Before concrete is placed, care shall be taken to determine that all embedded parts are firmly and securely fastened in place as indicated.
- H. They shall be thoroughly clean and free from paint or other coating, rust, scale, oil, or any foreign matter. No wood shall be embedded in concrete. The concrete shall be packed tightly around pipes and other metal work to prevent leakage and to secure perfect adhesion. Drains shall be adequately protected from intrusion of concrete.
- I. Separation Board: Two-inch separation board shall be installed as indicated on the Drawings.
- J. Concrete:
1. General: Reinforcement shall be secured in position, inspected and approved before placing concrete. Runways for transporting concrete shall not rest on reinforcing steel. Concrete not placed within 90 minutes from the time mixing is started will be rejected and shall be removed from the job by the Contractor. Concrete shall not be allowed to drop freely more than six feet. All concrete shall be placed in daylight and (excepting seal concrete) shall be placed in the dry unless otherwise authorized by the Architect in writing.
 2. Slabs Placed on Subgrade: Slab concrete placed on earth or fill subgrade shall be separated from direct contact with the subgrade by 6 mil polyethylene film or other approved material. Sidewalks and walkways will not require a separation sheet. Polyethylene film shall be lapped 4-inches on sides and 12-inches on ends.
 3. Compaction: Concrete shall be compacted by internal vibrating equipment, supplemented by hand rodding and tamping as required. Vibrators shall in no case be used to move the concrete laterally inside the forms. Internal vibrators shall maintain a speed of at least 5000 impulses per minute when submerged in concrete. (At least one spare vibrator in working condition shall be maintained at the site during concrete placing operations.) duration of vibration shall be limited to time necessary to produce satisfactory consolidation without causing segregation. Vibrator shall be moved constantly and placed in each specific spot only once.

Specifications

4. Bonding: Before depositing new concrete on or against concrete that has set, the surfaces of the set concrete shall be thoroughly cleaned so as to expose the coarse aggregate and be free of laitance, coatings, foreign matter and loose particles. Forms shall be retightened. The cleaned surfaces shall be dampened, but not saturated, and then thoroughly covered with a coat of cement grout of similar proportions to the mortar in the concrete. The grout shall be as thick as possible on vertical surfaces and at least 1/2-inch thick on horizontal surfaces. The fresh concrete shall be placed before the grout has attained its initial set.
 5. Protection: Rainwater shall not be allowed to increase the ratio of mixing water nor to damage the surface finish. Concrete shall be protected from disfigurement, damage, vibration, internal fractures and construction overloads.
- K. Curing:
1. All concrete, including gunite, shall be water cured by covering with a double thickness of clean burlap, cotton mats, or other approved material kept thoroughly saturated with water. The forms shall be kept wet until removed and upon removal, the curing specified herein shall be started immediately. Concrete shall be cured for a period of 7 days for normal Portland cement.
- L. Grout for pointing and patching shall consist of cement and fine aggregate mixed in the proportions used in the concrete and a minimum amount of water to produce a workable grout. Material for grouting column base plates, anchor bolts, reinforcing bars, pipe sleeves and pump base plates shall be of the non-shrink type and shall be mixed and placed as recommended by the manufacturer. Machinery set on grout pads shall not be operated until the grout has cured for at least 24 hours.
- 3.3 FIELD QUALITY CONTROL
- A. The quality of the concrete as to conformance to the specifications is the entire responsibility of the Contractor until it is accepted in place in the structure and verified by the final cylinder tests made by the laboratory. Arrangements for field testing shall be made by the Contractor with the laboratory as selected by the Owner.
 - B. Standard laboratory compressive test cylinders will be obtained by the laboratory when concrete is discharged from the mixer at the site of the work. A set of 6 cylinders will be obtained for each 60 cubic yards or fraction thereof placed each day, for each type of concrete. The cylinders will be cured under laboratory conditions and will be tested in two groups of three at 7 and 28 days of age, respectively.
 - C. The laboratory of the Owner or their representative will make slump tests of Class A and Class B concrete as it is discharged from the mixer at the site of the work. Slump tests will be made for each 25 cubic yards or "pour" of concrete placed. Slump tests may be made on any batch and failure to meet specified slump requirements will be sufficient cause for rejection of that batch.
 - D. Proper reports of all tests performed by the laboratory will be prepared by the laboratory and submitted promptly to the Architect. Such reports shall be properly labeled so as to identify the portions of the project into which the materials have been placed.
- 3.4 PRECAST CONCRETE STRUCTURES
- Precast structures shall be constructed in accordance with Section 400, Concrete Structures of the Florida Department of Transportation Standard Specifications for Road and Bridge Construction, latest edition.

END OF SECTION 03 00 00



Specifications

03 30 00 - CAST-IN-PLACE CONCRETE

1.1 QUALITY ASSURANCE

- A. Quality Standard: ACI 301.
- B. Mockups to demonstrate typical joints, surface finish, texture, tolerances, floor treatments, and standard of workmanship.

1.2 PRODUCTS

- A. Form facing materials.
- B. Steel Reinforcement:
 - 1. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
 - 2. Reinforcing Bars: Deformed.
 - 3. Welded Wire Reinforcement: Plain.
- C. Concrete Materials:
 - 1. Portland Cement: ASTM C 150, Type I for general construction and I/II for elements exposed to soil or water
 - 2. Blended Hydraulic Cement: ASTM C 595, Type IS.
 - 3. Silica fume.
 - 4. Aggregate: Normal weight.
 - 5. Water.
- D. Mixing: Ready mixed.

1.3 CONCRETE MIXTURES

- A. Portland Cement Replacement: Use fly ash, ground granulated blast-furnace slag, and silica fume to reduce portland cement by 40 percent.
- B. Compressive Strength (28 Days):
 - 1. Footings: 5000 psi.
 - 2. Foundation Walls: 5000 psi.
 - 3. Slabs-on-Grade: 4000 psi.
 - 4. Suspended Slabs: Normal-weight concrete: 5000 psi.
 - 5. Concrete Toppings: 4000 psi.
 - 6. Building Frame Members: 5000 psi.
 - 7. Building Walls: 5000 psi.



Specifications

1.4 INSTALLATION

- A. Formed Finishes: Smooth.
- B. Floor and Slab Finishes:
 - 1. Scratch: Surfaces to receive concrete floor toppings.
 - 2. Float: Surfaces to receive trowel finish and surfaces to be covered with fluid-applied or sheet waterproofing, built-up, membrane roofing.
 - 3. Trowel: Surfaces exposed to view or to be covered with resilient flooring, carpet, epoxy floor finish systems.
 - 4. Trowel and Fine-Broom: Surfaces to be covered with ceramic or quarry tile to be installed by either thickset or thin-set method.
 - 5. Broom: Exterior concrete steps ramps.
 - 6. Slip-Resistive Finish: Concrete stair treads, docks, platforms, and ramps.
 - 7. Dry-Shake Floor Hardener: docks, platforms, and ramps
 - 8. Polished Concrete: See room finish schedule for locations of exposed hardened and burnished concrete.

1.5 FIELD QUALITY CONTROL

- A. Testing: By Owner-engaged agency.
- B. Special Inspections: By Owner-engaged special inspector.

END OF SECTION 03 30 00



Specifications

03 41 00 - PRECAST STRUCTURAL CONCRETE

1.1 SUMMARY

- A. Precast structural concrete units.
- B. Insulated wall panels.

1.2 PERFORMANCE REQUIREMENTS

- A. Structural Performance: Fabricator responsible for engineering precast structural concrete units.
 - 1. Dead Loads: See Narrative
 - 2. Concrete Topping Load: 50 PSF
 - 3. Live Loads: See Narrative
 - 4. Roof Loads: 20 PSF
 - 5. Snow Loads: None
 - 6. Seismic Loads: None
 - 7. Wind Loads: See Narrative
 - 8. Project Specific Loads: See Narrative

1.3 QUALITY ASSURANCE

- A. Fabricator: PCI-certified plant.
- B. Installer Qualifications: PCI Certificate of Compliance Erectors' Post Audit Declaration.
- C. Design Standards: ACI 318 and PCI MNL 120 and PCI MNL 122
- D. Quality-Control Standard: PCI MNL 116 and PCI MNL 117
- E. Sample panels.
- F. Mockups.

1.4 MATERIALS

- A. Form liners.
- B. Reinforcing Materials:
 - 1. Recycled Content of Steel Products: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
 - 2. Reinforcing Bars: Steel.
 - 3. Steel Bar Mats: Steel.
 - 4. Welded Wire Reinforcement: Plain steel.

Specifications

- C. Prestressing tendons.
- D. Concrete Materials:
 - 1. Portland Cement: ASTM C 150, Type I or III.
 - 2. Supplementary Cementitious Materials: Fly ash.
 - 3. Aggregates: Normal weight.
 - a. Face-Mixture Coarse Aggregates: Uniformly graded.
 - 4. Coloring admixture.
 - 5. Admixtures: Air entraining Water reducing Retarding Water reducing and retarding Water reducing and accelerating High range, water reducing High range, water reducing and retarding Plasticizing and retarding.
 - 6. Corrosion-inhibiting admixture.
- E. Steel Connections: Carbon-steel shapes and plates.
 - 1. Finish: Galvanized or Painted.
- F. Stainless-Steel Connections: Stainless-steel plate, bolts and studs, and headed studs.
- G. Bearing Pads: Elastomeric
- H. Grout: Nonmetallic, nonshrink
- I. Insulated Panel Accessories:
 - 1. Insulation: Thermo-mass system is basis of design. Refer to narrative.
 - 2. Wythe connectors. Thermo-mass system is basis of design. Refer to narrative.

1.5 CONCRETE MIXTURES

- A. Portland Cement Replacement: Use fly ash, ground granulated blast-furnace slag, and silica fume to reduce portland cement by 40 percent.
- B. Compressive Strength (28 Days):
 - 1. Normal-Weight Concrete: 5000 psi.
 - 2. Lightweight Concrete: 5000 psi.

1.6 FABRICATION

- A. Formed Surfaces: Standard finishes where concealed, Grade A where exposed to occupants
- B. Unformed Surfaces: Smooth steel trowel finishes.
- C. Architectural Formed Finishes: Medium Acid etched



Specifications

- D. Electrical Conduit: All conduit to be concealed. No surface mounted conduit or boxes. Coordinate with Electrical requirements.

1.7 SOURCE QUALITY CONTROL

- A. Testing Agency: Contractor engaged to evaluate fabricator's quality-control and testing methods.

1.8 FIELD QUALITY CONTROL

- A. Special Inspections: By Contractor-engaged agency
- B. Testing and Inspections: By Contractor-engaged agency

END OF SECTION 03 41 00



Specifications

03 53 00 - CONCRETE TOPPING

1.1 QUALITY ASSURANCE

- A. Mockups for concrete floor toppings.

1.2 MATERIALS

- A. Concrete Floor Topping Compressive Strength (28 Days):

- 1. Emery-Aggregate Topping: 10,000 psi.
- 2. Iron-Aggregate Topping: 12,000 psi.

- B. Semirigid joint filler.

1.3 INSTALLATION

- A. Concrete Floor Topping Application: Epoxy-bonding adhesive applied to existing concrete; hard trowel finish.

1.4 FIELD QUALITY CONTROL

- A. Testing: By Owner-engaged agency.

END OF SECTION 03 53 00

04 20 00 - MASONRY

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONCRETE INSTITUTE INTERNATIONAL (ACI)

ACI 318	(2011; Errata 2011; Errata 2012) Building Code Requirements for Structural Concrete and Commentary
ACI 530/530.1	(2011; Errata 2011; Errata 2013) Building Code Requirements and Specification for Masonry Structures and Related Commentaries
ACI SP-66	(2004) ACI Detailing Manual ASTM INTERNATIONAL (ASTM)
ASTM A153/A153M	(2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A615/A615M	(2012) Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement
ASTM A641/A641M	(2009a) Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
ASTM A82/A82M	(2007) Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
ASTM B633	(2011) Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel
ASTM C1019	(2011) Standard Test Method for Sampling and Testing Grout
ASTM C1072	(2013) Standard Test Method for Measurement of Masonry Flexural Bond Strength
ASTM C1142	(1995; R 2007) Standard Specification for Extended Life Mortar for Unit Masonry
ASTM C129	(2011) Standard Specification for Nonloadbearing Concrete Masonry Units
ASTM C140	(2013) Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units
ASTM C144	(2011) Standard Specification for Aggregate for Masonry Mortar

Specifications

ASTM C150/C150M	(2012) Standard Specification for Portland Cement
ASTM C207	(2006; R 2011) Standard Specification for Hydrated Lime for Masonry Purposes
ASTM C270	(2012a) Standard Specification for Mortar for Unit Masonry
ASTM C476	(2010) Standard Specification for Grout for Masonry
ASTM C494/C494M	(2013) Standard Specification for Chemical Admixtures for Concrete
ASTM C593	(2006; R 2011) Fly Ash and Other Pozzolans for Use with Lime for Soil Stabilization
ASTM C641	(2009) Staining Materials in Lightweight Concrete Aggregates
ASTM C780	(2012a) Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry
ASTM C90	(2012) Loadbearing Concrete Masonry Units
ASTM C91/C91M	(2012) Standard Specification for Masonry Cement
ASTM C94/C94M	(2013) Standard Specification for Ready-Mixed Concrete
ASTM E119	(2012a) Standard Test Methods for Fire Tests of Building Construction and Materials

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System
---------	--

1.2 SYSTEM DESCRIPTION

1.2.1 Local/Regional Materials

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources. Masonry materials may be locally available. Submit documentation indicating distance between manufacturing facility and the project site, and distance of raw material origin from the project site. Indicate relative dollar value of local/regional materials to total dollar value of products included in the project.

1.2.2 Environmental Data

Submit manufacturer's descriptive data. Documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.



Specifications

1.2.3 Design Requirements

1.2.3.1 Masonry Strength

Determine masonry strength in accordance with ACI 530/530.1; submit test reports on three prisms as specified in ACI 530/530.1. The cost of testing shall be paid by the Contractor.

1.2.4 Additional Requirements

Provide bracing and scaffolding necessary for masonry work. Design bracing to resist wind pressure as required by local code.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Detail

Drawings

SD-03 Product Data

Local/Regional Materials; (LEED NC)
Cement(LEED NC)
Cold Weather Installation

SD-05 Design Data

Pre-mixed Mortar
Unit Strength Method

SD-06 Test Reports

Field Testing of Mortar
Field Testing of Grout
Prism tests
Masonry Cement Fire-rated CMU
Masonry Inspector Qualifications

SD-07 Certificates

Concrete Masonry Units (CMU) Anchors, Ties, and Bar Positioners Joint Reinforcement
Masonry Cement
Precast Concrete Items Admixtures for Masonry Mortar Admixtures for Grout

1.4 QUALITY ASSURANCE

1.4.1 Masonry Inspector Qualifications

A qualified masonry inspector approved by the Owner shall perform inspection of the masonry work. Minimum qualifications for the masonry inspector shall be 5 years of reinforced masonry inspection experience or acceptance by a State, municipality, or other governmental body having a program of examining and

Specifications

certifying inspectors for reinforced masonry construction. The masonry inspector shall be present during preparation of masonry prisms, sampling and placing of masonry units, placement of reinforcement (including placement of dowels in footings and foundation walls), inspection of grout space, immediately prior to closing of cleanouts, and during grouting operations. The masonry inspector shall assure compliance with the drawings and specifications. The masonry inspector shall keep a complete record of all inspections and shall submit daily written reports to the Architect reporting the quality of masonry construction. Submit copies of masonry inspector reports.

1.4.2 Detail Drawings

Submit detail drawings showing bar splice locations. Bent bars shall be identified on a bending diagram and shall be referenced and located on the drawings. Wall dimensions, bar clearances, and wall openings greater than one masonry unit in area shall be shown. No approval will be given to the shop drawings until the Contractor certifies that all openings, including those for mechanical and electrical service, are shown. If, during construction, additional masonry openings are required, the approved shop drawings shall be resubmitted with the additional openings shown along with the proposed changes. Location of these additional openings shall be clearly highlighted. The minimum scale for wall elevations shall be 1/4 inch per foot. Reinforcement bending details shall conform to the requirements of ACI SP-66. Submit drawings including plans, elevations, and details of wall reinforcement; details of reinforcing bars at corners and wall intersections; offsets; tops, bottoms, and ends of walls; control and expansion joints; lintels; and wall openings.

1.5 DELIVERY, STORAGE, AND HANDLING

Materials shall be delivered, stored, handled, and protected to avoid chipping, breakage, and contact with soil or contaminating material. Store and prepare materials in already disturbed areas to minimize project site disturbance and size of project site.

1.5.1 Masonry Units

Cover and protect moisture-controlled concrete masonry units and cementitious materials from precipitation. Conform to all handling and storage requirements of ASTM C90. Mark prefabricated lintels on top sides to show either the lintel schedule number or the number and size of top and bottom bars.

1.5.2 Reinforcement, Anchors, and Ties

Steel reinforcing bars, coated anchors, ties, and joint reinforcement shall be stored above the ground. Steel reinforcing bars and uncoated ties shall be free of loose mill scale and rust.

1.5.3 Cementitious Materials, Sand and Aggregates

Cementitious and other packaged materials shall be delivered in unopened containers, plainly marked and labeled with manufacturers' names and brands. Cementitious material shall be stored in dry, weathertight enclosures or be completely covered. Cement shall be handled in a manner that will prevent the inclusion of foreign materials and damage by water or dampness. Store sand and aggregates in a manner to prevent contamination or segregation.

1.6 PROJECT/SITE CONDITIONS

Conform to ACI 530/530.1 for hot and cold weather masonry erection.

1.6.1 Hot Weather Installation

Specifications

Take the following precautions if masonry is erected when the ambient air temperature is more than 99 degrees F in the shade and the relative humidity is less than 50 percent or the ambient air temperature exceeds 90 degrees F and the wind velocity is more than 8 mph. All masonry materials shall be shaded from direct sunlight; mortar beds shall be spread no more than 4 feet ahead of masonry; masonry units shall be set within one minute of spreading mortar; and after erection, masonry shall be protected from direct exposure to wind and sun for 48 hours.

1.6.2 Cold Weather Installation

Before erecting masonry when ambient temperature or mean daily air temperature falls below 40 degrees F or temperature of masonry units is below 40 degrees F, submit a written statement of proposed cold weather construction procedures for approval.

PART 2 PRODUCTS**2.1 GENERAL REQUIREMENTS**

The source of materials which will affect the appearance of the finished work shall not be changed after the work has started except with Architect's approval. Submit test reports from an approved independent laboratory. Test reports on a previously tested material shall be certified as the same as that proposed for use in this project. Submit certificates of compliance stating that the materials meet the specified requirements.

2.2 CONCRETE MASONRY UNITS (CMU)

Submit samples and certificates as specified. Cement shall have a low alkali content and be of one brand. Units shall be of modular dimensions and air, water, or steam cured. Exposed surfaces of units shall be smooth and of uniform texture.

- a. Hollow Load-Bearing Units: ASTM C90, made with normal weight aggregate. Provide load-bearing units for exterior walls, foundation walls, load-bearing walls, and shear walls.
- b. Hollow Non-Load-Bearing Units: ASTM C129, made with normal weight aggregate. Load-bearing units may be provided in lieu of non-load-bearing units.

2.2.1 Aggregates

Lightweight aggregates and blends of lightweight and heavier aggregates in proportions used in producing the units, shall comply with the following requirements when tested for stain-producing iron compounds in accordance with ASTM C641: by visual classification method, the iron stain deposited on the filter paper shall not exceed the "light stain" classification.

2.2.2 Kinds and Shapes

Units shall be modular in size and shall include closer, jamb, header, lintel, and bond beam units and special shapes and sizes to complete the work as indicated. In exposed interior masonry surfaces, units having a bullnose shall be used for vertical external corners except at door, window, and louver jambs. Radius of the bullnose shall be 1 inch. Units used in exposed masonry surfaces in any one building shall have a uniform fine to medium texture and a uniform color.

2.2.3 Fire-Rated CMU

Specifications

Concrete masonry units used in fire-rated construction shown on the drawings shall be of minimum equivalent thickness for the fire rating indicated and the corresponding type of aggregates indicated in TABLE I. Units containing more than one of the aggregates listed in TABLE I will be rated on the aggregate requiring the greater minimum equivalent thickness to produce the required fire rating. Construction shall conform to ASTM E119.

TABLE I FIRE-RATED CONCRETE MASONRY UNITS See note (a) in Table III			
	Minimum equivalent thickness in inches for fire rating of:		
Aggregate Type	4 hours	3 hours	2 hours
Pumice	4.7	4.0	3.0
Expanded slag	5.0	4.2	3.3
Expanded clay, shale, or slate	5.7	4.8	3.7
Limestone, scoria, cinders or unexpanded slag	5.9	5.0	4.0
Calcareous gravel	6.2	5.3	4.2
Siliceous gravel	6.7	5.7	4.5

Minimum equivalent thickness shall equal net volume as determined in conformance with ASTM C140 divided by the product of the actual length and height of the face shell of the unit in inches. Where walls are to receive plaster or be faced with brick, or otherwise form an assembly; the thickness of plaster or brick or other material in the assembly will be included in determining the equivalent thickness. Submit calculation results.

2.3 PRECAST CONCRETE ITEMS

Trim, lintels, copings, splashblocks and door sills shall be factory-made units from a plant regularly engaged in producing precast concrete units. Unless otherwise indicated, concrete shall be 3000 psi minimum conforming to Section 03 30 00 CAST-IN-PLACE CONCRETE using 1/2 inch to No. 4 nominal-size coarse aggregate, and minimum reinforcement shall be the reinforcement required for handling of the units. Clearance of 3/4 inch shall be maintained between reinforcement and faces of units. Unless precast-concrete items have been subjected during manufacture to saturated-steam pressure of at least 120 psi for at least 5 hours, the items, after casting, shall be either damp-cured for 24 hours or steam-cured and shall then be aged under cover for 28 days or longer. Cast-concrete members weighing over 80 pounds shall have built-in loops of galvanized wire or other approved provisions for lifting and anchoring. Units shall have beds and joints at right angles to the face, with sharp true arises and shall be cast with drip grooves on the underside where units overhang walls. Exposed-to-view surfaces shall be free of surface voids, spalls,

Specifications

cracks, and chipped or broken edges. Precast units exposed-to-view shall be of uniform appearance and color. Unless otherwise specified, units shall have a smooth dense finish. Prior to use, each item shall be wetted and inspected for crazing. Items showing evidence of dusting, spalling, crazing, or having surfaces treated with a protective coating will be rejected. Submit specified factory certificates.

2.3.1 Lintels

Precast lintels, unless otherwise shown, shall be of a thickness equal to the wall and reinforced with two No. 4 bars for the full length. Top of lintels shall be labeled "TOP" or otherwise identified and each lintel shall be clearly marked to show location in the structure. In reinforced masonry, lintels shall conform to ACI 318 for flexural and shear strength and shall have at least 8 inches bearing at each end. Concrete shall have a minimum 28 day compressive strength of 3,000 psi using 1/2 inch to No. 4 nominal-size coarse aggregate. Reinforcement shall conform to ASTM A615/A615M Grade 60,000 psi. Limit lintel deflection due to dead plus live load to $L/600$ or 0.3 inches. Provide top and bottom bars for lintels over 36 inches in length.

2.4 MORTAR FOR STRUCTURAL MASONRY

ASTM C270, Type S. Strength (f'm) as indicated. Test in accordance with ASTM C780. Use portland cement Type I or II, except III may be used for cold-weather construction. Do not use admixtures containing chlorides. When structural reinforcement is incorporated, maximum air-content shall be 12 percent in cement-lime mortar and 18 percent in masonry cement mortar. Use up to 40 percent Class F fly ash with type IP cement in cement-lime mortar. Fly ash shall comply with ASTM C593.

2.5 MASONRY MORTAR

Type M mortar shall conform to ASTM C270 and shall be used for foundation walls. Mortar Type S N shall conform to the proportion specification of ASTM C270 except Type S cement-lime mortar proportions shall be 1 part cement, 1/2 part lime and 4-1/2 parts aggregate; Type N cement-lime mortar proportions shall be 1 part cement, 1 part lime and 6 parts aggregate.

Type N or S mortar shall be used for non-load-bearing, non-shear-wall interior masonry; and Type S for remaining masonry work; except where higher compressive strength is indicated on structural drawings. When masonry cement ASTM C91/C91M is used the maximum air content shall be limited to 12 percent and performance equal to cement-lime mortar shall be verified. Verification of masonry cement performance shall be based on ASTM C780 and ASTM C1072. Pointing mortar in showers and kitchens shall contain ammonium stearate, or aluminum tri-stearate, or calcium stearate in an amount equal to 3 percent by weight of cement used. Cement shall have a low alkali content and be of one brand. Aggregates shall be from one source.

2.5.1 Admixtures for Masonry Mortar

In cold weather, a non-chloride based accelerating admixture may be used subject to approval. Accelerating admixture shall be non-corrosive, shall contain less than 0.2 percent chlorides, and shall conform to ASTM C494/C494M, Type C. Submit the required certifications.

2.5.2 Hydrated Lime and Alternates

Hydrated lime shall conform to ASTM C207, Type S.

2.5.3 Cement

Portland cement shall conform to ASTM C150/C150M, Type I, II, or III. Containers shall bear complete instructions for proportioning and mixing to obtain the required types of mortar. Incorporate to the maximum

Specifications

extent, without conflicting with other requirements of this section, up to 40 percent fly ash, up to 70 percent slag, up to 10 percent cenospheres, and up to 10 percent silica fume. When masonry cement is used, submit the manufacturer's printed instructions on proportions of water and aggregates and on mixing to obtain the type of mortar required. Additives shall conform to requirements in Section 03 30 00 CAST-IN-PLACE CONCRETE .

2.5.4 Pre-Mixed Mortar

Pre-mixed mortar shall conform to ASTM C1142, Type RS . Submit pre-mixed mortar composition.

2.5.5 Sand and Water

Sand shall conform to ASTM C144. Water shall be clean, potable, and free from substances which could adversely affect the mortar.

2.6 GROUT AND READY-MIXED GROUT

Grout shall conform to ASTM C476, fine or coarse. Cement used in grout shall have a low alkali content. Grout slump shall be between 8 and 11 inches. Minimum grout strength shall be 2000 psi in 28 days, as tested by ASTM C1019. Use grout subject to the limitations of Table III. Do not change proportions and do not use materials with different physical or chemical characteristics in grout for the work unless additional evidence is furnished that the grout meets the specified requirements. Ready-Mixed grout shall conform to ASTM C94/C94M.

2.6.1 Admixtures for Grout

In cold weather, a non-chloride based accelerating admixture may be used subject to approval; accelerating admixture shall be non-corrosive, shall contain less than 0.2 percent chlorides, and shall conform to ASTM C494/C494M, Type C. In general, air-entrainment, anti-freeze or chloride admixtures shall not be used except as approved by the Contracting Officer. Submit required certifications.

2.6.2 Grout Barriers

Grout barriers for vertical cores shall consist of fine mesh wire, fiberglass, or expanded metal.

2.7 ANCHORS, TIES, AND BAR POSITIONERS

Anchors and ties shall be fabricated without drips or crimps and shall be zinc-coated in accordance with ASTM A153/A153M, Class B-2. Steel wire used for anchors and ties shall be fabricated from steel wire conforming to ASTM A82/A82M. Joint reinforcement in interior walls, and in exterior or interior walls exposed to moist environment shall conform to ASTM A641/A641M; coordinate with paragraph JOINT REINFORCEMENT below. Anchors and ties shall be sized to provide a minimum of 5/8 inch mortar cover from either face. Submit two anchors, ties and bar positioners of each type used, as samples.

2.7.1 Wire Mesh Ties

Wire mesh for tying 4 inch thick concrete masonry unit partitions to other intersecting masonry partitions shall be 1/2 inch mesh of minimum 16 gauge steel wire. Minimum lengths shall be not less than 12 inches.

2.7.2 Bar Positioners

Bar positioners, used to prevent displacement of reinforcing bars during the course of construction, shall be factory fabricated from 9 gauge steel wire or equivalent, and coated with a hot-dip galvanized finish. Not more than one wire shall cross the cell. Telescoping bar positioner shall be manufactured from AISI 1065

Specifications

spring steel and coated in accordance with ASTM B633.

2.8 JOINT REINFORCEMENT

Joint reinforcement shall be factory fabricated from steel wire conforming to ASTM A82/A82M, welded construction. Tack welding will not be acceptable in reinforcement used for wall ties. Wire shall have zinc coating conforming to ASTM A153/A153M, Class B-2. All wires shall be a minimum of 9 gauge. Reinforcement shall be ladder type design, having one longitudinal wire in the mortar bed of each face shell for hollow units and one wire for solid units. Joint reinforcement shall be placed a minimum of 5/8 inch cover from either face. The distance between crosswires shall not exceed 16 inches. Joint reinforcement for straight runs shall be furnished in flat sections not less than 10 feet long. Joint reinforcement shall be provided with factory formed corners and intersections. If approved for use, joint reinforcement may be furnished with adjustable wall tie features. Submit one piece of each type used, including corner and wall intersection pieces, showing at least two cross wires.

2.9 REINFORCING STEEL BARS AND RODS

Reinforcing steel bars and rods shall conform to ASTM A615/A615M, Grade 60.

PART 3 EXECUTION**3.1 PREPARATION**

Prior to start of work, masonry inspector shall verify the applicable conditions as set forth in ACI 530/530.1, inspection. The Owner will select a masonry inspector.

3.1.1 Protection

Ice or snow formed on the masonry bed shall be thawed by the application of heat. Heat shall be applied carefully until the top surface of the masonry is dry to the touch. Sections of masonry deemed frozen and damaged shall be removed before continuing construction of those sections.

- a. Air Temperature 40 to 32 Degrees F. Sand or mixing water shall be heated to produce mortar temperatures between 40 and 120 degrees F
- b. Air Temperature 32 to 25 Degrees F. Sand and mixing water shall be heated to produce mortar temperatures between 40 and 120 degrees F. Temperature of mortar on boards shall be maintained above freezing.
- c. Air Temperature 25 to 20 Degrees F. Sand and mixing water shall be heated to provide mortar temperatures between 40 and 120 degrees F. Temperature of mortar on boards shall be maintained above freezing. Sources of heat shall be used on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 15 mph.
- d. Air Temperature 20 Degrees F and below. Sand and mixing water shall be heated to provide mortar temperatures between 40 and 120 degrees F. Enclosure and auxiliary heat shall be provided to maintain air temperature above 32 degrees F. Temperature of units when laid shall not be less than 20 degrees F.

3.1.2 Completed Masonry and Masonry Not Being Worked On

- a. Mean daily air temperature 40 to 32 degrees F. Masonry shall be protected from rain or snow for 24 hours by covering with weather-resistive membrane.

Specifications

- b. Mean daily air temperature 32 to 25 degrees F. Masonry shall be completely covered with weather-resistant membrane for 24 hours.
- c. Mean Daily Air Temperature 25 to 20 degrees F. Masonry shall be completely covered with insulating blankets or equally protected for 24 hours.
- d. Mean Daily Temperature 20 degrees F and Below. Masonry temperature shall be maintained above 32 degrees F for 24 hours by enclosure and supplementary heat, by electric heating blankets, infrared heat lamps, or other approved methods.

3.1.3 Stains

Protect exposed surfaces from mortar and other stains. When mortar joints are tooled, remove mortar from exposed surfaces with fiber brushes and wooden paddles. Protect base of walls from splash stains by covering adjacent ground with sand, sawdust, or polyethylene.

3.1.4 Loads

Do not apply uniform loads for at least 12 hours or concentrated loads for at least 72 hours after masonry is constructed. Provide temporary bracing as required.

3.1.5 Surfaces

Clean surfaces on which masonry is to be placed of laitance, dust, dirt, oil, organic matter, or other foreign materials and slightly roughen to provide a surface texture with a depth of at least 1/8 inch. Sandblast, if necessary, to remove laitance from pores and to expose the aggregate.

3.2 LAYING MASONRY UNITS

- a. Coordinate masonry work with the work of other trades to accommodate built-in items and to avoid cutting and patching. Masonry units shall be laid in running bond pattern. Each unit shall be adjusted to its final position while mortar is still soft and plastic.
- b. Units that have been disturbed after the mortar has stiffened shall be removed, cleaned, and relaid with fresh mortar. Air spaces, cavities, chases, expansion joints, and spaces to be grouted shall be kept free from mortar and other debris. Units used in exposed masonry surfaces shall be selected from those having the least amount of chipped edges or other imperfections detracting from the appearance of the finished work. Vertical joints shall be kept plumb.
- c. Units being laid and surfaces to receive units shall be free of water film and frost. Solid units shall be laid in a nonfurrowed full bed of mortar. Mortar for veneer wythes shall be beveled and sloped toward the center of the wythe from the cavity side. Units shall be shoved into place so that the vertical joints are tight. Vertical joints of brick and the vertical face shells of concrete masonry units, except where indicated at control, expansion, and isolation joints, shall be completely filled with mortar. Mortar will be permitted to protrude up to 1/2 inch into the space or cells to be grouted. Means shall be provided to prevent mortar from dropping into the space below.

3.2.1 Forms and Shores

Provide bracing and scaffolding as required. Design bracing to resist wind pressure as required by local codes. Forms and shores shall be sufficiently rigid to prevent deflections which may result in cracking or other damage to supported masonry and sufficiently tight to prevent leakage of mortar and grout. Supporting forms and

Specifications

shores shall not be removed in less than 10 days.

3.2.2 Reinforced Concrete Masonry Units Walls

Where vertical reinforcement occurs, fill cores solid with grout. Lay units in such a manner as to preserve the unobstructed vertical continuity of cores to be filled. Embed the adjacent webs in mortar to prevent leakage of grout. Remove mortar fins protruding from joints before placing grout. Minimum clear dimensions of vertical cores shall be 2 by 3 inches. Position reinforcing accurately as indicated before placing grout. As masonry work progresses, secure vertical reinforcing in place at vertical intervals not to exceed 160 bar diameters. Use puddling rod or vibrator to consolidate the grout. Minimum clear distance between masonry and vertical reinforcement shall be not less than 1/2 inch. Unless indicated or specified otherwise, form splices by lapping bars not less than 40 bar diameters and wire tying them together.

3.2.3 Concrete Masonry Units

Units in piers, pilasters, columns, starting courses on footings, solid foundation walls, lintels, and beams, and where cells are to be filled with grout shall be full bedded in mortar under both face shells and webs. Other units shall be full bedded under both face shells. Head joints shall be filled solidly with mortar for a distance in from the face of the unit not less than the thickness of the face shell. Foundation walls below grade shall be grouted solid. Jamb units shall be of the shapes and sizes to conform with wall units. Solid units may be incorporated in the masonry work where necessary to fill out at corners, gable slopes, and elsewhere as approved. Double walls shall be stiffened at wall-mounted plumbing fixtures by use of strap anchors, two above each fixture and two below each fixture, located to avoid pipe runs, and extending from center to center of the double wall. Walls and partitions shall be adequately reinforced for support of wall-hung plumbing fixtures when chair carriers are not specified.

Specifications

3.2.4 Tolerances

Lay masonry plumb, true to line, with courses level. Keep bond pattern plumb throughout. Square corners unless noted otherwise. Except for walls constructed of prefaced concrete masonry units, lay masonry within the following tolerances (plus or minus unless otherwise noted):

TABLE II TOLERANCES	
Variation from the plumb in the lines and surfaces of columns, walls and arises	
In adjacent masonry units	1/8 inch
In 10 feet	1/4 inch
In 20 feet	3/8 inch
In 40 feet or more	1/2 inch
Variations from the plumb for external corners, expansion joints, and other conspicuous lines	
In 20 feet	1/4 inch
In 40 feet or more	1/2 inch
Variations from the level for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines	
In 20 feet	1/4 inch
In 40 feet or more	1/2 inch
Variation from level for bed joints and top surfaces of bearing walls	
In 10 feet	1/4 inch
In 40 feet or more	1/2 inch

Specifications

TABLE II TOLERANCES	
Variations from horizontal lines	
In 10 feet	1/4 inch
In 20 feet	3/8 inch
In 40 feet or more	1/2 inch
Variations in cross sectional dimensions of columns and in thickness of walls	
Minus	1/4 inch
Plus	1/2 inch

3.2.5 Cutting and Fitting

Full units of the proper size shall be used wherever possible, in lieu of cut units. Cutting and fitting, including that required to accommodate the work of others, shall be done by masonry mechanics using power masonry saws. Concrete masonry units may be wet or dry cut. Wet cut units, before being placed in the work, shall be dried to the same surface-dry appearance as uncut units being laid in the wall. Cut edges shall be clean, true and sharp. Openings in the masonry shall be made carefully so that wall plates, cover plates or escutcheons required by the installation will completely conceal the openings and will have bottoms parallel with the masonry bed joints. Reinforced masonry lintels shall be provided above openings over 12 inches wide for pipes, ducts, cable trays, and other wall penetrations, unless steel sleeves are used.

3.2.6 Jointing

Joints shall be tooled when the mortar is thumbprint hard. Horizontal joints shall be tooled last. Joints shall be brushed to remove all loose and excess mortar. Mortar joints shall be finished as follows:

3.2.6.1 Flush Joints

Joints in concealed masonry surfaces and joints at electrical outlet boxes in wet areas shall be flush cut. Flush cut joints shall be made by cutting off the mortar flush with the face of the wall. Joints in unparged masonry walls below grade shall be pointed tight. Flush joints for architectural units, such as fluted units, shall completely fill both the head and bed joints.

3.2.6.2 Tooled Joints

Joints in exposed interior masonry surfaces shall be tooled slightly concave. Joints shall be tooled with a jointer slightly larger than the joint width so that complete contact is made along the edges of the unit. Tooling shall be performed so that the mortar is compressed and the joint surface is sealed. Jointer of sufficient length shall be used to obtain a straight and true mortar joint.

3.2.6.3 Door and Window Frame Joints

Joints between frames and abutting masonry walls shall be raked to a depth of 3/8 inch.

Specifications

3.2.7 Joint Widths

Joint widths shall be as follows:

3.2.7.1 Concrete Masonry Units

Concrete masonry units shall have 3/8 inch joints, except for prefaced concrete masonry units.

3.2.8 Embedded Items

Fill spaces around built-in items with mortar. Point openings around flush-mount electrical outlet boxes in wet locations with mortar. Embed anchors, ties, wall plugs, accessories, flashing, pipe sleeves and other items required to be built-in as the masonry work progresses. Fully embed anchors, ties and joint reinforcement in the mortar. Fill cells receiving anchor bolts and cells of the first course below bearing plates with grout.

3.2.9 Unfinished Work

Step back unfinished work for joining with new work. Toothing may be resorted to only when specifically approved. Remove loose mortar and thoroughly clean the exposed joints before laying new work.

3.2.10 Masonry Wall Intersections

Masonry bond each course at corners and elsewhere as shown. Masonry walls shall be anchored or tied together at corners and intersections with bond beam reinforcement and prefabricated corner or tee pieces of joint reinforcement as shown.

3.2.11 Partitions

Partitions shall be continuous from floor to underside of floor or roof deck where shown. Openings in firewalls around joists or other structural members shall be filled as indicated or approved. Where suspended ceilings on both sides of partitions are indicated, the partitions other than those shown to be continuous may be stopped approximately 4 inches above the ceiling level. An isolation joint shall be placed in the intersection between partitions and structural or exterior walls as shown. Interior partitions having 4 inch nominal thick units shall be tied to intersecting partitions of 4 inch units, 5 inches into partitions of 6 inch units, and 7 inches into partitions of 8 inch or thicker units. Cells within vertical plane of ties shall be filled solid with grout for full height of partition or solid masonry units may be used. Interior partitions having masonry walls over 4 inches thick shall be tied together with joint reinforcement. Partitions containing joint reinforcement shall be provided with prefabricated pieces at corners and intersections or partitions.

3.3 MORTAR MIX

Mix mortar in a mechanically operated mortar mixer for at least 3 minutes, but not more than 5 minutes. Measure ingredients for mortar by volume. Ingredients not in containers, such as sand, shall be accurately measured by the use of measuring boxes. Mix water with the dry ingredients in sufficient amount to provide a workable mixture which will adhere to the vertical surfaces of masonry units. Retemper mortar that has stiffened because of loss of water through evaporation by adding water to restore the proper consistency and workability. Discard mortar that has reached its initial set or that has not been used within 2.5 hours after mixing.

Specifications

3.4 REINFORCING STEEL

Clean reinforcement of loose, flaky rust, scale, grease, mortar, grout, or other coating which might destroy or reduce its bond prior to placing grout. Bars with kinks or bends not shown on the drawings shall not be used. Reinforcement shall be placed prior to grouting. Unless otherwise indicated, vertical wall reinforcement shall extend to within 2 inches of tops of walls.

3.4.1 Positioning Bars

Vertical bars shall be accurately placed within the cells at the positions indicated on the drawings. A minimum clearance of 1/2 inch shall be maintained between the bars and masonry units. Minimum clearance between parallel bars shall be one diameter of the reinforcement. Vertical reinforcing may be held in place using bar positioners located near the ends of each bar and at intermediate intervals of not more than 192 diameters of the reinforcement. Column and pilaster ties shall be wired in position around the vertical steel. Ties shall be in contact with the vertical reinforcement and shall not be placed in horizontal bed joints.

3.4.2 Splices

Bars shall be lapped a minimum of 48 diameters of the reinforcement. Welded or mechanical connections shall develop at least 125 percent of the specified yield strength of the reinforcement.

3.5 JOINT REINFORCEMENT INSTALLATION

Joint reinforcement shall be installed at 16 inches on center or as indicated. Reinforcement shall be lapped not less than 6 inches. Prefabricated sections shall be installed at corners and wall intersections. The longitudinal wires of joint reinforcement shall be placed to provide not less than 5/8 inch cover to either face of the unit.

3.6 PLACING GROUT

Fill cells containing reinforcing bars with grout. Hollow masonry units in walls or partitions supporting plumbing, heating, or other mechanical fixtures, voids at door and window jambs, and other indicated spaces shall be filled solid with grout. Cells under lintel bearings on each side of openings shall be filled solid with grout for full height of openings. Walls below grade, lintels, and bond beams shall be filled solid with grout. Units other than open end units may require grouting each course to preclude voids in the units. Grout not in place within 1-1/2 hours after water is first added to the batch shall be discarded. Sufficient time shall be allowed between grout lifts to preclude displacement or cracking of face shells of masonry units. If blowouts, flowouts, misalignment, or cracking of face shells should occur during construction, the wall shall be torn down and rebuilt.

3.6.1 Vertical Grout Barriers for Fully Grouted Walls

Provide grout barriers not more than 30 feet apart, or as required, to limit the horizontal flow of grout for each pour.

3.6.2 Horizontal Grout Barriers

Embed grout barriers in mortar below cells of hollow units receiving grout.

Specifications

3.6.3 Grout Holes and Cleanouts**3.6.3.1 Grout Holes**

Provide grouting holes in slabs, spandrel beams, and other in-place overhead construction. Locate holes over vertical reinforcing bars or as required to facilitate grout fill in bond beams. Provide additional openings spaced not more than 16 inches on centers where grouting of all hollow unit masonry is indicated. Openings shall not be less than 4 inches in diameter or 3 by 4 inches in horizontal dimensions. Upon completion of grouting operations, plug and finish grouting holes to match surrounding surfaces.

3.6.3.2 Cleanouts for Hollow Unit Masonry Construction

Provide cleanout holes at the bottom of every pour in cores containing vertical reinforcement when the height of the grout pour exceeds 5 feet. Where all cells are to be grouted, construct cleanout courses using bond beam units in an inverted position to permit cleaning of all cells. Provide cleanout holes at a maximum spacing of 32 inches where all cells are to be filled with grout. Establish a new series of cleanouts if grouting operations are stopped for more than 4 hours. Cleanouts shall not be less than 3 by 4 inch openings cut from one face shell. Manufacturer's standard cutout units may be used at the Contractor's option. Cleanout holes shall not be closed until masonry work, reinforcement, and final cleaning of the grout spaces have been completed and inspected. For walls which will be exposed to view, close cleanout holes in an approved manner to match surrounding masonry.

3.6.4 Grouting Equipment**3.6.4.1 Grout Pumps**

Pumping through aluminum tubes will not be permitted. Operate pumps to produce a continuous stream of grout without air pockets, segregation, or contamination. Upon completion of each day's pumping, remove waste materials and debris from the equipment, and dispose of outside the masonry.

3.6.4.2 Vibrators

Internal vibrators shall maintain a speed of not less than 5,000 impulses per minute when submerged in the grout. Maintain at least one spare vibrator at the site at all times. Apply vibrators at uniformly spaced points not further apart than the visible effectiveness of the machine. Limit duration of vibration to time necessary to produce satisfactory consolidation without causing segregation.

3.6.5 Grout Placement

Lay masonry to the top of a pour before placing grout. Do not place grout in two-wythe solid unit masonry cavity until mortar joints have set for at least 3 days during hot weather and 5 days during cold damp weather. Grout shall not be placed in hollow unit masonry until mortar joints have set for at least 24 hours. Grout shall be placed using a hand bucket, concrete hopper, or grout pump to completely fill the grout spaces without segregation of the aggregates. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. The height of grout pours and type of grout used shall be limited by the dimensions of grout spaces as indicated in Table III. Low-lift grout methods may be used on pours up to and including 5 feet in height. High-lift grout methods shall be used on pours exceeding 5 feet in height.

3.6.5.1 Low-Lift Method

Grout shall be placed at a rate that will not cause displacement of the masonry due to hydrostatic pressure of the grout. Mortar protruding more than 1/2 inch into the grout space shall be removed before beginning the grouting operation. Grout pours 12 inches or less in height shall be consolidated by

Specifications

mechanical vibration or by puddling. Grout pours over 12 inches in height shall be consolidated by mechanical vibration and reconsolidated by mechanical vibration after initial water loss and settlement has occurred. Vibrators shall not be inserted into lower pours that are in a semi-solidified state. Low-lift grout shall be used subject to the limitations of Table III.

3.6.5.2 High-Lift Method

Mortar droppings shall be cleaned from the bottom of the grout space and from reinforcing steel. Mortar protruding more than 1/4 inch into the grout space shall be removed by dislodging the projections with a rod or stick as the work progresses. Reinforcing, bolts, and embedded connections shall be rigidly held in position before grouting is started. CMU units shall not be pre-wetted. Grout, from the mixer to the point of deposit in the grout space shall be placed as rapidly as practical by pumping and placing methods which will prevent segregation of the mix and cause a minimum of grout splatter on reinforcing and masonry surfaces not being immediately encased in the grout lift. The individual lifts of grout shall be limited to 4 feet in height. The first lift of grout shall be placed to a uniform height within the pour section and vibrated thoroughly to fill all voids. This first vibration shall follow immediately behind the pouring of the grout using an approved mechanical vibrator. After a waiting period sufficient to permit the grout to become plastic, but before it has taken any set, the succeeding lift shall be poured and vibrated 12 to 18 inches into the preceding lift. If the placing of the succeeding lift is going to be delayed beyond the period of workability of the preceding, each lift shall be reconsolidated by reworking with a second vibrator as soon as the grout has taken its settlement shrinkage. The waiting, pouring, and reconsolidation steps shall be repeated until the top of the pour is reached. The top lift shall be reconsolidated after the required waiting period. The high-lift grouting of any section of wall between vertical grout barriers shall be completed to the top of a pour in one working day unless a new series of cleanout holes is established and the resulting horizontal construction joint cleaned. High-lift grout shall be used subject to the limitations in Table III.

TABLE III
POUR HEIGHT AND TYPE OF GROUT FOR VARIOUS GROUT SPACE DIMENSIONS

Maximum Grout Pour Height feet (4)	Grout Type	Grouting Procedure	Minimum Dimensions of the Total Clear Areas Within Grout Spaces and Cells in inches (1,2)	
			Multiwythe Masonry (3)	Hollow-unit Masonry
1	Fine	Low Lift	3/4	1-1/2 x 2
5	Fine	Low Lift	2	2 x 3
8	Fine	High Lift	2	2 x 3
12	Fine	High Lift	2-1/2	2-1/2 x 3
24	Fine	High Lift	3	3 x 3
1	Coarse	Low Lift	1-1/2	1-1/2 x 3
5	Coarse	Low Lift	2	2-1/2 x 3

Specifications

8	Coarse	High Lift	2	3 x 3
12	Coarse	High Lift	2-1/2	3 x 3
24	Coarse	High Lift	3	3 x 4

Notes:

- (1) The actual grout space or cell dimension shall be larger than the sum of the following items:
 - (a) The required minimum dimensions of total clear areas given in the table above;
 - (b) The width of any mortar projections within the space;
 - (c) The horizontal projections of the diameters of the horizontal reinforcing bars within a cross section of the grout space or cell.
- (2) The minimum dimensions of the total clear areas shall be made up of one or more open areas, with at least one area being 3/4 inch or greater in width.
- (3) For grouting spaces between masonry wythes.
- (4) Where only cells of hollow masonry units containing reinforcement are grouted, the maximum height of the pour shall not exceed the distance between horizontal bond beams.

3.7 BOND BEAMS

Bond beams shall be filled with grout and reinforced as indicated on the drawings. Grout barriers shall be installed under bond beam units to retain the grout as required. Reinforcement shall be continuous, including around corners, except through control joints or expansion joints, unless otherwise indicated on the drawings. Where splices are required for continuity, reinforcement shall be lapped 48 bar diameters. A minimum clearance of 1/2 inch shall be maintained between reinforcement and interior faces of units.

3.8 LINTELS

3.8.1 Masonry Lintels

Construct masonry lintels with lintel units filled solid with grout in all courses and reinforced with a minimum of two No. 4 bars in the bottom course unless otherwise indicated on the drawings. Lintel reinforcement shall extend beyond each side of masonry opening 40 bar diameters or 24 inches, whichever is greater. Reinforcing bars shall be supported in place prior to grouting and shall be located 1/2 inch above the bottom inside surface of the lintel unit.

3.8.2 Precast Concrete and Steel Lintels

Construct precast concrete and steel lintels as shown on the drawings. Lintels shall be set in a full bed of mortar with faces plumb and true. Steel and precast lintels shall have a minimum bearing length of 8 inches unless otherwise indicated on the drawings.

3.9 POINTING AND CLEANING

After mortar joints have attained their initial set, but prior to hardening, completely remove mortar and grout daubs or splashings from masonry-unit surfaces that will be exposed or painted. Before completion

Specifications

of the work, defects in joints of masonry to be exposed or painted shall be raked out as necessary, filled with mortar, and tooled to match existing joints. Immediately after grout work is completed, scum and stains which have percolated through the masonry work shall be removed using a high pressure stream of water and a stiff bristled brush. Masonry surfaces shall not be cleaned, other than removing excess surface mortar, until mortar in joints has hardened. Masonry surfaces shall be left clean, free of mortar daubs, dirt, stain, and discoloration, including scum from cleaning operations, and with tight mortar joints throughout. Metal tools and metal brushes shall not be used for cleaning.

3.9.1 Dry-Brushing

Exposed concrete masonry unit shall be dry-brushed at the end of each day's work and after any required pointing, using stiff-fiber bristled brushes.

3.10 BEARING PLATES

Set bearing plates for beams, joists, joist girders and similar structural members to the proper line and elevation with damp-pack bedding mortar, except where non-shrink grout is indicated. Bedding mortar and non-shrink grout shall be as specified in Section 03 30 00 CAST-IN-PLACE CONCRETE.

3.11 PROTECTION

Protect facing materials against staining. Cover top of walls with nonstaining waterproof covering or membrane when work is not in progress. Covering of the top of the unfinished walls shall continue until the wall is waterproofed with a complete roof or parapet system. Covering shall extend a minimum of 2 feet down on each side of the wall and shall be held securely in place. Before starting or resuming, top surface of masonry in place shall be cleaned of loose mortar and foreign material.

3.12 WASTE MANAGEMENT

Manage waste according to the Waste Management Plan and as follows. Minimize water used to wash mixing equipment. Use trigger operated spray nozzles for water hoses.

3.12.1 Separate and Recycle Waste

Place materials defined as hazardous or toxic waste in designated containers. Fold up metal banding, flatten, and place in designated area for recycling. Collect wood packing shims and pallets and place in designated area. Use leftover mixed mortar as underground utility pipe kickers where lower strength mortar meets the requirements for bulk fill. Separate masonry waste and place in designated area for use as structural fill. Separate selected masonry waste and excess for landscape uses, either whole or crushed as ground cover.

3.13 TEST REPORTS**3.13.1 Field Testing of Mortar**

Take at least three specimens of mortar each day. Spread a layer of mortar 1/2 to 5/8 inch thick on the masonry units and allowed to stand for one minute. Prepare and test the specimens for compressive strength in accordance with ASTM C780. Submit test results.

3.13.2 Field Testing of Grout

Field sampling and testing of grout shall be in accordance with the applicable provisions of ASTM C1019. A minimum of three specimens of grout per day shall be sampled and tested. Each specimen shall have a

Specifications

minimum ultimate compressive strength of 2000 psi at 28 days. Submit test results.

3.13.3 Prism Tests

Perform at least one prism test sample for each 5,000 square feet of wall but not less than three such samples shall be made for any building. Three prisms will be used in each sample. Prisms shall be tested in accordance with ACI 530/530.1. Seven-day tests may be used provided the relationship between the 7- and 28-day strengths of the masonry is established by the tests of the materials used. Compressive strength shall not be less than 1900psi at 28 days. If the compressive strength of any prism falls below the specified value by more than 500 psi, steps shall be taken to assure that the load-carrying capacity of the structure is not jeopardized. If the likelihood of low-strength masonry is confirmed and computations indicate that the load-carrying capacity may have been significantly reduced, tests of cores drilled, or prisms sawed, from the area in question may be required. In such case, three specimens shall be taken for each prism test more than 500 psi below the specified value. Masonry in the area in question shall be considered structurally adequate if the average compressive strength of three specimens is equal to at least 85 percent of the specified value, and if the compressive strength of no single specimen is less than 75 percent of the specified value. Additional testing of specimens extracted from locations represented by erratic core or prism strength test results will be permitted. Submit test results.

-- End of Section --

04 22 00 - CONCRETE UNIT MASONRY**1.1 PERFORMANCE REQUIREMENTS**

- A. Net-Area Compressive Strengths of Unit Masonry: As indicated.
- B. Determine net-area compressive strength of masonry by unit-strength method.

1.2 QUALITY ASSURANCE

- A. Preconstruction Testing: Owner engaged.

1.3 MATERIALS

- A. Concrete Masonry Units (CMUs):
 - 1. Manufactured within 500 miles of Project site from aggregates and cement extracted and manufactured within 500 miles of Project site.
 - 2. Units made with integral water repellent for exposed units and where indicated.
 - 3. CMUs: Normal weight.
- B. Concrete and Masonry Lintels: Precast units matching CMUs precast or formed-in-place concrete or prefabricated or built-in-place CMU lintels.
- C. Reinforcing Steel: Uncoated steel reinforcing bars.
- D. Masonry Joint Reinforcement:
 - 1. Interior Walls: Mill- or Hot-dip galvanized, carbon steel.
 - 2. Exterior Walls: Hot-dip galvanized, carbon or Stainless steel.
- E. Ties and Anchors: Galvanized or Stainless steel.
 - 1. Adjustable anchors for connecting to structural steel framing.
 - 2. Adjustable anchors for connecting to concrete.
 - 3. Partition top anchors.
 - 4. Rigid anchors.
- F. Embedded Flashing:
 - 1. All Flashing: Stainless steel
 - 2. Partially Exposed Flashing: Stainless steel.
 - 3. Concealed (Flexible) Flashing: Copper laminated asphalt-coated copper rubberized asphalt elastomeric thermoplastic or EPDM.
 - a. Used with stainless-steel sealant stop.



Specifications

- 4. Single-Wythe CMU Flashing System: Polyethylene flashing pans and interlocking web covers.
- G. Reinforcing bar positioners.
- H. Masonry-Cell Insulation: Loose-granular perlite or molded-polystyrene units.
- I. Mortar:
 - 1. Aggregates, cement, and lime extracted and manufactured within 500 miles of Project site.
 - 2. Portland cement-lime masonry cement or mortar cement mortar unless otherwise indicated.
 - 3. Portland cement-lime masonry cement or mortar cement for exterior masonry.
 - 4. Portland cement-lime masonry cement or mortar cement for reinforced masonry.
 - 5. Pigmented or Colored aggregate mortar for exposed mortar joints.

1.4 FIELD QUALITY CONTROL

- A. Testing Agency: Owner engaged.
- B. Inspections: Level 1 special inspections according to the "International Building Code."
- C. Testing: One set of tests.

1.5 MASONRY WASTE DISPOSAL

- A. Clean masonry waste recycled as fill material.

END OF SECTION 04 22 00



Specifications

05 12 00 - STRUCTURAL STEEL FRAMING

1.1 SUMMARY

- A. Structural steel as classified by AISC 303.
- B. Prefabricated building columns.
- C. Grout.

1.2 PERFORMANCE REQUIREMENTS

- A. Fabricator to select or complete connections, including engineering analysis by a qualified professional engineer, to withstand design loads.

1.3 QUALITY ASSURANCE

- A. Fabricator Qualifications: AISC-Certified Plant, Category STD.
- B. Installer Qualifications: AISC-Certified Erector, Category ACSE.
- C. Shop-Painting Applicator Qualifications: AISC's Sophisticated Paint Endorsement P1 or SSPC-QP 3.
- D. Quality Standards: AISC 303 and AISC 360.

1.4 MATERIALS

- A. Recycled Content of Steel: Postconsumer plus one-half of preconsumer recycled content not less than 25 percent.
 - 1. W-Shapes: 60 percent.
 - 2. Channels, Angles-Shapes: 60 percent.
 - 3. Plate and Bar: 25 percent.
 - 4. Cold-Formed Hollow Structural Sections: 25 percent.
 - 5. Steel Pipe: 25 percent.
 - 6. All Other Steel Materials: 25 percent.
- B. Structural-Steel Shapes: W-shapes, channels, angles plate, and bar cold-formed hollow structural sections and steel pipe.
- C. Steel castings.
- D. Steel forgings.
- E. Bolts, Nuts, and Washers: High strength, Tension control, high strength.



Specifications

- F. Anchor Rods: Unheaded, Headed rods, nuts, plate washers, and washers.
- G. Connectors: Shear connectors, threaded rods, clevises, turnbuckles, eye bolts and nuts and sleeve nuts.
- H. Structural slide bearings.
- I. Primer: Fabricator's standard, nonasphaltic.
 - 1. Primers comply with LEED for Schools Credit IEQ 4.
- J. Grout: Nonmetallic, shrinkage resistant.
- K. Prefabricated Building Columns:
 - 1. Fire-Resistance Rating: As indicated.

1.5 FABRICATION

- A. Shop Connections:
 - 1. High-Strength Bolts: Slip critical.
 - 2. Welded connections.
- B. Galvanizing: Hot dip.

1.6 SOURCE QUALITY CONTROL

- A. Testing Agency: Owner engaged.

1.7 INSTALLATION

- A. Field Connections:
 - 1. High-Strength Bolts: Slip critical.
 - 2. Welded connections.

1.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner engaged.

END OF SECTION 05 12 00

05 40 00 - COLD-FORMED METAL FRAMING**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN IRON AND STEEL INSTITUTE (AISI)

AISI S100	(2007; Supp 1: 2009; Supp 2: 2010) North American Specification for the Design of Cold-Formed Steel Structural Members
AISI S200	(2007) North American Standard for Cold-Formed Steel Framing - General Provision
AISI S201	(2007) North American Standard for Cold-Formed Steel Framing - Product Data
AISI S202	(2011) Code of Standard Practice for Cold-formed Steel Structural Framing
AISI S211	(2007) North American Standard for Cold-Formed Steel Framing - Wall Stud Design
AISI S212	(2007) North American Standard for Cold-Formed Steel Framing - Header Design
AISI S213	(2007; Suppl 1 2009) North American Standard for Cold-Formed Steel Framing - Lateral Design
AISI SG02-KIT	(2001; Supp 1 2004) North American Specification for the Design of Cold-Formed Steel Structural Members
AISI SG03-3	(2002; Suppl 2001-2004; R 2008) Cold-Formed Steel Design Manual Set AMERICAN WI

ASTM INTERNATIONAL (ASTM)

ASTM A1003/A1003M	(2013) Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members
ASTM A123/A123M	(2012) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153/A153M	(2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

Specifications

ASTM A653/A653M	(2011) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C1007	(2011a) Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories
ASTM C1513	(2013) Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections
ASTM C955	(2011c) Load-Bearing (Transverse and Axial) Steel Studs, Runners (Tracks), and Bracing or Bridging for Screw Application of Gypsum Panel Products and Metal Plaster Bases
ASTM F1941	(2010) Standard Specification for Electrodeposited Coatings on Threaded Fasteners (Unified Inch Screw Threads (UN/UNR))

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Steel studs, joists, tracks, bracing, bridging and accessories

LEED Submittals: Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to job site and store in adequately ventilated, dry locations. Storage area shall permit easy access for inspection and handling. If necessary to store materials outside, stack off the ground, support on a level platform, and protect from the weather as approved. Handle materials to prevent damage. Finish of the framing members shall be maintained at all times, using an approved high zinc dust content, galvanizing repair paint whenever necessary to prevent the formation of rust. Replace damaged items with new, as directed by the Architect. Steel framing and related accessories shall be stored and handled in accordance with the AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing".

1.4 QUALITY ASSURANCE

- a. Engineering Responsibility: Preparation of Shop Drawings, design calculations, and other structural data by a qualified professional engineer.
- b. Professional Engineer Qualifications: A professional engineer who is legally qualified to practice in jurisdiction where project is located and who is experienced in providing engineering services of the kind indicated. Engineering services are defined as those performed for installations of cold-formed metal framing that are similar to those indicated for this project in material, design, and extent.

Specifications

- c. Product Tests: Mill certificates or data from a qualified independent testing agency, or in-house testing with calibrated test equipment indicating steel sheet complies with requirements, including base-metal thickness, yield strength, tensile strength, total elongation, chemical requirements, and metallic-coating thickness.
- d. AISI Specifications and Standards: Comply with:
 - 1. AISI S100, "North American Specification for the Design of Cold-Formed Steel Structural Members".
 - 2. AISI S200, "North American Standard for Cold-Formed Steel Framing General Provision".
 - 3. AISI S201, "North American Standard for Cold-Formed Steel Framing Product Data".
 - 4. AISI S202, "Code of Standard Practice for Cold-Formed Steel Structural Framing".
 - 5. AISI S211, "North American Standard for Cold-Formed Steel Framing Wall Stud Design".
 - 6. AISI S212, "North American Standard for Cold-Formed Steel Framing Header Design".
 - 7. AISI S213, "North American Standard for Cold-Formed Steel Framing Lateral Design".

1.4.1 Drawing Requirements

Submit framing components to show sizes, thicknesses, layout, material designations, methods of installation, and accessories.

1.4.2 Design Data Required

Submit metal framing calculations to verify sizes, gages, and spacing of members and connections. Show methods and practices used in installation.

PART 2 PRODUCTS

2.1 STEEL STUDS, TRACKS, BRACING, BRIDGING AND ACCESSORIES

Framing components shall comply with ASTM C955 and the following.

- a. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
- b. Steel Sheet: ASTM A1003/A1003M, Structural Grade, Type H, metallic coated, of grade and coating weight as follows:
 - 1. Grade: ST33H (ST230H) or as required by structural performance.
 - 2. Coating: G90 (Z275).
- c. Steel Studs: Manufacturer's standard C-shaped steel studs, of web depths indicated, punched, with stiffened flanges, and as follows:

Specifications

1. Minimum Base-Metal Thickness: 0.0538 inch.

d. Steel Track: Manufacturer's standard U-shaped steel track, of web depths indicated, unpunched, with straight flanges, and as follows:

1. Minimum Base-Metal Thickness: 0.0538 inch.

2.1.1 Studs and Joists of 16 Gage (0.0538 Inch) and Heavier

Galvanized steel, ASTM A653/A653M and ASTM A1003/A1003M, SS Grade 50, G90.

2.2 MARKINGS

Studs and track shall have product markings stamped on the web of the section. The markings shall be repeated throughout the length of the member at a maximum spacing of 4 feet on center and shall be legible and easily read. The product marking shall include the following:

- a. An ICC number.
- b. Manufacturer's identification.
- c. Minimum delivered uncoated steel thickness.
- d. Protective coating designator.
- e. Minimum yield strength.

2.3 CONNECTIONS

Screws for steel-to-steel connections shall be self-drilling, tapping screws in compliance with ASTM C1513 of the type, size and location as shown on the drawings. Electroplated screws shall have a minimum 5 micron zinc coating in accordance with ASTM F1941. Screws, bolts, and anchors shall be hot-dipped galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M as appropriate. Screws bolts, and anchors shall be hot dipped galvanized in accordance with ASTM A123/A123M or ASTM A153/A153M as appropriate.

2.4 PLASTIC GROMMETS

Supply plastic grommets, recommended by stud manufacturer, to protect electrical wires.
Prevent metal to metal contact for plumbing pipes.

PART 3 EXECUTION

3.1 FASTENING

Fasten framing members together by using self-drilling or self-tapping screws. Screw connections shall be as required and indicated in the design calculations.

3.1.1 Screws

Screws shall be of the self-drilling self-tapping type. Screw penetration through joined materials shall not be less than three exposed threads. Minimum spacings and edge distances for screws shall be as specified in AISI SG02-KIT. Screws covered by sheathing materials shall have low profile heads.

Specifications**3.1.2 Anchors**

Anchors shall be of the type, size, and location shown on the drawings.

3.1.3 Powder-Actuated Fasteners

Powder-actuated fasteners shall be of the type, size, and location shown on the drawings.

3.2 INSTALLATION

Install cold-formed framing in accordance with ASTM C1007 and AISI S200.

Install cold-formed steel framing according to AISI S202 and to manufacturer's written instructions unless more stringent requirements are indicated.

3.2.1 Tracks

Provide accurately aligned runners. Anchor tracks as indicated in design calculations.

3.2.2 Studs

Cut studs square and set with firm bearing against webs of tracks. Position studs in tracks and space as indicated in design. Do not splice studs. Provide at least two studs at openings 2 feet wide or larger. Provide jack studs at openings, as necessary, to maintain indicated stud spacing. Fasten studs to tracks by screwing both flanges to the tracks. Framed openings shall include headers and supporting components as shown on the drawings. Headers shall be installed in all openings that are larger than the stud spacing. Provide bracing in accordance with the design calculations and AISI SG03-3, consisting of, as a minimum, runner channel cut to fit between the studs or hot- or cold-rolled steel channels inserted through cutouts in web of each stud and secured to studs with welded clip angles. Bracing shall be not less than the following:

<u>LOAD</u>	<u>HEIGHT</u>	<u>BRACING</u>
Wind load only	Up to 10 feet	One row at mid-height
	Over 10 feet	Rows 5'-0" o.c. maximum
Axial load	Up to 10 feet	Two rows at 1/3 points
	Over 10 feet	Rows 3'-4" o.c. maximum

3.2.3 Erection Tolerances

- a. Framing members which will be covered by finishes such as wallboard, plaster, or ceramic tile set in a mortar setting bed, shall be within the following limits:

- (1) Layout of framing: 1/4 inch from intended position;



Specifications

- (2) Plates and runners: 1/8 inch in 8 feet from a straight line;
- (3) Studs: 1/8 inch in 8 feet out of plumb, not cumulative; and
- (4) Face of framing members: 1/8 inch in 8 feet from a true plane.

-- End of Section --

05 50 13 - MISCELLANEOUS METAL FABRICATIONS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ALUMINUM ASSOCIATION (AA)

AA DAF45 (2003; Reaffirmed 2009) Designation System for Aluminum Finishes

AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC)

AISC 303 (2010) Code of Standard Practice for Steel Buildings and Bridges

AISC 360 (2010) Specification for Structural Steel Buildings

AMERICAN SOCIETY OF SAFETY ENGINEERS (ASSE/SAFE)

ASSE/SAFE A10.3 (2006) Operations - Safety Requirements for Powder Actuated Fastening Systems

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2012; Errata 2011) Structural Welding Code - Steel

ASME INTERNATIONAL (ASME)

ASME B18.2.1 (2012) Square and Hex Bolts and Screws (Inch Series)

ASME B18.2.2 (2010) Standard for Square and Hex Nuts

ASME B18.21.1 (2009) Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series)

ASME B18.21.2M (1999; R 2005) Lock Washers (Metric Series)

ASME B18.22M (1981; R 2010) Metric Plain Washers

ASME B18.6.2 (1998; R 2010) Slotted Head Cap Screws, Square Head Set Screws, and Slotted Headless Set Screws: Inch Series

ASME B18.6.3 (2010) Machine Screws, Tapping Screws, and Machine Drive Screws (Inch Series)

Specifications

ASTM INTERNATIONAL (ASTM)

ASTM A123/A123M	(2012) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products
ASTM A153/A153M	(2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A283/A283M	(2012a) Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates
ASTM A307	(2012) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength
ASTM A36/A36M	(2012) Standard Specification for Carbon Structural Steel
ASTM A47/A47M	(1999; R 2009) Standard Specification for Ferritic Malleable Iron Castings
ASTM A48/A48M	(2003; R 2012) Standard Specification for Gray Iron Castings
ASTM A500/A500M	(2010a) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes
ASTM A53/A53M	(2012) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A6/A6M	(2013) Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling
ASTM A653/A653M	(2011) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A780/A780M	(2009) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings
ASTM A924/A924M	(2013) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process
ASTM B108/B108M	(2012; E 2012) Standard Specification for Aluminum-Alloy Permanent Mold Castings
ASTM B209	(2010) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B209M	(2010) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate (Metric)
ASTM B221	(2012) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

Specifications

ASTM B221M	(2012a) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric)
ASTM B26/B26M	(2012) Standard Specification for Aluminum-Alloy Sand Castings
ASTM C1513	(2013) Standard Specification for Steel Tapping Screws for Cold-Formed Steel Framing Connections
ASTM D1187/D1187M	(1997; E 2011; R 2011) Asphalt-Base Emulsions for Use as Protective Coatings for Metal
PAINTERS INSITUTE (MPI)	
MPI 79	(Oct 2009) Alkyd Anti-Corrosive Metal Primer
NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)	
NAAMM MBG 531	(2009) Metal Bar Grating Manual
U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)	
29 CFR 1910.27	Fixed Ladders

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Access doors and panels, installation drawings
Floor gratings and roof walkways, installation drawings
Ladders, installation drawings
Metal Stair Systems

Submit fabrication drawings showing layout(s), connections to structural system, and anchoring details as specified in AISC 303.

Submit templates, erection and installation drawings indicating thickness, type, grade, class of metal, and dimensions. Show construction details, reinforcement, anchorage, and installation with relation to the building construction.

SD-03 Product Data

Access doors and panels
Floor gratings and roof walkways
Ladders
Steel Stairs

Certificates

Welding Qualification

Specifications

LEED Submittals

Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

1.3 QUALIFICATION OF WELDERS

Qualify welders in accordance with AWS D1.1/D1.1M. Use procedures, materials, and equipment of the type required for the work.

1.4 DELIVERY, STORAGE, AND PROTECTION

Protect from corrosion, deformation, and other types of damage. Store items in an enclosed area free from contact with soil and weather. Remove and replace damaged items with new items.

PART 2 PRODUCTS**2.1 GENERAL REQUIREMENTS**

Submit complete and detailed fabrication drawings for all iron and steel hardware, and for all steel shapes, plates, bars and strips used in accordance with the design specifications referenced in this section.

Pre-assemble items in the shop to the greatest extent possible. Disassemble units only to the extent necessary for shipping and handling. Clearly mark units for reassembly and coordinated installation.

For the fabrication of work exposed to view, use only materials that are smooth and free of surface blemishes, including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and application of surface finishes, including zinc coatings.

2.2 MATERIALS

2.2.1 Structural Carbon Steel ASTM A36/A36M.

2.2.2 Steel plates - bent or cold-formed, conforming to ASTM A283/A283M, Grade C.

2.2.3 Steel bars and bar-size shapes, conforming to ASTM A36/A36M, unless otherwise noted for steel bars and bar-size shapes.

2.2.4 Structural Tubing ASTM A500/A500M.

2.2.5 Steel Pipe ASTM A53/A53M, Type E or S, Grade B.

2.2.6 Fittings for Steel Pipe, Standard malleable iron fittings ASTM A47/A47M.

2.2.7 Gratings

a. Gray cast iron ASTM A48/A48M, Class 40.

b. Metal plank grating, non-slip requirement, steel ASTM A653/A653M, Z275 G90.

c. Metal bar type grating NAAMM MBG 531.

Specifications

2.2.8 Anchor Bolts ASTM A307. Where exposed, shall be of the same material, color, and finish as the metal to which applied.

2.2.8.1 Lag Screws and Bolts ASME B18.2.1, type and grade best suited for the purpose.

2.2.8.2 Bolts, Nuts, Studs and Rivets ASME B18.2.2 or ASTM A307.

2.2.8.3 Powder Actuated Fasteners Follow safety provisions of ASSE/SAFE A10.3.

2.2.8.4 Screws ASME B18.2.1, ASME B18.6.2, ASME B18.6.3 and ASTM C1513.

2.2.8.5 Washers

Provide plain washers to conform to ASME B18.22M ASME B18.21.1. Provide beveled washers for American Standard beams and channels, square or rectangular, tapered in thickness, and smooth. Provide lock washers to conform to ASME B18.21.2M ASME B18.21.1.

2.2.9 Aluminum Alloy Products

Conform to ASTM B209M ASTM B209 for sheet plate, ASTM B221M ASTM B221 for extrusions and ASTM B26/B26M or ASTM B108/B108M for castings, as applicable. Provide aluminum extrusions at least 3 mm 1/8 inch thick and aluminum plate or sheet at least 1.3 mm 0.050 inch thick.

2.3 FABRICATION FINISHES

2.3.1 Galvanizing

Hot-dip galvanize items specified to be zinc-coated, after fabrication where practicable. Galvanizing: ASTM A123/A123M, ASTM A153/A153M, ASTM A653/A653M or ASTM A924/A924M, Z275 G90, as applicable.

2.3.2 Galvanize

Anchor bolts, grating fasteners, washers, and parts or devices necessary for proper installation, unless indicated otherwise.

2.3.3 Repair of Zinc-Coated Surfaces

Repair damaged surfaces with galvanizing repair method and paint conforming to ASTM A780/A780M or by application of stick or thick paste material specifically designed for repair of galvanizing, as approved by Architect. Clean areas to be repaired and remove slag from welds. Heat surfaces to which stick or paste material is applied, with a torch to a temperature sufficient to melt the metallics in stick or paste; spread molten material uniformly over surfaces to be coated and wipe off excess material.

2.3.4 Nonferrous Metal Surfaces

Protect by plating, anodic, or organic coatings.

2.4 ACCESS DOORS AND PANELS

Provide flush type access doors and panels unless otherwise indicated. Fabricate frames for access doors of steel not lighter than 1.9 mm 14 gage with welded joints and anchorage for securing into construction. Provide access doors with a minimum of 350 by 500 mm 14 by 20 inches and of not lighter than 1.9 mm 14 gage steel, with stiffened edges and welded attachments. Provide access doors hinged to frame and

Specifications

with a flush-face, turn-screw-operated latch. Provide exposed metal surfaces with a shop applied prime coat. Provide maximum-security grade flush access doors within inmate areas.

2.5 FLOOR GRATINGS AND ROOF WALKWAYS

Design aluminum grating in accordance with NAAMM MBG 531 for bar type grating or manufacturer's charts for plank grating.

- a. Design floor gratings to support a stress live load of 40 pounds per square foot and 300 pound point load for the spans indicated, with maximum deflection of $L/240$.
- b. NAAMM MBG 531, band edges of grating with bars of the same size as the bearing bars. Weld banding in accordance with the manufacturer's standard for trim unless otherwise indicated. Design tops of bearing bars, cross or intermediate bars to be in the same plane and match grating finish.
- c. Attach grating as per manufacturer's roof attachment system.
- d. Slip resistance requirements must exceed both wet and dry a static coefficient of friction of 0.5.

2.6 GUARD POSTS (BOLLARDS/PIPE GUARDS)

Provide 8 inch galvanized extra strong weight steel pipe as specified in ASTM A53/A53M. Anchor posts in concrete as indicated and fill solidly with concrete with minimum compressive strength of 2500 psi.

2.7 MISCELLANEOUS PLATES AND SHAPES

Provide for items that do not form a part of the structural steel framework, such as lintels, sill angles, miscellaneous mountings and frames. Provide lintels fabricated from structural steel shapes over openings in masonry walls and partitions as indicated and as required to support wall loads over openings. Provide with connections. Construct to have at least 200 mm 8 inches bearing on masonry at each end.

Provide angles and plates, ASTM A36/A36M, for embedment as indicated. Galvanize embedded items exposed to the elements according to ASTM A123/A123M.

2.8 LADDERS

Fabricate vertical ladders conforming to Section 7 of 29 CFR 1910.27. Use 65 by 10 mm 2 1/2 by 3/8 inch steel flats for stringers and 20 mm 3/4 inch diameter steel rods for rungs. Rungs to be not less than 400 mm 16 inches wide, spaced one foot apart, plug welded or shouldered and headed into stringers. Install ladders so that the distance from the rungs to the finished wall surface will not be less than 175 mm 7 inches. Provide heavy clip angles riveted or bolted to the stringer and drilled [for not less than two 12 mm 1/2 inch diameter expansion bolts] as indicated. Provide intermediate clip angles not over 1200 mm 48 inches on centers.

2.8.1 Ladder Cages

Conform to 29 CFR 1910.27. Fabricate 50 by 6 mm 2 by 1/4 inch horizontal bands and 40 by 5 mm 1 1/2 by 3/16 inch vertical bars. Provide attachments for fastening bands to the side rails of ladders or directly to the structure. Provide and fasten vertical bars on the inside of the horizontal bands. Extend cages not less than 690 mm 27 inches or more than 710 mm 28 inches from the centerline of the rungs, excluding the flare at

Specifications

the bottom of the cage, and not less than 690 mm 27 inches in width. Clear the inside of the cage of projections.

2.9 STEEL STAIRS**2.9.1 General**

Prepare and submit metal stair system shop drawings with detailed plans and elevations at not less than 1 inch to 1 foot with details of sections and connections at not less than 3 inches to 1 foot. Also detail placement drawings, diagrams, templates for installation of anchorage, including but not limited to, concrete inserts, anchor bolts, and miscellaneous metal items having integral anchorage devices.

Provide steel stairs complete with stringers, grating treads, landings, columns, handrails, and necessary bolts and other fastenings. Hot-dip galvanize steel stairs and accessories.

2.9.1.1 Design Loads

Design stairs to sustain a live load of not less than 100 pounds per square foot, or a concentrated load of 300 pounds applied where it is most critical. Conform to AISC 360 with the design and fabrication of steel stairs, other than a commercial product.

2.9.2 Stair Framing

Fabricate stringers of structural steel channels, or plates, or a combination thereof as indicated. Provide closures for exposed ends of strings.

Construct platforms of structural steel channel headers and miscellaneous framing members as indicated. Bolt headers to stringers and newels and framing members to stringers and headers.

2.9.3 Floor Grating Treads And Platforms

Provide floor grating treads and platforms conforming to ASTM A6/A6M, ASTM A653/A653M Z275 G-90, and NAAMM MBG 531, "Metal Bar Grating Manual." Provide gratings with nonslip nosings.

a. Galvanized finish conforming to ASTM A123/A123M.

Fabricate grating treads with steel plate nosing on one edge and with steel angle or steel plate carrier at each end for string connections. Secure treads to strings by welding.

Fabricate grating platforms with nosing that matches on grating treads at landings. Provide toe-plates at open-sided edges of floor grating to platform framing members.

2.9.4 Fabrication

Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ease exposed edges to a radius of approximately 1/32 inch, and bend metal corners to the smallest radius possible without causing grain separation or otherwise impairing the work.

Provide steel stairs of welded construction except that bolts may be used where welding is not practicable. Screw or screw-type connections are not permitted.

Use welding for joining pieces together. Make joints true and tight, and connections between parts lightproof tight. Grind smooth exposed welds and flush to match and blend with adjoining surfaces. Continuously weld corners and seams in accordance with the recommendations of AWS D1.1/D1.1M. Form all exposed joints to exclude water.

Construct metal stair units to sizes and arrangements indicated to support a minimum live load of 100 pounds per square foot. Provide framing, hangers, columns, struts, clips, brackets, bearing plates, and other

Specifications

components as required for the support of stairs and platforms. Provide and coordinate anchorage of the type indicated with the supporting structure. Fabricate anchoring devices, space as indicated and required to provide adequate support for the intended use of the work.

Before fabrication, obtain necessary field measurements and verify drawing dimensions.

2.10 WINDOW SUB-SILL

Provide window sub-sill of extruded aluminum alloy with size and design indicated. Provide not less than two anchors per window section for securing into concrete sill. Provide sills for windows with standard mill finish with a protective coating, prior to shipment, of two coats of a clear, colorless, methacrylate lacquer applied to all surfaces of the sills.

PART 3 EXECUTION**3.1 GENERAL INSTALLATION REQUIREMENTS**

Install items at locations indicated, according to manufacturer's instructions. Verify all measurements and take all field measurements necessary before fabrication. Exposed fastenings shall be compatible materials, shall generally match in color and finish, and harmonize with the material to which fastenings are applied. Include materials and parts necessary to complete each item, even though such work is not definitely shown or specified. Poor matching of holes for fasteners shall be cause for rejection. Conceal fastenings where practicable. Thickness of metal and details of assembly and supports shall provide strength and stiffness. Form joints exposed to the weather shall be formed to exclude water. Items listed below require additional procedures.

3.2 WORKMANSHIP

Provide miscellaneous metalwork that is well formed to shape and size, with sharp lines and angles and true curves. Drilling and punching shall produce clean true lines and surfaces. Provide continuous welding along the entire area of contact except where tack welding is permitted. Do not tack weld exposed connections of work in place. Grind smooth exposed welds. Provide a smooth finish on exposed surfaces of work in place and unless otherwise approved, flush exposed riveting. Mill joints where tight fits are required. Corner joints shall be coped or mitered, well formed, and in true alignment. Accurately set work to established lines and elevations and securely fastened in place. Install in accordance with manufacturer's installation instructions and approved drawings, cuts, and details.

3.3 ANCHORAGE, FASTENINGS, AND CONNECTIONS

Provide anchorage where necessary for fastening miscellaneous metal items securely in place. Include for anchorage not otherwise specified or indicated slotted inserts, expansion shields, and powder-driven fasteners, when approved for concrete; toggle bolts and through bolts for masonry; machine and carriage bolts for steel; through bolts, lag bolts, and screws for wood. Do not use wood plugs in any material. Provide non-ferrous attachments for non-ferrous metal. Make exposed fastenings of compatible materials, generally matching in color and finish, to which fastenings are applied. Conceal fastenings where practicable.

3.4 BUILT-IN WORK

Form for anchorage metal work built-in with concrete or masonry, or provide with suitable anchoring devices as indicated or as required. Furnish metal work in ample time for securing in place as the work progresses.

Specifications

3.5 WELDING

Perform welding, welding inspection, and corrective welding, in accordance with AWS D1.1/D1.1M. Use continuous welds on all exposed connections. Grind visible welds smooth in the finished installation.

3.6 FINISHES

3.6.1 Dissimilar Materials

Where dissimilar metals are in contact, protect surfaces with a coat conforming to MPI 79 to prevent galvanic or corrosive action. Where aluminum is in contact with concrete, plaster, mortar, masonry, wood, or absorptive materials subject to wetting, protect with ASTM D1187/D1187M, asphalt-base emulsion.

3.6.2 Environmental Conditions

Do not clean or paint surface when damp or exposed to foggy or rainy weather, when metallic surface temperature is less than minus 5 degrees F above the dew point of the surrounding air, or when surface temperature is below 45 degrees F or over 95 degrees F, unless approved by the Architect.

3.7 ACCESS PANELS

Install a removable access panel not less than 12 by 12 inches directly below each valve, flow indicator, damper, or air splitter that is located above the ceiling, other than an acoustical ceiling, and that would otherwise not be accessible.

3.8 INSTALLATION OF GUARD POSTS (BOLLARDS/PIPE GUARDS)

Set pipe guards vertically in concrete piers. Construct piers of, and the hollow cores of the pipe filled with, concrete having a compressive strength of 3000 psi.

3.9 LADDERS

Secure to the adjacent construction with the clip angles attached to the stringer. Secure to masonry or concrete with not less than two 12 mm 1/2 inch diameter expansion bolts. Install intermediate clip angles not over 1200 mm 48 inches on center. Install brackets as required for securing of ladders welded or bolted to structural steel or built into the masonry or concrete. Ends of ladders must not rest upon finished roof or floor.

3.10 STEEL STAIRS

Provide anchor bolts, grating fasteners, washers, and all parts or devices necessary for proper installation. Provide lock washers under nuts.

-- End of Section --

05 52 00 - METAL RAILINGS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ASSOCIATION OF STATE HIGHWAY AND TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M 314 (1990; R 2008) Standard Specification for Steel Anchor Bolts

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2012; Errata 2011) Structural Welding Code - Steel

ASME INTERNATIONAL (ASME)

ASME B18.21.1 (2009) Washers: Helical Spring-Lock, Tooth Lock, and Plain Washers (Inch Series)

ASTM INTERNATIONAL (ASTM)

ASTM A108 (2007) Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished

ASTM A153/A153M (2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A27/A27M (2010) Standard Specification for Steel Castings, Carbon, for General Application

ASTM A283/A283M (2012a) Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates

ASTM A307 (2012) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

ASTM A325M (2013) Standard Specification for Structural Bolts, Steel, Heat Treated, 830 MPa Minimum Tensile Strength (Metric)

ASTM A36/A36M (2012) Standard Specification for Carbon Structural Steel

ASTM A449 (2010) Standard Specification for Hex Cap Screws, Bolts, and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use

ASTM A47/A47M (1999; R 2009) Standard Specification for Ferritic Malleable Iron Castings

ASTM A500/A500M (2010a) Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds

Specifications

	and Shapes
ASTM A512	(2006) Standard Specification for Cold-Drawn Butt Weld Carbon Steel Mechanical Tubing
ASTM A53/A53M	(2012) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless
ASTM A575	(1996; R 2007) Standard Specification for Steel Bars, Carbon, Merchant Quality, M-Grades
ASTM C514	(2004; E 2009; R 2009) Standard Specification for Nails for the Application of Gypsum Board
ASTM C636/C636M	(2013) Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
ASTM E488/E488M	(2010) Standard Test Methods for Strength of Anchors in Concrete and Masonry Elements

NATIONAL ASSOCIATION OF ARCHITECTURAL METAL MANUFACTURERS (NAAMM)

NAAMM AMP 521	(2001) Pipe Railing Manual THE
---------------	--------------------------------

SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC Paint 25	(1997; E 2004) Zinc Oxide, Alkyd, Linseed Oil Primer for Use Over Hand Cleaned Steel, Type I and Type II
---------------	--

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Fabrication

Drawings

SD-03 Product Data

Structural Steel Plates, Shapes, and Bars
Structural Steel Tubing
Cold-Finished Steel Bars
Hot-Rolled Carbon Steel Bars
Cold-Drawn Steel
Tubing

SD-07 Certificates Welder

Qualification

- B. LEED Submittals: Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

1.3 QUALITY ASSURANCE**1.3.1 Welder Qualification**

Submit certified welder qualification by tests in accordance with AWS D1.1/D1.1M, or under an equivalent approved qualification test. In addition be performed on test pieces in positions and with clearances equivalent to those actually encountered. If a test weld fails to meet requirements, make an immediate retest of two test welds and ensure each test weld passes. Failure in the immediate retest will require that the welder be retested after further practice or training and make a complete set of test welds.

PART 2 PRODUCTS**2.1 SYSTEM DESCRIPTION**

Provide complete, detailed fabrication and installation drawings for all iron and steel hardware, and for all steel shapes, plates, bars and strips used in accordance with the design specifications referenced in this section.

Pre-assemble items in the shop to the greatest extent possible. Disassemble units only to the extent necessary for shipping and handling. Clearly mark units for reassembly and coordinated installation.

For the fabrication of work exposed to view, use only materials that are smooth and free of surface blemishes, including pitting, seam marks, roller marks, rolled trade names, and roughness. Remove blemishes by grinding, or by welding and grinding, prior to cleaning, treating, and application of surface finishes, including zinc coatings.

2.2 GENERAL FABRICATION

Provide railings and handrails detail plans and elevations at not less than 1 inch to 1 foot. Provide details of sections and connections at not less than 3 inches to 1 foot. Also detail setting drawings, diagrams, templates for installation of anchorages, including concrete inserts, anchor bolts, and miscellaneous metal items having integral anchors.

Use materials of size and thicknesses indicated or, if not indicated, of required size and thickness to produce adequate strength and durability in finished product for intended use. Work materials to dimensions indicated on approved detail drawings, using proven details of fabrication and support. Use type of materials indicated or specified for the various components of work.

Form exposed work true to line and level with accurate angles and surfaces and straight sharp edges. Ensure all exposed edges are eased to a radius of approximately 1/32 inch. Bend metal corners to the smallest radius possible without causing grain separation or otherwise impairing the work.

Weld corners and seams continuously and in accordance with the recommendations of AWS D1.1/D1.1M. Grind exposed welds smooth and flush to match and blend with adjoining surfaces.

Form exposed connections with hairline joints that are flush and smooth, using concealed fasteners wherever possible. Use exposed fasteners of the type indicated or, if not indicated, use Phillips flathead (countersunk) screws or bolts.

Provide anchorage of the type indicated and coordinated with the supporting structure. Fabricate anchoring devices and space as indicated and as required to provide adequate support for the intended use of the work.

Use hot-rolled steel bars for work fabricated from bar stock unless work is indicated or specified to be fabricated from cold-finished or cold-rolled stock.

Specifications

2.3 STRUCTURAL STEEL PLATES, SHAPES AND BARS

Provide structural-size shapes and plates, except plates to be bent or cold-formed, conforming to ASTM A36/A36M, unless otherwise noted.

Provide steel plates, to be bent or cold-formed, conforming to ASTM A283/A283M, Grade C.

Provide steel bars and bar-size shapes conforming to ASTM A36/A36M, unless otherwise noted.

2.4 STRUCTURAL STEEL TUBING

Provide structural steel tubing, hot-formed, welded or seamless, conforming to ASTM A500/A500M, Grade B, unless otherwise noted.

2.5 HOT-ROLLED CARBON STEEL BARS

Provide bars and bar-size shapes conforming to ASTM A575, grade as selected by the fabricator.

2.6 COLD-FINISHED STEEL BARS

Provide cold-finished steel bars conforming to ASTM A108, grade as selected by the fabricator.

2.7 COLD-DRAWN STEEL TUBING

Provide tubing conforming to ASTM A512, sunk drawn, butt-welded, cold-finished, and stress-relieved.

2.8 STEEL PIPE

Provide pipe conforming to ASTM A53/A53M, type as selected, Grade B; primed finish, unless galvanizing is required; standard weight (Schedule 40).

2.9 CONCRETE INSERTS

Provide wedge-type concrete inserts consisting of galvanized box-type ferrous castings designed to accept 3/4-inch diameter bolts having special wedge-shaped heads, made of either malleable iron conforming to ASTM A47/A47M or cast steel conforming to ASTM A27/A27M and hot-dip galvanized in accordance with ASTM A153/A153M.

2.10 MASONRY ANCHORAGE DEVICES

Provide masonry anchorage devices consisting of expansion shields complying with AASHTO M 314, ASTM E488/E488M and ASTM C514 as follows:

Provide bolt anchor expansion shields for bolts; closed-end bottom bearing class, Group II, Type 2, Class 1.

Provide tumble-wing type toggle bolts conforming to ASTM A325, ASTM A449 and ASTM C636/C636M, type, class, and style as required.

2.11 FASTENERS

Specifications

Provide galvanized zinc-coated fasteners in accordance with ASTM A153/A153M used for exterior applications or where built into exterior walls or floor systems. Select fasteners for the type, grade, and class required for the installation of steel stair items.

Provide standard hexagon-head bolts, conforming to ASTM A307, Grade A.

Provide plain round, general-assembly-grade, carbon steel washers conforming to ASME B18.21.1.

2.12 PROTECTIVE COATING

Shop prime steelwork with red oxide primer in accordance with SSPC Paint 25.

2.13 STEEL RAILINGS AND HANDRAILS

Design handrails to resist a concentrated load of 200 lbs per foot in any direction or 50 lbs per foot uniform load applied in any direction, whichever is more severe. NAAMM AMP 521, provide the same size rail and post. Provide pipe collars of the same material and finish as the handrail and posts.

2.13.1 Steel Handrails

Provide steel handrails, including inserts in concrete, steel pipe conforming to ASTM A53/A53M or structural tubing conforming to ASTM A500/A500M, Grade A or B of equivalent strength. Provide steel railings of 1 1/2 inches nominal size, shop primed.

a. Fabrication: Joint posts, rail, and corners by one of the following methods:

- (1) Mitered and welded joints made by fitting post to top rail and intermediate rail to post, mitering corners, groove welding joints, and grinding smooth. Butt railing splices and reinforce them by a tight fitting interior sleeve not less than 6 inches long.
- (2) Railings may be bent at corners in lieu of jointing, provided bends are made in suitable jigs and the pipe is not crushed.

PART 3 EXECUTION**3.1 PREPARATION**

Adjust stair railings and handrails prior to securing in place to ensure proper matching at butting joints and correct alignment throughout their length. Space posts as indicated on shop drawings. Plumb posts in each direction. Secure posts and rail ends to building construction as follows:

Anchor posts in concrete by means of core drilling into concrete. Provide core having an inside diameter not less than 1/2-inch greater than the outside diameter of the inserted pipe post. After posts have been inserted into cores, fill the annular space between post and sleeve with a quick-setting hydraulic cement. Cover anchorage joint with a round steel flange welded to the post.

Secure handrails to walls by means of wall brackets and wall return fitting at handrail ends. Provide brackets of malleable iron castings, with not less than 3-inch projection from the finish wall surface to the center of the pipe drilled to receive one 3/8-inch bolt. Locate brackets not more than 60 inches on center. Provide wall return fittings of cast iron castings, flush-type, with the same projection as that specified for wall brackets. Secure wall brackets and wall return fittings to building construction as follows:

For concrete and solid masonry anchorage, use bolt anchor expansion shields and lag bolts.

For hollow masonry and stud partition anchorage, use toggle bolts having square heads.

Specifications

3.2 STEEL HANDRAIL

Install with expansion shields and bolts.

3.3 FIELD WELDING

Ensure procedures of manual shielded metal arc welding, appearance and quality of welds made, and methods used in correcting welding work comply with AWS D1.1/D1.1M.

3.4 TOUCHUP PAINTING

Immediately after installation, clean field welds, bolted connections, abraded areas of the shop paint, and exposed areas painted with the paint used for shop painting. Apply paint by brush or spray to provide a minimum dry-film thickness of 2 mils.

-- End of Section --



Specifications

05 53 00 - METAL GRATINGS

1.1 PERFORMANCE REQUIREMENTS

- A. Engineering design of gratings by Contractor.

1.2 MATERIALS

- A. Steel Bar Gratings: Welded.
 - 1. Traffic Surface: Applied abrasive.
 - 2. Finish: Galvanized.
 - 3. Recycled Content of Steel: Postconsumer recycled content plus one-half of preconsumer recycled content not less than 25 percent.
 - 4. Low-Emitting Primer: Primer complies with LEED for Schools Credit IEQ 4.
- B. Stainless-Steel Bar Gratings: Pressure locked.
 - 1. Traffic Surface: Applied abrasive.
 - 2. Finish: Mill, Abrasive blasted, or Electropolished.
- C. Grating Frames and Supports:
 - 1. Metal Gratings: Same metal as grating.
 - 2. Glass-Fiber-Reinforced Plastic Gratings: Glass-fiber-reinforced plastic.
 - 3. Exterior steel frames galvanized.
- D. Toeplates: Shop installed.

END OF SECTION 05 53 00

06 10 00 - ROUGH CARPENTRY**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN LUMBER STANDARDS COMMITTEE (ALSC)

ALSC PS 20 (2010) American Softwood Lumber Standard

WOOD COUNCIL (AWC)

AWC NDS (2012) National Design Specification (NDS) for Wood Construction

AWC WFCM (2012) Wood Frame Construction Manual for One- and Two-Family Dwellings

AMERICAN WOOD PROTECTION ASSOCIATION (AWPA)

AWPA BOOK (2012) AWPA Book of Standards

AWPA M2 (2011) Standard for Inspection of Treated Wood Products

AWPA M6 (2013) Brands Used on Preservative Treated Materials

APA - THE ENGINEERED WOOD ASSOCIATION (APA)

APA E445 (2002) Performance Standards and Qualification Policy for Structural-Use Panels (APA PRP-108)

APA F405 (1999) Performance Rated Panels

APA L870 (2010) Voluntary Product Standard, PS 1-09, Structural Plywood

APA S350 (2011) Performance Standard for Wood-Based Structural-Use Panels

ASME INTERNATIONAL (ASME)

ASME B18.2.1 (2012) Square and Hex Bolts and Screws (Inch Series)

ASME B18.6.1 (1981; R 2008) Wood Screws (Inch Series) ASTM

INTERNATIONAL (ASTM)

ASTM A153/A153M (2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A307 (2012) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

Specifications

ASTM D2898	(2010) Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing
ASTM F1667	(2011a; E 2012) Driven Fasteners: Nails, Spikes, and Staples
ASTM F547	(2006; R 2012) Nails for Use with Wood and Wood-Base Materials
INTERNATIONAL CODE COUNCIL (ICC)	
ICC IBC	(2012) International Building Code
U.S. GENERAL SERVICES ADMINISTRATION (GSA)	
CID A-A-1923	(Rev A; Notice 2) Shield, Expansion (Lag, Machine and Externally Threaded Wedge Bolt Anchors)
CID A-A-1924	(Rev A; Notice 2) Shield, Expansion (Self Drilling Tubular Expansion Shell Bolt Anchors)
CID A-A-1925	(Rev A; Notice 2) Shield Expansion (Nail Anchors)
U.S. GREEN BUILDING COUNCIL (USGBC)	
LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-11 Closeout Submittals Local/Regional Materials; (LEED NC)

LEED documentation relative to local/regional materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Engineered Wood Products; (LEED NC)

LEED Submittals

Certificates for Credit MR 6 and/or Credit MR 7: Chain-of-custody certificates indicating that products specified to be made from certified wood comply with forest certification requirements. Include documentation that manufacturer is certified for chain of custody by an FSC-accredited certification body. Include statement indicating cost for each certified wood product.

Product Data for Credit IEQ 4.4: For composite wood products, documentation indicating that product contains no urea formaldehyde.

1.3 DELIVERY AND STORAGE

Deliver materials to the site in an undamaged condition. Store, protect, handle, and install prefabricated structural elements in accordance with manufacturer's instructions and as specified. Store materials off the ground to provide proper ventilation, with drainage to avoid standing water, and protection against ground moisture and dampness. Store materials with a moisture barrier at both the ground level and as a cover forming a well ventilated enclosure. Remove defective and damaged materials and provide new materials. Store separated reusable wood waste convenient to cutting station and area of work.

1.4 GRADING AND MARKING**1.4.1 Lumber**

Mark each piece of framing and board lumber or each bundle of small pieces of lumber with the grade mark of a recognized association or independent inspection agency. Such association or agency shall be certified by the Board of Review, American Lumber Standards Committee, to grade the species used. Surfaces that are to be exposed to view shall not bear grademarks, stamps, or any type of identifying mark. Hammer marking will be permitted on timbers when all surfaces will be exposed to view.

1.4.2 Plywood

Mark each sheet with the mark of a recognized association or independent inspection agency that maintains continuing control over the quality of the plywood. The mark shall identify the plywood by species group or span rating, exposure durability classification, grade, and compliance with APA L870. Surfaces that are to be exposed to view shall not bear grademarks or other types of identifying marks.

1.4.3 Preservative-Treated Lumber and Plywood

The Contractor shall be responsible for the quality of treated wood products. Each treated piece shall be inspected in accordance with AWP A M2 and permanently marked or branded, by the producer, in accordance with AWP A M6. The Contractor shall provide Owner with the inspection report of an approved independent inspection agency that offered products comply with applicable AWP A Standards. The appropriate Quality Mark on each piece will be accepted, in lieu of inspection reports, as evidence of compliance with applicable AWP A treatment standards.

1.4.4 Fire-Retardant Treated Lumber

Mark each piece in accordance with AWP A M6, except pieces that are to be natural or transparent finished. In addition, exterior fire-retardant lumber shall be distinguished by a permanent penetrating blue stain. Labels of a nationally recognized independent testing agency will be accepted as evidence of conformance to the fire-retardant requirements of AWP A M6.

1.5 SIZES AND SURFACING

ALSC PS 20 for dressed sizes of yard and structural lumber. Lumber shall be surfaced four sides. Size references, unless otherwise specified, are nominal sizes, and actual sizes shall be within manufacturing tolerances allowed by the standard under which the product is produced. Other measurements are IP or SI standard.

1.6 MOISTURE CONTENT

Air-dry or kiln-dry lumber. Kiln-dry treated lumber after treatment. Maximum moisture content of wood products shall be as follows at the time of delivery to the job site:

- a. Framing lumber and board, 19 percent maximum
- b. Materials other than lumber; moisture content shall be in accordance with standard under which the product is produced

1.7 PRESERVATIVE TREATMENT

Treat

- a. 0.25 pcf intended for above ground use.

Specifications

- b. 0.40 pcf intended for ground contact and fresh water use.
- c. 0.60 pcf intended for Ammoniacal Copper Quaternary Compound (ACQ)-treated foundations.
- d. 0.80 to 1.00 pcf intended for ACQ-treated pilings.
- e. All wood shall be air or kiln dried after treatment. Specific treatments shall be verified by the report of an approved independent inspection agency, or the AWP Quality Mark on each piece. Brush coat areas that are cut or drilled after treatment with either the same preservative used in the treatment or with a 2 percent copper naphthenate solution. All lumber and woodwork shall be preservative treated.

1.8 FIRE-RETARDANT TREATMENT

Fire-retardant treated wood shall be pressure treated Treatment and performance inspection shall be by an independent and qualified testing agency that establishes performance ratings. Each piece or bundle of treated material shall bear identification of the testing agency to indicate performance in accordance with such rating. Treated materials to be exposed to rain wetting shall be subjected to an accelerated weathering technique in accordance with ASTM D2898 prior to being tested. Such items which will not be inside a building, and such items which will be exposed to heat or high humidity, shall receive exterior fire-retardant treatment. Fire-retardant-treated wood products shall be free of halogens, sulfates, ammonium phosphate, and formaldehyde. Items to be treated include the following:

- a. As required by ICC IBC.

1.9 SUSTAINABLE DESIGN REQUIREMENTS**1.9.1 Local/Regional Materials**

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources. See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Wood and materials may be locally available.

PART 2 PRODUCTS**2.1 MATERIALS****2.1.1 Engineered Wood Products**

Products shall contain no added urea-formaldehyde.

2.2 LUMBER**2.2.1 Framing Lumber**

Framing lumber such as studs, plates, caps, collar beams, cant strips, bucks, sleepers, nailing strips, and nailers and board lumber such as subflooring and wall and roof sheathing shall be graded by an agency certified by ALSC. Minimum grade of species shall be No. 2 any species.

2.3 PLYWOOD, STRUCTURAL-USE, AND ORIENTED STRAND BOARD (OSB) PANELS

APA L870, APA S350, APA E445, and APA F405 respectively.

Specifications

2.3.1 Other Uses**2.3.1.1 Plywood**

Plywood for blocking.

2.4 OTHER MATERIALS**2.4.1 Miscellaneous Wood Members****2.4.1.1 Blocking**

Blocking shall be standard or number 2 grade.

2.5 ROUGH HARDWARE

Unless otherwise indicated or specified, rough hardware shall be of the type and size necessary for the project requirements. Sizes, types, and spacing of fastenings of manufactured building materials shall be as recommended by the product manufacturer unless otherwise indicated or specified. Fasteners shall be fabricated from 100 percent re-melted steel. See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total recycled content requirements. Fasteners may contain post-consumer or post-industrial recycled content. Rough hardware exposed to the weather or embedded in or in contact with preservative treated wood, exterior masonry, or concrete walls or slabs shall be hot-dip zinc-coated in accordance with ASTM A153/A153M. Nails and fastenings for fire-retardant treated lumber and woodwork exposed to the weather shall be copper alloy or hot-dipped galvanized fasteners as recommended by the treated wood manufacturer.

2.5.1 Anchor Bolts

ASTM A307, size as indicated, complete with nuts and washers.

2.5.2 Expansion Shields

CID A-A-1923, CID A-A-1924, and CID A-A-1925. Except as shown otherwise, maximum size of devices shall be 3/8 inch.

2.5.3 Lag Screws and Lag Bolts ASME B18.2.1.**2.5.4 Wood Screws ASME B18.6.1.****2.5.5 Nails**

ASTM F547, size and type best suited for purpose. In general, 8-penny or larger nails shall be used for nailing through 1 inch thick lumber and for toe nailing 2 inch thick lumber; 16-penny or larger nails shall be used for nailing through 2 inch thick lumber. Nails used with treated lumber and sheathing shall be hot-dipped galvanized in accordance with ASTM A153/A153M. Nailing shall be in accordance with the recommended nailing schedule contained in AWC WFCM. Where detailed nailing requirements are not specified, nail size and spacing shall be sufficient to develop an adequate strength for the connection. The connection's strength shall be verified against the nail capacity tables in AWC NDS. Reasonable judgment backed by experience shall ensure that the designed connection will not cause the wood to split. If a load situation exceeds a reasonable limit for nails, a specialized connector shall be used.

2.5.6 Wire Nails

Specifications

ASTM F1667.

2.5.7 Metal Backing

Where not indicated or specified otherwise, No. 16 U.S. Standard gage, cadmium-plated or zinc-coated.

PART 3 EXECUTION

3.1 INSTALLATION

Conform to AWC WFCM unless otherwise indicated or specified. Select lumber sizes to minimize waste. Fit framing lumber and other rough carpentry, set accurately to the required lines and levels, and secure in place in a rigid manner. Do not splice framing members between bearing points. Provide as necessary for the proper completion of the work all framing members not indicated or specified. Spiking and nailing not indicated or specified otherwise shall be in accordance with the Nailing Schedule contained in ICC IBC; perform bolting in an approved manner. Spikes, nails, and bolts shall be drawn up tight.

3.1.1 Anchors in Concrete

Powder-actuated fasteners spaced 3 feet o.c. may be provided for single thickness plates on concrete.

3.2 MISCELLANEOUS

3.2.1 Wood Roof Nailers, Edge Strips, Crickets, Curbs, and Cants

Provide sizes and configurations indicated or specified and anchored securely to continuous construction.

3.2.1.1 Crickets, Cants, and Curbs

Provide wood saddles or crickets, cant strips, curbs for scuttles and ventilators, and wood nailers bolted to tops of concrete or masonry curbs and at expansion joints, as indicated, specified, or necessary and of lumber or exterior plywood.

3.2.2 Wood Blocking

Provide proper sizes and shapes at proper locations for the installation and attachment of wood and other finish materials, fixtures, equipment, and items indicated or specified.

3.2.3 Temporary Closures

Provide with hinged doors and padlocks and install during construction at exterior doorways and other ground level openings that are not otherwise closed. Cover windows and other unprotected openings with polyethylene or other approved material, stretched on wood frames. Provide dustproof barrier partitions to isolate areas as directed.

3.2.4 Temporary Centering, Bracing, and Shoring

Provide for the support and protection of masonry work during construction as specified in Section 04 20 00 Masonry. Forms and centering for cast-in-place concrete work are specified in Section 03 30 00 CAST-IN-PLACE CONCRETE.

3.3 WASTE MANAGEMENT

In accordance with the Waste Management Plan and as specified. Separate and reuse scrap sheet materials larger than 2 square feet, framing members larger than 16 inches, and multiple offcuts of any size larger than

Specifications

12 inches. Clearly separate damaged wood and other scrap lumber for acceptable alternative uses on site, including bracing, blocking, cripples, ties, and shims.

Separate composite wood from other wood types and recycle or reuse. Fold up metal banding, flatten, and recycle.

Separate treated, stained, painted, and contaminated wood and place in designated area for hazardous materials. Dispose of according to local regulations. Do not leave any wood, shavings, sawdust, or other wood waste buried in fill or on the ground. Prevent sawdust and wood shavings from entering the storm drainage system. Do not burn scrap lumber that has been pressure treated, or lumber that is less than one year old.

-- End of Section --

06 41 16 - LAMINATE CLAD ARCHITECTURAL CASEWORK**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI A161.2 (1998) Decorative Laminate Countertops, Performance Standards for Fabricated High Pressure

ARCHITECTURAL WOODWORK INSTITUTE (AWI)

AWI AWS (2009) Architectural Woodwork Standards ASTM

INTERNATIONAL (ASTM)

ASTM D1037 (2012) Evaluating Properties of Wood-Base Fiber and Particle Panel Materials

ASTM F547 (2006; R 2012) Nails for Use with Wood and Wood-Base Materials

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.9 (2010) Cabinet Hardware

COMPOSITE PANEL ASSOCIATION (CPA)

CPA A208.1 (2009) Medium Density Fiberboard (MDF) For Interior Applications

CPA A208.2 (2009) Medium Density Fiberboard (MDF) for Interior Applications

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI/NEMA LD 3 (2005) Standard for High-Pressure Decorative Laminates

SCIENTIFIC CERTIFICATION SYSTEMS (SCS)

SCS Scientific Certification Systems (SCS) Indoor Advantage



Specifications

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC (2009) Leadership in Energy and Environmental Design(tm)
New Construction Rating System

UL ENVIRONMENT (ULE)

ULE Greenguard UL Greenguard Certification Program

WINDOW AND DOOR MANUFACTURERS ASSOCIATION (WDMA)

WDMA I.S.1A (2011) Interior Architectural Wood Flush Doors

1.2 SYSTEM DESCRIPTION

Work in this section includes laminate clad custom casework cabinets as shown on the drawings and as described in this specification. This Section includes high-pressure laminate surfacing and cabinet hardware.

1.3 SUSTAINABILITY REQUIREMENTS

Materials in this technical specification may contribute towards contract compliance with sustainability requirements.

1.3.1 LEED REQUIREMENTS

See Section 01 33 29 LEED DOCUMENTATION for project LEED NC local/regional materials, low-emitting materials, recycled content, and rapidly renewable materials requirements.

1.4 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop Drawings Installation

SD-03 Product Data Certification

SD-04 Samples

Plastic Laminates Cabinet
Hardware

SD-07 Certificates Quality Assurance

Laminate Clad Casework

SD-11 Closeout Submittals

LEED Submittals

Product Certificates

Specifications

Include statement indicating location of manufacturer and distance to Project for each regionally manufactured material.

Chain-of-custody certificates indicating that products specified to be made from certified wood comply with forest certification and chain-of-custody requirements.

Product Data for Credit IEQ 4.4: For adhesives and composite wood products, documentation indicating that products contain no urea formaldehyde.

1.5 QUALITY ASSURANCE

1.5.1 General Requirements

Unless otherwise noted on the drawings, all materials, construction methods, and fabrication shall conform to and comply with the premium grade quality standards as outlined in AWI AWS, Section for laminate clad cabinets. These standards shall apply in lieu of omissions or specific requirements in this specification. Contractors and their personnel engaged in the work shall be able to demonstrate successful experience with work of comparable extent, complexity and quality to that shown and specified. Submit a quality control statement which illustrates compliance with and understanding of AWI AWS requirements, in general, and the specific AWI AWS requirements provided in this specification. The quality control statement shall also certify a minimum of ten years Contractor's experience in laminate clad casework fabrication and construction. The quality control statement shall provide a list of a minimum of five successfully completed projects of a similar scope, size, and complexity.

1.5.2 Mock-ups

Prior to final approval of shop drawings, provide a full-size mock-up of a typical floor cabinet, including all components and hardware necessary to illustrate a completed unit with a minimum of one door and one drawer assembly. The completed mock-up shall include countertops and back splashes where specified. The mock-up shall utilize specified finishes in the patterns and colors as indicated on the drawings. Upon disapproval, rework or remake the mock-up until approval is secured. Remove rejected units from the jobsite. Approved mock-up may remain as part of the finished work. Submit shop drawings showing all fabricated casework items in plan view, elevations and cross-sections to accurately indicate materials used, details of construction, dimensions, methods of fastening and erection, and installation methods proposed. Shop drawing casework items shall be clearly cross-referenced to casework items located on the project drawings. Shop drawings shall include a color schedule of all casework items to include all countertop, exposed, and semi-exposed cabinet finishes to include finish material manufacturer, pattern, and color.

1.5.3 Sustainable Design Certification

Product shall be third party certified in accordance with ULE Greenguard Gold, SCS Scientific Certification Systems Indoor Advantage Gold or equal. Certification shall be performed annually and shall be current.

1.6 DELIVERY, STORAGE, AND HANDLING

Casework may be delivered fully assembled. Deliver all units to the site in undamaged condition, stored off the ground in fully enclosed areas, and protected from damage. The storage area shall be well ventilated and not subject to extreme changes in temperature or humidity.

1.7 SEQUENCING AND SCHEDULING

Coordinate work with other trades. Units shall not be installed in any room or space until painting, and ceiling installation are complete within the room where the units are located. Floor cabinets shall be

Specifications

installed before finished flooring materials are installed.

PART 2 PRODUCTS

2.1 WOOD MATERIALS

2.1.1 Lumber

- a. All framing lumber shall be kiln-dried Grade III to dimensions as shown on the drawings. Frame front, where indicated on the drawings, shall be nominal 3/4 inch hardwood.

2.1.2 Panel Products

2.1.2.1 Plywood

All plywood panels used for framing purposes shall be veneer core hardwood plywood, AWI AWS Grade AA. Nominal thickness of plywood panels shall be as indicated in this specification and on the drawings.

2.1.2.2 Particleboard

All particleboard shall be industrial grade, medium density (40 to 50 pounds per cubic foot), 3/4 inch thick. A moisture-resistant particleboard in grade Type 2-M-2 or 2-M-3 shall be used as the substrate for subjected to moisture. Particleboard shall meet the minimum standards listed in ASTM D1037 and CPA A208.1.

2.1.2.3 Medium Density Fiberboard

Medium density fiberboard (MDF) shall be an acceptable panel substrate where noted on the drawings. Medium density fiberboard shall meet the minimum standards listed in CPA A208.2.

2.2 SOLID POLYMER MATERIAL

Solid surfacing casework components shall conform to the requirements of Section 06 61 16 SOLID POLYMER (SOLID SURFACING) FABRICATIONS.

2.3 HIGH PRESSURE DECORATIVE LAMINATE (HPDL)

All plastic laminates shall meet the requirements of ANSI/NEMA LD 3 and ANSI A161.2 for high-pressure decorative laminates. Design, colors, surface finish and texture, and locations shall be as indicated on the drawings. Submit two samples of each plastic laminate pattern and color. Samples shall be a minimum of 5 by 7 inches in size. Plastic laminate types and nominal minimum thicknesses for casework components shall be as indicated in the following paragraphs.

2.3.1 Horizontal General Purpose Standard (HGS) Grade

Horizontal general purpose standard grade plastic laminate shall be 0.048 inches (plus or minus 0.005 inches) in thickness. This laminate grade is intended for horizontal surfaces where postforming is not required.

2.3.2 Vertical General Purpose Standard (VGS) Grade

Vertical general purpose standard grade plastic laminate shall be 0.028 inches (plus or minus 0.004 inches) in thickness. This laminate grade is intended for exposed exterior vertical surfaces of casework components where postforming is not required.

Specifications

2.3.3 Cabinet Liner Standard (CLS) Grade

Cabinet liner standard grade plastic laminate shall be 0.020 inches in thickness. This laminate grade is intended for light duty semi-exposed interior surfaces of casework components.

2.3.4 Backing Sheet (BK) Grade

Undecorated backing sheet grade laminate is formulated specifically to be used on the backside of plastic laminated panel substrates to enhance dimensional stability of the substrate. Backing sheet thickness shall be 0.020 inches. Backing sheets shall be provided for all laminated casework components where plastic laminate finish is applied to only one surface of the component substrate.

2.4 THERMOSET DECORATIVE OVERLAYS (MELAMINE)

Thermoset decorative overlays (melamine panels) shall be used for drawer interior surfaces.

2.5 EDGE BANDING

Edge banding for casework doors and drawer fronts shall be PVC vinyl and shall be 0.020 inch thick. Material width shall be 15/16 inches. Color and pattern shall match exposed door and drawer front laminate pattern and color.

2.6 CABINET HARDWARE

Submit one sample of each cabinet hardware item specified. All hardware shall conform to ANSI/BHMA A156.9, unless otherwise noted.

Drawer Slide: Side mounted with full overtravel extension and a minimum 100 pound load capacity drawers and 200 pound capacity for file drawers. Slides shall include an integral stop to avoid accidental drawer removal.

2.7 FASTENERS

Nails, screws, and other suitable fasteners shall be the size and type best suited for the purpose and shall conform to ASTM F547 where applicable.

2.8 ADHESIVES, CAULKS, AND SEALANTS

2.8.1 Adhesives

Adhesives shall be of a formula and type recommended by AWI. Adhesives shall be selected for their ability to provide a durable, permanent bond and shall take into consideration such factors as materials to be bonded, expansion and contraction, bond strength, fire rating, and moisture resistance. Adhesives shall meet local regulations regarding VOC emissions and off-gassing.

2.8.1.1 Wood Joinery

Adhesives shall withstand a bond test as described in WDMA I.S.1A.

Specifications

2.8.1.2 Laminate Adhesive

Adhesive used to join high-pressure decorative laminate to wood shall be adhesive consistent with AWI and laminate manufacturer's recommendations. PVC edgebanding shall be adhered using a polymer-based hot melt glue.

2.8.2 Caulk

Caulk used to fill voids and joints between laminated components and between laminated components and adjacent surfaces shall be clear, 100 percent silicone.

2.8.3 Sealant

Sealant shall be of a type and composition recommended by the substrate manufacturer to provide a moisture barrier at sink cutouts and all other locations where unfinished substrate edges may be subjected to moisture.

2.9 ACCESSORIES**2.9.1 Grommets**

Grommets shall be plastic material for cutouts with a diameter of 2 inches. Locations shall be as indicated on the drawings.

2.10 FABRICATION

Verify field measurements as indicated in the shop drawings before fabrication. Fabrication and assembly of components shall be accomplished at the shop site to the maximum extent possible. Construction and fabrication of cabinets and their components shall meet or exceed the requirements for AWI premium grade unless otherwise indicated in this specification. Cabinet style, in accordance with AWI AWS, Section 400-G descriptions, shall be flush overlay.

2.10.1 Base and Wall Cabinet Case Body**2.10.1.1 Cabinet Components**

Frame members shall be glued-together, kiln-dried hardwood lumber. Top corners, bottom corners, and cabinet bottoms shall be braced with either hardwood blocks or water-resistant glue and nailed in place metal or plastic corner braces. Cabinet components shall be constructed from the following materials and thicknesses:

- a. Body Members (Ends, Divisions, Bottoms, and Tops): 3/4 inch particleboard or medium density fiberboard (MDF) panel product.
- b. Face Frames and Rails: 3/4 inch panel product.
- c. Shelving: 3/4 inch particleboard or medium density fiberboard (MDF) panel product.
- d. Cabinet Backs: 1/4 inch particleboard or medium density fiberboard (MDF) panel product.
- e. Drawer Sides, Backs, and Subfronts: 1/2 inch panel product.
- f. Drawer Bottoms: 1/4 inch particleboard or medium density fiberboard (MDF) panel product.

Specifications

- g. Door and Drawer Fronts: 3/4-inch particleboard or medium density fiberboard (MDF) panel product.

2.10.1.2 Joinery Method for Case Body Members

- a. Cabinet Backs (Wall Hung Cabinets): Wall hung cabinet backs must not be relied upon to support the full weight of the cabinet and its anticipated load for hanging/mounting purposes. Method of back joinery and hanging/mounting mechanisms should transfer the load to case body members.
- b. Wall Anchor Strips shall be required for all cabinets with backs less than 1/2 inch thick. Strips shall consist of minimum 1/2 inch thick lumber, minimum 2-1/2 inches width; securely attached to wall side of cabinet back - top and bottom for wall hung cabinets, top only for floor standing cabinets.

2.10.2 Cabinet Floor Base

Floor cabinets shall be mounted on a base constructed of 3/4 inch veneer core exterior plywood. Base assembly components shall be a moisture-resistant panel product. Finished height for each cabinet base shall be not less than the full height of the installed, specified wall base. Bottom edge of the cabinet door or drawer face shall be flush with top of base.

2.10.3 Cabinet Door and Drawer Fronts

Door and drawer fronts shall be fabricated from 3/4 inch medium density particleboard or 3/4 inch medium density fiberboard (MDF). All door and drawer front edges shall be surfaced with PVC edgebanding, color and pattern to match exterior face laminate.

2.10.4 Drawer Assembly

2.10.4.1 Drawer Components

Drawer components shall consist of a removable drawer front, sides, backs, and bottom. Drawer components shall be constructed of the following materials and thicknesses:

- a. Drawer Sides and Backs for Laminate Finish: 1/2 inch thick 7-ply hardwood veneer core substrate.
- b. Drawer Sides and Back for Thermoset Decorative Overlay (melamine) Finish: 1/2 inch thick medium density particleboard or MDF fiberboard substrate.

2.10.4.2 Drawer Assembly Joinery Method

- a. Lock shoulder, glued and pin nailed.
- b. Bottoms shall be set into sides, front, and back, 1/4 inch deep groove with a minimum 3/8 inch standing shoulder.

2.10.5 Shelving

2.10.5.1 General Requirements

Shelving shall be fabricated from 3/4 inch medium density particleboard or 3/4 inch medium density fiberboard (MDF). All shelving top and bottom surfaces shall be finished with HPDL plastic laminate. Shelf edges shall be finished in a PVC edgebanding.

Specifications

2.10.5.2 Shelf Support System

The shelf support system shall be recessed (mortised) metal shelf standards. Standards shall be mortised flush with the finishes surface of the cabinet interior side walls, two per side. Standards shall be positioned and spaced on the side walls to provide a stable shelf surface that eliminates tipping when shelf front is weighted. Standards shall be installed and adjusted vertically to provide a level, stable shelf surface when clips are in place.

2.10.6 Laminate Application

Laminate application to substrates shall follow the recommended procedures and instructions of the laminate manufacturer and ANSI/NEMA LD 3, using tools and devices specifically designed for laminate fabrication and application. Provide a balanced backer sheet (Grade BK) wherever only one surface of the component substrate requires a plastic laminate finish. Apply required grade of laminate in full uninterrupted sheets consistent with manufactured sizes using one piece for full length only, using adhesives specified herein or as recommended by the manufacturer. Fit corners and joints hairline. All laminate edges shall be machined flush, filed, sanded, or buffed to remove machine marks and eased (sharp corners removed). Clean up at easing shall be such that no overlap of the member eased is visible. Fabrication shall conform to ANSI A161.2. Laminate types and grades for component surfaces shall be as follows unless otherwise indicated on the drawings:

a. Base/Wall Cabinet Case Body.

- (1) Exterior (exposed) surfaces to include exposed and semi-exposed face frame surfaces: HPDL Grade VGS.
- (2) Interior (semi-exposed) surfaces to include interior back wall, bottom, and side walls: HPDL Grade CLS or Thermoset Decorative Overlay (melamine).

b. Adjustable Shelving.

- (1) Top and bottom surfaces: HPDL Grade HGS.
- (2) All edges: PVC edgebanding.

c. Fixed Shelving.

- (1) Top and bottom surfaces: HPDL Grade HGS.
- (2) Exposed edges: PVC edgebanding.

d. Door, Drawer Fronts, Access Panels.

- (1) Exterior (exposed) and interior (semi-exposed) faces: HPDL Grade VGS
- (2) Edges: PVC edgebanding.

e. Drawer Assembly.

All interior and exterior surfaces: Thermoset Decorative Overlay (melamine).

f. Tolerances: Flushness, flatness, and joint tolerances of laminated surfaces shall meet the AWI AWS

Specifications

premium grade requirements.

2.10.7 Finishing

2.10.7.1 Filling

No fasteners shall be exposed on laminated surfaces. All nails, screws, and other fasteners in non-laminated cabinet components shall be countersunk and the holes filled with wood filler consistent in color with the wood species.

PART 3 EXECUTION

3.1 INSTALLATION

Installation shall comply with applicable requirements for AWI AWS premium quality standards. Countertops and fabricated assemblies shall be installed level, plumb, and true to line, in locations shown on the drawings. Cabinets and other laminate clad casework assemblies shall be attached and anchored securely to the floor and walls with mechanical fasteners that are appropriate for the wall and floor construction.

3.1.1 Anchoring Systems

3.1.1.1 Floor

Base cabinets shall utilize a floor anchoring system. Anchoring and mechanical fasteners shall not be visible from the finished side of the casework assembly. Where assembly abuts a wall surface, anchoring shall include a minimum 1/2 inch thick lumber or panel product hanging strip, minimum 2-1/2 inch width; securely attached to the top of the wall side of the cabinet back.

3.1.1.2 Wall

Cabinet to be wall mounted shall utilize minimum 1/2 inch thick lumber or panel product hanging strips, minimum 2-1/2 inch width; securely attached to the wall side of the cabinet back, both top and bottom.

3.1.2 Hardware

Casework hardware shall be installed in types and locations as indicated on the drawings. Where fully concealed European-style hinges are specified to be used with particleboard or fiberboard doors, the use of plastic or synthetic insertion dowels shall be used to receive 3/16 inch "Euroscrews". The use of wood screws without insertion dowels is prohibited.

3.1.3 Doors, Drawers and Removable Panels

The fitting of doors, drawers and removable panels shall be accomplished within target fitting tolerances for gaps and flushness in accordance with AWI AWS premium grade requirements.

3.1.4 Plumbing Fixtures

Install sinks, sink hardware, and other plumbing fixtures in locations as indicated on the drawings and in accordance with Section 22 00 00 PLUMBING, GENERAL PURPOSE.

-- End of Section --

06 61 16 - SOLID POLYMER (SOLID SURFACING) FABRICATIONS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D2583	(2013) Indentation Hardness of Rigid Plastics by Means of a Barcol Impressor
ASTM D570	(1998; E 2010; R 2010) Standard Test Method for Water Absorption of Plastics
ASTM D638	(2010) Standard Test Method for Tensile Properties of Plastics
ASTM D696	(2008; E 2013) Standard Test Method for Coefficient of Linear Thermal Expansion of Plastics Between -30 degrees C and 30 degrees C With a Vitreous Silica Dilatometer
ASTM E84	(2012c) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM G21	(2009) Determining Resistance of Synthetic Polymeric Materials to Fungi

INTERNATIONAL ASSOCIATION OF PLUMBING AND MECHANICAL OFFICIALS (IAPMO)

IAPMO Z124.3	(2005) Plastic Lavatories
IAPMO Z124.6	(2007) Plastic Sinks NATIONAL

ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

ANSI/NEMA LD 3	(2005) Standard for High-Pressure Decorative Laminates
----------------	--

NSF INTERNATIONAL (NSF)

NSF/ANSI 51	(2012) Food Equipment Materials SCIENTIFIC
-------------	--

TILE COUNCIL OF NORTH AMERICA (TCNA)

TCNA Hdbk	(2013) Handbook for Ceramic, Glass, and Stone Tile Installation
-----------	---

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System
---------	---

Specifications

1.2 SYSTEM DESCRIPTION

- a. Work under this section includes countertops and other items utilizing solid polymer (solid surfacing) fabrication as shown on the drawings and as described in this specification. Do not change source of supply for materials after work has started, if the appearance of finished work would be affected.
- b. In most instances, installation of solid polymer fabricated components and assemblies will require strong, correctly located structural support provided by other trades. To provide a stable, sound, secure installation, close coordination is required between the solid polymer fabricator/installer and other trades to ensure that necessary structural wall support, cabinet counter top structural support, proper clearances, and other supporting components are provided for the installation of wall panels, countertops, shelving, and all other solid polymer fabrications to the degree and extent recommended by the solid polymer manufacturer.
- c. Appropriate staging areas for solid polymer fabrications. Allow variation in component size and location of openings of plus or minus 3 mm 1/8 inch.

1.3 SUSTAINABILITY REQUIREMENTS

Materials in this technical specification may contribute towards contract compliance with sustainability requirements.

1.3.1 LEED REQUIREMENTS

See Section 01 33 29 LEED DOCUMENTATION for project LEED NC local/ regional materials and recycled content requirements.

1.4 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Detail Drawings Installation

SD-03 Product Data

Solid polymer material
Qualifications

SD-04 Samples

Material

SD-06 Test Reports

Solid polymer material

SD-07 Certificates

Fabrications Qualifications

SD-10 Operation and Maintenance Data Clean-up

SD-11 Closeout Submittals

LEED Documentation

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

To ensure warranty coverage, solid polymer fabricators shall be certified to fabricate by the solid polymer material manufacturer being utilized. Mark all fabrications with the fabricator's certification label affixed in an inconspicuous location. Fabricators shall have a minimum of 5 years of experience working with solid polymer materials. Submit solid polymer manufacturer's certification attesting to fabricator qualification approval.

1.5.2 Mock-ups

Submit Detail Drawings indicating locations, dimensions, component sizes, fabrication and joint details, attachment provisions, installation details, and coordination requirements with adjacent work. Prior to final approval of shop drawings, provide a full-size mock-up of a typical countertop where multiple units are required. The mock-up shall include all solid polymer components required to provide a completed unit. The mock-up shall utilize finishes in patterns and colors indicated on the drawings. Should the mock-up not be approved, re-work or remake it until approval is secured. Remove rejected units from the jobsite. Approved mock-up may remain as part of the finished work.

1.6 DELIVERY, STORAGE, AND HANDLING

Do not deliver materials to project site until areas are ready for installation. Deliver components and materials to the site undamaged, in containers clearly marked and labeled with manufacturer's name. Materials shall be stored indoors and adequate precautions taken to prevent damage to finished surfaces. Provide protective coverings to prevent physical damage or staining following installation, for duration of project.

1.7 WARRANTY

Provide manufacturer's warranty of ten years against defects in materials, excluding damages caused by physical or chemical abuse or excessive heat. Warranty shall provide for material and labor for replacement or repair of defective material for a period of ten years after component installation.

PART 2 PRODUCTS

2.1 MATERIAL

Provide solid polymer material that is a homogeneous filled solid polymer; not coated, laminated or of a composite construction; meeting IAPMO Z124.3 and IAPMO Z124.6 requirements. Material shall have minimum physical and performance properties specified. Superficial damage to a depth of 0.25 mm 0.01 inch shall be repairable by sanding or polishing. Material thickness shall be as indicated on the drawings. In no case shall material be less than 6 mm 1/2 inch in thickness. Submit a minimum 100 by 100 mm 4 by 4 inch sample of each color and pattern for approval. Samples shall indicate full range of color and pattern variation. Approved samples shall be retained as a standard for this work. Submit test report results from an independent testing laboratory attesting that the submitted solid polymer material meets or exceeds each of the specified performance requirements.

Specifications

- 2.1.1 Cast, 100 Percent Acrylic Polymer Solid Surfacing Material Cast, 100 percent acrylic solid polymer material shall be composed of acrylic polymer, mineral fillers, and pigments and shall meet the following minimum performance requirements:

PROPERTY	REQUIREMENT (min. or max.)	TEST PROCEDURE
Tensile Strength	291 kg/cm ² 4000 psi (max.)	ASTM D638
Hardness	55-Barcol Impressor (min.)	ASTM D2583
Thermal Expansion	.0000386cm/cm/deg C .000023 in/in/F (max.)	ASTM D 696
Boiling Water Surface Resistance	No Change	ANSI/NEMA LD 3-3.05
High Temperature Resistance	No Change	ANSI/NEMA LD 3-3.06
Impact Resistance (Ball drop)		ANSI/NEMA LD 3-303
6.4 mm 1/4 inch sheet	910 mm, 227 g 36 inches, 1/2 lb ball, no failure	
12.7 mm 1/2 inch sheet	3550 mm, 227 g 140 inches, 1/2 lb ball, no failure	
19 mm 3/4 inch sheet	5070 mm, 227 g 200 inches, 1/2 lb ball, no failure	
Mold & Mildew Growth	No growth	ASTM G21
Bacteria Growth	No growth	ASTM G21
Liquid Absorption (Weight in 24 hrs.)	0.1 percent max.	ASTM D570
Flammability		ASTM E84
Flame Spread	25 max.	
Smoke Developed	30 max.	
Sanitation	"Food Contact" approval	NSF/ANSI 51

2.1.2 Material Patterns and Colors

Patterns and colors for all solid polymer components and fabrications shall be those indicated on the project drawings. Pattern and color shall occur, and shall be consistent in appearance, throughout the entire depth (thickness) of the solid polymer material.

2.1.3 Surface Finish

Exposed finished surfaces and edges shall receive a uniform appearance. Exposed surface finish shall be matte; gloss rating of 5-20.

2.2 ACCESSORY PRODUCTS

Accessory products, as specified below, shall be manufactured by the solid polymer manufacturer or shall be products approved by the solid polymer manufacturer for use with the solid polymer materials being specified.

Specifications

2.2.1 Seam Adhesive

Seam adhesive shall be a two-part adhesive kit to create permanent, inconspicuous, non-porous, hard seams and joints by chemical bond between solid polymer materials and components to create a monolithic appearance of the fabrication. Adhesive shall be approved by the solid polymer manufacturer. Adhesive shall be color-matched to the surfaces being bonded where solid-colored, solid polymer materials are being bonded together. The seam adhesive shall be clear or color matched where particulate patterned, solid polymer materials are being bonded together.

2.2.2 Panel Adhesive

Panel adhesive shall be neoprene based panel adhesive meeting TCNA Handbook, Underwriter's Laboratories (UL) listed. Use this adhesive to bond solid polymer components to adjacent and underlying substrates.

2.2.3 Silicone Sealant

Sealant shall be a mildew-resistant, FDA and OSHA Nationally Recognized Testing Laboratory (NRTL) listed silicone sealant or caulk in a clear formulation. The silicone sealant shall be approved for use by the solid polymer manufacturer. Use sealant to seal all expansion joints between solid polymer components and all joints between solid polymer components and other adjacent surfaces such as walls, floors, ceiling, and plumbing fixtures.

2.2.4 Mounting Hardware

Provide mounting hardware, including sink/bowl clips, inserts and fasteners for attachment of undermount sinks and lavatories.

2.3 FABRICATIONS

Components shall be factory or shop fabricated to sizes and shapes indicated, to the greatest extent practical, in accordance with approved Shop Drawings and manufacturer's requirements. Provide factory cutouts for sinks, lavatories, and plumbing fixtures where indicated on the drawings. Contours and radii shall be routed to template, with edges smooth. Defective and inaccurate work will be rejected. Submit product data indicating product description, fabrication information, and compliance with specified performance requirements for solid polymer, joint adhesive, sealants, and heat reflective tape. Both the manufacturer of materials and the fabricator shall submit a detailed description of operations and processes in place that support efficient use of natural resources, energy efficiency, emissions of ozone depleting chemicals, management of water and operational waste, indoor environmental quality, and other production techniques supporting sustainable design and products.

2.3.1 Joints and Seams

Form joints and seams between solid polymer components using manufacturer's approved seam adhesive. Joints shall be inconspicuous in appearance and without voids to create a monolithic appearance.

2.3.2 Edge Finishing

Rout and finish component edges to a smooth, uniform appearance and finish. Edge shapes and treatments, including any inserts, shall be as detailed on the drawings. Rout all cutouts, then sand all edges smooth. Repair or reject defective or inaccurate work.

Specifications

2.3.3 Counter and Vanity Top Splashes

Fabricate backsplashes and end splashes from 1/2 inch thick solid surfacing material to be 4 inches high in conformance with dimensions and shapes as indicated on the drawings. Backsplashes and end splashes shall be provided for all counter tops and vanity tops. Backsplashes shall be shop fabricated and be permanently attached.

2.3.3.1 Permanently Attached Backsplash

Permanently attached backsplashes shall be attached straight with seam adhesive to form a 90 degree transition.

2.3.3.2 End Splashes

End splashes shall be provided loose for installation at the jobsite after horizontal surfaces to which they are to be attached have been installed.

2.3.4 Counter and Vanity Tops

Fabricate all solid surfacing, solid polymer counter top and vanity top components from 1/2 inch thick material. Edge details, dimensions, locations, and quantities shall be as indicated on the Drawings. Counter tops shall be complete with 4 inch high permanently attached, 90 degree transition at all locations. Attach 2 inch wide reinforcing strip of polymer material under each horizontal counter top seam. Submit a minimum 1 foot wide by 6 inch deep, full size sample for each type of counter top shown on the project drawings. The sample shall include the edge profile and backsplash as detailed on the project drawings. Solid polymer material shall be of a pattern and color as indicated on the drawings. Sample shall include at least one seam. Approved sample shall be retained as standard for this work.

2.3.4.1 Counter Top With Sink

- a. Stainless Steel or Vitreous China Sink. Countertops with sinks shall include cutouts to template as furnished by the sink manufacturer. Manufacturer's standard sink mounting hardware for installation shall be provided. Seam between sink and counter top shall be sealed with silicone sealant. Sink, faucet, and plumbing requirements shall be in accordance with Section 22 00 00 PLUMBING, GENERAL PURPOSE.
- b. Solid polymer sinks shall be a manufacturer's standard, pre-molded product specifically designed for attachment to solid polymer counter tops.

PART 3 EXECUTION**3.1 INSTALLATION****3.1.1 Components**

Install all components and fabricated units plumb, level, and rigid. Make field joints between solid polymer components using solid polymer manufacturer's approved seam adhesives, to provide a monolithic appearance with joints inconspicuous in the finished work. Attach metal or vitreous china sinks and lavatory bowls to counter tops using solid polymer manufacturer's recommended clear silicone sealant and mounting hardware. Solid polymer sinks and bowls shall be installed using a color-matched seam adhesive. Plumbing connections to sinks and lavatories shall be made in accordance with Section 22 00 00 PLUMBING, GENERAL PURPOSE.

Specifications

3.1.2 Silicone Sealant

Use a clear, silicone sealant or caulk to seal all expansion joints between solid polymer components and all joints between solid polymer components and other adjacent surfaces such as walls, floors, ceiling, and plumbing fixtures. Sealant bead shall be smooth and uniform in appearance and shall be the minimum size necessary to bridge any gaps between the solid surfacing material and the adjacent surface. Bead shall be continuous and run the entire length of the joint being sealed.

3.1.3 Plumbing

Make plumbing connections to sinks and lavatories in accordance with Section 22 00 00 PLUMBING, GENERAL PURPOSE.

3.2 CLEAN-UP

Components shall be cleaned after installation and covered to protect against damage during completion of the remaining project items. Components damaged after installation by other trades will be repaired or replaced at the General Contractor's cost. Component supplier will provide a repair/replace cost estimate to the General Contractor who shall approve estimate before repairs are made. Submit maintenance data indicating manufacturer's care, repair and cleaning instructions. Maintenance video shall be provided, if available. Maintenance kit for matte finishes shall be submitted.

-- End of Section --

07 13 53 - ELASTOMERIC SHEET WATERPROOFING**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D146/D146M	(2004; E 2012; R 2012) Sampling and Testing Bitumen-Saturated Felts and Woven Fabrics for Roofing and Waterproofing
ASTM D1876	(2008) Standard Test Method for Peel Resistance of Adhesives (T-Peel Test)
ASTM D41/D41M	(2011) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D412	(2006a; R 2013) Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers - Tension
ASTM D5385	(1993; R 2006) Hydrostatic Pressure Resistance of Waterproofing Membranes
ASTM D570	(1998; E 2010; R 2010) Standard Test Method for Water Absorption of Plastics
ASTM D903	(1998; R 2010) Peel or Stripping Strength of Adhesive Bonds
ASTM E154/E154M	(2008a; R 2013; E 2013) Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover
ASTM E96/E96M	(2012) Standard Test Methods for Water Vapor Transmission of Materials

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Elastomeric waterproofing sheet material
Protection board
Primers, adhesives, and mastics

SD-06 Test Reports

Elastomeric waterproofing sheet material

Certify compliance with performance requirements specified herein.

Specifications

Protective Covering

SD-08 Manufacturer's Instructions Primers, adhesives, and mastics

Submit Manufacturer's material safety data sheets for primers, adhesives and mastics.

1.3 QUALITY ASSURANCE

1.3.1 Shop Drawing Requirements

Include description and physical properties; termination details; application details; recommendations regarding shelf life, application procedures; requirements for protective covering; and precautions for flammability and toxicity.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver and store materials out of the weather, in manufacturer's original packaging with brand name and product identification clearly marked. Do not permit uncertified materials in the work area.

1.5 ENVIRONMENTAL CONDITIONS

Do not apply waterproofing during inclement weather or when there is ice, frost, surface moisture, or visible dampness on the surface to receive waterproofing and when ambient and surface temperatures are 40 degrees F or below.

PART 2 PRODUCTS

2.1 MATERIALS

Provide the type of elastomeric waterproofing sheet material and related primers, adhesives, and mastics as specified herein. Ensure compatibility of waterproofing materials within a specific type, with each other, and with the materials on which they will be applied. Materials shall conform to the applicable performance requirements cited below when tested in accordance with the referenced ASTM publications.

2.2 COMPOSITE, SELF-ADHERING MEMBRANE SHEETING

Cold applied composite sheet consisting of rubberized asphalt and cross laminated, high density polyethylene film. Not less than 1.5 mm 60 mils minimum thickness is required.

2.2.1 Composite, Self-Adhering Sheeting Performance Requirements

- a. Tensile Strength, ASTM D412, Die C: 1.6 MPa 250 psi minimum;
- b. Ultimate Elongation, ASTM D412, Die C: 200 percent minimum;
- c. Water Vapor Transmission, ASTM E96/E96M 80 Degrees F Permeance, Procedure B: 5 2 0.1 perm maximum;
- d. Pliability Degrees F, ASTM D146/D146M: (180 Degrees Bend Over One Inch Mandrel): No cracks at minus 32 degrees C minus 25 degrees F;
- e. Cycling Over Crack at minus 15 Degrees F: Membrane is applied and rolled across two primed concrete blocks with no separation between blocks. Crack opened and closed from zero to 6 mm 1/4 inch. No effect at 100 cycles;

Specifications

- f. Puncture Resistance, ASTM E154/E154M: 40 lb. minimum;
- g. Lap Adhesion at Minimum Application Temperature, ASTM D1876 Modified, 880 N/m (5 lbs/in.);
- h. Peel Strength, ASTM D903: Modified 1576 N/m 9 lbs/n;
- i. Resistance to Hydrostatic Head, ASTM D5385: 231 ft of water;
- j. Water Absorption, ASTM D570: 0.1 percent maximum.

2.2.2 Primer

Asphalt composition, ASTM D41/D41M, or synthetic polymer in solvent as recommended by the membrane manufacturer.

2.2.3 Mastic

Polymer modified asphalt in suitable solvent of trowel-grade consistency and as recommended by the membrane manufacturer.

2.3 Protection Board

Three-dimensional, high impact resistant polymeric grid with woven monofilament drainage fabric bonded to the grid.

PART 3 EXECUTION

3.1 VERIFICATION OF CONDITIONS

Before starting the work, verify that surfaces to be waterproofed are in satisfactory condition. Notify the Contracting Officer of defects or conditions that will prevent a satisfactory application. Do not start application until defects and conditions have been corrected.

3.2 SURFACE PREPARATION

Ensure surfaces to be treated are clean, dry, smooth, and free from deleterious materials and projections. Thoroughly wet holes, joints, cracks, and voids with water and fill with Portland cement mortar, strike flush, and permit to dry. Cut off high spots or grind smooth. Finish top surfaces of projecting masonry or concrete ledges below grade, except footings, to a steep bevel with Portland cement mortar. Sweep surfaces to be covered before applying waterproofing to remove dust and foreign matter. Cure concrete by a method compatible with the waterproofing system.

3.3 APPLICATION

Follow manufacturer's printed installation instructions. When using solvent welding liquid, avoid prolonged contact with skin and breathing of vapor. Carry waterproofing of horizontal surfaces up abutting vertical surfaces as indicated and adhere solid to the substrate. Avoid wrinkles and buckles in applying membrane and joint reinforcement.

- a. Self-Adhering Membrane: Apply composite, self-adhering membrane on surfaces primed at a uniform coverage rate in accordance with membrane manufacturer's printed instructions. Remove release sheet and apply with tacky surface in contact with dried primer.
- b. Protection: Protect membrane over horizontal surfaces from abnormal traffic during installation. Use only equipment with rubber tires. Provide walkway protection where heavy traffic from other trades is expected. Do not store material on membrane.

Specifications

3.4 Composite, Self-Adhering Membrane

Lap sheets at edges and ends a minimum of 2-1/2 inches over the preceding sheet. All side laps shall be minimum 2-1/2 inches and end laps shall be 5 inches. Laps shall be self adhesive, mastic as per manufacturer's recommendation. Roll or firmly press to adhere membrane to substrate. Cover corners and joints with two layers of reinforcement by first applying a 12 inch width of membrane centered along the axis. Flash drains and projections with a second ply of membrane for a distance of 6 inches from the drain or projection. Finish exposed, terminated edges of membrane on horizontal or vertical surfaces with a trowelled bead of mastic. Apply mastic around edges of membrane, and drains and projections. Apply mastic at end of each work day.

3.5 FLASHING

Flash penetrations through membrane. Ensure that where reinforcing bars penetrate a waterproofing membrane, each of those penetrations be sealed with the appropriate sealant or mastic flashing component. Embed elastomeric membrane in a heavy coat of adhesive, except for self-adhering membrane.

3.6 PROTECTIVE COVERING

After installation has been inspected and approved by the Architect, apply a protective covering to the membrane waterproofing prior to backfilling.

-- End of Section --

07 21 13 - BOARD AND BLOCK INSULATION**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C578	(2012b) Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation
ASTM D6817/D6817M	(2013a) Standard Specification for Rigid Cellular Polystyrene Geofoam

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Block or board insulation

SD-08 Manufacturer's Instructions Block or

Board Insulation Adhesive

1.3 DELIVERY, STORAGE, AND HANDLING**1.3.1 Delivery**

Deliver materials to the site in original sealed wrapping bearing manufacturer's name and brand designation, type, grade, R-value, and class. Store and handle to protect from damage. Do not allow insulation materials to become wet, soiled, crushed, or covered with ice or snow. Comply with manufacturer's for handling, storing, and protecting of materials before and during installation.

1.3.2 Storage

Inspect materials delivered to the site for damage; unload and store out of weather in manufacturer's original packaging. Store only in dry locations, not subject to open flames or sparks, and easily accessible for inspection and handling.

PART 2 PRODUCTS**2.1 BLOCK OR BOARD INSULATION**

Provide only thermal insulating materials recommended by manufacturer for type of application indicated. Provide board or block thermal insulation conforming to the following standards and the physical properties listed below:

- a. Rigid Cellular Cellular Polystyrene: ASTM D6817/D6817M, Type EPS19.

Specifications

- b. Extruded Preformed Cellular Polystyrene: ASTM C578, Type IV 25 psi.

2.1.1 Other Material Properties

Provide thermal insulating materials with the following properties:

- a. Rigid cellular polystyrene geofoam: Compressive Resistance at Yield: Not less than 5.8 pounds per square inch (psi) at 1 percent deformation.
- b. Flexural strength: Not less than 30 psi.
- c. Water Absorption: Not more than 3 percent by total immersion, by volume.

2.2 ACCESSORIES

2.2.1 Adhesive

As recommended by insulation manufacturer.

2.2.2 Mechanical Fasteners

Multibarbed corrosion resistant fasteners as recommended by the insulation manufacturer.

PART 3 EXECUTION

3.1 EXISTING CONDITIONS

Before installing insulation, ensure that all areas that will be in contact with the insulation are dry and free of projections which could cause voids or compressed insulation. If moisture or other conditions are found that do not allow the proper installation of the insulation, do not proceed but notify the Architect of such conditions.

3.2 INSTALLATION

3.2.1 Insulation Board

Install and handle insulation in accordance with the manufacturer's installation instructions. Keep material dry and free of extraneous materials. Observe safe work practices.

3.3 UNDER FLOATING SLAB INSULATION

Install insulation at floating-slab construction.

3.3.1 Manufacturer's Instructions

Install, attach, tape edges, and provide vapor retarder and other requirements such as protection against damage during construction as recommended in manufacturer's instructions.

3.3.2 Insulation Under Slab

Provide insulation horizontally under entire floating slab.

-- End of Section --



Specifications

07 22 00 - ROOF AND DECK INSULATION

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C1177/C1177M	(2008) Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing
ASTM C1289	(2013) Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board
ASTM C208	(2012) Cellulosic Fiber Insulating Board
ASTM D4263	(1983; R 2012) Indicating Moisture in Concrete by the Plastic Sheet Method
ASTM E84	(2012c) Standard Test Method for Surface Burning Characteristics of Building Materials

FM GLOBAL (FM)

FM APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/
FM P9513	(2002) Specialist Data Book Set for Roofing Contractors; contains 1-22 (2001), 1-28 (2002), 1-29 (2002), 1-28R/1-29R (1998), 1-30 (2000), 1-31 (2000), 1-32 (2000), 1-33 (2000), 1-34 (2001), 1-49 (2000), 1-52 (2000), 1-54 (2001)

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System
---------	---

UNDERWRITERS LABORATORIES (UL)

UL Bld Mat Dir	(2012) Building Materials Directory
----------------	-------------------------------------

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Wood

Nailers
Tapered roof insulation system Taper cants and crickets

Specifications

SD-03 Product Data

Insulation
Recycled materials; (LEED NC)

MR4; Submit documentation indicating percentage of post-industrial and post-consumer recycled content per unit of product. Indicate relative dollar value of recycled content products to total dollar value of products included in project.

Local/Regional Materials; (LEED NC)

MR5; Submit documentation indicating distance between manufacturing facility and the project site. Indicate distance of raw material origin from the project site. Indicate relative dollar value of local/regional materials to total dollar value of products included in project.

SD-06 Test Reports

Flame spread and smoke developed ratings Submit in accordance with ASTM E84.

SD-07 Certificates

Installer qualifications

SD-08 Manufacturer's Instructions

Roof insulation, including field of roof and perimeter attachment requirements.

1.3 MANUFACTURER'S CERTIFICATE

Submit certificate from the insulation manufacturer attesting that the installer has the proper qualifications for installing tapered roof insulation systems.

Certificate attesting that the expanded perlite or polyisocyanurate insulation contains recovered material and showing estimated percent of recovered material. Certificates of compliance for felt materials.

1.4 QUALITY ASSURANCE

1.4.1 Insulation on Concrete Decks

Roof insulation shall have a flame spread rating not greater than 75 and a smoke developed rating not greater than 150, exclusive of covering, when tested in accordance with ASTM E84. Insulation bearing the UL label and listed in the UL Bld Mat Dir as meeting the flame spread and smoke developed ratings will be accepted in lieu of copies of test reports. Compliance with flame spread and smoke developed ratings will not be required when insulation has been tested as part of a roof construction assembly of the type used for this project and the construction is listed as fire-classified in the UL Bld Mat Dir or listed as Class I roof deck construction in the FM APP GUIDE. Insulation tested as part of a roof construction assembly shall bear UL or FM labels attesting to the ratings specified herein.

1.4.2 Local/Regional Materials

See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Roof insulation and materials may be locally available.

Specifications**1.5 DELIVERY, STORAGE, AND HANDLING****1.5.1 Delivery**

Deliver materials to site in manufacturer's unopened and undamaged standard commercial containers bearing the following legible information:

- a. Name of manufacturer;
- b. Brand designation;
- c. Specification number, type, and class, as applicable, where materials are covered by a referenced specification; and

Deliver materials in sufficient quantity to allow continuity of the work.

1.5.2 Storage and Handling

Store and handle materials in a manner to protect from damage, exposure to open flame or other ignition sources, and from wetting, condensation or moisture absorption. Store in an enclosed building or trailer that provides a dry, adequately ventilated environment. Replace damaged material with new material.

1.6 ENVIRONMENTAL CONDITIONS

Do not install roof insulation during inclement weather or when air temperature is below 40 degrees F and interior humidity is 45 percent or greater, or when there is visible ice, frost, or moisture on the roof deck.

PART 2 PRODUCTS**2.1 INSULATION****2.1.1 Insulation Types**

Roof insulation shall be the following materials and compatible with attachment methods for the specified insulation and roof membrane:

Polyisocyanurate Board: ASTM C1289 Type II, fibrous felt or glass mat membrane both sides, except minimum compressive strength shall be 20 pounds per square inch (psi).

2.1.2 Recovered Materials

Provide thermal insulation materials containing recycled materials to the extent practical. The required minimum recycled material content for the listed materials are:

Perlite Composition Board:	75 percent postconsumer paper
Polyisocyanurate/polyurethane:	9 percent recovered material
Wood Fiberboard:	25 percent recovered material
Cellular Glass Insulation:	75 percent recovered content
Structural Fiberboard:	100 percent recovered content

Specifications

Fiberglass Insulation:	20-25 percent recovered content
Fiber (felt) or Fiber composite:	50-100 percent recovered content
Rubber:	12-100 percent recovered content
Plastic or Plastic/Rubber composite:	100 percent recovered content
Wood/Plastic Composite:	100 percent Total Recovered content

2.1.3 Insulation Thickness

As necessary to provide a thermal resistance (R value) indicated or more for average thickness of tapered system. Thickness shall be based on the "R" value for aged insulation. Insulation over steel decks shall satisfy both specified R value and minimum thickness for width of rib opening recommended in insulation manufacturer's published literature.

2.1.4 Tapered Roof Insulation

One layer of the tapered roof insulation assembly shall be factory tapered to a slope of not less than 1/2 inch per foot. Provide starter and filler blocks as required to provide the total thickness of insulation necessary to meet the specified slope and thermal conductance. Mitered joints shall be factory fabricated and shall consist of two diagonally cut boards or one board shaped to provide the required slopes. Identify each piece of tapered insulation board by color or other identity coding system, allowing the identification of different sizes of tapered insulation board required to complete the roof insulation system.

2.2 PROTECTION BOARD

For use as a thermal barrier (underlayment), fire barrier (overlayment), or protection board for hot-mopped, torched-down, or adhesively-applied roofing membrane over roof insulation.

2.2.1 Glass Mat Gypsum Roof Board

ASTM C1177/C1177M, 0 Flame Spread and 0 Smoke Developed when tested in accordance with ASTM E84, 500 psi, Class A, non-combustible, 1/2 inch thick, 4 by 8 feet board size.

2.2.2 High Density Wood Fiber

Provide improved impact resistance to roof covers, but is hydroscopic in nature. High density fiber board shall be Grade 2 in accordance with ASTM C208 with a transverse load of 12 lbf.

2.3 ADHESIVE

Insulation manufacturer's recommended bead or full spread adhesive formulated to attach roof insulation to substrate and to other insulation layers.

2.4 WOOD NAILERS

Pressure-preservative-treated as specified in Section 06 10 00 ROUGH CARPENTRY.

Specifications

PART 3 EXECUTION**3.1 EXAMINATION AND PREPARATION****3.1.1 Surface Inspection**

Surfaces shall be clean, smooth, and dry. Check roof deck surfaces, including surfaces sloped to roof drains and outlets, for defects before starting work.

The Contractor shall inspect and approve the surfaces immediately before starting installation. Prior to installing insulation, perform the following:

- a. Examine precast concrete decks to ensure that joints between precast units are properly grouted and leveled to provide suitable surfaces for installation of insulation.
- b. Prior to installing any roof system on a concrete deck, conduct a test per ASTM D4263. The deck is acceptable for roof system application when there is no visible moisture on underside of plastic sheet after 24 hours.

3.1.2 Surface Preparation

Correct defects and inaccuracies in roof deck surface to eliminate poor drainage and hollow or low spots and perform the following:

- a. Install wood nailers the same thickness as insulation at eaves, edges, curbs, walls, and roof openings for securing, gravel stops, gutters, and flashing flanges.

3.2 INSULATION INSTALLATION

Apply insulation in two layers with staggered joints when total required thickness of insulation exceeds 1/2 inch. Lay insulation so that continuous longitudinal joints are perpendicular to direction of [felts for the built-up] roofing, as specified in Section 07 53 23 "Ethylene-Propylene-Diene-Monomer Roofing", and end joints of each course are staggered with those of adjoining courses. When using multiple layers of insulation, joints of each succeeding layer shall be parallel and offset in both directions with respect to layer below. Keep insulation 1/2 inch clear of vertical surfaces penetrating and projecting from roof surface.

3.2.1 Installation Using Adhesive

Set each layer of insulation adhesive, firmly pressing and maintaining insulation in place.

3.2.2 Special Precautions for Installation of Foam Insulation**3.2.2.1 Polyisocyanurate Insulation**

Where polyisocyanurate foam board insulation is provided, install 1/2 inch thick wood fiberboard, glass mat gypsum roof board, or 3/4 inch thick expanded perlite board insulation over top surface of foam board insulation. Stagger joints of insulation with respect to foam board insulation below.

3.3 PROTECTION**3.3.1 Protection of Applied Insulation**

Completely cover each day's installation of insulation with the finished roofing specified in 07 53 23 on same day. Do not permit phased construction. Protect open spaces between insulation and parapets or other walls and spaces at curbs, scuttles, and expansion joints, until permanent roofing and flashing

Specifications

are applied. Do not permit storing, walking, wheeling, or trucking directly on insulation or on roofed surfaces. Provide smooth, clean board or plank walkways, runways, and platforms near supports, as necessary, to distribute weight to conform to indicated live load limits of roof construction. Exposed edges of the insulation shall be protected by cutoffs at the end of each work day or whenever precipitation is imminent. Cutoffs shall be EPDM membrane set in roof cement. Fill all profile voids in cut-offs to prevent entrapping of moisture into the area below the membrane. Cutoffs shall be removed when work is resumed.

3.3.2 Damaged Work and Materials

Restore work and materials that become damaged during construction to original condition or replace with new materials.

3.4 INSPECTION

The Contractor shall establish and maintain an inspection procedure to assure compliance of the installed roof insulation with the contract requirements. Any work found not to be in compliance with the contract shall be promptly removed and replaced or corrected in an approved manner. Quality control shall include, but not be limited to, the following:

- a. Observation of environmental conditions; number and skill level of insulation workers; start and end time of work.
- b. Verification of certification, listing or label compliance with FM P9513.
- c. Verification of proper storage and handling of insulation and vapor retarder materials before, during, and after installation.
- d. Coordinate with other materials, cants, sleepers, and nailing strips.
- e. Inspection of insulation joint orientation and laps between layers, joint width and bearing of edges of insulation on deck.
- f. Installation of cutoffs and proper joining of work on subsequent days.
- g. Continuation of complete roofing system installation to cover insulation installed same day.

-- End of Section --

07 24 00 - DIRECT-APPLIED EXTERIOR AND FINISH SYSTEMS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM B117	(2011) Standard Practice for Operating Salt Spray (Fog) Apparatus
ASTM C1186	(2008; R 2012) Standard Specification for Flat Non-Asbestos Fiber Cement Sheets
ASTM C150/C150M	(2012) Standard Specification for Portland Cement
ASTM C473	(2012) Physical Testing of Gypsum Panel Products
ASTM C67	(2012) Standard Test Methods for Sampling and Testing Brick and Structural Clay Tile
ASTM C920	(2011) Standard Specification for Elastomeric Joint Sealants
ASTM D2247	(2011) Testing Water Resistance of Coatings in 100% Relative Humidity
ASTM D3273	(2012) Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber
ASTM D968	(2005; R 2010) Abrasion Resistance of Organic Coatings by Falling Abrasive
ASTM E2098	(2000; R 2006) Determining Tensile Breaking Strength of Glass Fiber Reinforcing Mesh for Use in Class PB Exterior Insulation and Finish Systems (EIFS) after Exposure to a Sodium Hydroxide Solution
ASTM E2485	(2006) Standard Test Method for Freeze/Thaw Resistance of Exterior Insulation and Finish Systems (EIFS) and Water Resistive Barrier Coatings
ASTM E331	(2000; R 2009) Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference
ASTM E84	(2012c) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM G153	(2004; R 2010) Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials

Specifications

1.2 SYSTEM DESCRIPTION AND REQUIREMENTS

The exterior insulation and finish system (DEFS) shall be a job-fabricated exterior covering consisting of sheathing, reinforcing fabric, base coat, finish coat, adhesive and mechanical fasteners as applicable. The system components shall be compatible with each other and with the substrate as recommended or approved by, and the products of, a single manufacturer regularly engaged in furnishing Exterior Insulation and Finish Systems. All materials shall be installed by an applicator approved by the system manufacturer.

1.2.1 System Requirements and Tests

The system shall meet the performance requirements as verified by the tests listed below. Where a system of similar type, size, and design as specified for this project has been previously tested under the condition specified herein, the resulting test reports may be submitted in lieu of job specific tests.

1.2.1.1 Water Penetration

Test the system for water penetration by uniform static air pressure in accordance with ASTM E331. There shall be no penetration of water beyond the plane of the base coat/sheathing interface after 15 minutes at 6.4 psf, or 20 percent of positive design wind pressure, whichever is greater.

1.2.2 Component Requirements and Tests

The components of the system shall meet the performance requirements as verified by the tests listed below.

1.2.2.1 Surface Burning Characteristics

Conduct ASTM E84 test on samples consisting of base coat, reinforcing fabric, and finish coat. Cure for 28 days. The flame spread index shall be 25 or less and the smoke developed index shall be 450 or less.

1.2.3 Sub-Component Requirements and Tests

Unless otherwise stated, the test specimen shall consist of reinforcing mesh, base coat, and finish coat applied in accordance with manufacturer's printed recommendations to the sheathing to be used on the building. For mildew resistance, only the finish coat is applied onto glass slides for testing. These specimens shall be suitably sized for the apparatus used and be allowed to cure for a minimum of 28 days prior to testing.

1.2.3.1 Abrasion Resistance

Test in accordance with ASTM D968, Method A. Test a minimum of two specimens. After testing, the specimens shall show only very slight smoothing, with no loss of film integrity after 132 gallons of sand.

1.2.3.2 Accelerated Weathering

Test in accordance with ASTM G153, Cycle 1. After 2000 hours specimens shall exhibit no visible cracking, flaking, peeling, blistering, yellowing, fading, or other such deterioration.

1.2.3.3 Mildew Resistance

Test in accordance with ASTM D3273. The specimen shall consist of the finish coat material, applied to clean 3 inch by 4 inch glass slides and shall be allowed to cure for 28 days. After 28 days of exposure, the specimen shall not show any growth.

Specifications

1.2.3.4 Salt Spray Resistance

Test in accordance with ASTM B117. The specimen shall be a minimum of 4 inch by 6 inch and shall be tested for a minimum of 300 hours. After exposure, the specimen shall exhibit no observable deterioration, such as chalking, fading, or rust staining.

1.2.3.5 Water Resistance

Test in accordance with ASTM D2247. The specimen shall be a minimum of 4 inch by 6 inch. After 14 days, the specimen shall exhibit no cracking, checking, crazing, erosion, blistering, peeling, or delamination.

1.2.3.6 Absorption-Freeze/Thaw

Class PB systems shall be tested in accordance with ASTM E2485 for 60 cycles of freezing and thawing. No cracking, checking, or splitting, and negligible weight gain. Class PM systems shall be tested in accordance with ASTM C67 for 50 cycles of freezing and thawing. After testing, the specimens shall exhibit no cracking or checking and have negligible weight gain.

1.3 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Shop drawings

Show layout, construction and expansion joints, decorative grooves, layout of sheathing board, and reinforcing mesh and strip reinforcing fabric; joint and flashing details; details at penetrations; types and location of fasteners; soffit perimeter.

SD-03 Product Data

Sheathing board Mechanical
Fasteners Accessories
Base coat Portland cement
Reinforcing fabric
Finish coat
Joint Sealant
Sealant Primer
Bond breaker
Backer Rod
Warranty

Include joint and other details, such as end conditions, corners, windows, and parapet. Include shelf life and recommended cleaning solvents in data for sealants. Include material safety data sheets (MSDS) for all components of the DEFS. The MSDS shall be available at the job site.

SD-04 Samples

Sample Boards Color and Texture

SD-06 Test Reports

Abrasion resistance
Accelerated weathering
Impact resistance

Specifications

Mildew resistance
Salt spray resistance
Water vapor transmission
Absorption-freeze-thaw
Water penetration
Water resistance
Surface Burning Characteristics

SD-07 Certificates

Qualifications of EIFS Manufacturer
Qualification of EIFS Installer
Qualification of Sealant Applicator

Certify that EIFS installer meets requirements specified under paragraph "Qualification of Installer," and that sealant applicator is approved by the EIFS Manufacturer.

SD-08 Manufacturer's Instructions Installation

Manufacturer's standard printed instructions for the installation of the EIFS. Include requirements for condition and preparation of substrate, installation of EIFS, and requirements for sealants and sealing.

SD-10 Operation and Maintenance Data DEFS

Include detailed finish repair procedures and information regarding compatibility of sealants with base and finish coatings.

1.4 QUALITY ASSURANCE

1.4.1 Qualifications of EIFS Manufacturer

The EIFS shall be the product of a manufacturer who has been in the practice of manufacturing and designing EIFS for a period of not less than 3 years, and has been involved in at least five projects similar to this project in size, scope, and complexity, in the same or a similar climate as this project.

1.4.2 Qualification of EIFS Installer

The EIFS Installer shall be trained by the EIFS manufacturer to perform the installation of the System and shall have successfully installed at least five projects at or near the size and complexity of this project. The contractor shall employ qualified workers trained and experienced in installing the manufacturer's DEFS.

1.4.3 Qualification of Sealant Applicator

The sealant applicator shall be experienced and competent in the installation of high performance industrial and commercial sealants and shall have successfully installed at least five projects at or near the size and complexity of this project.

1.5 DELIVERY AND STORAGE

Deliver materials to job site in original unopened packages, marked with manufacturer's name, brand name, and description of contents. Store materials off the ground and in accordance with the manufacturer's recommendations in a clean, dry, well-ventilated area. Protect stored materials from rain, sunlight, and excessive heat. Keep coating materials which would be damaged by freezing at a temperature not less than 40 degrees F. Do not expose insulation board to flame or other ignition sources.

Specifications

1.6 ENVIRONMENTAL CONDITIONS

- a. Do not prepare materials or apply DEFS during inclement weather unless appropriate protection is provided. Protect installed materials from inclement weather until they are dry.
- b. Apply sealants and wet materials only at ambient temperatures of 40 degrees F or above and rising, unless supplemental heat is provided. The system shall be protected from inclement weather and to maintain this temperature for a minimum of 24 hours after installation.

1.7 WARRANTY

Furnish manufacturer's standard warranty for the DEFS. Warranty shall run directly to Owner and cover a period of not less than 5 years from date Owner accepted the work.

PART 2 PRODUCTS

2.1 COMPATIBILITY

Provide all materials compatible with each other and with the substrate, and as recommended by EIFS manufacturer.

2.2 SHEATHING BOARD

2.2.1 Fiber Reinforced Cement Sheathing Board

- a. Meet ASTM C1186, Type A, for exterior applications.
- b. Nail Pull Resistance: No less than 120 lb when tested in accordance with ASTM C473.
- c. Thickness no less than 5/8 inch.
- d. Water Absorption not to exceed 17 percent.

2.3 MECHANICAL FASTENERS

Corrosion resistant and as approved by EIFS manufacturer. Select fastener type and pattern based on applicable wind loads and substrate into which fastener will be attached, to provide the necessary pull-out, tensile, and shear strengths.

2.4 BASE COAT

Manufacturer's standard product and compatible with other systems components.

2.5 PORTLAND CEMENT

Conform to ASTM C150/C150M, Type I or II as required, fresh and free of lumps, and approved by the systems manufacturer.

2.6 REINFORCING FABRIC

Reinforcing fabric mesh shall be alkali-resistant, balanced, open weave, glass fiber fabric made from twisted multi-end strands specifically treated for compatibility with the other system materials, and comply with ASTM E2098 and as recommended by EIFS manufacturer.

Specifications

2.7 FINISH COAT

Manufacturer's standard product conforming to the requirements in the paragraph on Sub-Component Requirements and Tests. For color consistency, use materials from the same batch or lot number.

2.8 SEALANT PRIMER

Non-staining, quick-drying type recommended by sealant manufacturer and EIFS manufacturer.

2.9 ACCESSORIES

Conform to recommendations of EIFS manufacturer, including trim, edging, anchors, expansion joints. All metal items and fasteners to be corrosion resistant.

2.10 JOINT SEALANT

Non-staining, quick-drying type meeting ASTM C920, as Type S or M, minimum Grade NS, minimum Class 25 and compatible with the finish system type and grade, and recommended by both the sealant manufacturer and EIFS manufacturer.

2.11 BOND BREAKER

As required by EIFS manufacturer and recommended by sealant manufacturer and EIFS manufacturer.

2.12 BACKER ROD

Closed cell polyethylene free from oil or other staining elements and as recommended by sealant manufacturer and EIFS manufacturer. Do not use absorptive materials as backer rod. The backer rod should be sized 25 percent larger than the width of the joint.

PART 3 EXECUTION

3.1 EXAMINATION

Examine substrate and existing conditions to determine that the EIFS can be installed as required by the EIFS manufacturer and that all work related to the EIFS is properly coordinated. Surface shall be sound and free of oil, loose materials or protrusions which will interfere with the system installation. If deficiencies are found, notify the Contracting Officer and do not proceed with installation until the deficiencies are corrected. The substrate shall be plane, with no deviation greater than 1/4 inch when tested with a 10 foot straightedge. Determine flatness, plumbness, and any other conditions for conformance to manufacturer's instructions.

3.2 SURFACE PREPARATION

Prepare surfaces for application of the EIFS to meet flatness tolerances and surface preparation according to manufacturer's installation instructions. Provide clean surfaces free of oil and loose material without protrusions adversely affecting the installation of the insulation board. Due to substrate conditions or as recommended by the system manufacturer, a primer may be required. Apply the primer to surfaces as recommended by the manufacturer. Use masking tape to protect areas adjacent to the EIFS to prevent base or finish coat to be applied to areas not intended to be covered with the EIFS. The contractor shall not proceed with the installation until all noted deficiencies of the substrate are corrected.

Specifications

3.3 INSTALLATION

Install DEFS as indicated, comply with manufacturer's instructions except as otherwise specified, and in accordance with the shop drawings. DEFS shall be installed only by an applicator trained by the EIFS manufacturer. Specifically, include all manufacturer recommended provisions regarding flashing and treatment of wall penetrations.

3.3.1 Sheathing Board

Edges and ends of boards shall be butted snugly with vertical joints staggered to provide full and even support for the insulation. Do not align sheathing board joints with wall openings. Provide support at both vertical and horizontal joints. Attach sheathing board to metal framing with self-tapping drywall screws. Place fasteners sufficiently close to support imposed loads, but not more than maximum of 8 inches apart on each supporting framing member. Space fasteners more closely when required for negative wind load resistance.

3.3.2 Base Coat and Reinforcing Fabric Mesh,**3.3.2.1 Class PM Systems**

Mechanically fasten reinforcing fabric mesh to the insulated wall using the type and spacing of fasteners specified in the manufacturer's instructions. Provide diagonal reinforcement at opening corners. Mix base coat in accordance with manufacturer's instructions. Apply base coat in accordance with manufacturer's instruction to provide a complete, tight coating of uniform thickness as specified by the manufacturer. Cover all fiberglass reinforcing fabric, including at back wrapped areas at panel joints and at fasteners.

3.3.3 Finish Coat

The base coat/reinforcing mesh must be allowed to dry a minimum of 24 hours prior to application of the finish coat. Surface irregularities in the base coat, such as trowel marks, board lines, reinforcing mesh laps, etc., shall be corrected prior to the application of the finish coat. Apply and level finish coat in one operation. Obtain final texture by trowels, floats, or by spray application as necessary to achieve the required finish matching approved sample. Apply the finish coat to the dry base coat maintaining a wet edge at all times to obtain a uniform appearance. The thickness of the finish coat shall be in accordance with the system manufacturer's current published instructions. Apply finish coat so that it does not cover surfaces to which joint sealants are to be applied.

3.4 JOINT SEALING

Seal DEFS at openings as recommended by the system manufacturer. Apply sealant only to the base coat or base coat with EIFS Manufacturer's color coating. Do not apply sealant to the finish coat.

3.4.1 Surface Preparation, Backer Rod, and Primer

Immediately prior to application, remove loose matter from joint. Ensure that joint is dry and free of finish coat, or other foreign matter. Install backer rod. Apply primer as required by sealant and EIFS manufacturer. Check that joint width is as shown on drawings but in no case shall it be less than 0.5 inch for perimeter seals and 0.75 inch for expansion joints. The width shall not be less than 4 times the anticipated movement. Check sealant manufacturer's recommendations regarding proper width to depth ratio.

Specifications

3.4.2 Sealant

Do not apply sealant until all DEFS coatings are fully dry. Apply sealant in accordance with sealant manufacturer's instructions with gun having nozzle that fits joint width. Do not use sealant that has exceeded shelf life or cannot be discharged in a continuous flow. Completely fill the joint solidly with sealant without air pockets so that full contact is made with both sides of the joint. Tool sealant with a round instrument that provides a concave profile and a uniformly smooth and wrinkle free sealant surface. Do not wet tool the joint with soap, water, or any other liquid tooling aid. During inclement weather, protect the joints until sealant application. Use particular caution in sealing joints between window and door frames and the EIFS wall and at all other wall penetrations. Clean all surfaces to remove excess sealant.

3.5 CLEANUP

Upon completion, remove all scaffolding, equipment, materials and debris from site. Remove all temporary protection installed to facilitate installation of DEFS.

-- End of Section --

07 42 13 – METAL WALL PANELS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 620	Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Aluminum Substrates
AAMA 621	Voluntary Specification for High Performance Organic Coatings on Coil Coated Architectural Hot Dipped Galvanized (HDG) and Zinc-Aluminum Coated Steel Substrates

ASTM INTERNATIONAL (ASTM)

ASTM A 653/A 653M	(2009a) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM A 666	(2003) Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate and Flat Bar
ASTM A 755/A 755M	(2003; R 2008) Standard Specification for Steel Sheet, Metallic Coated by the Hot-Dip Process and Prepainted by the Coil-Coating Process for Exterior Exposed Building Products
ASTM A 792/A 792M	(2009a) Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process
ASTM B 209	(2007) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM C 1007	(2008a) Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories
ASTM E 72	(2005) Conducting Strength Tests of Panels for Building Construction
ASTM E 283	(2004) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
ASTM E 331	(2000; R 2009) Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference

Specifications

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA 1793

(2006) Architectural Sheet Metal Manual, Sixth
Edition, Second Printing

1.2 SYSTEM DESCRIPTION

Concealed fastener metal wall panels and integrated louvers as part of the assembly described below.

Single-skin exposed fastener metal wall panels applied as exterior rainscreen cladding. Metal wall panel installation specified in this Section includes secondary metal subgirt framing for panel attachment.

1.3 PERFORMANCE REQUIREMENTS

1.3.1 General

Provide metal wall panel assemblies meeting performance requirements as determined by application of specified tests by a qualified testing agency on manufacturer's standard assemblies.

1.3.2 Air Infiltration

Maximum 0.06 cfm/sq. ft. per ASTM E 283 at a static-air-pressure difference of 1.57 lbf/sq. ft., using minimum 10-by-10 foot test panel that includes side joints.

1.3.3 Water Penetration, Static Pressure

No uncontrolled water penetration per ASTM E 331 at a minimum static differential pressure of 6.24 lbf/sq. ft., using minimum 10-by-10 foot test panel that includes side joints.

1.3.4 Structural Performance

Provide metal wall panel assemblies capable of withstanding the effects of indicated loads and stresses within limits and under conditions indicated, per ASTM E 72:

Wind Loads: Determine loads based on uniform pressure, importance factor, exposure category, and basic wind speed indicated on drawings.

Limits of Deflection: Metal wall panel assembly shall withstand scheduled wind pressure with the following allowable deflection:

Maximum allowable deflection: All Exposed Fastener Series panels specified with Liner Panels: Limited to L/180 deflection of panel perimeter normal to plane of wall.

Secondary Metal Framing: Design secondary metal framing for metal wall panel assembly according to AISI's "Standard for Cold-Formed Steel Framing - General Provisions."

1.3.5 Thermal Movements

Allow for thermal movements from variations in both ambient and internal temperatures. Accommodate movement of support structure caused by thermal expansion and contraction.

1.4 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

Specifications

SD-01 Preconstruction Submittals

Qualification of Applicator
Miami-Dade County Building Code Compliance

SD-02 Shop Drawings

Provide shop drawings prepared by manufacturer or manufacturer's authorized Installer.
Include full elevations showing openings and penetrations. Include details of each condition of installation and attachment. Provide details at a minimum scale 1-1/2-inch per foot (1:8) of all required trim and extrusions needed for a complete installation.

Indicate points of supporting structure that must coordinate with metal wall panel assembly installation.

SD-03 Product Data

Manufacturer's data sheets
For specified products
Include data indicating compliance with performance requirements.

LEED Submittals

Credit MR 4: Product data indicating the following:
Percentages by weight of post-consumer and pre-consumer recycled content.
Total weight of products provided.

SD-04 Samples

Initial Selection Samples
For each product specified. Provide representative color charts of manufacturer's full range of colors.

Verification Samples
Provide 12-inch section of panel showing finishes.
Provide 12-inch long pieces of trim pieces and other exposed components.

SD-06 Test Reports

Product Test Reports
Indicating compliance of products with requirements, from a qualified independent testing agency.

SD-07 Certificates

Approval Notice of Acceptance (NOA)

SD-11 Closeout Submittals

Manufacturer's warranty
Maintenance data

1.5 QUALITY ASSURANCE

1.5.1 Single Source

Specifications

Provide metal wall panel and panel accessories from a single manufacturer.

1.5.2 Manufacturer Qualifications

Manufacturer with minimum 10 years experience in manufacture of similar products in successful use in similar applications.

Installer Qualifications: Experienced Installer with minimum of 5 years experience with successfully completed projects of a similar nature and scope.

1.5.3 Pre-Installation Conference

Conduct preinstallation meeting at site attended by Owner, manufacturer's representative, and other trade contractors.

Coordinate building construction in relation to metal wall panel assembly.
Coordinate window, door and louver, and other openings and penetrations of metal wall panel assembly.

1.6 DELIVERY, STORAGE, AND HANDLING

Protect metal wall panel products during shipping, handling, and storage to prevent staining, denting, deterioration of components or other damage.

Deliver, unload, store, and erect metal wall panel products and accessory items without misshaping panels or exposing panels to surface damage from weather or construction operations.

1.7 WARRANTY

1.7.1 Special Manufacturer s Warranty

On manufacturer s standard form, in which manufacturer agrees to repair or replace components of metal wall panel assemblies that fail in materials and workmanship within [two] years from date of Substantial Completion.

1.7.2 Special Panel Finish Warranty

On manufacturer s standard form, in which manufacturer agrees to repair or replace metal wall panels that evidence deterioration of finish within the following periods from the date of substantial completion:

Warranty Period: 20 years.

PART 2 PRODUCTS

2.1 MANUFACTURER

Basis of Design: CENTRIA, Exposed Fastener Series Metal Wall Panels.

2.2 METAL WALL PANEL MATERIALS

2.2.1 Aluminum Face Sheet

Smooth surface coil-coated, ASTM B 209, 3003-H14 or 5052-H32 alloy.

Face Sheet: 0.050 inch nominal thickness.

Surface: Smooth.

2.3 EXPOSED FASTENER PROFILE METAL WALL PANELS

Metal Wall Panels, General: Factory-formed, Exposed fastener panels with interconnecting side joints, fastened to supports with exposed fasteners, with field-applied sealants in side laps when required to meet performance requirements.

Symmetrical deep rib profile with lap joint:

Basis of Design Product: CENTRIA, Super-Rib.

Panel Coverage: 24 inches.

Panel Height: 4 inches.

Rib Spacing: 12 inches o.c.

2.4 METAL WALL PANEL ACCESSORIES

2.4.1 Metal Wall Panel Accessories, General

Provide complete metal wall panel assembly incorporating trim, copings, fasciae, parapet caps, soffits, sills, inside and outside corners, and miscellaneous flashings. Fabricate accessories in accordance with SMACNA 1793. Provide manufacturer's factory-formed clips, shims, flashings, gaskets, lap strips, closure strips, and caps for a complete installation as required for the following:

Single-skin application over furring.

2.4.2 Extruded Trim

Manufacturer's complementary aluminum extrusions for head, jamb, sill, base, flush, reveal, inside and outside corner, end wall, and expansion joint details. Finish matching metal wall panels.

Basis of Design: CENTRIA, Microline Extrusions.

2.4.3 Mitered Corners

Structurally-bonded horizontal interior and exterior trimless corners matching metal wall panel material, profile, and factory-applied finish, fabricated and finished by metal wall panel manufacturer.

Welded, riveted, fastened, or field- fabricated corners do not meet the requirements of this specification.

Basis of Design: CENTRIA, MicroSeam Corners.

2.4.4 Formed Flashing and Trim

Match material, thickness, and color of metal wall panel face sheets.

2.4.5 Sealants

Type recommended by metal wall panel manufacturer for application, meeting requirements of Division 07 Section "Joint Sealants."

2.4.6 Flashing Tape

4-inch wide self-adhering butyl flashing tape.

2.4.7 Fasteners

Self-tapping screws, bolts, nuts, and other acceptable fasteners recommended by panel manufacturer.

Specifications

Where exposed fasteners cannot be avoided, supply corrosion-resistant fasteners with heads matching color of metal wall panels by means factory-applied coating.

2.5 WALL LOUVER UNITS

2.5.1 Wall Louvers, General

Metal louvers, designed to integrate with metal wall panel profile and secondary support system without receptor channels or other flashing, of types and performance indicated. Provide manufacturer's standard louver blade clips matching panel color.

Basis of Design: CENTRIA, Profile Series for Super Rib Metal Wall Panels

2.5.2 Horizontal, Drainable-Blade Fixed Louver

Louver Size: As indicated on Drawings.

Louver Depth: Match metal wall panel system depth.

2.5.3 Base Metal and Finish

Match metal wall panel base metal and finish.

2.5.4 Louver Screens

Mounted in removable aluminum frame.

Bird Screen: (1/2-inch) (12 mm) mesh aluminum, crimped.

2.6 SECONDARY METAL FRAMING

Miscellaneous Framing Components, General: Cold-formed metallic-coated steel sheet, ASTM A 653/A 653M, G90 (Z180).

Hat Channels: (0.053 inch/16 ga.) (1.34 mm) minimum.

Sill Channels: (0.053 inch/16 ga.) (1.34 mm) minimum.

2.7 METAL WALL PANEL FINISHES

2.7.1 Exposed Coil-Coated Finish System

Fluoropolymer Two-Coat System: 70 percent PVDF fluoropolymer color coat, AAMA 620.

2.7.2 Color

Exterior Surface: As selected by Owner from manufacturer's standard colors.

Interior Surface: Manufacturer's standard primer color.

PART 3 EXECUTION

3.1 EXAMINATION

Examine metal wall panel substrate with Installer present. Inspect for erection tolerances and other conditions that would adversely affect installation of metal wall panels.

3.1.1 Wall Substrate

Confirm that wall substrate is within tolerances acceptable to metal wall panel system manufacturer.

Specifications

Maximum substrate and framing deviations from flat plane acceptable:

- 1/4-inch in 20 feet vertically or horizontally.
- 1/2-inch across building elevation.
- 1/8-inch in 5 feet.

3.1.2 Openings

Verify that window, door, louver and other penetrations match layout on shop drawings.

3.1.3 Out of Tolerance

Correct out-of-tolerance work and other deficient conditions prior to proceeding with metal wall panel system installation.

3.2 SECONDARY FRAMING INSTALLATION

3.2.1 Secondary Metal Subgirt Framing

Install secondary metal framing components to tolerances indicated, as shown on approved shop drawings. Install secondary metal framing and other metal panel supports per ASTM C 1007 and metal wall panel manufacturer's recommendations.

3.3 METAL WALL PANEL INSTALLATION

General: Install metal wall panels in accordance with approved shop drawings and manufacturer's recommendations. Install metal wall panels in orientation, sizes, and locations indicated. Anchor metal wall panels and other components securely in place.

Attach panels to metal framing using recommended screws, fasteners, sealants, and adhesives indicated on approved shop drawings.

Fasteners for Wall Panels: Stainless-steel for exterior locations and locations exposed to moisture.

Provide weatherproof escutcheons for pipe and conduit penetrating exterior walls.

Dissimilar Materials: Where elements of metal wall panel system will come into contact with dissimilar materials, treat faces and edges in contact with dissimilar materials as recommended by manufacturer.

Joint Sealers: Install joint sealants where indicated on approved shop drawings.

3.4 ACCESSORY INSTALLATION

3.4.1 General

Install metal wall panel accessories with positive anchorage to building. Coordinate installation with flashings and other components.

Install related flashings and sheet metal trim per requirements of Division 07 Section "Sheet Metal Flashing and Trim."

Install components required for a complete metal wall panel assembly, including trim, copings, corners, lap strips, flashings, sealants, fillers, closure strips, and similar items.

Comply with performance requirements and manufacturer's written installation instructions.



Specifications

Set units true to line and level as indicated.

3.5 FIELD QUALITY CONTROL

Manufacturer's Field Service: Engage a service representative authorized by metal wall panel manufacturer to inspect completed installation. Submit written report.

Correct deficiencies noted in manufacturer's report.

3.6 CLEANING AND PROTECTION

Remove temporary protective films. Clean finished surfaces as recommended by metal wall panel manufacturer. Clear weep holes and drainage channels of obstructions, dirt, and sealant. Maintain in a clean condition during construction.

Replace damaged panels and accessories that cannot be repaired by finish touch-up or minor repair.

-- End of Section --



Specifications

**07 52 16 - STYRENE-BUTADIENE-STYRENE (SBS) MODIFIED BITUMINOUS MEMBRANE
ROOFING**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. The following applies to this Section:

1. Contracting Requirements.
2. Performance Criteria
 - a. Design Requirements.
 - b. Performance Specifications
3. Appendices.
4. Concept Drawings

B. Review these documents for coordination with additional requirements and information that apply to work under this Section.

1.2 SECTION INCLUDES

- A. SBS-modified bituminous membrane roofing.**
- B. Base sheet.**

1.3 REFERENCES

A. Roofing Terminology: Refer to the following publications for definitions of roofing work related terms in this Section:

1. ASTM D 1079 "Terminology Relating to Roofing and Waterproofing."
2. Glossary of NRCA's "The NRCA Roofing and Waterproofing Manual."
3. Roof Consultants Institute "Glossary of Roofing Terms" for definition of terms related to roofing work in this Section.

B. Sheet Metal Terminology and Techniques: SMACNA Architectural Sheet Metal Manual.

1.4 DESIGN CRITERIA

- A. General: Installed roofing membrane system shall remain watertight; and resist specified wind uplift pressures, thermally induced movement, and exposure to weather without failure.**



Specifications

- B. **Material Compatibility:** Roofing materials shall be compatible with one another under conditions of service and application required, as demonstrated by roofing system manufacturer based on testing and field experience.
- C. **Wind Uplift Performance:** Roofing system shall be identical to systems that have been successfully tested by a qualified testing and inspecting agency to resist wind uplift pressure calculated in accordance with ASCE-7-10. The following design pressures and building data have been supplied by the Structural Engineer of Record.
 - 1. Field-of-Roof Uplift Pressure: -59.04 lbf/sq. ft. (kN/sq. m).
 - 2. Perimeter Uplift Pressure: -92.7 lbf/sq. ft. (kN/sq. m).
 - 3. Corner Uplift Pressure: -126.36 lbf/sq. ft. (kN/sq. m).

1.5 SUBMITTALS

- A. **Product Data:** Manufacturer's data sheets for each product to be provided.
- B. **Detail Drawings:** Provide roofing system plans, elevations, sections, details, and details attachment to other Work, including:
 - 1. Base flashings, cants, and membrane terminations.
 - 2. Tapered insulation, including slopes.
 - 3. Crickets, saddles, and tapered edge strips, including slopes.
 - 4. Insulation fastening patterns.
- C. **Verification Samples:** Provide for each product specified.
- D. **Maintenance Data:** Refer to Johns Manville's latest published documents on www.specJM.com.
- E. **Guarantees:** Special guarantees specified in this Section.

1.6 QUALITY ASSURANCE

- A. **Installer Qualifications:** A qualified firm that is approved, authorized, or licensed by roofing system manufacturer to install manufacturer's product and that is eligible to receive the specified manufacturer's guarantee.
- B. **Manufacturer Qualifications:** A qualified manufacturer that has UL listing for roofing system identical to that used for this Project.
- C. **Testing Agency Qualifications:** An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.
- D. **Test Reports:**
 - 1. Roof drain and leader test or submit plumber's verification.
 - 2. Core cut (if requested).
 - 3. Roof deck fastener pullout test.



Specifications

- E. Moisture Survey:
 - 1. Submit prior to installation, results of a non-destructive moisture test of roof system completed by approved third party. Utilize one of the approved methods:
 - a. Infrared Thermography
 - b. Nuclear Backscatter
- F. Source Limitations: Obtain all components from the single source roofing system manufacturer guaranteeing the roofing system. All products used in the system shall be labeled by the single source roofing manufacturer issuing the guarantee.
- G. Provide evidence of CERTA training for any installer of torch-applied modified bitumen membrane. Copies of certifications are required prior to award and must be maintained on the jobsite for inspection at any time.
- H. Fire-Test-Response Characteristics: Provide roofing materials with the fire-test-response characteristics indicated as determined by testing identical products per test method below by UL, or another testing and inspecting agency acceptable to authorities having jurisdiction. Materials shall be identified with appropriate markings of applicable testing and inspecting agency.
 - 1. Exterior Fire-Test Exposure: Class A; ASTM E 108, for application and roof slopes indicated.
 - 2. Fire-Resistance Ratings: ASTM E 119, for fire-resistance-rated roof assemblies of which roofing system is a part.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver roofing materials in original containers with seals unbroken and labeled with manufacturer's name, product brand name and type, date of manufacture, and directions for storage.
- B. Store liquid materials in their original undamaged containers in a clean, dry, protected location and within the temperature range required by roofing system manufacturer.
- C. Protect roof insulation materials from physical damage and from deterioration by sunlight, moisture, soiling, and other sources. Comply with insulation manufacturer's written instructions for handling, storing, and protecting during installation.
- D. Handle and store roofing materials and place equipment in a manner to avoid permanent deflection of deck.

1.8 PROJECT CONDITIONS

- A. Weather Limitations: Proceed with installation only when current and forecasted weather conditions permit roofing system to be installed in accordance with manufacturer's written instructions and guarantee requirements.



Specifications

1.9 GUARANTEE

- A. Provide manufacturer's system guarantee equal to Johns Manville's Peak Advantage No Dollar Limit Roofing System Guarantee.
 - 1. Single-Source special guarantee includes roofing plies, base flashings, liquid applied flashing, roofing membrane accessories, [granule surfaced roofing membrane] [fasteners], [substrate board], [walkway products], [manufacturer's expansion joints], [manufacturer's edge metal products], and other single-source components of roofing system marketed by the manufacturer.
 - 2. Guarantee Period: 20 years from date of Substantial Completion.
- B. Installer's Guarantee: Submit roofing Installer's guarantee, signed by Installer, covering Work of this Section, including all components of roofing system, for the following guarantee period:
 - 1. Guarantee Period: Two Years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SBS-MODIFIED ASPHALT-SHEET MATERIALS

- A. Roofing Membrane Sheet: [ASTM D 6164, Grade S, Type I, polyester-reinforced, SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified. Basis of Design: DynaWeld 180 S]
- B. Roofing Membrane Cap Sheet: [ASTM D 6164, Grade G, Type I, polyester-reinforced], SBS-modified asphalt sheet; granular surfaced; suitable for application method specified. Basis of Design: DynaWeld Cap 180 FR]

2.2 BASE FLASHING SHEET MATERIALS - SBS

- A. Backer Sheet: ASTM D 6164, Grade S, Type I, polyester-reinforced SBS-modified asphalt sheet; smooth surfaced; suitable for application method specified. Basis of Design: DynaWeld 180 S]
- B. Flashing Sheet: [ASTM D 6164, Grade G, Type I, polyester-reinforced], SBS-modified asphalt sheet; granular surfaced; suitable for application method specified. Basis of Design: DynaWeld Cap 180 FR]
- C. Liquid Applied Flashing: A liquid and fabric reinforced flashing system created with a stitchbonded polyester scrim and a two-component, moisture cured, elastomeric, liquid applied flashing material, consisting of an asphalt extended urethane base material and an activator. Basis of Design: PermaFlash System

2.3 AUXILIARY ROOFING MEMBRANE - BITUMINOUS

- A. General: Auxiliary materials recommended by roofing system manufacturer for intended use and compatible with built-up roofing.
- B. Asphalt Primer: ASTM D 41. Basis of Design: Asphalt Primer



Specifications

- C. Cold-Applied Flashing Adhesive: Roofing system manufacturer's asphalt-based, two-component, asbestos-free, trowel-grade, cold-applied adhesive specially formulated for compatibility and use with flashing applications. Basis of Design: MBR Flashing Cement
- D. Mastic Sealant: As required by Johns Manville.
- E. Roofing Granules: Ceramic-coated roofing granules matching specified cap sheet, provided by roofing system manufacturer.
- F. Coating: Acrylic elastomeric coating with unique bleed-blocking properties particularly well suited for coating over asphalt surfaces. Basis of Design: JM CR Seam Coating
- G. Miscellaneous Accessories: Provide miscellaneous accessories recommended by roofing system manufacturer.

2.4 AUXILIARY ROOFING SYSTEM COMPONENTS

- A. Expansion Joints: Provide factory fabricated weatherproof, exterior covers for expansion joint openings consisting of flexible rubber membrane, supported by a closed cell foam to form flexible bellows, with two metal flanges, adhesively and mechanically combined to the bellows by a bifurcation process. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: [Expand-O-Flash] [Expand-O-Gard]
- B. Coping System: Manufacturer's factory fabricated coping consisting of a base piece and a snap-on cap. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: Presto-Lock Coping
- C. Fascia System: Manufacturer's factory fabricated fascia consisting of a base piece and a snap-on cover. Provide product manufactured and marketed by single-source membrane supplier that is included in the No Dollar Limit guarantee. Basis of Design: [Presto Lock Fascia] [Presto-Tite Fascia]
- D. Metal Flashing Sheet: Metal flashing sheet is specified in Division 07 Section "Sheet Metal Flashing and Trim."

2.5 WALKWAYS

- A. Walkway Pads: Mineral-granule-surfaced, reinforced modified asphalt composition, slip-resisting pads, manufactured as a traffic pad for foot traffic provided by roofing system manufacturer, with a pad size of 32 inch x 32 inch. Basis of Design: [Johns Manville DynaTred]

2.6 BASE-SHEET MATERIALS

- A. Base Sheet: ASTM D 4897, Type II, venting, nonperforated, heavyweight, asphalt-impregnated and -coated, glass-fiber base sheet with coarse granular surfacing or embossed venting channels on bottom surface. Basis of Design: Ventsulation Felt



Specifications

- B. Fasteners: Twin legged, factory-coated steel fasteners and Galvalume metal plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening base-sheet to substrate, tested by manufacturer for required pullout strength, and provided by the roofing system manufacturer. Product: [Lightweight Concrete (LWC) Base Sheet Fasteners]

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions for compliance with requirements affecting performance of roofing system:
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Clean and remove from substrate sharp projections, dust, debris, moisture, and other substances detrimental to roofing installation in accordance with roofing system manufacturer's written instructions.
- B. Prevent materials from entering and clogging roof drains and conductors and from spilling or migrating onto surfaces of other construction.
- C. Prime surface of concrete deck with asphalt primer at a rate recommended by roofing manufacturer and allow primer to dry.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.

3.3 BASE-SHEET INSTALLATION

- A. Install one lapped base sheet course and mechanically fasten to substrate according to roofing system manufacturer's written instructions.
 - 1. Enhance fastening rate in perimeter and corner zones according to code or manufacturer, whichever is more stringent.
- B. Comply with roofing system manufacturer's written instructions for installing roof insulation.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.4 ROOFING MEMBRANE INSTALLATION, GENERAL

- A. Install roofing membrane in accordance with roofing system manufacturer's written instructions, applicable recommendations of the roofing manufacturer and requirements in this Section.



Specifications

- B. Start installation of roofing membrane in presence of roofing system manufacturer's technical personnel.
- C. Where roof slope exceeds 1/2 inch per 12 inches (1:24, contact the membrane manufacturer for installation instructions regarding installation direction and backnailing
- D. Cooperate with testing and inspecting agencies engaged or required to perform services for installing roofing system.
- E. Coordinate installing roofing system so insulation and other components of the roofing membrane system not permanently exposed are not subjected to precipitation or left uncovered at the end of the workday or when rain is imminent.
 - 1. Provide tie-offs at end of each day's work to cover exposed roofing membrane sheets and insulation with a course of coated felt set in roofing cement or hot roofing asphalt with joints and edges sealed.
 - 2. Complete terminations and base flashings and provide temporary seals to prevent water from entering completed sections of roofing system.
 - 3. Remove and discard temporary seals before beginning work on adjoining roofing.
- F. Substrate-Joint Penetrations: Prevent roofing asphalt from penetrating substrate joints, entering building, or damaging roofing system components or adjacent building construction.
- G. Proceed with installation only after unsatisfactory conditions have been corrected.

3.5 SBS-MODIFIED BITUMINOUS MEMBRANE INSTALLATION

- A. Install **two** modified bituminous roofing membrane sheets and cap sheet according to roofing manufacturer's written instructions, starting at low point of roofing system. Extend roofing membrane sheets over and terminate beyond cants, installing as follows:
 - 1. Torch apply to substrate according to roofing system manufacturer's instruction.
 - 2. Unroll roofing membrane sheets and allow them to relax for minimum time period required by manufacturer.
- B. Laps: Accurately align roofing membrane sheets, without stretching, and maintain uniform side and end laps. Stagger end laps. Completely bond and seal laps, leaving no voids.
 - 1. Repair tears and voids in laps and lapped seams not completely sealed.
 - 2. Apply roofing granules to cover exuded bead at laps while bead is hot.
- C. Install roofing membrane sheets so side and end laps shed water.
- D. Proceed with installation only after unsatisfactory conditions have been corrected.



Specifications

3.6 FLASHING AND STRIPPING INSTALLATION

- A. Install base flashing over cant strips and other sloping and vertical surfaces, at roof edges, and at penetrations through roof, and secure to substrates according to roofing system manufacturer's written instructions and as follows:
 - 1. Prime substrates with asphalt primer if required by roofing system manufacturer.
 - 2. Backer Sheet Application: Install backer sheet and torch apply substrate as required by roofing system manufacturer.
 - 3. Flashing Sheet Application: Torch apply flashing sheet to substrate as required by roofing system manufacturer.
- B. Extend base flashing up walls or parapets a minimum of 8 inches (200 mm) above roofing membrane and 4 inches (100 mm) onto field of roofing membrane.
- C. Mechanically fasten top of base flashing securely at terminations and perimeter of roofing.
 - 1. Seal top termination of base flashing with a strip of glass-fiber fabric set in MBR Flashing cement.
- D. Roof Drains: Flash drain using PermaFlash system. Clamp roofing membrane, flashing, and stripping into roof-drain clamping ring.
 - 1. Install stripping according to roofing system manufacturer's written instructions.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.7 WALKWAY INSTALLATION

- A. Walkway Pads: Install walkway pads using units of size indicated or, if not indicated, of manufacturer's standard size according to walkway pad manufacturer's written instructions.
- B. Walkway Cap Sheet Strips: Install roofing membrane walkway cap sheet strips over roofing membrane by torch application. – SBS
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.8 FIELD QUALITY CONTROL

- A. Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform roof tests and inspections and to prepare test reports.
- B. Final Roof Inspection: Arrange for roofing system manufacturer's Registered Roof Observer (RRO) to inspect roofing installation on completion and submit report to Architect.
- C. Repair or remove and replace components of roofing system where test results or inspections indicate that they do not comply with specified requirements.



Specifications

- D. Additional testing and inspecting, at Contractor's expense, will be performed to determine compliance of replaced or additional work with specified requirements.

3.9 PROTECTION AND CLEANING

- A. Protect roofing system from damage and wear during remainder of construction period.
- B. Clean overspray and spillage from adjacent construction using cleaning agents and procedures recommended by manufacturer of affected construction.

END OF SECTION 07 52 16

07 60 00 - FLASHING AND SHEET METAL**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INTERNATIONAL (ASTM)

ASTM B209	(2010) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B32	(2008) Standard Specification for Solder Metal
ASTM D1784	(2011) Standard Specification for Rigid Poly(Vinyl Chloride) (PVC) Compounds and Chlorinated Poly(Vinyl Chloride) (CPVC) Compounds
ASTM D226/D226M	(2009) Standard Specification for Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing
ASTM D41/D41M	(2011) Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing
ASTM D4586/D4586M	(2007; E 2012; R 2012) Asphalt Roof Cement, Asbestos-Free

SHEET METAL AND AIR CONDITIONING CONTRACTORS' NATIONAL ASSOCIATION (SMACNA)

SMACNA 1793	(2012) Architectural Sheet Metal Manual, 7th Edition
-------------	--

1.2 GENERAL REQUIREMENTS

Finished sheet metalwork will form a weathertight construction without waves, warps, buckles, fastening stresses or distortion, which allows for expansion and contraction. Sheet metal mechanic is responsible for cutting, fitting, drilling, and other operations in connection with sheet metal required to accommodate the work of other trades. Coordinate installation of sheet metal items used in conjunction with roofing with roofing work to permit continuous roofing operations.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Covering on flat, sloped, or curved surfaces Gutters
Downspouts
Gravel stops and fascias Counterflashing
Reglets Scuppers
Copings
Conductor heads

Specifications

Indicate thicknesses, dimensions, fastenings and anchoring methods, expansion joints, and other provisions necessary for thermal expansion and contraction. Scaled manufacturer's catalog data may be submitted for factory fabricated items.

SD-11 Closeout Submittals Quality**Control Plan**

Submit for sheet metal work in accordance with paragraph entitled "Field Quality Control."

LEED Submittals

Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.

1.4 DELIVERY, HANDLING, AND STORAGE

Package and protect materials during shipment. Uncrate and inspect materials for damage, dampness, and wet-storage stains upon delivery to the job site. Remove from the site and replace damaged materials that cannot be restored to like-new condition. Handle sheet metal items to avoid damage to surfaces, edges, and ends. Store materials in dry, weather-tight, ventilated areas until immediately before installation.

PART 2 PRODUCTS**2.1 MATERIALS**

Conform to the requirements specified and to the thicknesses and configurations established in SMACNA Arch. Manual for the materials.

Furnish sheet metal items in 8 to 10 foot lengths. Single pieces less than 8 feet long may be used to connect to factory-fabricated inside and outside corners, and at ends of runs. Factory fabricate corner pieces with minimum 12 inch legs. Provide accessories and other items essential to complete the sheet metal installation. Provide accessories made of the same or compatible materials as the items to which they are applied. Fabricate sheet metal items of the materials specified below and to the gage, thickness, or weight shown in Table I at the end of this section. Where more than one material is listed for a particular item in Table I, each is acceptable and may be used except as follows:

2.1.1 Exposed Sheet Metal Items

Must be of the same material. Consider the following as exposed sheet metal: gutters, including hangers; downspouts; gravel stops and fascias; cap, valley, steeped, base, and eave flashings and related accessories.

2.1.2 Aluminum Alloy Sheet and Plate

ASTM B209 form alloy, and temper appropriate for use.

2.1.2.1 Finish

Exposed exterior sheet metal items of aluminum must have a baked-on, factory-applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating applied after metal substrates have been cleaned and pretreated. Provide finish coating dry-film thickness of 0.8 to 1.3 mils and color selected by Architect.

Specifications

2.1.3 Solder

ASTM B32, 95-5 tin-antimony.

2.1.4 Polyvinyl Chloride Reglet

ASTM D1784, Type II, Grade 1, Class 14333-D, 0.075 inch minimum thickness.

2.1.5 Bituminous Plastic Cement ASTM

D4586/D4586M, Type I.

2.1.6 Roofing Felt

ASTM D226/D226M Type II.

2.1.7 Asphalt Primer ASTM D41/D41M.**2.1.8 Fasteners**

Use the same metal or a metal compatible with the item fastened. Use stainless steel fasteners to fasten dissimilar materials.

PART 3 EXECUTION**3.1 INSTALLATION****3.1.1 Workmanship**

Make lines and angles sharp and true. Free exposed surfaces from visible wave, warp, buckle, and tool marks. Fold back exposed edges neatly to form a 1/2 inch hem on the concealed side. Make sheet metal exposed to the weather watertight with provisions for expansion and contraction. Make surfaces to receive sheet metal plumb and true, clean, even, smooth, dry, and free of defects and projections. For installation of items not shown in detail or not covered by specifications conform to the applicable requirements of SMACNA 1793, Architectural Sheet Metal Manual. Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes, or other vertical surfaces and wherever indicated and necessary to make the work watertight. Join sheet metal items together as shown in Table II.

3.1.2 Nailing

Confine nailing of sheet metal generally to sheet metal having a maximum width of 18 inch. Confine nailing of flashing to one edge only. Space nails evenly not over 3 inch on center and approximately 1/2 inch from edge unless otherwise specified or indicated. Face nailing will not be permitted. Where sheet metal is applied to other than wood surfaces, include in shop drawings, the locations for sleepers and nailing strips required to secure the work.

3.1.3 Cleats

Provide cleats for sheet metal 18 inch and over in width. Space cleats evenly not over 12 inch on center unless otherwise specified or indicated. Unless otherwise specified, provide cleats of 2 inch wide by 3 inch long and of the same material and thickness as the sheet metal being installed. Secure one end of the cleat with two nails and the cleat folded back over the nailheads. Lock the other end into the seam. Where the fastening is to be made to concrete or masonry, use screws and drive in expansion shields set in concrete or masonry. Prein cleats for soldered seams.

Specifications

3.1.4 Bolts, Rivets, and Screws

Install bolts, rivets, and screws where indicated or required. Provide compatible washers where required to protect surface of sheet metal and to provide a watertight connection. Provide mechanically formed joints in aluminum sheets 0.040 inch or less in thickness.

3.1.5 Seams

Straight and uniform in width and height with no solder showing on the face.

3.1.5.1 Loose-Lock Expansion Seams

Not less than 3 inch wide; provide minimum one inch movement within the joint. Completely fill the joints with the specified sealant, applied at not less than 1/8 inch thick bed.

3.1.6 Welding and Mechanical Fastening

Use welding for aluminum of thickness greater than 0.040 inch. Aluminum 0.040 inch or less in thickness must be butted and the space backed with formed flashing plate; or lock joined, mechanically fastened, and filled with sealant as recommended by the aluminum manufacturer.

3.1.6.1 Mechanical Fastening of Aluminum

Use No. 12, aluminum alloy, sheet metal screws or other suitable aluminum alloy or stainless steel fasteners. Drive fasteners in holes made with a No. 26 drill in securing side laps, end laps, and flashings. Space fasteners 12 inch maximum on center. Where end lap fasteners are required to improve closure, locate the end lap fasteners not more than 2 inch from the end of the overlapping sheet.

3.1.7 Protection from Contact with Dissimilar Materials

3.1.7.1 Aluminum

Do not allow aluminum surfaces in direct contact with other metals except stainless steel, zinc, or zinc coating. Where aluminum contacts another metal, paint the dissimilar metal with a primer followed by two coats of aluminum paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.

3.1.7.2 Metal Surfaces

Paint surfaces in contact with mortar, concrete, or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.

3.1.7.3 Wood or Other Absorptive Materials

Paint surfaces that may become repeatedly wet and in contact with metal with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.

3.1.8 Expansion and Contraction

Provide expansion and contraction joints at not more than 32 foot intervals for aluminum and at not more than 40 foot intervals for other metals. Provide an additional joint where the distance between the last expansion joint and the end of the continuous run is more than half the required interval. Space joints evenly. Join extruded aluminum gravel stops and fascias by expansion and contraction joints spaced not more than 12 feet apart.

Specifications

3.1.9 Counterflashing

Except where indicated or specified otherwise, insert counterflashing in reglets located from 9 to 10 inch above roof decks, extend down vertical surfaces over upturned vertical leg of base flashings not less than 3 inch. Fold the exposed edges of counterflashings 1/2 inch. Provide end laps in counterflashings not less than 3 inch and make it weathertight with plastic cement. Do not make lengths of metal counterflashings exceed 10 feet.

Form the flashings to the required shapes before installation. Factory-form the corners not less than 12 inch from the angle. Secure the flashings in the reglets with lead wedges and space not more than 18 inch apart; on short runs, place wedges closer together. Fill caulked-type reglets or raked joints which receive counterflashing with caulking compound. Turn up the concealed edge of counterflashings built into masonry or concrete walls not less than 1/4 inch and extend not less than 2 inch into the walls. Install counterflashing to provide a spring action against base flashing.

3.1.10 Metal Reglets

Provide factory fabricated caulked type or friction type reglets with a minimum opening of 1/4 inch and a depth of 1 1/4 inch, as approved.

3.1.10.1 Caulked Reglets

Provide with rounded edges and metal strap brackets or other anchors for securing to the concrete forms. Provide reglets with a core to protect them from injury during the installation. Provide built-up mitered corner pieces for internal and external angles. Wedge the flashing in the reglets with lead wedges every 18 inch, caulked full and solid with an approved compound.

3.1.10.2 Friction Reglets

Provide with flashing receiving slots not less than 5/8 inch deep, one inch jointing tongues, and upper and lower anchoring flanges installed at 24 inch maximum snaplock receiver. Insert the flashing the full depth of the slot and lock by indentations made with a dull-pointed tool, wedges, and filled with a sealant. For friction reglets, install flashing snaplock receivers at 24 inch on center maximum. When the flashing has been inserted the full depth, caulk the slot and lock with wedges and fill with sealant.

3.1.11 Gravel Stops and Fascias

Prefabricate in the shapes and sizes indicated and in lengths not less than 8 feet. Extend flange at least 4 inch onto roofing. Provide prefabricated, mitered corners internal and external corners. Install gravel stops and fascias after all plies of the roofing membrane have been applied, but before the flood coat of bitumen is applied. Prime roof flange of gravel stops and fascias on both sides with an asphalt primer. After primer has dried, set flange on roofing membrane and strip-in. Nail flange securely to wood nailer with large-head, barbed-shank roofing nails 1.5 inch long spaced not more than 3 inch on center, in two staggered rows.

3.1.11.1 Edge Strip

Hook the lower edge of fascias at least 3/4 inch over a continuous strip of the same material bent outward at an angle not more than 45 degrees to form a drip. Nail hook strip to a wood nailer at 6 inch maximum on center. Where fastening is made to concrete or masonry, use screws spaced 12 inch on center driven in expansion shields set in the concrete or masonry. Where horizontal wood nailers are slotted to provide for insulation venting, install strips to prevent obstruction of vent slots. Where necessary, install strips over 1/16 inch thick compatible spacer or washers.

Specifications

3.1.11.2 Joints

Leave open the section ends of gravel stops and fascias 1/4 inch and backed with a formed flashing plate, mechanically fastened in place and lapping each section end a minimum of 4 inch set laps in plastic cement. Face nailing will not be permitted. Install prefabricated aluminum gravel stops and fascias in accordance with the manufacturer's printed instructions and details.

3.1.12 Gutters

The hung type of shape indicated and supported on underside by brackets that permit free thermal movement of the gutter. Provide gutters in sizes indicated complete with mitered corners, end caps, outlets, brackets, and other accessories necessary for installation. Bead with hemmed edge or reinforce the outer edge of gutter with a stiffening bar not less than 3/4 by 3/16 inch of material compatible with gutter. Fabricate gutters in sections not less than 8 feet. Lap the sections a minimum of one inch in the direction of flow or provide with concealed splice plate 6 inch minimum. Join the gutters, other than aluminum, by riveted and soldered joints. Join aluminum gutters with riveted sealed joints. Provide expansion-type slip joints midway between outlets. Install gutters below slope line of the roof so that snow and ice can slide clear. Support gutters on as indicated. Adjust gutters to slope uniformly to outlets, with high points occurring midway between outlets. Fabricate hangers and fastenings from metals.

3.1.13 Downspouts

Space supports for downspouts according to the manufacturer's recommendation for the substrate. Types, shapes and sizes are indicated. Provide complete including elbows and offsets. Provide downspouts in approximately 10 foot lengths. Provide end joints to telescope not less than 1/2 inch and lock longitudinal joints. Provide gutter outlets with wire ball strainers for each outlet. Provide strainers to fit tightly into outlets and be of the same material used for gutters. Keep downspouts not less than one inch away from walls. Fasten to the walls at top, bottom, and at an intermediate point not to exceed 5 feet on center with leader straps or concealed rack-and-pin type fasteners. Form straps and fasteners of metal compatible with the downspouts.

3.1.13.1 Terminations

Neatly fit into the drainage connection the downspouts terminating in drainage lines and fill the joints with a portland cement mortar cap sloped away from the downspout. Provide downspouts terminating in splash blocks with elbow-type fittings. Provide splash pans as specified.

3.1.14 Scuppers

Line interior of scupper openings with sheet metal. Extend the lining through and project outside of the wall to form a drip on the bottom edge and form to return not less than one inch against the face of the outside wall at the top and sides. Fold outside edges under 1/2 inch on all sides. Provide the perimeter of the lining approximately 1/2 inch less than the perimeter of the scupper. Join the top and sides of the lining on the roof deck side to a closure flange by a locked and soldered joint. Join the bottom edge by a locked and soldered joint to the closure flange, where required, form with a ridge to act as a gravel stop around the scupper inlet. Provide surfaces to receive the scupper lining and coat with bituminous plastic cement.

3.1.15 Conductor Heads

Type indicated and fabricated of the same material as the downspouts. Set the depth of top opening equal to two-thirds of the width. Provide outlet tubes not less than 4 inch long. Flat-lock solder the seams. Where conductor heads are used in conjunction with scuppers, set the conductor a minimum of 2 inch wider than the scupper. Attach conductor heads to the wall with masonry fasteners, and loose-lock to provide conductor heads with screens of the same material. Securely fasten screens to the heads.

Specifications

3.1.16 Copings

Provide coping using sheets 8 or 10 feet long. Terminate outer edges in edge strips. Install with sealed lap joints or cover plate joints as indicated.

3.2 PAINTING

Field-paint sheet metal for separation of dissimilar materials.

3.2.1 Aluminum Surfaces

Shall be solvent cleaned and given one coat of zinc-molybdate primer and one coat of aluminum paint.

3.3 CLEANING

Clean exposed sheet metal work at completion of installation. Remove grease and oil films, handling marks, contamination from steel wool, fittings and drilling debris, and scrub-clean. Free the exposed metal surfaces of dents, creases, waves, scratch marks, and solder or weld marks.

3.4 REPAIRS TO FINISH

Scratches, abrasions, and minor surface defects of finish may be repaired in accordance with the manufacturer's printed instructions and as approved. Repair damaged surfaces caused by scratches, blemishes, and variations of color and surface texture. Replace items which cannot be repaired.

3.5 FIELD QUALITY CONTROL

Establish and maintain a Quality Control Plan for sheet metal used in conjunction with roofing to assure compliance of the installed sheet metalwork with the contract requirements. Remove work that is not in compliance with the contract and replace or correct. Include quality control, but not be limited to, the following:

- a. Observation of environmental conditions; number and skill level of sheet metal workers; condition of substrate.
- b. Verification that specified material is provided and installed.
- c. Inspection of sheet metalwork, for proper size(s) and thickness(es), fastening and joining, and proper installation.

3.5.1 Procedure

Submit for approval prior to start of roofing work. Include a checklist of points to be observed. Document the actual quality control observations and inspections. Furnish a copy of the documentation to the Contracting Officer at the end of each day.

TABLE I. SHEET METAL WEIGHTS, THICKNESSES, AND GAGES	
Sheet Metal Items	Aluminum, inch
Downspouts and leaders	.032
Downspout clips and anchors	.040 clip .125 anchor

Specifications

Downspout straps, 2-inch	.060
Conductor heads	.032
Scupper lining	.032
Strainers, wire diameter or gage	.144 diameter
Flashings:	
Cap (Counter-flashing)	.032
Sheet Metal Items	Aluminum, inch
Coping	.050
Gravel stops and fascias:	
Extrusions	.075
Sheets, smooth	.050
Edge strip	.050
Gutters:	
Gutter section	.032
Continuous cleat	.032
Hangers, dimensions	1 inch by .080 inch (c)
Reglets (c)	-
(a) Brass.	
(b) May be lead weighing 4 pounds per square foot.	
(c) May be polyvinyl chloride.	
(d) 2.5 pound minimum lead sleeve with 4 inch flange. Where lead sleeve is impractical, refer to paragraph entitled "Single Pipe Vents" for optional material.	

Specifications

TABLE II. SHEET METAL JOINTS		
TYPE OF JOINT		
Item Designation	Aluminum	Remarks
Flashings		
Cap-in reglet	3 inch lap	Seal groove with joint sealing compound.
Reglets	--	Seal reglet groove with joint sealing compound.
Edge strip	Butt	--
Gravel stops:	Butt with 1/2 inch space	Use sheet flashing beneath and a cover plate
Extrusions	Butt with 1/4 inch space	Use sheet flashing backup plate.
Sheet, smooth	One inch flat locked riveted and sealed	Aluminum producers recommended hard setting sealant for locked aluminum joints.
Gutters		
(a) Provide a 3 inch lap elastomeric flashing with manufacturer's recommended sealant.		
(b) Seal Polyvinyl chloride reglet with manufacturer's recommended sealant.		

-- End of Section --

Specifications

07 84 00 - FIRESTOPPING**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E119	(2012a) Standard Test Methods for Fire Tests of Building Construction and Materials
ASTM E1399	(1997; R 2009) Cyclic Movement and Measuring the Minimum and Maximum Joint Widths of Architectural Joint Systems
ASTM E1966	(2007; R 2011) Fire-Resistive Joint Systems
ASTM E2174	(2010a; E 2011) Standard Practice for On-Site Inspection of Installed Fire Stops
ASTM E2393	(2010a) Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers
ASTM E814	(2011a) Standard Test Method for Fire Tests of Through-Penetration Fire Stops
ASTM E84	(2012c) Standard Test Method for Surface Burning Characteristics of Building Materials

FM GLOBAL (FM)

FM APP GUIDE	(updated on-line) Approval Guide http://www.approvalguide.com/
FM AS 4991	(2001) Approval of Firestop Contractors

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2012) International Building Code
---------	------------------------------------

UNDERWRITERS LABORATORIES (UL)

UL 1479	(2003; Reprint Oct 2012) Fire Tests of Through-Penetration Firestops
UL 2079	(2004; Reprint Dec 2012) Tests for Fire Resistance of Building Joint Systems
UL 723	(2008; Reprint Sep 2010) Test for Surface Burning Characteristics of Building Materials
UL Fire Resistance	(2012) Fire Resistance Directory

Specifications

1.2 SYSTEM DESCRIPTION**1.2.1 General**

Furnish and install tested and listed firestopping systems, combination of materials, or devices to form an effective barrier against the spread of flame, smoke and gases, and maintain the integrity of fire resistance rated walls, partitions, floors, and ceiling-floor assemblies, including through-penetrations and construction joints and gaps.

- a. Through-penetrations include the annular space around pipes, tubes, conduit, wires, cables and vents.
- b. Construction joints include those used to accommodate expansion, contraction, wind, or seismic movement; firestopping material shall not interfere with the required movement of the joint.

Gaps requiring firestopping include gaps between the curtain wall and the floor slab and between the top of the fire-rated walls and the roof or floor deck above and at the intersection of shaft assemblies and adjoining fire resistance rated assemblies.

1.2.2 Sequencing

Coordinate the specified work with other trades. Apply firestopping materials, at penetrations of pipes and ducts, prior to insulating, unless insulation meets requirements specified for firestopping. Apply firestopping materials at building joints and construction gaps, prior to completion of enclosing walls or assemblies. Firestop material shall be inspected and approved prior to final completion and enclosing of any assemblies that may conceal installed firestop.

1.2.3 Submittals Requirements

- a. Submit detail drawings including manufacturer's descriptive data, typical details conforming to UL Fire Resistance or other details certified by another nationally recognized testing laboratory, installation instructions or UL listing details for a firestopping assembly in lieu of fire-test data or report. For those firestop applications for which no UL tested system is available through a manufacturer, a manufacturer's engineering judgment, derived from similar UL system designs or other tests, shall be submitted for review and approval prior to installation. Submittal shall indicate the firestopping material to be provided for each type of application. When more than a total of 5 penetrations and/or construction joints are to receive firestopping, provide drawings that indicate location, "F" "T" and "L" ratings, and type of application.
- b. Submit certificates attesting that firestopping material complies with the specified requirements. For all intumescent firestop materials used in through penetration systems, manufacturer shall provide certification of compliance with UL 1479.
- c. Submit documentation of training and experience for Installer.
- d. Submit inspection report stating that firestopping work has been inspected and found to be applied according to the manufacturer's recommendations and the specified requirements.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Firestopping

Materials

Specifications

SD-06 Test Reports Inspection

SD-07 Certificates

Inspector Qualifications
Firestopping Materials Installer
Qualifications

1.4 QUALITY ASSURANCE

1.4.1 Installer

Engage an experienced Installer who is:

- a. FM Research approved in accordance with FM AS 4991, operating as a UL Certified Firestop Contractor, or
- b. Certified, licensed, or otherwise qualified by the firestopping manufacturer as having the necessary staff, training, and a minimum of 3 years experience in the installation of manufacturer's products in accordance with specified requirements. A manufacturer's willingness to sell its firestopping products to the Contractor or to an installer engaged by the Contractor does not in itself confer installer qualifications on the buyer. The Installer shall have been trained by a direct representative of the manufacturer (not distributor or agent) in the proper selection and installation procedures. The installer shall obtain from the manufacturer written certification of training, and retain proof of certification for duration of firestop installation.

1.4.2 Inspector Qualifications

The inspector shall have a minimum of two years experience in construction field inspections of firestopping systems, products, and assemblies. The inspector shall be completely independent of, and divested from, the installer, the manufacturer, and the supplier of any material or item being inspected. The inspector shall not be a competitor of the installer, the contractor, the manufacturer, or supplier of any material or item being inspected. Include in the qualifications submittal a notarized statement assuring compliance with the requirements stated herein.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver materials in the original unopened packages or containers showing name of the manufacturer and the brand name. Store materials off the ground, protected from damage and exposure to elements and temperatures in accordance with manufacturer requirements. Remove damaged or deteriorated materials from the site. Use materials within their indicated shelf life.

PART 2 PRODUCTS

2.1 FIRESTOPPING MATERIALS

Provide firestopping materials, supplied from a single domestic manufacturer, consisting of commercially manufactured, asbestos-free, VOC content less than 250g/l as calculated by EPA Method 24, nontoxic products FM APP GUIDE approved, or UL listed, for use with applicable construction and penetrating items, complying with the following minimum requirements:

Specifications

2.1.1 Fire Hazard Classification

Material shall have a flame spread of 25 or less, and a smoke developed rating of 50 or less, when tested in accordance with ASTM E84 or UL 723. Material shall be an approved firestopping material as listed in UL Fire Resistance or by a nationally recognized testing laboratory.

2.1.2 Toxicity

Material shall be nontoxic and carcinogen free to humans at all stages of application or during fire conditions and shall not contain hazardous chemicals or require harmful chemicals to clean material or equipment.

Firestop material must be free from Ethylene Glycol, PCB, MEK, or other types of hazardous chemicals.

2.1.3 Fire Resistance Rating

Firestop systems shall be UL Fire Resistance listed or FM APP GUIDE approved with "F" rating at least equal to fire-rating of fire wall or floor in which penetrated openings are to be protected. Where required, firestop systems shall also have "T" rating at least equal to the fire-rated floor in which the openings are to be protected.

2.1.3.1 Through-Penetrations

Firestopping materials for through-penetrations, as described in paragraph SYSTEM DESCRIPTION, shall provide "F", "T" and "L" fire resistance ratings in accordance with ASTM E814 or UL 1479. Fire resistance ratings shall be as follows:

2.1.3.1.1 Penetrations of Fire Resistance Rated Walls and Partitions F Rating = Rating of wall or partition being penetrated.

2.1.3.1.2 Penetrations of Fire Resistance Rated Floors, Floor-Ceiling Assemblies and the Ceiling Membrane of Roof-Ceiling Assemblies

Where the penetrating item is outside of a wall cavity the F rating must be equal to the fire resistance rating of the floor penetrated, and the T rating shall be in accordance with the requirements of ICC IBC.

2.1.3.1.3 Penetrations of Fire and Smoke Resistance Rated Walls, Floors, Floor-Ceiling Assemblies, and the ceiling membrane of Roof-Ceiling Assemblies Rating of system being penetrated.

2.1.3.2 Construction Joints and Gaps

Fire resistance ratings of construction joints, as described in paragraph SYSTEM DESCRIPTION, and gaps such as those between floor slabs and curtain walls shall be the same as the construction in which they occur. Construction joints and gaps shall be provided with firestopping materials and systems that have been tested in accordance with ASTM E119, ASTM E1966 or UL 2079 to meet the required fire resistance rating. Systems installed at construction joints shall meet the cycling requirements of ASTM E1399 or UL 2079. All joints at the intersection of the top of a fire resistance rated wall and the underside of a fire-rated floor, floor ceiling, or roof ceiling assembly shall provide a minimum class II movement capability.

PART 3 EXECUTION**3.1 PREPARATION**

Areas to receive firestopping shall be free of dirt, grease, oil, or loose materials which may affect the fitting or fire resistance of the firestopping system. Prepare surfaces as recommended by the manufacturer.

3.2 INSTALLATION

Completely fill void spaces with firestopping material regardless of geometric configuration, subject to tolerance established by the manufacturer. Firestopping systems for filling floor voids 4 inches or more in any direction shall be capable of supporting the same load as the floor is designed to support or shall be protected by a permanent barrier to prevent loading or traffic in the firestopped area. Install firestopping in accordance with manufacturer's written instructions. Provide tested and listed firestop systems in the following locations, except in floor slabs on grade:

- a. Penetrations of duct, conduit, tubing, cable and pipe through floors and through fire-resistance rated walls, partitions, and ceiling-floor assemblies.
- b. Penetrations of vertical shafts such as pipe chases, elevator shafts, and utility chutes.
- c. Gaps at the intersection of floor slabs and curtain walls, including inside of hollow curtain walls at the floor slab.
- d. Gaps at perimeter of fire-resistance rated walls and partitions, such as between the top of the walls and the bottom of roof decks.
- e. Construction joints in floors and fire rated walls and partitions.
- f. Other locations where required to maintain fire resistance rating of the construction.

3.2.1 Insulated Pipes and Ducts

Thermal insulation shall be cut and removed where pipes or ducts pass through firestopping, unless insulation meets requirements specified for firestopping. Replace thermal insulation with a material having equal thermal insulating and firestopping characteristics.

3.2.2 Fire Dampers

Install and firestop fire dampers in accordance with Section 23 00 00 AIR SUPPLY, DISTRIBUTION, VENTILATION, AND EXHAUST SYSTEM. Firestop installed with fire damper must be tested and approved for use in fire damper system. Firestop installed with fire damper must be tested and approved for use in fire damper system.

3.2.3 Data and Communication Cabling

Cabling for data and communication applications shall be sealed with re-enterable firestopping products.

3.2.3.1 Re-Sealable Products

Provide firestopping pre-manufactured modular products, containing self-sealing intumescent inserts. Firestopping products shall allow for cable moves, additions or changes. Devices shall be capable of maintaining the fire resistance rating of the penetrated membrane at 0 percent to 100 percent visual fill of penetrants.

Specifications

3.3 INSPECTION**3.3.1 General Requirements**

The firestopped areas shall not be covered or enclosed until inspection is complete and approved by the Architect. Inspect the applications initially to ensure adequate preparations (clean surfaces suitable for application, etc.) and periodically during the work to assure that the completed work has been accomplished according to the manufacturer's written instructions and the specified requirements. Submit written reports indicating locations of and types of penetrations and types of firestopping used at each location; type shall be recorded by UL listed printed numbers.

3.3.2 Inspection Standards

Inspect all firestopping in accordance to ASTM standards for firestop inspection, and document inspection results to be submitted.

a. ASTM E2393

b. ASTM E2174

-- End of Section --

07 92 00 - JOINT SEALANTS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C1311	(2010) Standard Specification for Solvent Release Agents
ASTM C509	(2006; R 2011) Elastomeric Cellular Preformed Gasket and Sealing Material
ASTM C734	(2006; R 2012) Low-Temperature Flexibility of Latex Sealants After Artificial Weathering
ASTM C919	(2012) Use of Sealants in Acoustical Applications
ASTM C920	(2011) Standard Specification for Elastomeric Joint Sealants
ASTM D1056	(2007) Standard Specification for Flexible Cellular Materials - Sponge or Expanded Rubber
ASTM D217	(2010) Cone Penetration of Lubricating Grease
ASTM E84	(2012c) Standard Test Method for Surface Burning Characteristics of Building Materials

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Sealants Primers
Bond breakers
Backstops

Manufacturer's descriptive data including storage requirements, shelf life, curing time, instructions for mixing and application, and primer data (if required). Provide a copy of the Material Safety Data Sheet for each solvent, primer or sealant material.

SD-07 Certificates Sealant

Certificates of compliance stating that the materials conform to the specified requirements.

LEED Submittals

Product Data for Credit IEQ 4.1: For sealants and sealant primers used inside the weatherproofing system, documentation including printed statement of VOC content.

Specifications**1.3 ENVIRONMENTAL CONDITIONS**

Apply sealant when the ambient temperature is between 40 and 90 degrees F.

1.4 DELIVERY AND STORAGE

Deliver materials to the job site in unopened manufacturers' external shipping containers, with brand names, date of manufacture, color, and material designation clearly marked thereon. Label elastomeric sealant containers to identify type, class, grade, and use. Carefully handle and store materials to prevent inclusion of foreign materials or subjection to sustained temperatures exceeding 90 degrees F or less than 0 degrees F.

1.5 QUALITY ASSURANCE**1.5.1 Compatibility with Substrate**

Verify that each of the sealants are compatible for use with joint substrates.

1.5.2 Joint Tolerance

Provide joint tolerances in accordance with manufacturer's printed instructions.

1.5.3 Mock-Up

Project personnel is responsible for installing sealants in mock-up prepared by other trades, using materials and techniques approved for use on the project.

1.6 SPECIAL WARRANTY

Guarantee sealant joint against failure of sealant and against water penetration through each sealed joint for five years.

PART 2 PRODUCTS**2.1 SEALANTS**

Provide sealant that has been tested and found suitable for the substrates to which it will be applied.

2.1.1 Interior Sealant

Provide ASTM C920, Type S or M, Grade NS, Class 12.5, Use NT. Location(s) and color(s) of sealant for the following:

LOCATION	COLOR
a. Small voids between walls or partitions and adjacent lockers, casework, shelving, door frames, built-in or surface-mounted equipment and fixtures, and similar items.	As selected
b. Perimeter of frames at doors, windows, and access panels which adjoin exposed interior concrete and masonry surfaces.	As selected
c. Joints of interior masonry walls and partitions which adjoin columns, pilasters, concrete walls, and exterior walls unless otherwise detailed.	As selected
d. Joints between edge members for acoustical tile and adjoining vertical surfaces.	As selected

Specifications

e. Interior locations, not otherwise indicated or specified, where small voids exist between materials specified to be painted.	As selected
f. Joints formed where nonplanar tile surfaces meet.	As selected
g. Joints formed between tile floors and tile base cove; joints between tile and dissimilar materials; joints occurring where substrates change.	As selected

2.1.2 Exterior Sealant

For joints in vertical surfaces, provide ASTM C920, Type S or M, Grade NS, Class 25, Use NT. For joints in horizontal surfaces, provide ASTM C920, Type S or M, Grade P, Class 25, Use T. Provide location(s) and color(s) of sealant as follows:

LOCATION	COLOR
a. Joints and recesses formed where frames and subsills of windows, doors, louvers, and vents adjoin masonry, concrete, or metal frames. Use sealant at both exterior and interior surfaces of exterior wall penetrations.	As selected
b. Expansion and control joints.	As selected
c. Interior face of expansion joints in exterior concrete or masonry walls where metal expansion joint covers are not required.	As selected
d. Voids where items pass through exterior walls.	As selected
e. Metal reglets, where flashing is inserted and where flashing is penetrated by coping dowels.	As selected
f. Metal-to-metal joints where sealant is indicated or specified.	As selected
g. Joints between ends of gravel stops, fascias, copings, and adjacent walls.	As selected

2.1.3 Floor Joint Sealant

ASTM C920, Type S or M, Grade P, Class 25, Use T. Provide location(s) and color(s) of sealant as follows:

LOCATION	COLOR
a. Seats of metal thresholds for exterior doors.	As selected
b. Control and expansion joints in floors, slabs, ceramic tile, and walkways.	As selected

2.1.4 Acoustical Sealant

Rubber or polymer-based acoustical sealant conforming to ASTM C919 must have a flame spread of 25 or less and a smoke developed rating of 50 or less when tested in accordance with ASTM E84. Acoustical sealant must have a consistency of 250 to 310 when tested in accordance with ASTM D217, and must remain flexible and adhesive after 500 hours of accelerated weathering as specified in ASTM C734, and must be non-staining.

2.2 PRIMERS

Specifications

Provide a nonstaining, quick-drying type and consistency recommended by the sealant manufacturer for the particular application.

2.3 BOND BREAKERS

Provide the type and consistency recommended by the sealant manufacturer to prevent adhesion of the sealant to backing or to bottom of the joint.

2.4 BACKSTOPS

Provide glass fiber roving or neoprene, butyl, polyurethane, or polyethylene foams free from oil or other staining elements as recommended by sealant manufacturer. Provide 25 to 33 percent oversized backing for closed cell and 40 to 50 percent oversized backing for open cell material, unless otherwise indicated. Make backstop material compatible with sealant. Do not use oakum and other types of absorptive materials as backstops.

2.4.1 Rubber

Conform to ASTM D1056, Type 2, closed cell, Class A, for cellular rubber sponge backing.

2.4.2 Synthetic Rubber

Conform to ASTM C509, Option I, Type I preformed Synthetic rubber backing.

2.4.3 Neoprene

Conform to ASTM D1056, closed cell expanded neoprene cord Type 2, Class C, Grade for Neoprene backing.

2.4.4 Butyl Rubber Based

Provide Butyl Rubber Based Sealants of single component, solvent release, color as selected, conforming to ASTM C1311.

2.4.5 Silicon Rubber Base

Provide Silicon Rubber Based Sealants of single component, solvent release, color as selected, conforming to ASTM C920, Non-sag.

2.5 CLEANING SOLVENTS

Provide type(s) recommended by the sealant manufacturer except for aluminum and bronze surfaces that will be in contact with sealant.

PART 3 EXECUTION**3.1 SURFACE PREPARATION**

Clean surfaces from dirt frost, moisture, grease, oil, wax, lacquer, paint, or other foreign matter that would tend to destroy or impair adhesion. Remove oil and grease with solvent. Surfaces must be wiped dry with clean cloths. When resealing an existing joint, remove existing caulk or sealant prior to applying new sealant. For surface types not listed below, contact sealant manufacturer for specific recommendations.

Specifications

3.1.1 Steel Surfaces

Remove loose mill scale by sandblasting or, if sandblasting is impractical or would damage finish work, scraping and wire brushing. Remove protective coatings by sandblasting or using a residue-free solvent.

3.1.2 Aluminum or Bronze Surfaces

Remove temporary protective coatings from surfaces that will be in contact with sealant. When masking tape is used as a protective coating, remove tape and any residual adhesive just prior to sealant application. For removing protective coatings and final cleaning, use nonstaining solvents recommended by the manufacturer of the item(s) containing aluminum or bronze surfaces.

3.1.3 Concrete and Masonry Surfaces

Where surfaces have been treated with curing compounds, oil, or other such materials, remove materials by sandblasting or wire brushing. Remove laitance, efflorescence and loose mortar from the joint cavity.

3.1.4 Wood Surfaces

Keep wood surfaces to be in contact with sealants free of splinters and sawdust or other loose particles.

3.2 SEALANT PREPARATION

Do not add liquids, solvents, or powders to the sealant. Mix multicomponent elastomeric sealants in accordance with manufacturer's instructions.

3.3 APPLICATION

3.3.1 Joint Width-To-Depth Ratios

a. Acceptable Ratios:

JOINT WIDTH	JOINT DEPTH	
	Minimum	Maximum
For metal, glass, or other nonporous surfaces:		
1/4 inch (minimum)	1/4 inch	1/4 inch
over 1/4 inch	1/2 of width	Equal to width
For wood, concrete, masonry, or stone:		
1/4 inch (minimum)	1/4 inch	1/4 inch
over 1/4 inch to 1/2 inch	1/4 inch	Equal to width
over 1/2 inch to 2 inch	1/2 inch	5/8 inch
Over 2 inch	As recommended by sealant manufacturer	

- b. Unacceptable Ratios: Where joints of acceptable width-to-depth ratios have not been provided, clean out joints to acceptable depths and grind or cut to acceptable widths without damage to the adjoining work. Grinding is not required on metal surfaces.

Specifications

3.3.2 Masking Tape

Place masking tape on the finish surface on one or both sides of a joint cavity to protect adjacent finish surfaces from primer or sealant smears. Remove masking tape within 10 minutes after joint has been filled and tooled.

3.3.3 Backstops

Install backstops dry and free of tears or holes. Tightly pack the back or bottom of joint cavities with backstop material to provide a joint of the depth specified. Install backstops in the following locations:

- a. Where indicated.
- b. Where backstop is not indicated but joint cavities exceed the acceptable maximum depths specified in paragraph entitled, "Joint Width-to-Depth Ratios".

3.3.4 Primer

Immediately prior to application of the sealant, clean out loose particles from joints. Where recommended by sealant manufacturer, apply primer to joints in concrete masonry units, wood, and other porous surfaces in accordance with sealant manufacturer's instructions. Do not apply primer to exposed finish surfaces.

3.3.5 Bond Breaker

Provide bond breakers to the back or bottom of joint cavities, as recommended by the sealant manufacturer for each type of joint and sealant used, to prevent sealant from adhering to these surfaces. Carefully apply the bond breaker to avoid contamination of adjoining surfaces or breaking bond with surfaces other than those covered by the bond breaker.

3.3.6 Sealants

Provide a sealant compatible with the material(s) to which it is applied. Do not use a sealant that has exceeded shelf life or has jelled and cannot be discharged in a continuous flow from the gun. Apply the sealant in accordance with the manufacturer's printed instructions with a gun having a nozzle that fits the joint width. Force sealant into joints to fill the joints solidly without air pockets. Tool sealant after application to ensure adhesion. Make sealant uniformly smooth and free of wrinkles. Upon completion of sealant application, roughen partially filled or unfilled joints, apply sealant, and tool smooth as specified. Apply sealer over the sealant when and as specified by the sealant manufacturer.

3.4 PROTECTION AND CLEANING**3.4.1 Protection**

Protect areas adjacent to joints from sealant smears. Masking tape may be used for this purpose if removed 5 to 10 minutes after the joint is filled.

3.4.2 Final Cleaning

Upon completion of sealant application, remove remaining smears and stains and leave the work in a clean and neat condition.

- a. **Masonry and Other Porous Surfaces:** Immediately scrape off fresh sealant that has been smeared on masonry and rub clean with a solvent as recommended by the sealant manufacturer. Allow excess sealant to cure for 24 hour then remove by wire brushing or



Specifications

sanding.

- b. Metal and Other Non-Porous Surfaces: Remove excess sealant with a solvent-moistened cloth.

-- End of Section --

07 92 22 – SECURITY JOINT SEALANTS**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes the following:
 - 1. Security Joint Sealant
 - 2. Security Gap Filler.

1.2 SUBMITTALS

- A. Product Data: For each joint sealant product indicated.
 - 1. Certification by joint sealant manufacturer that sealants plus the primers and cleaners required for sealant installation comply with local regulations controlling use of volatile organic compounds.
- B. Certificates by Manufacturer: That products supplied complies with performance requirements specified and are suitable for the use indicated.

1.3 QUALITY ASSURANCE

- A. Installer Qualifications: Engage an experienced Installer who has completed joint sealant applications similar in material, design, and extent to that indicated for Project that have resulted in construction with a record of successful in-service performance.

1.4 DELIVERY, STORAGE, AND HANDLING

- A. Deliver materials to Project site in original unopened containers or bundles with labels indicating manufacturer, product name and designation, color, expiration period for use, pot life, curing time, and mixing instructions for multicomponent materials.
- B. Store and handle materials in compliance with manufacturer's recommendations to prevent their deterioration or damage due to moisture, high or low temperatures, contaminants, or other causes.

1.5 PROJECT CONDITIONS

- A. Environmental Conditions: Do not proceed with installation of joint sealants under the following conditions:
 - 1. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer.
 - 2. When ambient and substrate temperature conditions are outside the limits permitted by joint sealant manufacturer or below 40 deg F (4.4 deg C).
 - 3. When joint substrates are wet.

Specifications

- B. Joint Width Conditions: Do not proceed with installation of joint sealants where joint widths are less than allowed by joint sealant manufacturer for application indicated.
- C. Joint Substrate Conditions: Do not proceed with installation of joint sealants until contaminants capable of interfering with their adhesion are removed from joint substrates.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Compatibility: Provide products, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by sealant manufacturer based on testing and field experience.
- B. Colors: Provide color of exposed joint sealants to comply with the following:
 - 1. Provide selections made by Architect from manufacturer's full range of standard colors for products of type indicated.

2.2 SECURITY JOINT SEALANT, SJS, PICK RESISTANT, LIMITED FLEXIBILITY WHEN CURED.

- A. Product/Manufacturer:
 - 1. SikaFlex -2c NS TG/Sika Corp.
 - 2. Dyna Flex/Pecora Corp.
 - 3. Sonolastic Ultra/BASF

2.3 SECURITY GAP FILLER, SGF, PICK PROOF, RIGID WHEN CURED.

- A. Product/Manufacturer:
 - 1. Sika-Dur 23/Sika Corp.
 - 2. DynaPoxy/Pecora Corp.
 - 3. Concrese Paste LPL/BASF
- B. Materials:
 - 1. Epoxy resin adhesive binder:
 - a. Component "A" shall be a modified epoxy resin of the epichlorohydrin bisphenol A type containing suitable viscosity control agents. It shall not contain butyl glycidyl ether.
 - b. Component "B" shall be a blend of aliphatic amines containing suitable viscosity control agents, pigments and accelerators.
 - c. The ratio of Component "A": Component "B" shall be 1:1 by volume.
 - d. The material shall not contain asbestos.
- C. Performance Criteria
 - 1. Properties of the mixed epoxy resin adhesive:
 - a. Pot Life: 45-65 minutes
 - b. Tack-Free Time to Touch (20 mil thickness): 1.5-2.5 hours
 - c. Consistency (½ in. thick) : non-sag
 - d. Color: gray

Specifications

2. Properties of the mixed epoxy resin adhesive:
 - a. Compressive Properties (ASTM D-695) at 28 days
 - b. Compressive Strength: 4400 psi min
 - c. Modulus of Elasticity: 1.5×10^5 psi min
 - d. Tensile Properties (ASTM D-638) at 14 days
 - 1) Tensile Strength: 1725 psi min
 - 2) Elongation at Break: 5.5% min
 - 3) Modulus of Elasticity: 2.7×10^5 psi min
 - e. Flexural Properties (ASTM D-790) at 14 days
 - 1) Flexural Strength (Modulus of Rupture): 4100 psi min.
 - 2) Tangent Modulus of Elasticity in Bending: 4.0×10^5 psi min
 - f. Shear Strength (ASTM D-732) at 14 days: 2600 psi min
 - g. Total Water Absorption (ASTM D-570) at 7 days: .5% max. (2 hour boil)
 - h. Bond Strength (ASTM C-882) Hardened Concrete to Hardened Concrete
 - 1) 2 day (Dry cure): 2200 psi min
 - 2) 14 day (moist cure): 1500 psi min
 - i. Deflection Temperature (ASTM D-648) at 14 days: 87F min (fiber stress loading = 66 psi)
 - j. The epoxy resin adhesive shall conform to ASTM C-881 and AASHTO M 235-90.
 - k. The epoxy resin adhesive binder shall be approved by the United States Department of Agriculture.
3. Properties of the epoxy resin mortar (epoxy resin/aggregate* =1/1 by loose volume):
 - a. Compressive Properties (ASTM D-695) at 28 days
 - 1) Compressive Strength: 6100 psi min.
 - 2) Modulus of Elasticity: 3.4×10^5 psi min.
 - b. Tensile Properties (ASTM D-638) at 14 days
 - 1) Tensile Strength: 2050 psi min.
 - 2) Elongation at Break: 0.85% min.
 - 3) Modulus of Elasticity: 5.2×10^5 psi min.
 - c. Flexural Properties (ASTM D-790) at 14 days
 - 1) Flexural Strength (Modulus of Rupture): 3300 psi min.
 - 2) Tangent Modulus of Elasticity in Bending: 5.8×10^5 psi min.
 - d. Shear Strength (ASTM D-732) at days: 2800 psi min.
 - e. Aggregate used shall conform to ASTM C-190.

2.4 JOINT SEALANT AND FILLER BACKING

- A. General: Provide sealant backings of material that are nonstaining; are compatible with joint substrates, sealants, primers, and other joint fillers; and are approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.
- B. Cylindrical Sealant Backings: ASTM C 1330, Type C (closed-cell material with a surface skin) as approved in writing by joint-sealant manufacturer for joint application indicated, and of size and density to control sealant depth and otherwise contribute to producing optimum sealant performance.

2.5 MISCELLANEOUS MATERIALS

- A. Primer: Material recommended by joint sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealant-substrate tests and field tests.

Specifications

- B. Cleaners for Nonporous Surfaces: Chemical cleaners acceptable to manufacturers of sealants and sealant backing materials, free of oily residues or other substances capable of staining or harming in any way joint substrates and adjacent nonporous surfaces, and formulated to promote optimum adhesion of sealants with joint substrates.
- C. Masking Tape: Nonstaining, nonabsorbent material compatible with joint sealants and surfaces adjacent to joints.

PART 3 - EXECUTION

3.1 LOCATIONS

- A. Provide security joint sealants and security gap filler work as required under the General, Mechanical, and Electrical Sections. See security matrix at the end of this Section.

3.2 EXAMINATION

- A. Examine joints indicated to receive joint sealants, with Installer present, for compliance with requirements for joint configuration, installation tolerances, and other conditions affecting joint sealant performance. Do not proceed with installation of joint sealants until unsatisfactory conditions have been corrected.

3.3 PREPARATION

- A. Surface Cleaning of Joints: Clean out joints immediately before installing joint sealants to comply with recommendations of joint sealant manufacturer and the following requirements:
 - 1. Remove all foreign material from joint substrates that could interfere with adhesion of joint sealant, including dust, paints (except for permanent, protective coatings tested and approved for sealant adhesion and compatibility by sealant manufacturer), old joint sealants, oil, grease, waterproofing, water repellents, water, surface dirt, and frost.
 - 2. Clean concrete, masonry, unglazed surfaces of ceramic tile, and similar porous joint substrate surfaces by brushing, grinding, blast cleaning, mechanical abrading, or a combination of these methods to produce a clean, sound substrate capable of developing optimum bond with joint sealants. Remove loose particles remaining from above cleaning operations by vacuuming or blowing out joints with oil-free compressed air.
 - 3. Remove laitance and form release agents from concrete.
 - 4. Clean metal, glass, porcelain enamel, glazed surfaces of ceramic tile, and other nonporous surfaces with chemical cleaners or other means that do not stain, harm substrates, or leave residues capable of interfering with adhesion of joint sealants.
- B. Joint Priming: Prime joint substrates where indicated or where recommended by joint sealant manufacturer based on preconstruction joint sealant-substrate tests or prior experience. Apply primer to comply with joint sealant manufacturer's recommendations. Confine primers to areas of joint sealant bond; do not allow spillage or migration onto adjoining surfaces.

Specifications

- C. Masking Tape: Use masking tape where required to prevent contact of sealant with adjoining surfaces that otherwise would be permanently stained or damaged by such contact or by cleaning methods required to remove sealant smears. Remove tape immediately after tooling without disturbing joint seal.

3.4 INSTALLATION OF JOINT SEALANTS

- A. Comply with joint sealant manufacturer's printed installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

3.5 CLEANING

- A. Clean off excess sealants or sealant smears adjacent to joints as work progresses by methods and with cleaning materials approved by manufacturers of joint sealants and of products in which joints occur.

3.6 PROTECTION

- A. Protect joint sealants during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time of Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated joint sealants immediately so that and installations with repaired areas are indistinguishable from original work.

Specifications

3.7 SEALANT MATRIX

LOCATIONS	KITCHEN, LAUNDRY, AND PROGRAM AREAS
DETENTION HOLLOW METAL FRAMES	SGF
ARCH. DOOR & WINDOW FRAMES	SJS
MECH. GRILLES/ DIFFUSERS	SJS
SECURITY SINKS, SHOWERS	SJS
WATER CLOSETS & LAVATORIES	SJS
SPRINKLER HEADS/ PLUMBING	SJS
SECURITY LIGHT FIXTURES	SJS
EXPOSED CONDUIT /RACEWAYS	SJS
SWITCH/OUTLET	SJS
INMATE DURESS PLATES	SJS
DETENTION FURNITURE-FURNISHINGS	SGF
INTERIOR MASONRY UNITS AT BASE TO FLOORING.	SGF
WALL AND CEILING JOINT	SJS
INTERCOM CALLSTATIONS	SJS

SJS = Security Joint Sealant. (Flexible)

SGF = Security Gap Filler.(Rigid)

END OF SECTION 07 92 22

08 11 13 - STEEL DOORS AND FRAMES**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

AMERICAN WELDING SOCIETY (AWS)

AWS D1.1/D1.1M (2012; Errata 2011) Structural Welding Code - Steel

ASTM INTERNATIONAL (ASTM)

ASTM A653/A653M (2011) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM A879/A879M (2012) Standard Specification for Steel Sheet, zinc Coated by the Electrolytic Process for Applications Requiring Designation of the Coating Mass on Each Surface

ASTM A924/A924M (2013) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

ASTM C578 (2012b) Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation

ASTM C591 (2012a) Standard Specification for Unfaced Preformed Rigid Cellular Polyisocyanurate Thermal Insulation

ASTM C612 (2010) Mineral Fiber Block and Board Thermal Insulation

ASTM D2863 (2012) Measuring the Minimum Oxygen Concentration to Support Candle-Like Combustion of Plastics (Oxygen Index)

ASTM E1300 (2012a; E 2012) Determining Load Resistance of Glass in Buildings

ASTM F2248 (2012) Standard Practice for Specifying an Equivalent 3-Second Duration Design Loading for Blast Resistant Glazing Fabricated with Laminated Glass

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.115 (2006) Hardware Preparation in Steel Doors and Steel Frames

FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 105 (2013) Standard for Installation of Smoke Door Assemblies and Other Opening Protectives

NFPA 252 (2012) Standard Methods of Fire Tests of Door Assemblies

Specifications

NFPA 80	(2013) Standard for Fire Doors and Other Opening Protectives
STEEL DOOR INSTITUTE (SDI/DOOR)	
SDI/DOOR 111	(2009) Recommended Selection and Usage Guide for Standard Steel Doors, Frames and Accessories
SDI/DOOR 113	(2001; R2006) Standard Practice for Determining the Steady State Thermal Transmittance of Steel Door and Frame Assemblies
SDI/DOOR A250.11	(2001) Recommended Erection Instructions for Steel Frames
SDI/DOOR A250.4	(2011) Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors and Hardware Reinforcing
SDI/DOOR A250.6	(2003; R2009) Recommended Practice for Hardware Reinforcing on Standard Steel Doors and Frames
SDI/DOOR A250.8	(2003; R2008) Recommended Specifications for Standard Steel Doors and Frames
UNDERWRITERS LABORATORIES (UL)	
UL 10C	(2009) Standard for Positive Pressure Fire Tests of Door Assemblies

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Doors

Frames Accessories

Show elevations, construction details, metal gages, hardware provisions, method of glazing, and installation details.

Schedule of doors Schedule of frames

SD-03 Product Data Doors

Frames Accessories

Submit manufacturer's descriptive literature for doors, frames, and accessories. Include data and details on door construction, panel (internal) reinforcement, insulation, and door edge construction. When "custom hollow metal doors" are provided in lieu of "standard steel doors," provide additional details and data sufficient for comparison to SDI/DOOR A250.8 requirements.

LEED Submittals

Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement

Specifications

indicating cost for each product having recycled content.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver doors, frames, and accessories undamaged and with protective wrappings or packaging. Provide temporary steel spreaders securely fastened to the bottom of each welded frame. Store doors and frames on platforms under cover in clean, dry, ventilated, and accessible locations, with 1/4 inch airspace between doors. Remove damp or wet packaging immediately and wipe affected surfaces dry. Replace damaged materials with new.

PART 2 PRODUCTS**2.1 STANDARD STEEL DOORS**

SDI/DOOR A250.8, except as specified otherwise. Prepare doors to receive door hardware as specified in Section 08 71 00. Undercut where indicated. Exterior doors shall have top edge closed flush and sealed to prevent water intrusion. Doors shall be 1-3/4 inch thick, unless otherwise indicated. Provide exterior glazing in accordance with ASTM F2248 and ASTM E1300.

2.1.1 Classification - Level, Performance, Model**2.1.1.1 Extra Heavy Duty Doors**

SDI/DOOR A250.8, Level 3, physical performance Level A, Model 2 with core construction as required by the manufacturer for interior doors, of size(s) and design(s) indicated. Provide Level 3 for interior doors.

2.1.1.2 Maximum Duty Doors

SDI/DOOR A250.8, Level 4, physical performance Level A, Model 2 with core construction as required by the manufacturer for exterior doors, of size(s) and design(s) indicated. Provide Level 4 for exterior doors.

2.2 INSULATED STEEL DOOR SYSTEMS

Insulated steel doors shall have a core of polyurethane foam and an R factor of 10.0 or more (based on a k-value of 0.16); face sheets, edges, and frames of galvanized steel not lighter than 23 gage, 16 gage, and 16 gage respectively; magnetic weatherstripping; nonremovable-pin hinges; thermal-break aluminum threshold; and vinyl door bottom. Doors and frames shall receive phosphate treatment, rust-inhibitive primer, and baked acrylic enamel finish. Doors shall have been tested in accordance with SDI/DOOR A250.4 and shall have met the requirements for Level C. Prepare doors to receive specified hardware. Doors shall be 1-3/4 inch thick. Provide insulated steel doors and frames at exterior doors.

2.3 ACCESSORIES**2.3.1 Astragals**

For pairs of exterior steel doors which will not have aluminum astragals or removable mullions, as specified in Section 08 71 00 DOOR HARDWARE provide overlapping steel astragals with the doors. For interior pairs of fire rated and smoke control doors, provide stainless steel astragals complying with NFPA 80 for fire rated assemblies and NFPA 105 for smoke control assemblies.

Specifications

2.3.2 Moldings

Provide moldings around glass of interior and exterior doors. Provide nonremovable moldings on outside of exterior doors and on corridor side of interior doors. Other moldings may be stationary or removable. Secure inside moldings to stationary moldings, or provide snap-on moldings.

2.4 INSULATION CORES

Insulated cores shall be of type specified, and provide an apparent factor of 0.48 in accordance with SDI/DOOR 113 and shall conform to:

- a. Rigid Cellular Polyisocyanurate Foam: ASTM C591, Type I or II, foamed-in-place or in board form, with oxygen index of not less than 22 percent when tested in accordance with ASTM D2863; or
- b. Rigid Polystyrene Foam Board: ASTM C578, Type I or II; or
- c. Mineral board: ASTM C612, Type I.

2.5 STANDARD STEEL FRAMES

SDI/DOOR A250.8, Level 3 and 4 to match door level, except as otherwise specified. Form frames to sizes and shapes indicated, with welded corners. Provide steel frames for doors, sidelights, mullions, cased openings, and interior glazed panels, unless otherwise indicated.

2.5.1 Welded Frames

Continuously weld frame faces at corner joints. Mechanically interlock or continuously weld stops and rabbets. Grind welds smooth.

Weld frames in accordance with the recommended practice of the Structural Welding Code Sections 1 through 6, AWS D1.1/D1.1M and in accordance with the practice specified by the producer of the metal being welded.

2.5.2 Mullions and Transom Bars

Mullions and transom bars shall be closed or tubular construction and be a member with heads and jambs butt-welded thereto. Bottom of door mullions shall have adjustable floor anchors and spreader connections.

2.5.3 Stops and Beads

Form stops and beads from 20 gage steel. Provide for glazed and other openings in standard steel frames. Secure beads to frames with oval-head, countersunk Phillips self-tapping sheet metal screws or concealed clips and fasteners. Space fasteners approximately 12 to 16 inch on center. Miter molded shapes at corners. Butt or miter square or rectangular beads at corners.

2.5.4 Cased Openings

Fabricate frames for cased openings of same material, gage, and assembly as specified for metal door frames, except omit door stops and preparation for hardware.

2.5.5 Anchors

Provide anchors to secure the frame to adjoining construction. Provide steel anchors, zinc-coated or painted with rust-inhibitive paint, not lighter than 18 gage.

Specifications

2.5.5.1 Wall Anchors

Provide at least three anchors for each jamb. For frames which are more than 7.5 feet in height, provide one additional anchor for each jamb for each additional 2.5 feet or fraction thereof.

- a. Masonry: Provide anchors of corrugated or perforated steel straps or 3/16 inch diameter steel wire, adjustable or T-shaped;
- b. Completed openings: Secure frames to previously placed concrete or masonry with expansion bolts in accordance with SDI/DOOR 111; and

2.5.5.2 Floor Anchors

Provide floor anchors drilled for 3/8 inch anchor bolts at bottom of each jamb member. Where floor fill occurs, terminate bottom of frames at the indicated finished floor levels and support by adjustable extension clips resting on and anchored to the structural slabs.

2.6 FIRE AND SMOKE DOORS AND FRAMES

NFPA 80 and NFPA 105 and this specification. The requirements of NFPA 80 and NFPA 105 shall take precedence over details indicated or specified.

2.6.1 Labels

Fire doors and frames shall bear the label of Underwriters Laboratories (UL), Factory Mutual Engineering and Research (FM), or Warnock Hersey International (WHI) attesting to the rating required. Testing shall be in accordance with NFPA 252 or UL 10C. Labels shall be metal with raised letters, and shall bear the name or file number of the door and frame manufacturer. Labels shall be permanently affixed at the factory to frames and to the hinge edge of the door. Door labels shall not be painted.

2.6.2 Oversized Doors

For fire doors and frames which exceed the size for which testing and labeling are available, furnish certificates stating that the doors and frames are identical in design, materials, and construction to a door which has been tested and meets the requirements for the class indicated.

2.6.3 Astragal on Fire and Smoke Doors

On pairs of labeled fire doors, conform to NFPA 80 and UL requirements. On smoke control doors, conform to NFPA 105.

2.7 WEATHERSTRIPPING

As specified in Section 08 71 00 DOOR HARDWARE.

2.8 HARDWARE PREPARATION

Provide minimum hardware reinforcing gages as specified in SDI/DOOR A250.6. Drill and tap doors and frames to receive finish hardware. Prepare doors and frames for hardware in accordance with the applicable requirements of SDI/DOOR A250.8 and SDI/DOOR A250.6. For additional requirements refer to ANSI/BHMA A156.115. Drill and tap for surface-applied hardware at the project site. Build additional reinforcing for surface-applied hardware into the door at the factory. Locate hardware in accordance with the requirements of SDI/DOOR A250.8, as applicable. Punch door frames, with the exception of frames that will have weatherstripping gasketing, to receive a minimum of two rubber or vinyl door silencers on lock side of single doors and one silencer for each leaf at heads of double doors. Set lock strikes out to provide clearance for silencers.

Specifications

2.9 FINISHES**2.9.1 Factory-Primed Finish**

All surfaces of doors and frames shall be thoroughly cleaned, chemically treated and factory primed with a rust inhibiting coating as specified in SDI/DOOR A250.8.

2.9.2 Hot-Dip Zinc-Coated and Factory-Primed Finish

Fabricate exterior doors and frames from hot dipped zinc coated steel, alloyed type, that complies with ASTM A924/A924M and ASTM A653/A653M. The coating weight shall meet or exceed the minimum requirements for coatings having 0.4 ounces per square foot, total both sides, i.e., A40. Repair damaged zinc-coated surfaces by the application of zinc dust paint. Thoroughly clean and chemically treat to insure maximum paint adhesion. Factory prime as specified in SDI/DOOR A250.8. Provide for exterior doors.

2.9.3 Electrolytic Zinc-Coated Anchors and Accessories

Provide electrolytically deposited zinc-coated steel in accordance with ASTM A879/A879M, Commercial Quality, Coating Class A. Phosphate treat and factory prime zinc-coated surfaces as specified in SDI/DOOR A250.8.

2.10 FABRICATION AND WORKMANSHIP

Finished doors and frames shall be strong and rigid, neat in appearance, and free from defects, waves, scratches, cuts, dents, ridges, holes, warp, and buckle. Molded members shall be clean cut, straight, and true, with joints coped or mitered, well formed, and in true alignment. Dress exposed welded and soldered joints smooth. Design door frame sections for use with the wall construction indicated. Corner joints shall be well formed and in true alignment. Conceal fastenings where practicable. Design frames in exposed masonry walls or partitions to allow sufficient space between the inside back of trim and masonry to receive caulking compound.

2.10.1 Grouted Frames

For frames to be installed in exterior walls and to be filled with mortar or grout, fill the stops with strips of rigid insulation to keep the grout out of the stops and to facilitate installation of stop-applied head and jamb seals.

2.11 PROVISIONS FOR GLAZING

Materials are specified in Section 08 81 00, GLAZING.

PART 3 EXECUTION**3.1 INSTALLATION****3.1.1 Frames**

Set frames in accordance with SDI/DOOR A250.11. Plumb, align, and brace securely until permanent anchors are set. Anchor bottoms of frames with expansion bolts or powder-actuated fasteners. Build in or secure wall anchors to adjoining construction. Backfill frames in concrete and masonry walls with mortar. Coat inside of frames with corrosion-inhibiting bituminous material. For frames in exterior walls, ensure that stops are filled with rigid insulation before grout is placed.



Specifications

3.1.2 Doors

Hang doors in accordance with clearances specified in SDI/DOOR A250.8. After erection and glazing, clean and adjust hardware.

3.1.3 Fire and Smoke Doors and Frames

Install fire doors and frames, including hardware, in accordance with NFPA 80. Install fire rated smoke doors and frames in accordance with NFPA 80 and NFPA 105.

3.2 PROTECTION

Protect doors and frames from damage. Repair damaged doors and frames prior to completion and acceptance of the project or replace with new, as directed. Wire brush rusted frames until rust is removed. Clean thoroughly. Apply an all-over coat of rust-inhibitive paint of the same type used for shop coat.

3.3 CLEANING

Upon completion, clean exposed surfaces of doors and frames thoroughly. Remove mastic smears and other unsightly marks.

End of Section 08 11 13

Specifications

08 33 23 - OVERHEAD COILING DOORS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN SOCIETY OF CIVIL ENGINEERS (ASCE)

ASCE 7 (2010; Change 2010; Change 2011; Errata 2011; Change 2011) Minimum Design Loads for Buildings and Other Structures

AMERICAN SOCIETY OF HEATING, REFRIGERATING AND AIR-CONDITIONING ENGINEERS (ASHRAE)

ASHRAE FUN IP (2009; Errata 2010) Fundamentals Handbook, I-P Edition

ASME INTERNATIONAL (ASME)

ASME B29.400 (2001; R 2008) Combination, "H" Type Mill Chains, and Sprockets

ASTM INTERNATIONAL (ASTM)

ASTM A153/A153M (2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM A27/A27M (2010) Standard Specification for Steel Castings, Carbon, for General Application

ASTM A307 (2012) Standard Specification for Carbon Steel Bolts and Studs, 60 000 PSI Tensile Strength

ASTM A36/A36M (2012) Standard Specification for Carbon Structural Steel

ASTM A48/A48M (2003; R 2012) Standard Specification for Gray Iron Castings

ASTM A53/A53M (2012) Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless

ASTM A653/A653M (2011) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process

ASTM A780/A780M (2009) Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings

ASTM A924/A924M (2013) Standard Specification for General Requirements for Steel Sheet, Metallic-Coated by the Hot-Dip Process

Specifications

ASTM B209	(2010) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate
ASTM B221	(2012) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM D2000	(2012) Standard Classification System for Rubber Products in Automotive Applications
ASTM E330	(2002; R 2010) Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference
ASTM E84	(2012c) Standard Test Method for Surface Burning Characteristics of Building Materials
ASTM F568M	(2007) Standard Specification for Carbon and Alloy Steel Externally Threaded Metric Fasteners

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2	(2000; R 2005; Errata 2008) Standard for Controllers, Contactors, and Overload Relays Rated 600 V
NEMA ICS 6	(1993; R 2011) Enclosures
NEMA MG 1	(2011; Errata 2012) Motors and Generators
NEMA ST 1	(1988; R 1994; R 1997) Specialty Transformers (Except General Purpose Type)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70	(2011; Errata 2 2012) National Electrical Code
---------	--

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Overhead

- Coiling Doors
- Counterbalancing Mechanism
- Manual Door Operators
- Electric Door Operators
- Bottom Bars
- Guides
- Mounting Brackets
- Overhead Drum
- Hood
- Painting
- Installation Drawings

SD-03 Product Data

Specifications

Overhead Coiling Doors Hardware
Counterbalancing Mechanism
Manual Door Operators
Electric Door Operators
Fire-Rated Door Assembly

SD-04 Samples

Paint Finish

SD-05 Design Data

Overhead Coiling Doors

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals
Parts Lists
Cleaning

1.3 OVERHEAD COILING DOOR DETAIL SHOP DRAWINGS

Provide installation drawings for overhead coiling door assemblies which show: elevations of each door type, shape and thickness of materials, finishes, details of joints and connections, details of guides and fittings, rough opening dimensions, location and description of hardware, anchorage locations, and counterbalancing mechanism and door operator details. Include a schedule showing the location of each door with the drawings.

1.4 WARRANTY, OPERATION AND MAINTENANCE DATA

Submit Operation and Maintenance Manuals for Overhead Coiling Door Assemblies, including the following items:

Manual Door Operators
Electric Door Operators
Hood
Counterbalancing Mechanism
Painting
Parts Lists

Furnish a written guarantee that the helical spring and counterbalance mechanism are free from defects in material and workmanship for not less than two years after completion and acceptance of the project.

Warrant that upon notification by the Owner, any defects in material, workmanship, and door operation are immediately correct within the same time period covered by the guarantee, at no cost to the Owner.

1.5 DELIVERY AND STORAGE

Deliver doors to the jobsite wrapped in a protective covering with the brands and names clearly marked thereon. Store doors in an adequately ventilated dry location that is free from dirt and dust, water, or other contaminants. Store in a manner that permits easy access for inspection and handling.

PART 2 PRODUCTS

Specifications

2.1 DESCRIPTION

Doors to be coiling type, with interlocking slats, complete with anchoring and door hardware, guides, hood, and operating mechanisms, and designed for use on openings as indicated. Use grease-sealed or self-lubricating bearings for rotating members.

2.2 PERFORMANCE REQUIREMENTS**2.2.1 Wind Loading**

Design and fabricate door assembly to withstand the wind loading pressure indicated on the Drawing with a maximum deflection of 1/120 of the opening width. Provide test data showing compliance with ASTM E330. Sound engineering principles may be used to interpolate or extrapolate test results to door sizes not specifically tested. Ensure complete assembly meets or exceeds the requirements of ASCE 7.

2.2.2 Operational Cycle Life

Design all portions of the door, hardware and operating mechanism that are subject to movement, wear, or stress fatigue to operate through a minimum number of 10 cycles per day. One complete cycle of door operation is defined as when the door is in the closed position, moves to the fully open position, and returns to the closed position.

2.3 OVERHEAD COILING DOORS**2.3.1 Curtain Materials and Construction**

Provide curtain slats fabricated from aluminum sheets conforming to ASTM B209, or ASTM B221 extrusions, alloy and tempering standard from manufacturer for type of use and finish indicated; with a thickness of 0.050 inch.

Fabricate doors from interlocking slats, with section profiles as specified, designed to withstand the specified wind loading. Ensure the provided slats are continuous without splices for the width of the door.

Provide slats filled with manufacturer's standard thermal insulation complying with maximum flame-spread and smoke-developed indexes of 75 and 450, respectively, according to ASTM E84. Enclose insulation completely within slat faces on interior surface of slats.

2.3.2 Insulated Curtains

Form Curtains from manufacturer's standard shapes of interlocking slats. Supply slat system with a minimum R-value of 7 when calculated in accordance with ASHRAE FUN IP. Slats to consist of a urethane core not less than 11/16 inch thick, completely enclosed within metal facings. Ensure the exterior face of slats are the same gauge as specified for curtains. Select an interior face not lighter than 0.0219 inches. The insulated slat assembly requires a flame spread rating of not more than 25 and a smoke development factor of not more than 50 when tested in accordance with ASTM E84.

2.3.3 Curtain Bottom Bar

Install curtain bottom bars as pairs of angles from the manufacturer's aluminum extrusions not less than 2.0 by 2.0 inches by 0.188 inch. Aluminum extrusions conforming to ASTM B221. Coat welds and abrasions with paint conforming to ASTM A780/A780M.

Specifications

2.3.4 Vision Panels

Provide complete manufacturer's standard vision panels assembly consisting of clear acrylic glazing panels or fire-rated glass as required for the type door. Set panels in a neoprene channel with a galvanized-steel frame not less than 0.0359-inch uncoated thickness.

2.3.5 Locks

Provide end and/or wind locks of Grade B cast steel conforming to ASTM A27/A27M, galvanized in accordance with ASTM A653/A653M, ASTM A153/A153M and ASTM A924/A924M. Secure locks at every other curtain slat.

2.3.6 Weather Stripping

Ensure weather-stripping at the door-head and jamb is 1/8-inch thick sheet of natural or neoprene rubber with air baffles. Secure weather stripping to the insides of hoods with galvanized-steel fasteners through continuous galvanized-steel pressure bars at least 5/8-inch wide and 1/8-inch thick.

Ensure threshold weather-stripping is 1/8-inch thick sheet natural or neoprene rubber secured to the bottom bars.

Provide weather-stripping of natural or neoprene rubber conforming to ASTM D2000.

2.3.7 Locking Devices

Ensure slide bolt engages through slots in tracks for locking by padlock, located on both left and right jamb sides, operable from coil side.

Provide a locking device assembly which includes cylinder lock, spring-loaded dead bolt, operating handle, cam plate, and adjustable locking bars to engage through slots in tracks for electric operation with safety interlock switch.

2.3.8 Safety Interlock

Equip power-operated doors with safety interlock switch to disengage power supply when door is locked.

2.3.9 Overhead Drum

Fabricate drums from nominal 0.040-inch thick aluminum sheet complying with ASTM B209. Aluminum of alloy and temper recommended by manufacturer. Select finish for type of use and finish indicated.

2.4 HARDWARE

Ensure all hardware conforms to ASTM A153/A153M, ASTM A307, ASTM F568M, and ASTM A27/A27M.

2.4.1 Guides

Fabricate curtain jamb guides from the manufacturer's standard angles or channels of same material and finish as curtain slats unless otherwise indicated. Provide guides with sufficient depth and strength to retain curtain, and to withstand loading. Ensure curtain operates smoothly. Slot bolt holes for track adjustment.

Fabricate with aluminum angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Flare the top of inner and outer guide angles outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar.

Specifications

2.4.2 Equipment Supports

Fabricate door-operating equipment supports from the manufacturer's standard steel shapes and plates conforming to ASTM A36/A36M, galvanized in accordance with ASTM A653/A653M and ASTM A924/A924M. Size the shapes and plates in accordance with the industry standards for the size, weight, and type of door installation.

2.4.3 Hood

Provide a 0.040 inch aluminum hood with reinforced top and bottom edges. Provide minimum 1/4 inch steel intermediate support brackets as required to prevent excessive sag.

2.5 COUNTERBALANCING MECHANISM

Counterbalance doors by means of manufacturer's standard mechanism with an adjustable-tension, steel helical torsion spring mounted, around a steel shaft and contained in a spring barrel connected to top of curtain with barrel rings. Use grease-sealed or self-lubricating bearings for rotating members.

2.5.1 Brackets

Provide the manufacturer's standard mounting brackets with one located at each end of the counterbalance barrel conforming to ASTM A48/A48M. Provide brackets of either cast iron or cold-rolled steel.

2.5.2 Counterbalance Barrels

Fabricate spring barrel of manufacturer's standard hot-formed, structural-quality, welded or seamless carbon-steel pipe, conforming to ASTM A53/A53M. Ensure the barrel is of sufficient diameter and wall thickness to support rolled-up curtain without distortion of slats. Limit barrel deflection to not more than 0.03 inch per foot of span under full load.

Curtain to be coiled on a pipe of sufficient size to carry door load with deflection not to exceed 0.033 inches per foot of door span and to be correctly balanced by helical springs, oil tempered torsion type. Use cast iron barrel plugs to anchor springs to tension shaft and pipe.

2.5.2.1 Barrel

Provide steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot of width.

2.5.2.2 Spring Balance

Provide an oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door. Ensure that effort to operate manually operated units does not exceed 25 lbs. Provide wheel for applying and adjusting spring torque.

2.5.3 Torsion Rod for Counter Balance

Fabricate rod from the manufacturer's standard cold-rolled steel, sized to hold fixed spring ends and carry torsional load.

Specifications

2.5.4 Counterbalance Shaft Assembly**2.5.4.1 Barrel**

Provide steel pipe capable of supporting the curtain load with maximum deflection of 0.03 inches per foot of width.

2.5.4.2 Spring Balance

Provide an oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door. Ensure that maximum effort to operate does not exceed 25 pounds. Provide wheel for applying and adjusting spring torque.

2.6 MANUAL DOOR OPERATORS**2.6.1 Manual Chain-Hoist Door Operators**

Provide door operators which consist of an endless steel hand chain, chain-pocket wheel, guard, and a geared reduction unit with a maximum lifting force of 25 lbf. Required pull for operation cannot exceed 35 pounds.

Provide chain hoists with a self-locking mechanism allowing the curtain to be stopped at any point in its upward or downward travel and to remain in that position until moved to the fully open or closed position. Provide hand chains of cadmium-plated alloy steel conforming to ASME B29.400. Ensure yield point of the chain is at least three times the required hand-chain pull.

Provide chain sprocket wheels of cast iron conforming to ASTM A48/A48M.

2.7 ELECTRIC DOOR OPERATORS

Provide electrical wiring and door operating controls conforming to the applicable requirements of NFPA 70.

Electric door-operator assemblies needs to be the sizes and capacities recommended and provided by the door manufacturer for specified doors. Furnish complete assemblies with electric motors and factory-prewired motor controls, starter, gear reduction units, solenoid-operated brakes, clutch, remote-control stations, manual or automatic control devices, and accessories as required for proper operation of the doors.

Design the operators so that motors may be removed without disturbing the limit-switch adjustment and affecting the emergency auxiliary operators.

Provide a manual operator of chain-gear mechanisms with a release clutch to permit manual operation of doors in case of power failure. Arrange the emergency manual operator so that it may be put into and out of operation from floor level, and its use does not affect the adjustment of the limit switches. Provide an electrical or mechanical device that automatically disconnects the motor from the operating mechanism when the emergency manual operating mechanism is engaged.

2.7.1 Door-Operator Types

Provide an operator mounted to the inside front wall on the left or right side of door and connected to door drive shaft with drive chain and sprockets. Side room is required for this type of mounting. Wall mounted operator can also be mounted above or below shaft; if above shaft, headroom is required.

Specifications

2.7.2 Electric Motors

Provide motors which are the high-starting-torque, reversible, constant-duty electrical type with overload protection of sufficient torque and horsepower to move the door in either direction from any position. Ensure they produce a door-travel speed of not less than 8 nor more than 12 inches per second without exceeding the horsepower rating.

Provide motors which conform to NEMA MG 1 designation, temperature rating, service factor, enclosure type, and efficiency to the requirements specified.

2.7.3 Motor Bearings

Select bearings with bronze-sleeve or heavy-duty ball or roller antifriction type with full provisions for the type of thrust imposed by the specific duty load.

Pre-lubricate and factory seal bearings in motors less than 1/2 horsepower.

Equip motors coupled to worm-gear reduction units with either ball or roller bearings.

Equip bearings in motors 1/2 horsepower or larger with lubrication service fittings. Fit lubrication fittings with color-coded plastic or metal dust caps.

In any motor, bearings that are lubricated at the factory for extended duty periods do not need to be lubricated for a given number of operating hours. Display this information on an appropriate tag or label on the motor with instructions for lubrication cycle maintenance.

2.7.4 Motor Starters, Controls, and Enclosures

Provide each door motor with: a factory-wired, unfused, disconnect switch; a reversing, across-the-line magnetic starter with thermal overload protection; 120-volt operating coils with a control transformer limit switch; and a safety interlock assembled in a NEMA ICS 6 type enclosure as specified herein. Ensure control equipment conforms to NEMA ICS 2.

Provide adjustable switches, electrically interlocked with the motor controls and set to stop the door automatically at the fully open and fully closed position.

2.7.5 Control Enclosures

Provide control enclosures that conform to NEMA ICS 6 for general purpose NEMA Type 1.

2.7.6 Transformer

Provide starters with 230/460 to 115 volt control transformers with one secondary fuse when required to reduce the voltage on control circuits to 120 volts or less. Provide a transformer conforming to NEMA ST 1.

2.7.7 Safety-Edge Device

Provide each door with a pneumatic safety device extending the full width of the door and located within a U-section neoprene or rubber astragal, mounted on the bottom rail of the bottom door section. Device needs to immediately stop and reverse the door upon contact with an obstruction in the door opening during downward travel and cause the door to return to full-open position. A safety device is not a substitute for a limit switch.

Connect safety device to the control circuit through a retracting safety cord and reel.

Specifications

2.7.8 Remote-Control Stations

Provide interior remote control stations which are full-guarded, momentary-contact three-button, heavy-duty, surface-mounted NEMA ICS 6 type enclosures as specified. Mark buttons "OPEN," "CLOSE," and "STOP." Ensure the "CLOSE" button requires a constant pressure to maintain the closing motion of the door. When the door is in motion and the "STOP" button is pressed, ensure the door stops instantly and remains in the stopped position. From the stopped position, the door may then be operated in either direction.

Provide exterior control stations which are full-guarded, momentary-contact three-button standard-duty, surface-mounted, weatherproof type, NEMA ICS 6, Type 4 enclosures, key-operated, with the same operating functions as specified herein for interior remote-control stations.

2.7.9 Speed-Reduction Units

Provide speed-reduction units consisting of hardened-steel worm and bronze worm gear assemblies running in oil or grease and inside a sealed casing, coupled to the motor through a flexible coupling. Drive shafts need to rotate on ball- or roller-bearing assemblies that are integral with the unit.

Provide minimum ratings of speed reduction units in accordance with AGMA provisions for class of service.

Ground worm gears to provide accurate thread form; machine teeth for all other types of gearing. Surface harden all gears.

Provide antifriction type bearings equipped with oil seals.

2.7.10 Chain Drives

Provide roller chains that are a power-transmission series steel roller type conforming to ASME B29.400, with a minimum safety factor of 10 times the design load.

Heat-treat or otherwise harden roller-chain side bars, rollers, pins, and bushings.

Provide high-carbon steel chain sprockets with machine-cut hardened teeth, finished bore and keyseat, and hollow-head setscrews.

2.7.11 Brakes

Provide 360-degree shoe brakes or shoe and drum brakes. Ensure the brakes are solenoid-operated and electrically interlocked to the control circuit to set automatically when power is interrupted.

2.7.12 Clutches

Ensure clutches are either the 4-inch diameter, multiple face, externally adjustable friction type or adjustable centrifugal type.

2.7.13 Weather/Smoke Seal Sensing Edge

Provide automatic stop control by an automatic sensing switch within neoprene astragal extending the full width of door bottom bar.

Specifications

Provide an electric sensing edge device. Ensure the door immediately stops downward travel when contact occurs before door fully closes. Provide a self-monitoring wireless sensing edge connection to the motor operator; eliminating the need for a physical traveling electric cord connection between bottom bar sensing edge device and motor operator. Supervised system alters normal door operation; preventing damage, injury or death due to an inoperable sensing edge system.

2.8 SURFACE FINISHING

Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes. Noticeable variations in the same metal component are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved samples and are assembled or installed to minimize contrast.

PART 3 EXECUTION**3.1 GENERAL**

Install overhead coiling door assembly, anchors and inserts for guides, brackets, motors, switches, hardware, and other accessories in accordance with approved detail drawings and manufacturer's written instructions.

Upon completion of installation, ensure doors are free from all distortion.

Install overhead coiling doors, motors, hoods, and operators at the mounting locations as indicated for each door in the contract documents and as required by the manufacturer.

Install overhead coiling doors, switches, and controls along accessible routes in compliance with regulatory requirements for accessibility and as required by the manufacturer.

3.2 ACCEPTANCE PROVISIONS

After installation, adjust hardware and moving parts. Lubricate bearings and sliding parts as recommended by manufacturer to provide smooth operating functions for ease movement, free of warping, twisting, or distortion of the door assembly.

Adjust seals to provide weather-tight fit around entire perimeter.

Engage a factory-authorized service representative to perform startup service and checks according to manufacturer's written instructions.

Test the door opening and closing operation when activated by controls or alarm-connected fire-release system. Adjust controls and safeties. Replace damaged and malfunctioning controls and equipment. Reset door-closing mechanism after successful test.

Test and make final adjustment of new doors at no additional cost to the Owner.

3.2.1 Maintenance and Adjustment

Not more than 90 calendar days after completion and acceptance of the project, examine, lubricate, test, and re-adjust doors as required for proper operation.

3.2.2 CLEANING

Clean aluminum doors in accordance with manufacturer's approved instructions.

Specifications

3.3 OPERATION AND MAINTENANCE

Submit the Operation and Maintenance Manuals 30 calendar days prior to testing the Overhead Coiling Door Assemblies. Update and resubmit data for final approval no later than 30 calendar days prior to contract completion.

Provide operation and maintenance manuals which are consistent with manufacturer's standard brochures, schematics, printed instructions, general operating procedures, and safety precautions. Provide test data that is legible and of good quality.

-- End of Section --

08 71 00 - DOOR HARDWARE**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM E283	(2004; R 2012) Determining the Rate of Air Leakage Through Exterior Windows, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen
-----------	--

BUILDERS HARDWARE MANUFACTURERS ASSOCIATION (BHMA)

ANSI/BHMA A156.1	(2013) Butts and Hinges
ANSI/BHMA A156.13	(2012) Mortise Locks & Latches Series 1000
ANSI/BHMA A156.16	(2008) Auxiliary Hardware
ANSI/BHMA A156.21	(2009) Thresholds
ANSI/BHMA A156.3	(2008) Exit Devices
ANSI/BHMA A156.4	(2008) Door Controls - Closers
ANSI/BHMA A156.5	(2010) Auxiliary Locks and Associated Products
ANSI/BHMA A156.6	(2010) Architectural Door Trim
ANSI/BHMA A156.7	(2003; R 2009) Template Hinge Dimensions
ANSI/BHMA A156.8	(2010) Door Controls - Overhead Stops and Holders
BHMA A156.15	(2011) Release Devices Closer Holder, Electromagnetic and Electromechanical
BHMA A156.22	(2012) Door Gasketing and Edge Seal Systems NATIONAL FIRE

PROTECTION ASSOCIATION (NFPA)

NFPA 101	(2012; Amendment 1 2012) Life Safety Code
NFPA 80	(2013) Standard for Fire Doors and Other Opening Protectives

STEEL DOOR INSTITUTE (SDI/DOOR)

SDI/DOOR A250.8	(2003; R2008) Recommended Specifications for Standard Steel Doors and Frames
-----------------	--

UNDERWRITERS LABORATORIES (UL)

UL Bld Mat Dir

(2012) Building Materials Directory

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES.

SD-02 Shop Drawings

Hardware schedule
Keying system

SD-03 Product Data Hardware items

SD-08 Manufacturer's Instructions Installation

SD-10 Operation and Maintenance Data

Hardware Schedule items

SD-11 Closeout Submittals Key Bitting

1.3 KEY BITTING CHART REQUIREMENTS

Submit key bitting charts to the Architect prior to completion of the work. Include:

- a. Complete listing of all keys (AA1, AA2, etc.).
- b. Complete listing of all key cuts (AA1-123456, AA2-123458).
- c. Tabulation showing which key fits which door.
- d. Copy of floor plan showing doors and door numbers.
- e. Listing of 20 percent more key cuts than are presently required in each master system.

1.4 QUALITY ASSURANCE

1.4.1 Hardware Manufacturers and Modifications

Provide, as far as feasible, locks, hinges, and closers of one lock, hinge, or closer manufacturer's make.
Modify hardware as necessary to provide features indicated or specified.

1.4.2 Key Shop Drawings Coordination Meeting

Prior to the submission of the key shop drawing, the Owner, Contractor, Door Hardware subcontractor, Architect shall meet to discuss key requirements for the facility.

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver hardware in original individual containers, complete with necessary appurtenances including fasteners and instructions. Mark each individual container with item number as shown in hardware schedule. Deliver permanent keys and removable cores to the Owner, either directly or by certified mail. Deliver construction master keys with the locks.

PART 2 PRODUCTS**2.1 TEMPLATE HARDWARE**

Provide hardware to be applied to metal manufactured to template. Promptly furnish template information or templates to door and frame manufacturers. Conform to ANSI/BHMA A156.7 for template hinges. Coordinate hardware items to prevent interference with other hardware.

2.2 HARDWARE FOR FIRE DOORS AND EXIT DOORS

Provide all hardware necessary to meet the requirements of NFPA 80 for fire doors and NFPA 101 for exit doors, as well as to other requirements indicated, even if such hardware is not specifically mentioned under paragraph entitled "Hardware Schedule." Provide the label of Underwriters Laboratories, Inc. for such hardware listed in UL Bld Mat Dir or labeled and listed by another testing laboratory acceptable to the Owner.

2.3 HARDWARE ITEMS

Clearly and permanently mark with the manufacturer's name or trademark, hinges, pivots, locks, latches, exit devices, bolts and closers where the identifying mark will be visible after the item is installed. For closers with covers, the name or trademark may be beneath the cover.

2.3.1 Hinges

ANSI/BHMA A156.1, 4-1/2 by 4-1/2 inch unless otherwise indicated. Construct loose pin hinges for exterior doors and reverse-bevel interior doors so that pins will be nonremovable when door is closed. Other antifriction bearing hinges may be provided in lieu of ball-bearing hinges.

2.3.2 Locks and Latches**2.3.2.1 Mortise Locks and Latches**

ANSI/BHMA A156.13, Series 1000, Operational Grade 1, Security Grade 2. Install handles and roses of mortise locks with screwless shanks and no exposed screws.

2.3.2.2 Hospital Latches

Push-pull latchset similar and equal to Glynn-Johnson HL6, 1/2 inch throw, 2-3/4 inch backset, to fit 161 cutout. Cover approximately 2-1/2 by 5-1/2 inch, handle approximately 1-1/2 by 4-1/2 inch, projection approximately 2-1/2 inch, covers and handles of stainless steel, BHMA 630 finish, engraved "PUSH" and "PULL" on handles, push handle pointing up, pull handle pointing down.

2.3.2.3 Auxiliary Locks

ANSI/BHMA A156.5, Grade 1.

2.3.3 Exit Devices

ANSI/BHMA A156.3, Grade 1. Provide adjustable strikes for rim type and vertical rod devices. Provide open back strikes for pairs of doors with mortise and vertical rod devices. Provide touch bars in lieu of conventional crossbars and arms.

Specifications

2.3.4 Cylinders and Cores

Provide cylinders and cores for new locks, including locks provided under other sections of this specification. Provide cylinders and cores with seven pin tumblers. Provide cylinders from products of one manufacturer, and provide cores from the products of one manufacturer. Rim cylinders and mortise cylinders have interchangeable cores which are removable by special control keys. Stamp each interchangeable core with a key control symbol in a concealed place on the core.

2.3.5 Keying System

Provide a grand master keying system. Provide a construction master keying system construction interchangeable cores. Provide construction interchangeable cores. Provide key cabinet as specified.

2.3.6 Lock Trim

Cast, forged, or heavy wrought construction and commercial plain design.

2.3.6.1 Lever Handles

Provide lever handles in lieu of knobs. Conform to the minimum requirements of ANSI/BHMA A156.13 for mortise locks of lever handles for exit devices. Provide lever handle locks with a breakaway feature (such as a weakened spindle or a shear key) to prevent irreparable damage to the lock when force in excess of that specified in ANSI/BHMA A156.13 is applied to the lever handle. Provide lever handles return to within 1/2 inch of the door face.

2.3.6.2 Texture

Provide knurled or abrasive coated knobs or lever handles for doors which are accessible to blind persons and which lead to dangerous areas.

2.3.7 Keys

Furnish one file key, one duplicate key, and one working key for each key change and for each master and grand master keying system. Furnish one additional working key for each lock of each keyed-alike group. Furnish a quantity of key blanks equal to 20 percent of the total number of file keys. Stamp each key with appropriate key control symbol and "Do not duplicate." Do not place room number on keys.

2.3.8 Door Bolts

ANSI/BHMA A156.16. Provide dustproof strikes for bottom bolts, except for doors having metal thresholds.

Automatic latching flush bolts: ANSI/BHMA A156.3, Type 25.

2.3.9 Closers

ANSI/BHMA A156.4, Series C02000, Grade 1, with PT 4C. Provide with brackets, arms, mounting devices, fasteners, full size covers, except at storefront mounting, and other features necessary for the particular application. Size closers in accordance with manufacturer's recommendations, or provide multi-size closers, Sizes 1 through 6, and list sizes in the Hardware Schedule. Provide manufacturer's 10 year warranty.

2.3.9.1 Identification Marking

Engrave each closer with manufacturer's name or trademark, date of manufacture, and manufacturer's size designation located to be visible after installation.

Specifications

2.3.10 Overhead Holders ANSI/BHMA A156.8.

2.3.11 Closer Holder-Release Devices BHMA A156.15.

2.3.12 Door Protection Plates ANSI/BHMA A156.6.

2.3.12.1 Sizes of Armor Mop and Kick Plates

2 inch less than door width for single doors; one inch less than door width for pairs of doors. Provide 10 inch kick plates for flush doors. Provide a minimum 48 inch armor plates for flush doors. Provide 6 inch mop plates.

2.3.13 Edge Guards

ANSI/BHMA A156.6, stainless steel, of same height as armor plates. Apply to lock stile and meeting stiles.

2.3.14 Door Stops and Silencers

ANSI/BHMA A156.16. Silencers Type L03011. Provide three silencers for each single door, two for each pair.

2.3.15 Thresholds

ANSI/BHMA A156.21. Use J35100, with vinyl or silicone rubber insert in face of stop, for exterior doors opening out, unless specified otherwise.

2.3.16 Weather Stripping Gasketing

BHMA A156.22. Provide the type and function designated. Provide a set to include head and jamb seals, sweep strips, and, for pairs of doors, astragals. Air leakage of weather stripped doors not to exceed 1.25 cubic feet per minute of air per square foot of door area when tested in accordance with ASTM E283. Provide weather stripping with one of the following:

2.3.16.1 Extruded Aluminum Retainers

Extruded aluminum retainers not less than 0.050 inch wall thickness with vinyl, neoprene, silicone rubber, or polyurethane inserts.

2.3.16.2 Interlocking Type

Zinc or bronze not less than 0.018 inch thick.

2.3.16.3 Spring Tension Type

Spring bronze or stainless steel not less than 0.008 inch thick.

2.3.17 Rain Drips

Extruded aluminum, not less than 0.08 inch thick. Set drips in sealant and fasten with stainless steel screws.

2.3.17.1 Door Rain Drips

Approximately 1-1/2 inch high by 5/8 inch projection. Align bottom with bottom edge of door.

Specifications

2.3.17.2 Overhead Rain Drips

Approximately 1-1/2 inch high by 2-1/2 inch projection, with length equal to overall width of door frame. Align bottom with door frame rabbet.

2.3.18 Special Tools

Provide special tools, such as spanner and socket wrenches and dogging keys, required to service and adjust hardware items.

2.4 FASTENERS

Provide fasteners of proper type, quality, size, quantity, and finish with hardware. Provide stainless steel or nonferrous metal fasteners that are exposed to weather. Provide fasteners of type necessary to accomplish a permanent installation.

2.5 FINISHES

Provide hardware in finish as selected by architect.

2.6 KEY CABINET AND CONTROL SYSTEM

ANSI/BHMA A156.5, Type required to yield a capacity (number of hooks) 50 percent greater than the number of key changes used for door locks.

PART 3 EXECUTION

3.1 INSTALLATION

Install hardware in accordance with manufacturers' printed installation instructions. Provide machine screws set in expansion shields for fastening hardware to solid concrete and masonry surfaces. Provide toggle bolts where required for fastening to hollow core construction. Provide through bolts where necessary for satisfactory installation.

3.1.1 Weather Stripping Installation

Handle and install weather stripping to prevent damage. Provide full contact, weather-tight seals. Operate doors without binding.

3.1.1.1 Stop-Applied Weather Stripping

Fasten in place with color-matched sheet metal screws not more than 9 inch on center after doors and frames have been finish painted.

3.1.1.2 Interlocking Type Weather Stripping

Provide interlocking, self-adjusting type on heads and jambs and flexible hook type at sills. Nail weather stripping to door 1 inch on center and to heads and jambs at 4 inch on center

3.1.1.3 Spring Tension Type Weather Stripping

Provide spring tension type on heads and jambs. Provide bronze nails with bronze, stainless steel nails with stainless steel. Space nails not more than 1-1/2 inch on center.

Specifications

3.1.2 Threshold Installation

Extend thresholds the full width of the opening and notch end for jamb stops. Set thresholds in a full bed of sealant and anchor to floor with cadmium-plated, countersunk, steel screws in expansion sleeves.

3.2 FIRE DOORS AND EXIT DOORS

Install hardware in accordance with NFPA 80 for fire doors, NFPA 101 for exit doors.

3.3 HARDWARE LOCATIONS

SDI/DOOR A250.8, unless indicated or specified otherwise.

- a. Kick and Armor Plates: Push side of single-acting doors. Both sides of double-acting doors.
- b. Mop Plates: Bottom flush with bottom of door.

3.4 KEY CABINET AND CONTROL SYSTEM

Tag one set of file keys and one set of duplicate keys. Place other keys in appropriately marked envelopes, or tag each key. Furnish complete instructions for setup and use of key control system. On tags and envelopes, indicate door and room numbers or master or grand master key.

3.5 FIELD QUALITY CONTROL

After installation, protect hardware from paint, stains, blemishes, and other damage until acceptance of work. Submit notice of testing 15 days before scheduled, so that testing can be witnessed by the Architect.

Adjust hinges, locks, latches, bolts, holders, closers, and other items to operate properly. Demonstrate that permanent keys operate respective locks, and give keys to the Owner. Correct, repair, and finish, as directed, errors in cutting and fitting and damage to adjoining work.

-- End of Section --



Specifications

08 81 00 - GLAZING

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI)

ANSI Z97.1 (2009; Errata 2010) Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test

ASTM INTERNATIONAL (ASTM)

ASTM C1036 (2010; E 2012) Standard Specification for Flat Glass

ASTM C1048 (2012; E 2012) Standard Specification for Heat-Treated Flat Glass - Kind HS, Kind FT Coated and Uncoated Glass

ASTM C1172 (2009; E 2011) Standard Specification for Laminated Architectural Flat Glass

ASTM C509 (2006; R 2011) Elastomeric Cellular Preformed Gasket and Sealing Material

ASTM C864 (2005; R 2011) Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers

ASTM C920 (2011) Standard Specification for Elastomeric Joint Sealants

ASTM D2287 (2012) Nonrigid Vinyl Chloride Polymer and Copolymer Molding and Extrusion Compounds

ASTM D395 (2003; R 2008) Standard Test Methods for Rubber Property - Compression Set

ASTM E119 (2012a) Standard Test Methods for Fire Tests of Building Construction and Materials

ASTM E1300 (2012a; E 2012) Determining Load Resistance of Glass in Buildings

GLASS ASSOCIATION OF NORTH AMERICA (GANA)

GANA Glazing Manual (2004) Glazing Manual

GANA Sealant Manual (2008) Sealant Manual

INSULATING GLASS MANUFACTURERS ALLIANCE (IGMA)

IGMA TB-3001 (2001) Guidelines for Sloped Glazing

IGMA TM-3000 (1990; R 2004) North American Glazing Guidelines for Sealed



Specifications

Insulating Glass Units for Commercial & Residential Use

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC

(2009) Leadership in Energy and Environmental Design(tm)
New Construction Rating System

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

16 CFR 1201

Safety Standard for Architectural Glazing Materials

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Installation

Drawings showing complete details of the proposed setting methods, mullion details, edge blocking, size of openings, frame details, materials, and types and thickness of glass.

SD-03 Product Data

Insulating Glass Glazing
Accessories

Manufacturer's descriptive product data, handling and storage recommendations, installation instructions, and cleaning instructions.

SD-04 Samples

Insulating Glass

Two 8 by 10 inch samples of each of the following: insulating glass units.

SD-07 Certificates Insulating Glass

Certificates stating that the glass meets the specified requirements. Labels or manufacturers marking affixed to the glass will be accepted in lieu of certificates.

SD-08 Manufacturer's Instructions

Setting and sealing materials Glass setting

Submit glass manufacturer's recommendations for setting and sealing materials and for installation of each type of glazing material specified.

SD-11 Closeout Submittals Local/Regional

Materials; LEED NC

LEED (tm) documentation relative to local/regional materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Specifications

1.3 SYSTEM DESCRIPTION

Glazing systems shall be fabricated and installed watertight and airtight to withstand thermal movement and wind loading without glass breakage, gasket failure, deterioration of glazing accessories, and defects in the work. Glazed panels shall comply with the safety standards, as indicated in accordance with ANSI Z97.1. Glazed panels shall comply with indicated wind/snow loading in accordance with ASTM E1300.

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver products to the site in unopened containers, labeled plainly with manufacturers' names and brands. Store glass and setting materials in safe, enclosed dry locations and do not unpack until needed for installation. Handle and install materials in a manner that will protect them from damage.

1.5 ENVIRONMENTAL REQUIREMENTS

Do not start glazing work until the outdoor temperature is above 40 degrees F and rising, unless procedures recommended by the glass manufacturer and approved by the Architect are made to warm the glass and rabbet surfaces. Provide ventilation to prevent condensation of moisture on glazing work during installation. Do not perform glazing work during damp or rainy weather.

1.6 SUSTAINABLE DESIGN REQUIREMENTS**1.6.1 Local/Regional Materials**

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources. See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements.

1.7 WARRANTY**1.7.1 Warranty for Insulating Glass Units**

Warranty insulating glass units against development of material obstruction to vision (such as dust, fogging, or film formation on the inner glass surfaces) caused by failure of the hermetic seal, other than through glass breakage, for a 10-year period following acceptance of the work. Provide new units for any units failing to comply with terms of this warranty within 45 working days after receipt of notice from the Owner.

PART 2 PRODUCTS**2.1 GLASS**

ASTM C1036, unless specified otherwise. In doors and sidelights, provide safety glazing material conforming to 16 CFR 1201.

2.1.1 Clear Glass

For interior glazing (i.e., pass and observation windows), 1/4 inch thick glass should be used.

Type I, Class 1 (clear), Quality q3. Provide for glazing openings not indicated or specified otherwise.

2.1.2 Annealed Glass

Annealed glass shall be Type I transparent flat type, Class 1 - tinted, Quality q3 - glazing select, conforming

Specifications

to ASTM C1036. Color shall be as selected by Architect.

2.1.3 Tempered Glass

ASTM C1048, Kind FT (fully tempered), Condition A (uncoated), Type I, Class 2 (tinted heat absorbing), Quality q3, 1/4 inch thick. Color shall be as selected by Architect.

2.1.4 Heat-Strengthened Glass

ASTM C1048, Kind HS (heat strengthened), Condition A (uncoated), Type I, Class 2 (tinted heat absorbing), Quality q3, 1/4 inch thick.

2.1.5 Spandrel Glass

2.1.5.1 Ceramic-Opacified Spandrel Glass

Ceramic-opacified spandrel glass shall be Kind HS heat-strengthened transparent flat type, Condition B, coated with a colored ceramic material on No. 2 surface, Quality q3 - glazing select, 1/4 inch thick, conforming to ASTM C1048.

2.1.6 Fire/Safety Rated Glass

Fire/safety rated glass shall be laminated Type I transparent flat type, Class 1-clear. Glass shall have a rating to meet requirements at opening when tested in accordance with ASTM E119. Glass shall be permanently labeled with appropriate markings.

2.1.7 Tinted (Light-Reducing) Glass

Tinted (light-reducing) glass shall be Type I transparent flat type, Class 3-tinted, Quality q3 - glazing select. Color as selected by Architect.

2.1.8 Laminated Glass

ASTM C1172, Kind LA fabricated from two pieces of Type I, Class 1, Quality q3, flat annealed transparent glass conforming to ASTM C1036. Flat glass shall be laminated together with a minimum of 0.030 inch thick, polyvinyl butyral interlayer or alternatives such as resin laminates, conforming to requirements of 16 CFR 1201 and ASTM C1172. Color shall be selected by Owner.

2.2 Low Emissivity Insulating Glass

Interior and exterior glass panes for Low-E insulating units shall be Type I annealed flat glass, Class 2-tinted with anti-reflective low-emissivity coating on No. 2 surface (inside surface of exterior pane), Quality q3 - glazing select, conforming to ASTM C1036. Provide fully tempered glass where safety glass is required. Provide heat-strengthened glass where required.

2.3 SETTING AND SEALING MATERIALS

Provide as specified in the GANA Glazing Manual, IGMA TM-3000, IGMA TB-3001, and manufacturer's recommendations, unless specified otherwise herein. Do not use metal sash putty, nonskinning compounds, nonresilient preformed sealers, or impregnated preformed gaskets. Materials exposed to view and unpainted shall be gray or neutral color.

Specifications

2.3.1 Putty and Glazing Compound

Glazing compound shall be as recommended by manufacturer for face-glazing metal sash. Putty shall be linseed oil type. Putty and glazing compounds shall not be used with insulating glass or laminated glass.

2.3.2 Glazing Compound

Use for face glazing metal sash. Do not use with insulating glass units or laminated glass.

2.3.3 Sealants

Provide elastomeric sealants.

2.3.3.1 Elastomeric Sealant

ASTM C920, Type S, Grade NS, Class 12.5, Use G. Use for channel or stop glazing metal sash. Sealant shall be chemically compatible with setting blocks, edge blocks, and sealing tapes, with sealants used in manufacture of insulating glass units. Color of sealant shall be white.

2.3.4 Preformed Channels

Neoprene, vinyl, or rubber, as recommended by the glass manufacturer for the particular condition.

2.3.5 Sealing Tapes

Preformed, semisolid, PVC-based material of proper size and compressibility for the particular condition, complying with ASTM D2287. Use only where glazing rabbet is designed for tape and tape is recommended by the glass or sealant manufacturer. Provide spacer shims for use with compressible tapes. Tapes shall be chemically compatible with the product being set.

2.3.6 Setting Blocks and Edge Blocks

Closed-cell neoprene setting blocks shall be dense extruded type conforming to ASTM C509 and ASTM D395, Method B, Shore A durometer between 70 and 90. Edge blocking shall be Shore A durometer of 50 (plus or minus 5). Silicone setting blocks shall be required when blocks are in contact with silicone sealant. Profiles, lengths and locations shall be as required and recommended in writing by glass manufacturer. Block color shall be black.

2.3.7 Glazing Gaskets

Glazing gaskets shall be extruded with continuous integral locking projection designed to engage into metal glass holding members to provide a watertight seal during dynamic loading, building movements and thermal movements. Glazing gaskets for a single glazed opening shall be continuous one-piece units with factory-fabricated injection-molded corners free of flashing and burrs. Glazing gaskets shall be in lengths or units recommended by manufacturer to ensure against pull-back at corners. Glazing gasket profiles shall be as recommended by the manufacturer for the intended application.

2.3.7.1 Fixed Glazing Gaskets

Fixed glazing gaskets shall be closed-cell (sponge) smooth extruded compression gaskets of cured elastomeric virgin neoprene compounds conforming to ASTM C509, Type 2, Option 1.

2.3.7.2 Wedge Glazing Gaskets

Wedge glazing gaskets shall be high-quality extrusions of cured elastomeric virgin neoprene compounds,

Specifications

ozone resistant, conforming to ASTM C864, Option 1, Shore A durometer between 65 and 75.

2.3.7.3 Aluminum Framing Glazing Gaskets

Glazing gaskets for aluminum framing shall be permanent, elastic, non-shrinking, non-migrating, watertight and weathertight.

2.3.8 Accessories

Provide as required for a complete installation, including glazing points, clips, shims, angles, beads, and spacer strips. Provide noncorroding metal accessories. Provide primer-sealers and cleaners as recommended by the glass and sealant manufacturers.

PART 3 EXECUTION

3.1 PREPARATION

Preparation, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA Glazing Manual, GANA Sealant Manual, IGMA TB-3001, IGMA TM-3000, and manufacturer's recommendations. Determine the sizes to provide the required edge clearances by measuring the actual opening to receive the glass. Grind smooth in the shop glass edges that will be exposed in finish work. Leave labels in place until the installation is approved, except remove applied labels on heat-absorbing glass and on insulating glass units as soon as glass is installed. Securely fix movable items or keep in a closed and locked position until glazing compound has thoroughly set.

3.2 GLASS SETTING

Shop glaze or field glaze items to be glazed using glass of the quality and thickness specified or indicated. Glazing, unless otherwise specified or approved, shall conform to applicable recommendations in the GANA Glazing Manual, GANA Sealant Manual, IGMA TB-3001, IGMA TM-3000, and manufacturer's recommendations. Aluminum windows may be glazed in conformance with one of the glazing methods described in the standards under which they are produced, except that face puttying with no bedding will not be permitted. Handle and install glazing materials in accordance with manufacturer's instructions. Use beads or stops which are furnished with items to be glazed to secure the glass in place. Verify products are properly installed, connected, and adjusted.

3.2.1 Sheet Glass

Cut and set with the visible lines or waves horizontal.

3.2.2 Insulating Glass Units

Do not grind, nip, or cut edges or corners of units after the units have left the factory. Springing, forcing, or twisting of units during setting will not be permitted. Handle units so as not to strike frames or other objects. Installation shall conform to applicable recommendations of IGMA TB-3001 and IGMA TM-3000.

3.2.3 Installation of Heat-Absorbing Glass

Glass shall have clean-cut, factory-fabricated edges. Field cutting will not be permitted.

3.2.4 Installation of Laminated Glass

Sashes which are to receive laminated glass shall be weeped to the outside to allow water drainage into the channel.



Specifications

3.2.5 Installation of Laminated Glass

Sashes which are to receive laminated glass shall be weeped to the outside to allow water drainage into the channel.☐

3.3 CLEANING

Clean glass surfaces and remove labels, paint spots, putty, and other defacement as required to prevent staining. Glass shall be clean at the time the work is accepted.

3.4 PROTECTION

Glass work shall be protected immediately after installation. Glazed openings shall be identified with suitable warning tapes, cloth or paper flags, attached with non-staining adhesives. Reflective glass shall be protected with a protective material to eliminate any contamination of the reflective coating. Protective material shall be placed far enough away from the coated glass to allow air to circulate to reduce heat buildup and moisture accumulation on the glass. Glass units which are broken, chipped, cracked, abraded, or otherwise damaged during construction activities shall be removed and replaced with new units.

3.5 WASTE MANAGEMENT

Disposal and recycling of waste materials, including corrugated cardboard recycling, shall be in accordance with the Waste Management Plan. Separate float glass and reuse or recycle. Upon removal, separate protective materials and reuse or recycle. Close and seal tightly all partly used sealant containers and store protected in well-ventilated, fire-safe area at moderate temperature.

End of Section 08 81 00

08 88 53 - SECURITY GLAZING**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Security glazing.
 - 2. Glazing accessories.
 - 3. Tinting film.

1.3 REFERENCE STANDARDS

- A. American Society for Testing and Materials (ASTM)
 - 1. ASTM F1915: Test Method for Security Glazing Materials and Systems
- B. National Institute of Justice (NIJ)
 - 1. NIJ - 0108.01: Ballistic Resistant Protective Materials
- C. H.P. White Test Procedures
 - 1. H.P. White TP.0500 Forced entry/Ballistic standard
- D. Walker, McGough, Foltz, and Lyeria (WMFL)
 - 1. WMFL (Levels 1-3) forced entry procedures plus ballistics.
- E. Federal Specifications (FS)
 - 1. FS TT-S-230A: Sealing Compound, Synthetic rubber base, single component, chemically curing for caulking, sealing and glazing in building construction
 - 2. FS TT-S-002303: Sealing compound, Elastomeric type, single component (for caulking, sealing, and glazing in buildings and other structures.
 - 3. FS MIL-P46144: Polycarbonate and plastic sheet standards
- F. Flat Glass Marketing Association (FGMA)
 - 1. FGMA: Glazing Manual
 - 2. FGMA: Sealant Manual

1.4 SUBMITTALS

- A. Product Data: For each security glazing type and glazing material. Include type of materials, thickness, method of test and performance.

Specifications

- B. Samples:
- C. Certification by Manufacturer: That products supplied complies with performance requirements specified.
- D. Product Test Reports: Showing compliance with specified requirements.
- E. Maintenance Data: Covering cleaning and protection requirements.
- F. Warranties: Special warranties specified in this Section.

1.5 QUALITY ASSURANCE

- A. Manufacturer Qualifications: Company specializing in the manufacture of security glass, types as specified, with minimum documented (5) years experience.
- B. Installer Qualifications: Engage an experienced Installer who has specialized in installing security glazing similar to that required for this Project.
- C. Certified Safety Glazing: Category II products complying with test requirements of 16 CFR 1201 and ANSI Z97.1, certified by Safety Glazing Certification Council, and permanently labeled.
- D. Ballistics-Resistant and Forced-Entry Resistant Performance: Provide products identical to those tested for compliance with requirements indicated per tests specified for specific glazing types.
 - 1. Have tests performed by qualified independent testing agency.
 - 2. Testing Agencies: Subject to compliance with requirements, acceptable testing agencies are:
 - a. ETL Testing Laboratories, Inc.
 - b. H. P. White Laboratory, Inc.
 - c. Underwriters Laboratories, Inc.
 - d. Warnock-Hersey International, Inc.
 - e. Wiss, Janney, Elstner Associates, Inc.
- E. Test data shall have been performed within the past five (5) years and shall be submitted with the shop drawing submittal.

1.6 DELIVERY, STORAGE AND HANDLING

- A. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

1.7 PROJECT CONDITIONS

- A. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.

Specifications

1.8 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Manufacturer's standard form, made out to Owner and signed by manufacturer, in which manufacturer agrees to furnish replacements for units that deteriorate from normal use by developing defects attributable to the manufacturing process, within warranty period.
- C. Warranty Period: Five (5) year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Laminated Polycarbonate and Glass Clad Polycarbonate Laminate Products:
 - a. Global Security Glazing
 - b. Oldcastle Glass
 - c. North American Specialty Glass
 - d. CM Security Glazing.

2.2 SECURITY GLAZING TYPES

- A. Designation **SG-1**: Glass Clad Polycarbonate; 7/16-inch nominal thickness.
 - 1. Consisting of chemically strengthened glass; polycarbonate core; strengthened glass. Laminated by two layers of special interlayer material.
 - 2. Forced-Entry Resistance: HP White I-TP-0500.02
- B. Designation **SG-2**: Glass Clad Polycarbonate; 15/16-inch nominal thickness.
 - 1. Consisting of tempered or chemically strengthened glass; laminated polycarbonate cores; chemically strengthened glass. Laminated by layers of special interlayer material.
 - 2. Forced-Entry Resistance: ASTM F1915 Grade 2
- C. Designation **SG-2F**: Fire Rated Glass Clad Polycarbonate; 1-inch nominal thickness.
 - 1. Consisting of wire glass; laminated polycarbonate cores; wire glass. Laminated by layers of special interlayer material.
 - 2. Forced-Entry Resistance: ASTM F1915 Grade 2
 - 3. Fire Labeled: 45min. Exposed glazing: 1296 sq in max and no width or height to exceed 42".

2.3 ACCESSORIES General: Provide products of material, size, and shape complying with referenced glazing standard and requirements of manufacturers of glazing materials for application indicated, and with a proven record of compatibility with surfaces contacted in installation.

- A. Cleaners, Primers, and Sealers: Types recommended by sealant or gasket manufacturer.

Specifications

- B. Glazing Tape: Precured, 100 percent solids, butyl polyisobutylene rubber with internal spacer rod, complying with AAMA 807.1 tape, as described in AAMA 800-86.
- C. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85, plus or minus 5.
- D. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glazing unit manufacturer to maintain glazing units in place for installation indicated.
- E. Edge Blocks: Elastomeric material of hardness needed to limit lateral movement (side walking) of glazing units.
- F. Backer Rods: Flexible, nonabsorbent, compressible polyurethane foam, either open-cell or nongassing closed-cell, unless otherwise restricted by sealant manufacturer; preformed to appropriate size and shape.
- G. Glazing Sealant: Black, neutral-curing silicone complying with ASTM C 920, Grade NS, Type S or M, Class 25, Uses NT, A, G, and O--as applicable to glazing substrates indicated.
- H. Soft Compression Gaskets: Preformed, closed-cell neoprene, complying with ASTM C 509, Type II; shape and density to maintain seal.
 - 1. Color: As selected by the Architect from manufacturer's standard colors.
- I. Perimeter Insulation for Fire-Resistive Glazing: Identical to product used in test assembly to obtain fire-resistance rating.

2.4 TINTING FILM

- A. Manufacturers: Subject to compliance with requirements, provide products by one of the following:
 - 1. Madico Window Film/Madico, Inc.
 - 2. LLUMAR Solar Control Window Film/Martin Processing, Inc.
- B. Interior applied tinted film to be installed after occupancy around all control room areas and where indicated.
- C. Color to be selected by Owner under supervision of Architect from manufacturer's standard colors.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine framing for glazing, with Installer present, for compliance with the following:
 - 1. Manufacturing and installation tolerances, including those for size, squareness, and offsets at corners.
 - 2. Presence and functioning of weep system.
 - 3. Minimum required face or edge clearances.
 - 4. Effective sealing between joints of glazing-unit-framing members.
 - 5. Check for conditions that would void the manufacturer's warranty.
- B. Proceed with installation only after unsatisfactory conditions have been corrected.

Specifications

3.2 PREPARATION

- A. Clean the glazing channel or other framing members to receive glass immediately before glazing. Remove coatings that are not firmly bonded to the substrate.

3.3 INSTALLATION - GENERAL

- A. Expenses carried by the Architect/Engineer, Project Manager and Owner in troubleshooting Security Glass and Glazing problems, caused by inadequate workmanship or other form of poor performance on the part of a contractor, shall be borne by that Contractor.
- B. Expenses carried by the Architect/Engineer, Project Manager or Owner in troubleshooting security glazing problems caused by inadequate workmanship or other form of poor performance on the part of the Contractor, shall be borne by the Contractor.
- C. Comply with combined written instructions of manufacturers of glazing, sealants, gaskets, other glazing materials and tinting film, unless more stringent requirements are indicated, including those in referenced glazing publications.
- D. Glazing channel dimensions, as indicated on Drawings or determined by glazing material thicknesses and by other requirements indicated, provide necessary bite on lites, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.
- E. Protect glazing from edge and surface damage during handling and installation. Remove damaged glazing from Project site and legally dispose of off Project site. Damaged glazing are those with edge damage or other imperfections that, when installed, could weaken glazing and impair performance and appearance.
- F. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.
- G. Install setting blocks in sill rabbets, sized and located to comply with referenced glazing publications, unless otherwise required by glazing unit manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.
- H. Do not block weep holes.
- I. Do not exceed edge pressures stipulated by glazing unit manufacturers for installing lites.
- J. Provide spacers for glazing lites where the length plus width is larger than 50 inches (1270 mm) as follows:
 - 1. Locate spacers directly opposite each other on both inside and outside faces of glazing lites. Install correct size and spacing to preserve required face clearances unless gaskets and glazing tapes are used that have demonstrated ability to maintain required face clearances and to comply with system performance requirements.
 - 2. Provide 1/8-inch (3-mm) minimum bite of spacers on glazing lites and use thickness equal to sealant width. With glazing tape, use thickness slightly less than final compressed thickness of tape.

Specifications

- K. Provide edge blocking where indicated or needed to prevent glazing lites from moving sideways in glazing channel, as recommended in writing by glazing unit manufacturer and according to requirements in referenced glazing publications.
- L. Set glass lites in each series with uniform pattern, draw, bow, and similar characteristics.

3.4 TAPE GLAZING

- A. Position tapes on fixed stops so that, when compressed by glazing units, their exposed edges are flush with sightline of stops.
- B. Install tapes continuously. Do not stretch tapes to make them fit opening.
- C. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.
- D. Do not remove release paper from tape until just before each glazing unit is installed.
- E. Place setting blocks at 1/4 points.
- F. Rest glass on setting blocks and press against tape with sufficient pressure to ensure full contact and adhesion at perimeter.
- G. Place glazing tape on free perimeter of glass in same manner described above.
- H. Install removable stop, avoid displacement of tape, exert pressure on tape for full continuous contact.
- I. Knife trim excess or protruding tape.
- J. After installation of stops, apply fillet bead of glazing sealant along entire glazing perimeter on both sides of glazing, installed with a substantial "wash" away from the glass, providing a water-tight seal from detergents and cleaning solutions.

3.5 PROTECTION AND CLEANING

- A. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.
- B. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.
- C. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.
- D. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.



Specifications

- E. Wash both sides of glazing not more than 4 days before inspection for Substantial Completion. Wash glass as recommended by glass manufacturer.

END OF SECTION 088853

08 91 00 - METAL WALL LOUVERS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AIR MOVEMENT AND CONTROL ASSOCIATION INTERNATIONAL (AMCA)

AMCA 500-D (2012) Laboratory Methods of Testing Dampers for Rating

AMCA 511 (2010) Certified Ratings Program for Air Control Devices

ALUMINUM ASSOCIATION (AA)

AA DAF45 (2003; Reaffirmed 2009) Designation System for Aluminum Finishes

AMERICAN ARCHITECTURAL MANUFACTURERS ASSOCIATION (AAMA)

AAMA 611 (1998; R 2004) Voluntary Specification for Anodized Architectural Aluminum

ASTM INTERNATIONAL (ASTM)

ASTM B209 (2010) Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate

ASTM B221 (2012) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Wall louvers

SD-03 Product Data Metal Wall

Louvers

SD-04 Samples

Wall louvers

1.3 DELIVERY, STORAGE, AND PROTECTION

Deliver materials to the site in an undamaged condition. Carefully store materials off the ground to provide proper ventilation, drainage, and protection against dampness. Louvers shall be free from nicks, scratches, and blemishes. Replace defective or damaged materials with new.

Specifications

1.4 DETAIL DRAWINGS

Show all information necessary for fabrication and installation of wall louvers. Indicate materials, sizes, thicknesses, fastenings, and profiles.

1.5 COLOR SAMPLES

Colors of finishes for wall louvers shall closely approximate colors indicated. Where color is not indicated, submit the manufacturer's standard colors to the Architect for selection.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Aluminum Sheet

ASTM B209, alloy 3003 or 5005 with temper as required for forming.

2.1.2 Extruded Aluminum

ASTM B221, alloy 6063-T5 or -T52.

2.2 METAL WALL LOUVERS

Weather resistant type, with bird screens and made to withstand a wind load indicated on drawings. Wall louvers shall bear the AMCA certified ratings program seal for air performance and water penetration in accordance with AMCA 500-D and AMCA 511. The rating shall show a water penetration of 0.20 or less ounce per square foot of free area at a free velocity of 800 feet per minute.

2.2.1 Extruded Aluminum Louvers

Fabricated of extruded 6063-T5 or -T52 aluminum with a wall thickness of not less than 0.081 inch.

2.2.2 Mullions and Mullion Covers

Same material and finish as louvers. Provide mullions for all louvers more than 5 feet in width at not more than 5 feet on centers. Provide mullions covers on both faces of joints between louvers.

2.2.3 Screens and Frames

For aluminum louvers, provide 1/2 inch square mesh, 14 or 16 gage aluminum or 1/4 inch square mesh, 16 gage aluminum bird screening. Mount screens in removable, re-wirable frames of same material and finish as the louvers.

2.3 FASTENERS AND ACCESSORIES

Provide stainless steel screws and fasteners for aluminum louvers. Provide other accessories as required for complete and proper installation.

2.4 FINISHES

2.4.1 Aluminum

Exposed aluminum surfaces shall be factory finished with an anodic coating. Color shall be as selected by Architect. Louvers shall have the same finish.



Specifications

2.4.1.1 Anodic Coating

Clean exposed aluminum surfaces and provide an anodized finish conforming to AA DAF45 and AAMA 611. Finish shall be Architectural Class I (0.7 mil or thicker), designation AA-M10-C22-A41, clear (natural)A42, integral color or A44, electrolytically deposited color anodized.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Wall Louvers

Install using stops or moldings, flanges, strap anchors, or jamb fasteners as appropriate for the wall construction and in accordance with manufacturer's recommendations.

3.1.2 Screens and Frames

Attach frames to louvers with screws or bolts.

3.2 PROTECTION FROM CONTACT OF DISSIMILAR MATERIALS

3.2.1 Aluminum

Where aluminum contacts metal other than zinc, paint the dissimilar metal with a primer and two coats of aluminum paint.

3.2.2 Wood

Paint wood or other absorptive materials that may become repeatedly wet and in contact with metal with two coats of aluminum paint or a coat of heavy-bodied bituminous paint.

-- End of Section --

09 22 00 - SUPPORTS FOR PLASTER AND GYPSUM BOARD**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A463/A463M	(2010) Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process
ASTM A653/A653M	(2011) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C645	(2011a) Nonstructural Steel Framing Members
ASTM C754	(2011) Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings**Metal support systems**

Submit for the erection of metal framing, and ceiling suspension systems. Indicate materials, sizes, thicknesses, and fastenings.

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the job site and store in ventilated dry locations. Storage area shall permit easy access for inspection and handling. If materials are stored outdoors, stack materials off the ground, supported on a level platform, and fully protected from the weather. Handle materials carefully to prevent damage. Remove damaged items and provide new items.

PART 2 PRODUCTS**2.1 MATERIALS**

Provide steel materials for metal support systems with galvanized coating ASTM A653/A653M, G-60; aluminum coating ASTM A463/A463M, T1-25; or a 55-percent aluminum-zinc coating.

2.1.1 Materials for Attachment of Gypsum Wallboard**2.1.1.1 Suspended and Furred Ceiling Systems ASTM C645.****PART 3 EXECUTION****3.1 INSTALLATION**



Specifications

3.1.1 Systems for Attachment of Gypsum Wallboard

3.1.1.1 Suspended and Furred Ceiling Systems

ASTM C754, except provide framing members 16 inches o.c. unless indicated otherwise.

3.2 ERECTION TOLERANCES

Provide framing members which will be covered by finish materials such as wallboard, plaster, or ceramic tile set in a mortar setting bed, within the following limits:

- a. Layout of framing: 1/4 inch from intended position;
- b. Plates and runners: 1/4 inch in 8 feet from a straight line;
- c. Studs: 1/4 inch in 8 feet out of plumb, not cumulative; and
- d. Face of framing members: 1/4 inch in 8 feet from a true plane.

-- End of Section --

09 29 00 - GYPSUM BOARD**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A653/A653M	(2011) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM C1002	(2007) Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs
ASTM C1047	(2010a) Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base
ASTM C1396/C1396M	(2013) Standard Specification for Gypsum Board
ASTM C475/C475M	(2012) Joint Compound and Joint Tape for Finishing Gypsum Board
ASTM C840	(2011) Application and Finishing of Gypsum Board
ASTM C847	(2012) Standard Specification for Metal Lath
ASTM C954	(2011) Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs from 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness

GYPSUM ASSOCIATION (GA)

GA 214	(2010) Recommended Levels of Gypsum Board Finish
GA 216	(2010) Application and Finishing of Gypsum Panel Products
GA 600	(2009) Fire Resistance Design Manual

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System
---------	---

UNDERWRITERS LABORATORIES (UL)

UL Fire Resistance	(2012) Fire Resistance Directory
--------------------	----------------------------------

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data Accessories

Submit for each type of gypsum board and for cementitious backer units.

SD-07 Certificates

Asbestos Free Materials

Certify that gypsum board types, gypsum backing board types, cementitious backer units, and joint treating materials do not contain asbestos.

SD-08 Manufacturer's Instructions Material Safety Data

Sheets

SD-10 Operation and Maintenance Data Waste

Management

SD-11 Closeout Submittals Local/Regional

Materials; (LEED)

LEED documentation relative to local/regional materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Gypsum Board; (LEED)

LEED documentation relative to recycled content credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

1.3 DELIVERY, STORAGE, AND HANDLING

1.3.1 Delivery

Deliver materials in the original packages, containers, or bundles with each bearing the brand name, applicable standard designation, and name of manufacturer, or supplier.

1.3.2 Storage

Keep materials dry by storing inside a sheltered building. Where necessary to store gypsum board and cementitious backer units outside, store off the ground, properly supported on a level platform, and protected from direct exposure to rain, snow, sunlight, and other extreme weather conditions. Provide adequate ventilation to prevent condensation. Store per manufacturer's recommendations for allowable temperature and humidity range. Do not store panels near materials that may offgas or emit harmful fumes, such as kerosene heaters, fresh paint, or adhesives.

1.3.3 Handling

Neatly stack gypsum board and cementitious backer units flat to prevent sagging or damage to the edges, ends, and surfaces.

Specifications

1.4 ENVIRONMENTAL CONDITIONS**1.4.1 Temperature**

Maintain a uniform temperature of not less than 50 degrees F in the structure for at least 48 hours prior to, during, and following the application of gypsum board, cementitious backer units, and joint treatment materials, or the bonding of adhesives.

1.4.2 Exposure to Weather

Protect gypsum board and cementitious backer unit products from direct exposure to rain, snow, sunlight, and other extreme weather conditions.

1.5 SUSTAINABLE DESIGN REQUIREMENTS**1.5.1 Local/Regional Materials**

Use materials or products extracted, harvested, or recovered, as well as manufactured, within a 500 mile radius from the project site, if available from a minimum of three sources. See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Gypsum board materials may be locally available.

PART 2 PRODUCTS**2.1 MATERIALS**

Conform to specifications, standards and requirements specified. Provide gypsum board types, gypsum backing board types, cementitious backing units, and joint treating materials manufactured from asbestos free materials only.

2.1.1 Gypsum Board

ASTM C1396/C1396M. See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total recycled content requirements. Gypsum board may contain post-consumer or post-industrial recycled content.

2.1.1.1 Type X (Special Fire-Resistant)

48 inch wide, 5/8 inch thick, tapered edges.

2.1.2 Joint Treatment Materials

ASTM C475/C475M. Use all purpose joint and texturing compound containing inert fillers and natural binders, including lime compound. Pre-mixed compounds shall be free of antifreeze, vinyl adhesives, preservatives, biocides and other slow releasing compounds.

2.1.2.1 Embedding Compound

Specifically formulated and manufactured for use in embedding tape at gypsum board joints and compatible with tape, substrate and fasteners.

2.1.2.2 Finishing or Topping Compound

Specifically formulated and manufactured for use as a finishing compound.

Specifications

2.1.2.3 All-Purpose Compound

Specifically formulated and manufactured to serve as both a taping and a finishing compound and compatible with tape, substrate and fasteners.

2.1.2.4 Setting or Hardening Type Compound

Specifically formulated and manufactured for use with fiber glass mesh tape.

2.1.2.5 Joint Tape

Use cross-laminated, tapered edge, reinforced paper, or fiber glass mesh tape recommended by the manufacturer.

2.1.3 Fasteners**2.1.3.1 Screws**

ASTM C1002, Type "G", Type "S" or Type "W" steel drill screws for fastening gypsum board to gypsum board, wood framing members and steel framing members less than 0.033 inch thick. ASTM C954 steel drill screws for fastening gypsum board to steel framing members 0.033 to 0.112 inch thick. Provide cementitious backer unit screws with a polymer coating.

2.1.4 Expanded Metal

Expanded-metal: ASTM C 847 with ASTM A 653/A 653M. G60 (Z180), hot-dip galvanized zinc coating. Flat diamond mesh.

2.1.5 Accessories

ASTM C1047. Fabricate from corrosion protected steel or plastic designed for intended use. Accessories manufactured with paper flanges are not acceptable. Flanges shall be free of dirt, grease, and other materials that may adversely affect bond of joint treatment.

2.1.6 Water

Provide clean, fresh, and potable water.

PART 3 EXECUTION**3.1 EXAMINATION****3.1.1 Framing and Furring**

Verify that framing and furring are securely attached and of sizes and spacing to provide a suitable substrate to receive gypsum board and cementitious backer units. Verify that all blocking, headers and supports are in place to support plumbing fixtures and to receive soap dishes, grab bars, towel racks, and similar items. Do not proceed with work until framing and furring are acceptable for application of gypsum board and cementitious backer units.

3.2 APPLICATION OF GYPSUM BOARD

Apply gypsum board to framing and furring members in accordance with ASTM C840 or GA 216 and the requirements specified. Apply gypsum board with separate panels in moderate contact; do not force in place. Stagger end joints of adjoining panels. Neatly fit abutting end and edge joints. Use gypsum board of maximum practical length; select panel sizes to minimize waste. Cut out gypsum

Specifications

board to make neat, close, and tight joints around openings. In vertical application of gypsum board, provide panels in lengths required to reach full height of vertical surfaces in one continuous piece. Lay out panels to minimize waste; reuse cutoffs whenever feasible. Surfaces of gypsum board and substrate members may not be bonded together with an adhesive. Treat edges of cutouts for plumbing pipes, screwheads, and joints with water-resistant compound as recommended by the gypsum board manufacturer. Provide type of gypsum board for use in each system specified herein as indicated.

- 3.2.1 Application of Gypsum Board to Steel Framing and Furring Apply in accordance with ASTM C840, System VIII or GA 216.

3.2.2 Control Joints

Install expansion and contraction joints in ceilings in accordance with ASTM C840, System XIII or GA 216. Fill control joints between studs in fire-rated construction with firesafing insulation to match the fire-rating of construction.

3.3 FINISHING OF GYPSUM BOARD

Tape and finish gypsum board in accordance with ASTM C840, GA 214 and GA 216. Unless otherwise specified, finish all gypsum board ceilings to Level 5 in accordance with GA 214. Provide joint, fastener depression, and corner treatment. Tool joints as smoothly as possible to minimize sanding and dust. Do not use fiber glass mesh tape with conventional drying type joint compounds; use setting or hardening type compounds only. Protect workers, building occupants, and HVAC systems from gypsum dust.

3.3.1 Uniform Surface

Wherever gypsum board is to receive eggshell, semigloss or gloss paint finish, finish gypsum surface in accordance to GA 214 Level 5. In accordance with GA 214 Level 5, apply a thin skim coat of joint compound to the entire gypsum board surface, after the two-coat joint and fastener treatment is complete and dry.

3.4 SEALING

Seal openings around pipes, fixtures, and other items projecting through gypsum board as specified in Section 07 92 00 JOINT SEALANTS. Apply material with exposed surface flush with gypsum board.

3.5 FIRE-RESISTANT ASSEMBLIES

Wherever fire-rated construction is indicated, provide materials and application methods, including types and spacing of fasteners, and ceiling framing in accordance with the specifications contained in UL Fire Resistance, or GA 600. Joints of fire-rated gypsum board enclosures shall be closed and sealed in accordance with UL test requirements or GA requirements. Seal penetrations through rated partitions and ceilings tight in accordance with tested systems.

3.6 PATCHING

Patch surface defects in gypsum board to a smooth, uniform appearance, ready to receive finishes.

Specifications

3.7 WASTE MANAGEMENT

As specified in Waste Management Plan.

Identify manufacturer's policy for collection or return of remaining construction scrap, unused material, and packaging material. Institute construction recycling to take advantage of manufacturer's programs. When such a service is not available, seek local recyclers to reclaim the materials.

-- End of Section --

09 51 00 - ACOUSTICAL CEILINGS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A641/A641M	(2009a) Standard Specification for Zinc-Coated (Galvanized) Carbon Steel Wire
ASTM C423	(2009a) Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method
ASTM C635/C635M	(2013) Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-In Panel Ceilings
ASTM C636/C636M	(2013) Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-In Panels
ASTM C834	(2010) Latex Sealants
ASTM E1264	(2008; E 2010) Acoustical Ceiling Products
ASTM E1414/E1414M	(2011a) Airborne Sound Attenuation Between Rooms Sharing a Common Ceiling Plenum
ASTM E1477	(1998a; R 2013) Luminous Reflectance Factor of Acoustical Materials by Use of Integrating-Sphere Reflectometers

1.2 SYSTEM DESCRIPTION

Provide sound controlling units mechanically mounted on a ceiling suspension system for acoustical treatment. The unit size, texture, finish, and color must be as specified. The location and extent of acoustical treatment shall be as shown on the approved detail drawings. Submit drawings showing suspension system, method of anchoring and fastening, details, and reflected ceiling plan.

1.2.1 Ceiling Attenuation Class and Test

Provide a ceiling system with an attenuation class (CAC) determined in accordance with ASTM E1414/E1414M. Provide fixture attenuators over light fixtures and other ceiling penetrations, and provide acoustical blanket insulation adjacent to partitions, as required to achieve the specified CAC. Provide test ceiling continuous at the partition and assembled in the suspension system in the same manner that the ceiling will be installed on the project.

1.2.2 Ceiling Sound Absorption

Determine the Noise Reduction Coefficient (NRC) in accordance with ASTM C423 Test Method.

1.2.3 Light Reflectance

Determine light reflectance factor in accordance with ASTM E1477 Test Method.

Specifications

1.2.4 Other Submittals Requirements The following shall be submitted:

- a. Manufacturer's data indicating percentage of recycle material in acoustic ceiling tiles to verify affirmative procurement compliance.
- b. Total weight and volume quantities of acoustic ceiling tiles with recycle material.
- c. Reports by an independent testing laboratory attesting that acoustical ceiling systems meet specified sound transmission requirements.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Approved Detail Drawings

SD-03 Product Data

Acoustical Ceiling Systems

SD-04 Samples

Acoustic Ceiling Tiles

SD-06 Test Reports

Ceiling Attenuation Class and Test

1.4 DELIVERY, STORAGE. AND HANDLING

Deliver materials to the site in the manufacturer's original unopened containers with brand name and type clearly marked. Carefully handle and store materials in dry, watertight enclosures. Immediately before installation, store acoustical units for not less than 24 hours at the same temperature and relative humidity as the space where they will be installed in order to assure proper temperature and moisture acclimation.

1.5 ENVIRONMENTAL REQUIREMENTS

Maintain a uniform temperature of not less than 60 degrees F nor more than 85 degrees F and a relative humidity of not more than 70 percent for 24 hours before, during, and 24 hours after installation of acoustical units.

1.6 SCHEDULING

Complete and dry interior finish work such as plastering, concrete and terrazzo work before ceiling installation. Complete mechanical, electrical, and other work above the ceiling line; install and start operating heating, ventilating, and air conditioning systems in order to maintain temperature and humidity requirements.

Specifications

1.7 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that extend beyond a one year period. Include an agreement to repair or replace acoustical panels that fail within the warranty period in the standard performance guarantee or warranty. Failures include, but are not limited to, sagging and warping of panels; rusting and manufacturers defects of grid system.

1.8 EXTRA MATERIALS

Furnish spare tiles, from the same lot as those installed, of each color at the rate of 5 tiles for each 1000 tiles installed.

PART 2 PRODUCTS**2.1 ACOUSTICAL UNITS**

Submit two samples of each type of acoustical unit and each type of suspension grid tee section showing texture, finish, and color. Conform acoustical units to ASTM E1264, Class A, and the following requirements:

2.1.1 Metal Pans Minimum to Medium Security

- a. Type: V, steel perforated pans with acoustical, non-asbestos, insulation backing.
- b. Flame Spread: Class: A, 25 or less.
- c. Finish: Factory-applied standard finish.
- d. Pads: Completely enclosed, of material and thickness required for acoustical and fire test ratings.

2.2 SUSPENSION SYSTEM

Provide snap-in metal pan exposed-grid standard width flange suspension system conforming to ASTM C635/C635M for heavy-duty systems. Provide surfaces exposed to view of aluminum or steel with a factory-applied white baked-enamel finish. Provide wall molding having a flange of not less than 15/16 inch. Provide mitered corners. Suspended ceiling framing system must have the capability to support the finished ceiling, light fixtures, air diffusers, and accessories, as shown. Provide a suspension system with a maximum deflection of 1/360 of the span length. Provide vertical steel compression struts.

2.3 HANGERS

Provide hangers and attachment capable of supporting a minimum 300 pound ultimate vertical load without failure of supporting material or attachment.

2.3.1 Wires

Conform wires to ASTM A641/A641M, Class 1, 0.08 inch (12 gauge) in diameter.

2.3.2 Masonry Anchorage Devices

Comply with ASTM C636/C636M for anchorage devices for machine screws.

Specifications

2.4 ACCESS PANELS

Provide access panels that match adjacent acoustical units, designed and equipped with suitable framing and fastenings for removal and replacement without damage. Size panel to be not less than 12 by 12 inch or more than 12 by 24 inch.

2.5 FINISHES

Use manufacturer's standard textures, patterns and finishes as specified for acoustical units and suspension system members. Treat ceiling suspension system components to inhibit corrosion.

2.6 COLORS AND PATTERNS

Use colors and patterns for acoustical units and suspension system components as selected by Architect.

2.7 ACOUSTICAL SEALANT

Conform acoustical sealant to ASTM C834, nonstaining.

PART 3 EXECUTION**3.1 INSTALLATION**

Complete and dry interior finish work such as plastering, concrete, and terrazzo work before installation. Complete and approve mechanical, electrical, and other work above the ceiling line prior to the start of acoustical ceiling installation. Provide acoustical work complete with necessary fastenings, clips, and other accessories required for a complete installation. Do not expose mechanical fastenings in the finished work. Lay out hangers for each individual room or space. Provide hangers to support framing around beams, ducts, columns, grilles, and other penetrations through ceilings. Keep main runners and carrying channels clear of abutting walls and partitions. Provide at least two main runners for each ceiling span. Wherever required to bypass an object with the hanger wires, install a subsuspension system so that all hanger wires will be plumb.

3.1.1 Suspension System

Install suspension system in accordance with ASTM C636/C636M and as specified herein. Do not suspend hanger wires or other loads from underside of steel decking.

3.1.1.1 Plumb Hangers

Install hangers plumb and not pressing against insulation covering ducts and pipes. Where lighting fixtures are supported from the suspended ceiling system, provide hangers at a minimum of four hangers per fixture and located not more than 6 inch from each corner of each fixture.

3.1.1.2 Splayed Hangers

Where hangers must be splayed (sloped or slanted) around obstructions, offset the resulting horizontal force by bracing, countersplaying, or other acceptable means.

3.1.2 Wall Molding

Provide wall molding where ceilings abut vertical surfaces. Miter corners where wall moldings intersect or install corner caps. Secure wall molding not more than 3 inch from ends of each length and not more than 16 inch on centers between end fastenings. Provide wall molding springs at each acoustical unit in semi-exposed or concealed systems.



Specifications

3.1.3 Acoustical Units

Install acoustical units in accordance with the approved installation instructions of the manufacturer. Ensure that edges of acoustical units are in close contact with metal supports, with each other, and in true alignment. Arrange acoustical units so that units less than one-half width are minimized. Hold units in exposed-grid system in place with manufacturer's standard hold-down clips, if units weigh less than 1 psf or if required for fire resistance rating.

3.1.4 Caulking

Seal all joints around pipes, ducts or electrical outlets penetrating the ceiling. Apply a continuous ribbon of acoustical sealant on vertical web of wall or edge moldings.

3.2 CEILING ACCESS PANELS

Locate ceiling access panels directly under the items which require access.

3.3 CLEANING

Following installation, clean dirty or discolored surfaces of acoustical units and leave them free from defects. Remove units that are damaged or improperly installed and provide new units as directed.

-- End of Section --

09 65 00 - RESILIENT FLOORING**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM D4078	(2002; R 2008) Water Emulsion Floor Polish
ASTM E648	(2010; E 2011) Standard Test Method for Critical Radiant Flux of Floor-Covering Systems Using a Radiant Heat Energy Source
ASTM F1066	(2004; E 2010; R 2010) Standard Specification for Vinyl Composition Floor Tile
ASTM F1482	(2004; E 2009; R 2009) Installation and Preparation of Panel Type Underlayments to Receive Resilient Flooring
ASTM F1861	(2008; E 2012; R 2012) Resilient Wall Base
ASTM F1869	(2011) Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride
ASTM F2170	(2011) Determining Relative Humidity in Concrete Floor Slabs in situ Probes
ASTM F710	(2011) Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 253	(2011) Standard Method of Test for Critical Radiant Flux of Floor Covering Systems Using a Radiant Heat Energy Source
----------	---

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System
---------	---

1.2 SYSTEM DESCRIPTION**1.2.1 Fire Resistance Requirements**

Provide a critical radiant flux of not less than 0.45 watts per square centimeter (Class 1) for flooring in corridors and exits when tested in accordance with ASTM E648 or NFPA 253.

1.3 SUSTAINABILITY REQUIREMENTS

Specifications

Materials in this technical specification may contribute towards contract compliance with sustainability requirements.

1.3.1 LEED REQUIREMENTS

LEED DOCUMENTATION for project LEED NC local/regional materials, low-emitting materials, recycled content, and rapidly renewable materials requirements.

1.4 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings

Resilient Flooring and Accessories

SD-03 Product Data

Resilient Flooring and Accessories Adhesives

SD-04 Samples

Resilient Flooring and Accessories

SD-06 Test Reports

Moisture, Alkalinity and Bond Tests

SD-08 Manufacturer's Instructions

Surface Preparation Installation

SD-10 Operation and Maintenance Data

Resilient Flooring and Accessories

SD-11 Closeout Submittals LEED

Documentation

1.5 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the building site in original unopened containers bearing the manufacturer's name, style name, pattern color name and number, production run, project identification, and handling instructions. Store materials in a clean, dry, secure, and well-ventilated area with ambient air temperature maintained above 68 degrees F and below 85 degrees F, stacked according to manufacturer's recommendations. Protect materials from the direct flow of heat from hot-air registers, radiators and other heating fixtures and appliances. Observe ventilation and safety procedures specified in the MSDS. Do not store resilient products near materials that may offgas or emit harmful fumes, such as kerosene heaters, fresh paint, or adhesives.

Specifications

1.6 ENVIRONMENTAL REQUIREMENTS

Maintain areas to receive resilient flooring at a temperature above 68 degrees F and below 85 degrees F for 3 days before application, during application and 2 days after application, unless otherwise directed by the flooring manufacturer for the flooring being installed. Maintain a minimum temperature of 55 degrees F thereafter. Provide adequate ventilation to remove moisture from area and to comply with regulations limiting concentrations of hazardous vapors.

1.7 SCHEDULING

Schedule resilient flooring application after the completion of other work which would damage the finished surface of the flooring.

1.8 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that extend beyond a one year period.

1.9 EXTRA MATERIALS

Provide extra flooring material of each color and pattern at the rate of 5 tiles for each 1000 tiles installed. Provide extra wall base material composed of 20 linear feet of each type, color and pattern. Package all extra materials in original properly marked containers bearing the manufacturer's name, brand name, pattern color name and number, production run, and handling instructions. Provide extra materials from the same lot as those installed. Leave extra stock at the site in location assigned by Owner.

PART 2 PRODUCTS**2.1 VINYL COMPOSITION TILE**

Conform to ASTM F1066 Class 2, (through pattern tile), Composition 1, asbestos-free, 12 inch square and 1/8 inch thick. Provide color and pattern uniformly distributed throughout the thickness of the tile.

2.2 WALL BASE

Conform to ASTM F1861, Type TS (vulcanized thermoset rubber), Style B (coved - installed with resilient flooring). Provide 4 inch high and a minimum 1/8 inch thick wall base. Provide job formed corners in matching height, shape, and color.

2.3 MOULDING

Provide tapered mouldings of vinyl or rubber and types as recommended by flooring manufacturer for both edges and transitions of flooring materials specified. Provide vertical lip on moulding of maximum 1/4 inch. Provide bevel change in level between 1/4 and 1/2 inch with a slope no greater than 1:2.

2.4 ADHESIVES

Provide adhesives for flooring, base and accessories as recommended by the manufacturer and comply with local indoor air quality standards. Submit manufacturer's descriptive data, documentation stating physical characteristics, and mildew and germicidal characteristics.

Specifications

2.5 SURFACE PREPARATION MATERIALS

Provide surface preparation materials, such as panel type underlayment, lining felt, and floor crack fillers as recommended by the flooring manufacturer for the subfloor conditions. Comply with ASTM F1482 for panel type underlayment products.

2.6 POLISH/FINISH

Provide polish finish as recommended by the manufacturer and conform to ASTM D4078 for polish.

2.7 CAULKING AND SEALANTS

Provide caulking and sealants in accordance with Section 07 92 00 JOINT SEALANTS.

2.8 MANUFACTURER'S COLOR, PATTERN AND TEXTURE

Provide color, pattern and texture for resilient flooring and accessories selected from manufacturer's standard colors. Provide flooring in any one continuous area or replacement of damaged flooring in continuous area from same production run with same shade and pattern. Submit scaled drawings indicating patterns (including location of patterns and colors) and dimensions. Submit manufacturer's descriptive data and three samples of each indicated color and type of flooring, base, mouldings, and accessories sized a minimum 2-1/2 by 4 inch.

PART 3 EXECUTION**3.1 EXAMINATION**

Examine and verify that site conditions are in agreement with the design package. Report all conditions that will prevent a proper installation. Do not take any corrective action without written permission from the Architect. Work will proceed only when conditions have been corrected and accepted by the installer. Submit manufacturer's printed installation instructions for all flooring materials and accessories, including preparation of substrate, seaming techniques, and recommended adhesives.

3.2 SURFACE PREPARATION

Provide a smooth, true, level plane for surface preparation of the flooring, except where indicated as sloped. Floor to be flat to within 3/16 inch in 10 feet. Prepare subfloor in accordance with flooring manufacturer's recommended instructions. Prepare the surfaces of lightweight concrete slabs (as defined by the flooring manufacturer) as recommended by the flooring manufacturer. Comply with ASTM F710 for concrete subfloor preparation. Floor fills or toppings may be required as recommended by the flooring manufacturer. Install underlayments, when required by the flooring manufacturer, in accordance with manufacturer's recommended printed installation instructions. Comply with ASTM F1482 for panel type underlayments. Before any work under this section is begun, correct all defects such as rough or scaling concrete, chalk and dust, cracks, low spots, high spots, and uneven surfaces. Repair all damaged portions of concrete slabs as recommended by the flooring manufacturer. Remove concrete curing and sealer compounds from the slabs, other than the type that does not adversely affect adhesion. Remove paint, varnish, oils, release agents, sealers, waxes, and adhesives, as required by the flooring product in accordance with manufacturer's printed installation instructions.

3.3 MOISTURE, ALKALINITY AND BOND TESTS

Determine the suitability of the concrete subfloor for receiving the resilient flooring with regard to moisture content and pH level by moisture and alkalinity tests. Conduct moisture testing in accordance with ASTM F1869 or ASTM F2170, unless otherwise recommended by the flooring manufacturer. Conduct alkalinity testing as recommended by the flooring manufacturer. Determine the compatibility

Specifications

of the resilient flooring adhesives to the concrete floors by a bond test in accordance with the flooring manufacturer's recommendations. Submit copy of test reports for moisture and alkalinity content of concrete slab, and bond test stating date of test, person conducting the test, and the area tested.

3.4 PLACING VINYL COMPOSITION, LINOLEUM AND SOLID VINYL TILES

Install tile flooring and accessories in accordance with manufacturer's printed installation instructions. Prepare and apply adhesives in accordance with manufacturer's directions. Keep tile lines and joints square, symmetrical, tight, and even. Keep each floor in true, level plane, except where slope is indicated. Vary edge width as necessary to maintain full-size tiles in the field, no edge tile to be less than one-half the field tile size, except where irregular shaped rooms make it impossible. Cut flooring to fit around all permanent fixtures, built-in furniture and cabinets, pipes, and outlets. Cut, fit, and scribe edge tile to walls and partitions after field flooring has been applied.

3.5 PLACING MOULDING

Provide moulding where flooring termination is higher than the adjacent finished flooring and at transitions between different flooring materials. When required, locate moulding under door centerline. Moulding is not required at doorways where thresholds are provided. Secure moulding with adhesive as recommended by the manufacturer. Prepare and apply adhesives in accordance with manufacturer's printed directions.

3.6 CLEANING

Immediately upon completion of installation of flooring in a room or an area, dry/clean the flooring and adjacent surfaces to remove all surplus adhesive. Clean flooring as recommended in accordance with manufacturer's printed maintenance instructions and within the recommended time frame. As required by the manufacturer, apply the recommended number of coats and type of polish and/or finish in accordance with manufacturer's written instructions.

3.7 PROTECTION

From the time of installation until acceptance, protect flooring from damage as recommended by the flooring manufacturer. Remove and replace flooring which becomes damaged, loose, broken, or curled and wall base which is not tight to wall or securely adhered.

-- End of Section --



Specifications

09 90 00 - PAINTS AND COATINGS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN CONFERENCE OF GOVERNMENTAL INDUSTRIAL HYGIENISTS (ACGIH)

ACGIH 0100 (2001; Supplements 2002-2008) Documentation of the Threshold Limit Values and Biological Exposure Indices

ASTM INTERNATIONAL (ASTM)

ASTM D4263 (1983; R 2012) Indicating Moisture in Concrete by the Plastic Sheet Method

ASTM D4444 (2013) Use and Calibration of Hand-Held Moisture Meters

ASTM D523 (2008) Standard Test Method for Specular Gloss

ASTM D6386 (2010) Standard Practice for Preparation of Zinc (Hot-Dip Galvanized) Coated Iron and Steel Product and Hardware Surfaces for Painting

ASTM F1869 (2011) Measuring Moisture Vapor Emission Rate of Concrete Subfloor Using Anhydrous Calcium Chloride

MASTER PAINTERS INSTITUTE (MPI)

MPI 107 (Oct 2009) Rust Inhibitive Primer (Water-Based)

MPI 13 (Oct 2009) Exterior Solvent-Based Semi-Transparent Stain

MPI 134 (Oct 2009) Galvanized Primer (Waterbased)

MPI 139 (Oct 2009) Interior High Performance Latex, MPI Gloss Level 3

MPI 144 (Oct 2009) Institutional Low Odor / VOC Interior Latex, MPI Gloss Level 2

MPI 145 (Oct 2009) Institutional Low Odor / VOC Interior Latex, MPI Gloss Level 3

MPI 163 (Oct 2009) Exterior W.B. Light Industrial Coating, Semi-Gloss, MPI Gloss Level 5

MPI 164 (Oct 2009) Exterior W.B. Light Industrial Coating, Gloss, MPI Gloss Level 6

MPI 4 (Oct 2009) Interior/Exterior Latex Block Filler

MPI 50 (Oct 2009) Interior Latex Primer Sealer



Specifications

MPI 79 (Oct 2009) Alkyd Anti-Corrosive Metal Primer

THE SOCIETY FOR PROTECTIVE COATINGS (SSPC)

SSPC 7/NACE No.4 (2007; E 2004) Brush-Off Blast Cleaning

SSPC PA 1 (2000; E 2004) Shop, Field, and Maintenance Painting of Steel

SSPC PA Guide 3 (1982; E 1995) A Guide to Safety in Paint Application

SSPC QP 1 (1998; E 2004) Standard Procedure for Evaluating Painting Contractors (Field Application to Complex Industrial Structures)

SSPC SP 1 (1982; E 2004) Solvent Cleaning

SSPC SP 10/NACE No. 2 (2007) Near-White Blast Cleaning

SSPC SP 12/NACE No.5 (2002) Surface Preparation and Cleaning of Metals by Waterjetting Prior to Recoating

SSPC SP 2 (1982; E 2000; E 2004) Hand Tool Cleaning

SSPC SP 3 (1982; E 2004) Power Tool Cleaning

SSPC SP 6/NACE No.3 (2007) Commercial Blast Cleaning

SSPC VIS 3 (2004) Guide and Reference Photographs for Steel Surfaces Prepared by Hand and Power Tool Cleaning

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FED-STD-313 (Rev D; Notice 1) Material Safety Data, Transportation Data and Disposal Data for Hazardous Materials Furnished to Government Activities

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC (2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.1000 Air Contaminants

1.2 SUBMITTALS

The following shall be submitted in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

The current MPI, "Approved Product List" which lists paint by brand, label, product name and product code as of the date of contract award, will be used to determine compliance with the submittal requirements of this specification. The Contractor may choose to use a subsequent MPI "Approved Product List", however, only one list may be used for the entire contract and each coating system is to be from a single manufacturer. All coats on a particular substrate must be from a single manufacturer. No variation from the MPI Approved Products List is acceptable.

Samples of specified materials may be taken and tested for compliance with specification requirements.

Specifications

SD-02 Shop Drawings

Piping identification
Submit color stencil codes

SD-03 Product Data

Coating
Manufacturer's Technical Data Sheets

SD-04 Samples

Color

Submit manufacturer's samples of paint colors. Cross reference color samples to color scheme as indicated.

SD-07 Certificates

Applicator's qualifications

SD-08 Manufacturer's Instructions

Manufacturer's Material Safety Data Sheets

Submit manufacturer's Material Safety Data Sheets for coatings, solvents, and other potentially hazardous materials, as defined in FED-STD-313.

SD-10 Operation and Maintenance Data Coatings

Preprinted cleaning and maintenance instructions for all coating systems shall be provided.

SD-11 Closeout Submittals Local/Regional

Materials; (LEED)

LEED documentation relative to local/regional materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

Materials; (LEED)

LEED documentation relative to recycled content credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

LEED documentation relative to low emitting materials credit in accordance with LEED Reference Guide. Include in LEED Documentation Notebook.

1.3 APPLICATOR'S QUALIFICATIONS

1.3.1 SSPC QP 1 Certification

All contractors and subcontractors that perform surface preparation or coating application shall be certified by the Society for Protective Coatings (formerly Steel Structures Painting Council) (SSPC) to the

Specifications

requirements of SSPC QP 1 prior to contract award, and shall remain certified while accomplishing any surface preparation or coating application. The painting contractors and painting subcontractors must remain so certified for the duration of the project. If a contractor's or subcontractor's certification expires, the firm will not be allowed to perform any work until the certification is reissued. Requests for extension of time for any delay to the completion of the project due to an inactive certification will not be considered and liquidated damages will apply. Notify the Architect of any change in contractor certification status.

1.4 REGULATORY REQUIREMENTS**1.4.1 Environmental Protection**

In addition to requirements specified elsewhere for environmental protection, provide coating materials that conform to the restrictions of the local Air Pollution Control District and regional jurisdiction. Notify Contracting Officer of any paint specified herein which fails to conform.

1.4.2 Lead Content

Do not use coatings having a lead content over 0.06 percent by weight of nonvolatile content.

1.4.3 Chromate Content

Do not use coatings containing zinc-chromate or strontium-chromate.

1.4.4 Asbestos Content

Materials shall not contain asbestos.

1.4.5 Mercury Content

Materials shall not contain mercury or mercury compounds.

1.4.6 Silica

Abrasive blast media shall not contain free crystalline silica.

1.4.7 Human Carcinogens

Materials shall not contain ACGIH 0100 confirmed human carcinogens (A1) or suspected human carcinogens (A2).

1.5 PACKAGING, LABELING, AND STORAGE

Paints shall be in sealed containers that legibly show the contract specification number, designation name, formula or specification number, batch number, color, quantity, date of manufacture, manufacturer's formulation number, manufacturer's directions including any warnings and special precautions, and name and address of manufacturer. Pigmented paints shall be furnished in containers not larger than 5 gallons. Paints and thinners shall be stored in accordance with the manufacturer's written directions, and as a minimum, stored off the ground, under cover, with sufficient ventilation to prevent the buildup of flammable vapors, and at temperatures between 40 to 95 degrees F.

1.6 SAFETY AND HEALTH

Apply coating materials using safety methods and equipment in accordance with the following:

Work shall comply with applicable Federal, State, and local laws and regulations.

Specifications

1.6.1 Safety Methods Used During Coating Application Comply with the requirements of SSPC PA Guide 3.

1.6.2 Toxic Materials

To protect personnel from overexposure to toxic materials, conform to the most stringent guidance of:

- a. The applicable manufacturer's Material Safety Data Sheets (MSDS) or local regulation.
- b. 29 CFR 1910.1000.
- c. ACGIH 0100, threshold limit values.

1.7 ENVIRONMENTAL CONDITIONS

Comply, at minimum, with manufacturer recommendations for space ventilation during and after installation.

1.7.1 Coatings

Do not apply coating when air or substrate conditions are:

- a. Less than 5 degrees F above dew point;
- b. Below 50 degrees F or over 95 degrees F, unless specifically pre-approved by the Contracting Officer and the product manufacturer. Under no circumstances shall application conditions exceed manufacturer recommendations.

1.8 SUSTAINABLE DESIGN REQUIREMENTS

1.8.1 Local/Regional Materials

See Section 01 33 29 LEED(tm) DOCUMENTATION for cumulative total local material requirements. Paint and coating materials may be locally available.

1.9 COLOR SELECTION

Colors of finish coats shall be as indicated or specified. Where not indicated or specified, colors shall be selected by the Architect. Manufacturers' names and color identification are used for the purpose of color identification only. Named products are acceptable for use only if they conform to specified requirements. Products of other manufacturers are acceptable if the colors approximate colors indicated and the product conforms to specified requirements.

Tint each coat progressively darker to enable confirmation of the number of coats.

1.10 LOCATION AND SURFACE TYPE TO BE PAINTED

1.10.1 Painting Included

Where a space or surface is indicated to be painted, include the following unless indicated otherwise.

- a. Surfaces behind portable objects and surface mounted articles readily detachable by removal of fasteners, such as screws and bolts.
- b. New factory finished surfaces that require identification or color coding and factory finished surfaces that are damaged during performance of the work.

Specifications

- c. Existing coated surfaces that are damaged during performance of the work.

1.10.1.1 Exterior Painting

Includes new surfaces of the building and appurtenances. Also included are existing coated surfaces made bare by cleaning operations.

1.10.1.2 Interior Painting

Includes new surfaces of the building and appurtenances as indicated and existing coated surfaces made bare by cleaning operations. Where a space or surface is indicated to be painted, include the following items, unless indicated otherwise.

- a. Exposed columns, girders, beams, joists, and metal deck; and
- b. Other contiguous surfaces.

1.10.2 Painting Excluded

Do not paint the following unless indicated otherwise.

- a. Surfaces concealed and made inaccessible by panelboards, fixed ductwork, machinery, and equipment fixed in place.
- b. Surfaces in concealed spaces. Concealed spaces are defined as enclosed spaces above suspended ceilings, furred spaces, attic spaces, crawl spaces, elevator shafts and chases.
- c. Steel to be embedded in concrete.
- d. Copper, stainless steel, aluminum, brass, and lead except existing coated surfaces.
- e. Hardware, fittings, and other factory finished items.

1.10.3 Mechanical and Electrical Painting Includes field coating of interior new surfaces.

- a. Where a space or surface is indicated to be painted, include the following items unless indicated otherwise.
 - (1) Exposed piping, conduit, and ductwork;
 - (2) Supports, hangers, air grilles, and registers;
 - (3) Miscellaneous metalwork and insulation coverings.
- b. Do not paint the following, unless indicated otherwise:
 - (1) New zinc-coated, aluminum, and copper surfaces under insulation
 - (2) New aluminum jacket on piping
 - (3) New interior ferrous piping under insulation.

Specifications

1.10.4 Definitions and Abbreviations**1.10.4.1 Coating**

A film or thin layer applied to a base material called a substrate. A coating may be a metal, alloy, paint, or solid/liquid suspensions on various substrates (metals, plastics, wood, paper, leather, cloth, etc.). They may be applied by electrolysis, vapor deposition, vacuum, or mechanical means such as brushing, spraying, calendaring, and roller coating. A coating may be applied for aesthetic or protective purposes or both. The term "coating" as used herein includes emulsions, enamels, stains, varnishes, sealers, epoxies, and other coatings, whether used as primer, intermediate, or finish coat. The terms paint and coating are used interchangeably.

1.10.4.2 DFT or dft

Dry film thickness, the film thickness of the fully cured, dry paint or coating.

1.10.4.3 DSD

Degree of Surface Degradation, the MPI system of defining degree of surface degradation. Five (5) levels are generically defined under the Assessment sections in the MPI Maintenance Repainting Manual.

1.10.4.4 EPP

Environmentally Preferred Products, a standard for determining environmental preferability in support of Executive Order 13101.

1.10.4.5 EXT

MPI short term designation for an exterior coating system.

1.10.4.6 INT

MPI short term designation for an interior coating system.

1.10.4.7 micron / microns

The metric measurement for 0.001 mm or one/one-thousandth of a millimeter.

1.10.4.8 mil / mils

The English measurement for 0.001 in or one/one-thousandth of an inch, equal to 25.4 microns or 0.0254 mm.

1.10.4.9 mm

The metric measurement for millimeter, 0.001 meter or one/one-thousandth of a meter.

1.10.4.10 MPI Gloss Levels

MPI system of defining gloss. Seven (7) gloss levels (G1 to G7) are generically defined under the Evaluation sections of the MPI Manuals. Traditionally, Flat refers to G1/G2, Eggshell refers to G3, Semigloss refers to G5, and Gloss refers to G6.

Specifications

Gloss levels are defined by MPI as follows:

Gloss Level	Description	Units at 60 degrees	Units at 85 degrees
G1	Matte or Flat	0 to 5	10 max
G2	Velvet	0 to 10	10 to 35
G3	Eggshell	10 to 25	10 to 35
G4	Satin	20 to 35	35 min
G5	Semi-Gloss	35 to 70	
G6	Gloss	70 to 85	
G7	High Gloss		

Gloss is tested in accordance with ASTM D523. Historically, the Government has used Flat (G1 / G2), Eggshell (G3), Semi-Gloss (G5), and Gloss (G6).

1.10.4.11 MPI System Number

The MPI coating system number in each Division found in either the MPI Architectural Painting Specification Manual or the Maintenance Repainting Manual and defined as an exterior (EXT/REX) or interior system (INT/RIN). The Division number follows the CSI Master Format.

1.10.4.12 Paint

See Coating definition.

PART 2 PRODUCTS

2.1 MATERIALS

Conform to the coating specifications and standards referenced in PART 3. Submit manufacturer's technical data sheets for specified coatings and solvents. Comply with applicable regulations regarding toxic and hazardous materials.

PART 3 EXECUTION

3.1 PROTECTION OF AREAS AND SPACES NOT TO BE PAINTED

Prior to surface preparation and coating applications, remove, mask, or otherwise protect, hardware, hardware accessories, machined surfaces, radiator covers, plates, lighting fixtures, public and private property, and other such items not to be coated that are in contact with surfaces to be coated. Following completion of painting, workmen skilled in the trades involved shall reinstall removed items. Restore surfaces contaminated by coating materials, to original condition and repair damaged items.

3.2 SURFACE PREPARATION

Remove dirt, splinters, loose particles, grease, oil, and other foreign matter and substances deleterious to coating performance as specified for each substrate before application of paint or surface treatments. Oil and grease shall be removed prior to mechanical cleaning. Cleaning shall be programmed so that dust and other contaminants will not fall on wet, newly painted surfaces. Exposed ferrous metals such as nail heads on or in contact with surfaces to be painted with water-thinned paints, shall be spot-primed with a suitable corrosion-inhibitive primer capable of preventing flash rusting and compatible with the coating specified for the adjacent areas.

Specifications

3.3 PREPARATION OF METAL SURFACES**3.3.1 Existing and New Ferrous Surfaces**

- a. Ferrous Surfaces including Shop-coated Surfaces and Small Areas That Contain Rust, Mill Scale and Other Foreign Substances: Detergent wash in accordance with SSPC SP 1 to remove oil and grease. Where shop coat is missing or damaged, clean according to SSPC SP 2, SSPC SP 3, SSPC SP 6/NACE No.3, or SSPC SP 10/NACE No. 2. Brush-off blast remaining surface in accordance with SSPC 7/NACE No.4; Shop-coated ferrous surfaces shall be protected from corrosion by treating and touching up corroded areas immediately upon detection.
- b. Surfaces With More Than 20 Percent Rust, Mill Scale, and Other Foreign Substances: Clean entire surface in accordance with SSPC SP 10/NACE No. 2/SSPC SP 12/NACE No.5 WJ-2.

3.3.2 Final Ferrous Surface Condition:

For tool cleaned surfaces, the requirements are stated in SSPC SP 2 and SSPC SP 3. As a visual reference, cleaned surfaces shall be similar to photographs in SSPC VIS 3.

3.3.3 Galvanized Surfaces

- a. New or Existing Galvanized Surfaces With Only Dirt and Zinc Oxidation Products: Clean with steam, or non-alkaline detergent solution in accordance with SSPC SP 1. If the galvanized metal has been passivated or stabilized, the coating shall be completely removed by brush-off abrasive blast. New galvanized steel to be coated shall not be "passivated" or "stabilized" if the absence of hexavalent stain inhibitors is not documented, test as described in ASTM D6386, Appendix X2, and remove by one of the methods described therein.
- b. Galvanized with Slight Coating Deterioration or with Little or No Rusting: Water jetting to SSPC SP 12/NACE No.5 WJ3 to remove loose coating from surfaces with less than 20 percent coating deterioration and no blistering, peeling, or cracking. Use inhibitor as recommended by the coating manufacturer to prevent rusting.

3.4 PREPARATION OF CONCRETE AND CEMENTITIOUS SURFACE**3.4.1 Concrete and Masonry**

- a. Curing: Concrete, stucco and masonry surfaces shall be allowed to cure at least 30 days before painting, except concrete slab on grade, which shall be allowed to cure 90 days before painting.
- b. Surface Cleaning: Remove the following deleterious substances.
 - (1) Dirt, Chalking, Grease, and Oil: Wash new surfaces with a solution composed of 1/2 cup trisodium phosphate, 1/4 cuphousehold detergent, and 4 quarts of warm water. Then rinse thoroughly with fresh water. For large areas, water blasting may be used.
 - (2) Fungus and Mold: Wash new surfaces with a solution composed of 1/2 cup trisodium phosphate, 1/4 cup household detergent, 1 quart 5 percent sodium hypochlorite solution and 3 quarts of warm water. Rinse thoroughly with fresh water.
 - (3) Efflorescence: Remove by scraping or wire brushing followed by washing with a 5 to 10 percent by weight aqueous solution of hydrochloric (muriatic) acid. Do not allow acid to remain on the surface for more than five minutes before rinsing with fresh water. Do not acid clean more than 4 square feet of surface, per workman, at one time.

Specifications

- c. Cosmetic Repair of Minor Defects: Repair or fill mortar joints and minor defects, including but not limited to spalls, in accordance with manufacturer's recommendations and prior to coating application.
- d. Allowable Moisture Content: Latex coatings may be applied to damp surfaces, but not to surfaces with droplets of water. Do not apply epoxies to damp vertical surfaces as determined by ASTM D4263 or horizontal surfaces that exceed 3 lbs of moisture per 1000 square feet in 24 hours as determined by ASTM F1869. In all cases follow manufacturers recommendations. Allow surfaces to cure a minimum of 30 days before painting.

3.4.2 Gypsum Board

- a. Surface Cleaning: Shall be clean and free from loose matter; gypsum board shall be dry. Remove loose dirt and dust by brushing with a soft brush, rubbing with a dry cloth, or vacuum-cleaning prior to application of the first coat material. A damp cloth or sponge may be used if paint will be water-based.
- b. Repair of Minor Defects: Prior to painting, repair joints, cracks, holes, surface irregularities, and other minor defects with patching plaster or spackling compound and sand smooth.
- c. Allowable Moisture Content: Latex coatings may be applied to damp surfaces, but not surfaces with droplets of water. Do not apply epoxies to damp surfaces as determined by ASTM D4263.

3.5 APPLICATION

3.5.1 Coating Application

Painting practices shall comply with applicable federal, state and local laws enacted to insure compliance with Federal Clean Air Standards. Apply coating materials in accordance with SSPC PA 1. SSPC PA 1 methods are applicable to all substrates, except as modified herein.

At the time of application, paint shall show no signs of deterioration. Uniform suspension of pigments shall be maintained during application.

Unless otherwise specified or recommended by the paint manufacturer, paint may be applied by brush, roller, or spray. Use trigger operated spray nozzles for water hoses. Rollers for applying paints and enamels shall be of a type designed for the coating to be applied and the surface to be coated. Wear protective clothing and respirators when applying oil-based paints or using spray equipment with any paints.

Paints, except water-thinned types, shall be applied only to surfaces that are completely free of moisture as determined by sight or touch.

Thoroughly work coating materials into joints, crevices, and open spaces. Special attention shall be given to insure that all edges, corners, crevices, welds, and rivets receive a film thickness equal to that of adjacent painted surfaces.

Each coat of paint shall be applied so dry film shall be of uniform thickness and free from runs, drops, ridges, waves, pinholes or other voids, laps, brush marks, and variations in color, texture, and finish. Hiding shall be complete.

Touch up damaged coatings before applying subsequent coats. Interior areas shall be broom clean and dust free before and during the application of coating material.

Specifications

- a. **Drying Time:** Allow time between coats, as recommended by the coating manufacturer, to permit thorough drying, but not to present topcoat adhesion problems. Provide each coat in specified condition to receive next coat.
- b. **Primers, and Intermediate Coats:** Do not allow primers or intermediate coats to dry more than 30 days, or longer than recommended by manufacturer, before applying subsequent coats. Follow manufacturer's recommendations for surface preparation if primers or intermediate coats are allowed to dry longer than recommended by manufacturers of subsequent coatings. Each coat shall cover surface of preceding coat or surface completely, and there shall be a visually perceptible difference in shades of successive coats.
- c. **Finished Surfaces:** Provide finished surfaces free from runs, drops, ridges, waves, laps, brush marks, and variations in colors.

3.5.2 Mixing and Thinning of Paints

Reduce paints to proper consistency by adding fresh paint, except when thinning is mandatory to suit surface, temperature, weather conditions, application methods, or for the type of paint being used. Obtain written permission from the Architect to use thinners. The written permission shall include quantities and types of thinners to use.

When thinning is allowed, paints shall be thinned immediately prior to application with not more than 1 pint of suitable thinner per gallon. The use of thinner shall not relieve the Contractor from obtaining complete hiding, full film thickness, or required gloss. Thinning shall not cause the paint to exceed limits on volatile organic compounds. Paints of different manufacturers shall not be mixed.

3.5.3 Two-Component Systems

Two-component systems shall be mixed in accordance with manufacturer's instructions. Any thinning of the first coat to ensure proper penetration and sealing shall be as recommended by the manufacturer for each type of substrate.

3.5.4 Coating Systems

- a. **Systems by Substrates:** Apply coatings that conform to the respective specifications listed in the following Tables.
- b. **Minimum Dry Film Thickness (DFT):** Apply paints, primers, varnishes, enamels, undercoats, and other coatings to a minimum dry film thickness of 1.5 mil each coat unless specified otherwise in the Tables. Coating thickness where specified, refers to the minimum dry film thickness.
- c. **Coatings for Surfaces Not Specified Otherwise:** Coat surfaces which have not been specified, the same as surfaces having similar conditions of exposure.
- d. **Existing Surfaces Damaged During Performance of the Work,** Coat surfaces with the following:
 - (1) One coat of primer.
 - (2) One coat of undercoat or intermediate coat.
 - (3) One topcoat to match adjacent surfaces.

Specifications

3.6 COATING SYSTEMS FOR METAL

Apply coatings of Tables in Division 5 for Exterior and Interior.

- a. Apply specified ferrous metal primer on the same day that surface is cleaned, to surfaces that meet all specified surface preparation requirements at time of application.
- b. Inaccessible Surfaces: Prior to erection, use one coat of specified primer on metal surfaces that will be inaccessible after erection.
- c. Shop-primed Surfaces: Touch up exposed substrates and damaged coatings to protect from rusting prior to applying field primer.
- d. Pipes and Tubing: The semitransparent film applied to some pipes and tubing at the mill is not to be considered a shop coat, but shall be overcoated with the specified ferrous-metal primer prior to application of finish coats.
- e. Exposed Nails, Screws, Fasteners, and Miscellaneous Ferrous Surfaces.

On surfaces to be coated with water thinned coatings, spot prime exposed nails and other ferrous metal with latex primer MPI 107.

3.7 COATING SYSTEMS FOR CONCRETE AND CEMENTITIOUS SUBSTRATES

Apply coatings of Tables in Division 3, 4 and 9 for Exterior and Interior.

3.8 INSPECTION AND ACCEPTANCE

In addition to meeting previously specified requirements, demonstrate mobility of moving components, including swinging and sliding doors, cabinets, and windows with operable sash, for inspection by the Contracting Officer. Perform this demonstration after appropriate curing and drying times of coatings have elapsed and prior to invoicing for final payment.

3.9 WASTE MANAGEMENT

As specified in the Waste Management Plan and as follows. Do not use kerosene or any such organic solvents to clean up water based paints. Properly dispose of paints or solvents in designated containers. Close and seal partially used containers of paint to maintain quality as necessary for reuse. Store in protected, well-ventilated, fire-safe area at moderate temperature. Place materials defined as hazardous or toxic waste in designated containers. Set aside extra paint for future color matches or reuse by the Owner.

3.10 PAINT TABLES

All DFT's are minimum values. Use only interior paints and coatings that meet VOC requirements of LEED low emitting materials credit. Acceptable products are listed in the MPI Green Approved Products List, available at <http://www.specifygreen.com/APL/ProductIdxByMPInum.asp>.

3.10.1 EXTERIOR PAINT TABLES**DIVISION 5: EXTERIOR METAL, FERROUS AND NON-FERROUS PAINT TABLE EXTERIOR****GALVANIZED SURFACES**

- A. New Galvanized surfaces:

Specifications

1. Waterborne Primer / Waterborne Light Industrial Coating MPI EXT 5.3J-G5

(Semigloss)

Primer:	Intermediate:	Topcoat:
MPI 134	MPI 163	MPI 163
System DFT:	4.5 mils	

MPI EXT 5.3J-G6 (Gloss)

Primer:	Intermediate:	Topcoat:
MPI 134	MPI 164	MPI 164
System DFT:	4.5 mils	

3.10.2 INTERIOR PAINT TABLES

DIVISION 3: INTERIOR CONCRETE PAINT TABLE

A. New Concrete, vertical surfaces, not specified otherwise:

1. Institutional Low Odor / Low VOC Latex

New; MPI INT 3.1M-G3 (Eggshell) / Existing; MPI RIN 3.1L-G3 (Eggshell)

Primer:	Intermediate:	Topcoat:
MPI 50	MPI 145	MPI 145
System DFT:	4 mils	

DIVISION 4: INTERIOR CONCRETE MASONRY UNITS PAINT TABLE

A. New Concrete masonry:

1. Institutional Low Odor / Low VOC Latex

New; MPI INT	4.2E-G3 (Eggshell)		
Filler	Primer:	Intermediate:	Topcoat:
MPI 4	N/A	MPI 145	MPI 145
System DFT:	4 mils		

DIVISION 5: INTERIOR METAL, FERROUS AND NON-FERROUS PAINT TABLE

INTERIOR STEEL / FERROUS SURFACES

A. Metal:

1. High Performance Architectural Latex MPI INT 5.1R-

G3 (Eggshell)

Primer:	Intermediate:	Topcoat:
MPI 79	MPI 139	MPI 139
System DFT:	5 mils	

DIVISION 9: INTERIOR PLASTER, GYPSUM BOARD, TEXTURED SURFACES PAINT TABLE

A. New Wallboard not otherwise specified:

1. Institutional Low Odor / Low VOC Latex



Specifications

New; MPI INT 9.2M-G2 (Flat) / Existing; MPI RIN 9.2M-G2 (Flat)

Primer:	Intermediate:	Topcoat:
---------	---------------	----------

MPI 50	MPI 144	MPI 144
--------	---------	---------

System DFT:	4 mils
-------------	--------

New; MPI INT 9.2M-G3 (Eggshell) / Existing; MPI RIN 9.2M-G3 (Eggshell)

Primer:	Intermediate:	Topcoat:
---------	---------------	----------

MPI 50	MPI 145	MPI 145
--------	---------	---------

System DFT:	4 mils
-------------	--------

-- End of Section --

09 96 00 - HIGH-PERFORMANCE COATINGS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

MASTER PAINTERS INSTITUTE (MPI)**MPI ASM****(2004) Architectural Painting Specification Manual****1.2 SUBMITTALS**

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Submit manufacturer's catalog data for the following items including manufacturer's name and identification. Data shall include detailed analysis of each special coating material required for the project, with all the coating constituents measured as percentages of the total weight of the coating. Manufacturer's data concerning application, thinning, and average coverage per gallon shall be included.

Epoxy Coatings

SD-04 Samples

Submit sample Color Chips in accordance with paragraph entitled, "Delivery, Handling and Storage," of this section.

SD-07 Certificates

Submit certificates for following items showing conformance with the referenced standards contained in this section.

Epoxy Coatings

1.3 DELIVERY, HANDLING AND STORAGE

Special coating materials must be delivered to the project in their original containers bearing manufacturer's name, descriptive label, and coating formulations. Provide new and unopened containers.

Special coating materials must be stored in tightly closed containers in a covered, well-ventilated area where they will not be exposed to excessive heat, fumes, sparks, flame, or direct sunlight. Protect water-based coatings against freezing.

Solvents, thinners, and equipment cleaners must be stored with the same care as the coating materials with ambient temperatures continuously maintained at a minimum 45 degrees F.

Submit Material, Equipment and Fixture List consisting of a list of proposed equipment to be used in performance of construction work.

Specifications

Submit three color chips 3 inch by 4 inch or manufacture pull-down of each finish color and gloss as scheduled.

1.4 FIELD TESTS

Owner may take dry-film tests from time to time on finished surfaces. Apply additional coatings to surfaces where there is less than the minimum specified dry-film thickness.

1.5 PROTECTIONS AND SAFETY PRECAUTIONS

Protect adjacent materials and equipment against damage from spillage, dripping, and spatter of coating materials. Building materials and equipment must be left clean and with all damaged surfaces corrected. Provide "WET PAINT" signs to indicate newly painted surfaces.

Provide forced ventilation for interior spaces during application and drying of coatings to prevent the buildup of toxic or explosive concentrations of solvent vapors.

Provide fire extinguishers of the required quantity and correct type to combat flammable liquid fires.

Dispose of rags that are used to wipe up coating materials, solvents, and thinners by drenching them with water and placing in a covered metal container.

1.6 QUALITY ASSURANCE

Comply with Master Painters Institute (MPI) Standards indicated and listed in "MPI Approved Products List." Comply with the requirements in "MPI Architectural Painting Specification Manual" before any project is started.

PART 2 PRODUCTS**2.1 EPOXY COATINGS****2.1.1 General**

Conform to MPI ASM, No. 116 for epoxy coatings and epoxy block filler, as modified.

Vehicle resins for finish coats must be based on a polyamide-cured, epoxy-resin material. Apply finish coats with a dry-film thickness of not less than 4 mils per coat. Finish color and gloss must be as indicated.

2.1.2 Concrete Surface Coatings

Apply a water-based epoxy coating system in conformance with MPI ASM, No. 115 for concrete surfaces. Prime coat must fill concrete surface pores with a total dry-film thickness of not less than 2 mils.

PART 3 EXECUTION**3.1 SURFACE PREPARATION****3.1.1 Concrete Surfaces**

Conform to MPI ASM for substrates indicated. Remove plates, machined surfaces, and similar items already in place that are not to be coated. Provide surface-applied protection before surface preparation and coating where removal is impractical or impossible. After completing coating operations, reinstall items that were removed.

Specifications

Clean dirt, oil, grease, and incompatible paints from substrates to ensure bonding. Coordination of shop-applied prime coats with high-performance coatings is critical. Remove incompatible primers. Reprime substrate with compatible primers as required to produce coating systems indicated.

3.2 COATING MATERIAL PREPARATION

3.2.1 General

Mix and prepare coating materials in accordance with the coating manufacturer's printed instructions for the particular material and coat to be applied. Keep materials which are not in actual use in closed containers.

Coating materials that have been mixed with an automatic shaker must be allowed to stand to let air bubbles escape, then given a final hand mixing before application. Stir materials so as to produce a mixture of uniform density. Stir at frequent intervals during application to prevent skinning. Do not stir film which may form on the surface of the material. Remove film and strain, if necessary.

3.2.2 Thinning

Thinning must be done in accordance with coating manufacturer's printed directions for the particular material and coat.

3.2.3 Tinting

Prime and intermediate coats of paint must be a slightly different tint from the finish coat to facilitate identification of each coat. Tinting must be done by the coating manufacturer and clearly identified as to color and coat.

3.3 APPLICATION OF COATING MATERIALS

3.3.1 General

Do not perform exterior painting in damp or rainy weather. Interior painting must not be allowed until the building is enclosed and has thoroughly dried out. Do not allow painting below 50 degrees F and above 95 degrees F. Painting application must be in accordance with the coating manufacturer's recommendations, and as specified.

Application of coatings must be done by skilled applicators. Apply coatings to clean and properly prepared surfaces. Apply coatings carefully with clean, high-quality application equipment. Allow sufficient time between coats to ensure complete drying and curing. Surfaces must be sanded and dusted between coatings, as required, to produce a surface free of visible defects. High gloss coatings and clear finishes must be lightly sanded between coats to ensure bond of following coats.

Apply coats to the surfaces in an even film. Do not accept cloudiness, spotting, holidays, laps, application marks, runs, sags, and other similar surface imperfections. Remove defective coating applications and recoat as directed.

Coating lines such as wainscots must be sharp, true, and well-defined. Tape may be used to establish coating lines, providing tape is removed before ragging or sawtooth edges form.

Surfaces, including edges, corners, crevices, welds, and other similar changes in surface plane, must receive a dry-film thickness not less than specified.

Specifications

3.3.2 Brush Application

Brushes must be clean and the proper size and type for high-quality application of the specified coating materials. Slow-dry coatings must be brushed out. Quick-dry coatings must be brushed only enough to spread out evenly.

3.3.3 Roller Application

Roller covers must be clean and of the proper nap length, nap texture, and material for high-quality application of the specified coating materials.

Roller application must be done carefully and must be equivalent in all respects to the same coats applied by high-quality brush application.

3.3.4 Spray Application

Do not allow spray application of coatings.

3.4 ACCEPTANCE PROVISIONS**3.4.1 Repairing**

Remove damaged and unacceptable portions of completed work and replace with new work to match adjacent surfaces at no additional cost to the Government.

3.4.2 Cleaning

At end of each workday, remove rubbish, empty cans, rags, and other discarded materials from Project site.

After completing coating application, clean spattered surfaces. Remove spattered coatings by washing, scraping, or other methods. Do not scratch or damage adjacent finished surfaces.

Application equipment must be cleaned promptly and thoroughly with a suitable solvent after each use and stored in a clean, covered, well-ventilated container.

Protect work of other trades against damage from coating operation. Correct damage by cleaning, repairing, replacing, and recoating, as approved by Architect, and leave in an undamaged condition. At completion of construction activities of other trades, touch up and restore damaged or defaced coated surfaces.

-- End of Section --

Specifications

09 98 00 – SEAMLESS EPOXY SYSTEM**PART 1 - GENERAL****1.1 SUMMARY**

- A. This Section includes the labor, equipment and materials to complete interior wall and flooring coatings and finishing as indicated and as specified herein.

1.2 REFERENCE STANDARDS

- A. ASTM E 1907 Standard Guide to Methods of Evaluating Moisture Conditions of Concrete Floors to Receive Resilient Floor Coverings.
- B. ASTM D 4263 Standard Test Method for Indicating Moisture in Concrete by the Plastic Sheet Method.
- C. ASTM F 1869 Standard Test Method for Measuring Moisture Vapor Emission Rate of Concrete Sub-floor by Using Anhydrous Calcium Chloride.
- D. ASTM F 2170 Standard Test Method for Determining Relative Humidity in Concrete Slabs Using in situ Probes.
- E. ASTM D 4501 Standard Test Method for Shear Strength of Adhesive Bonds Between Rigid Substrates by the Block-Shear Method.
- F. ASTM F 710 Standard Practice for Preparing Concrete Floors to Receive Resilient Flooring.
- G. ASTM C 579 Standard Test Methods for Compressive Strength of Chemical- Resistant Mortars, Grouts, Monolithic Surfacings, and Polymer Concretes .
- H. ICRI No. 03732 Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays, CSP 1-9.

1.3 QUALITY ASSURANCE

- A. References: Cited Standards are incorporated herein by reference and govern the work:
 - 1. Pamphlet No. 03732, International Concrete Repair Institute (Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings and Polymer Overlays).
- B. Single Source Responsibility:
 - 1. Single Point Responsibility: One entity, Manufacturer or Epoxy subcontractor, shall the single point of responsibility for the material and installation of products specified within this section.
 - 2. Obtain primary resinous wall and ceiling materials including hardening agents, finish or sealing coats from a single manufacturer with not less than 5 years of successful experience in manufacturing and installing the principal materials described in this section. Provide secondary

Specifications

materials only of type and from a source recommended by the manufacturer of the primary material.

- C. Subcontractor Experience: Furnish list of projects using materials specified for this project that applicator has furnished during the past five years. Include the Following:
1. Installer Qualifications: Engage an experienced installer who is experienced in applying the resinous system specified herein.
 2. Submit written description of the subcontractor's experience with the specified material over the last five (5) years. Include job size (in square feet) and complexity of projects. List a minimum of ten (10) projects with different Owners giving contact names and phone numbers. Project list must be for projects including renovation work including removal of existing finishes, all required surface preparation and the installation of specified or equal fiberglass reinforced seamless system including wall, ceiling and floor integrated spray applied fiberglass reinforced systems. Include owner's names and phone numbers.
 3. Submit resume of the key person(s) who will be performing the actual work and list a minimum of five (5) projects with different Owners giving contact names and phone numbers that this key person has performed work for.
- D. Sampling of Material:
1. When directed by Owner obtain test samples from material stored at the project site or source of supply.
 2. Select samples at random from sealed containers
- E. Mock Up:
1. Apply mockups to verify selections made from sample materials and to set quality standards for materials and execution. The entity who approves the mockups and who performs the final inspection shall be the same.
 - a. Approved mockups may become part of completed Work if undisturbed at the time of Substantial Completion.
 - b. Apply full thickness mockups on a minimum of a 4' x 4' section of flooring integrated with a 4' x 4' section of wall selected by the Owner.
 - c. If a cove base is to be included on the project, mockup shall include same.
- F. Pre-Installation Meeting:
1. Pre-installation Meeting: Prior to the installation of the seamless system, meeting shall be held at the project site with the installer, Design Builder, the manufacturer's representative, and the Owner's representative. Record discussions and furnish a copy to each participant. Topics to be discussed shall include, but not be limited to:
 - a. Planned start and completion timing for each mobilization.
 - b. Safety procedures.
 - c. Coordination of other trades in area.
 - d. Existing and new slab conditions.
 - e. Slab testing results.
 - f. Existing wall substrate conditions.
 - g. Surface preparation.

Specifications

- h. Required room temperatures.
- i. Ventilation.
- j. Step by step installation procedures.
- k. Curing time and methods.
- l. Protection of completed work.
- m. Review of performance requirements including chemical abuse, effluent temperature, type, size, and weights of vehicular and static loads.

1.4 SUBMITTALS

- A. Submit manufacturer's product literature indicating technical data.
- B. Submit manufacturer's Installation and Application Guide.
- C. Shop Drawings:
 - 1. Provide floor plans to scale matching Architectural Plans, indicating extent of each resinous floor/wall system, including type, color and pattern, degree of slip-resistance, and dimensioned locations of control joints, seams, divider strips if applicable, and terminations.
 - 2. Provide enlarged details indication terminations at walls, door frames, pits, curbing, etc.
- D. Submit finished product samples on substrate to be applied:
 - 1. Prepare samples on each type of material to be covered.
 - 2. Make samples not less than three inches square.
- E. Submit manufacturer's Material Safety Data Sheets.
- F. Submit a list of ten projects of similar complexity and size as this project including Owner's names with phone numbers.
- G. Warranty: Manufacturer shall provide a specimen copy of warranty.
- H. LEED Submittals: For each resinous component being used on this project, manufacturer shall provide data indicating compliance with standards.

1.5 PRODUCT DELIVERY, STORAGE AND HANDLING

- A. Delivery of Materials:
 - 1. Materials shall be delivered in original packages and containers, with seals unbroken, bearing manufacturer's labels indicating brand name and directions for storage and mixing with other components.
- B. Storage of Materials:
 - 1. Store only acceptable project materials on project site.
 - 2. Store in a suitable location, convenient to progress of work.

Specifications

3. Store materials in a location to prevent deleterious effects from sunlight, moisture, excessive heat, or cold.
4. Restrict storage to paint and coating materials and related equipment.
5. Comply with health and fire regulations.
6. Storage temperature shall be between 65°F and 90°F or such other ambient temperature conditions as may be specifically recommended by product manufacturer.

1.6 JOB CONDITIONS

A. Environmental Requirements:

1. Comply with manufacturer's recommendations as to environmental conditions under which coatings and coating systems can be applied. Surfaces to be coated shall be between 65°F and 85°F. Do not apply coating system at temperatures beyond those limits stated in the manufacturer's technical data sheet unless given written permission by the manufacturer.
2. Do not apply finish in areas where dust is being generated.

B. Protections:

1. Cover or otherwise protect finished work of other trades and surfaces not being coated concurrently or not to be coated.

C. Conditions of Substrates:

1. Floor slabs: Concrete must be clean, sound free of surface contaminants and meet all requirements as outlined in "PREPARATION OF SURFACES" article.
2. Walls:
 - a. Concrete Masonry Unit (CMU):
 - 1) Mortar joints are struck clean and filled tightly to avoid gaps or holes providing a neat, uniform appearance in accordance with procedures as outlined under Division 4 - "Masonry".
 - 2) All mortar spatter shall be removed, including protruding mortar edges, and other excessive mortar.
 - 3) All rough edges shall be ground smooth.
 - 4) All surfaces shall be clean, dry and free of contaminants prior to installing coating system.
 - 5) Existing Surfaces shall remove all tile, mastics, or coatings prior to installing specified system. Removal shall be in accordance with manufacturer's recommended procedure. Any renovation/removal of existing finishes, glues, mastics, or coatings will be charged to client at additional costs through change order. All surfaces shall be clean, dry and down to bare substrate prior to coating.
 - b. Old Glazed Block and Ceramic Tile:
 - 1) All surfaces shall be clean, dry and free of contaminants prior to installing coatings. This includes the removal of mold, mildew or other surface contaminants.
 - 2) All glazing must be removed by grinding to provide proper surface profile to insure maximum adhesion of coating system.

Specifications

- c. Concrete Walls and Ceilings: All surfaces shall be clean, dry and free of contaminants. Areas containing imperfections such as pinholes, recesses, holes, etc. shall be pre-patched or filled in accordance with manufacturer's recommendations prior to installing the specified system.
- 3. Lighting: Proper lighting is required for installation. When possible lighting shall simulate permanent lighting conditions during resinous floor/wall application.
- 4. Close spaces to traffic during resinous coatings application and for not less than 48 hours after application, unless manufacturer recommends a longer period.
- 5. Airborne contamination: Resinous systems shall not be applied in areas where dust or other airborne particulate matter is being generated.

1.7 WARRANTY

- 1. Furnish a single, written warranty covering 100% of the material and labor costs protecting the Owner from delamination and product failure caused by defective product or defective installation for a period of 1 year from Date of Substantial Completion.
 - a. Issuance of warranty shall be a condition contingent on the receipt of final payment to the Installer.
 - b. Extent of warranty shall be limited to the repair or replacement of defective surfaces at no cost to the Owner. The warranty shall not include any remedy for defects caused by abuse, improper maintenance, change of use or operation, moisture migration from the back side of coating system or by normal wear, tear and usage.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Manufacturer: Basis of Design: Prime Coat Coating Systems, Waukegan, IL. Contact: Kurt Schilling 217-971-3746.
 - 1. Approval is required by Owner for any and all substitutions.

2.2 SYSTEMS

- A. EPOXY FLOORING SYSTEM: (Utility and cart wash bays); Seamless urethane mortar flooring with integrated cove base and consisting of 100% solids urethane slurry mixture and broadcasting aggregate with pigmented Novolac heat resistant finish and an integrated anti-microbial additive.
 - 1. Basis of Design Product: "Prime Cast 2410" as manufactured by Prime Coat Corporation.
 - 2. System Characteristics:
 - a. Color and Pattern: As selected by Owner from manufacturer's full range.
 - b. Wearing Surface: Textured for slip-resistance per Owner selection from manufacturer's full range.
 - c. Integral Cove Base: Radius.

Specifications

- d. System Thickness: minimum 3/16th inch.
 - e. VOC's: less than 8 g/l.
- 3. System Components: Manufacturer's standard components which are compatible with each other as follows:
 - a. Basecoat:
 - 1) Product: PC 352 Cretecoat SL
 - 2) Resin: urethane
 - 3) Application method: Slurry/Broadcast
 - 4) Minimum installed thickness: 3/16th inch with broadcast
 - 5) Type: pigmented
 - b. Broadcast:
 - 1) Product: PCA 331 aggregate
 - 2) Application: broadcast to rejection
 - c. Topcoat:
 - 1) Product: PC 421
 - 2) Resin: novolac epoxy
 - 3) Application method: roller
 - 4) Minimum installed thickness: 16-20 mils
 - 5) Type: pigmented
 - 6) Number of coats: 1
- 4. Performance Requirements:
 - a. Resinous flooring shall withstand chemical attack by agents provided in writing by Owner, in temperatures and concentrations stated therein.
 - b. Resinous flooring shall normal use in commercial kitchen.
 - c. Physical/Chemical Characteristics:
 - 1) Compressive Strength: 8,400 psi after 7 days (ASTM C-579)
 - 2) Tensile Strength: 1,100 psi (ASTM C-307)
 - 3) Flexural Strength: 2,300 psi (ASTM C-580)
 - 4) Flexural Modulus of Elasticity: 1.7 x 10⁵ (ASTM D-790)
 - 5) Abrasion Resistance: .05 gm loss, 1000 gm load, 1000 cycles (ASTM D4060/CS-17)
 - 6) Hardness: 75-80 (ASTM D-2240/Shore D Durometer)
 - 7) Bond Strength: >400 psi (100% concrete failure)
 - 8) Indentation: No indentation (MIL-D-3134F)
 - 9) Flammability: Self extinguishing (ASTM E648) Extent of burning 0.25
 - 10) Service Temperature: -100°F to 220°F (-73°C to 104°C)
 - 11) All products must be 100% solids with zero VOC's.
- B. EPOXY WALL COATING SYSTEM: Seamless Wall System consisting of 100% solids accelerated amine cured epoxy with fiberglass and Kevlar® reinforcement and integrated anti-microbial glaze topcoat.
 - 1. Basis of Design Product: "Prime Guard 1200", as manufactured by Prime Coat Corporation.

Specifications

2. System Characteristics/Performance Requirements:
 - a. Color and Pattern: As selected by Owner from manufacturer's full range.
 - b. System Thickness: Walls: 45-50 mils minimum.
 - c. VOC's: in compliance with EQ 4.2, less than 100 g/l.
 - d. Product Composition: Wall Systems must be spray applied 100% solids with Fiberglass and Kevlar strands premixed into both the Part A and Part B epoxy components. Fiberglass and Kevlar Strands must be sufficient enough to form a reinforced matrix/web within the resin providing increased tensile strength and impact resistance and high build characteristics as specified. Mat-layup systems excluded.
 - e. Compressive Strength Minimum: 11,700 p.s.i. (ASTM D-695-77)
 - f. Tensile Strength Minimum: 3,900 p.s.i. (ASTM D-638-77a)
 - g. Hardness minimum: 83-88 (ASTM D-2240/Shore D Durometer)
 - h. Abrasion Resistance Minimum: 0.03 gm/1000 revolutions (ASTM D-4060 Taber Abrader.)
 - i. High or Low Solids solvent based and all water based systems excluded.
3. System Components: Manufacturer's standard components which are compatible with each other as follows:
 - a. Primer All Surfaces:
 - 1) Resin: 100% solids plural component thixotropic epoxy.
 - 2) Product: PC 630.
 - 3) Application method: spray, roller, or brush.
 - 4) Minimum installed thickness: 8 mils over concrete and non-porous surfaces; 12-20 mils over CMU.
 - 5) Number of coats: 1
 - b. Body/Build Coat:
 - 1) Resin: 100% solids Fiberglass and Kevlar reinforced epoxy.
 - 2) Product: PC 200.
 - 3) Application method: 45:1 air-powered airless spray w/gravity-fed hopper .
 - 4) Reinforcement: Chopped strand fiberglass and Kevlar®
 - 5) Minimum Installed thickness: 45 mils.
 - 6) Number of coats: 1
 - c. Top Coat All Surfaces
 - 1) Resin: 100% solids Bisphenol A chemically resistant epoxy.
 - 2) Product: PC 400 with PC 499 Anti-Microbial.
 - 3) Application method: roller or spray.
 - 4) Minimum installed thickness: 8 - 10 mils.
 - 5) Antimicrobial: Integrated into topcoat.
 - 6) Type: pigmented.

2.3 ACCESSORY MATERIALS

- A. Patching and Fill Material: Resinous product of resinous flooring manufacturer.



Specifications

- B. Joint Sealants: Formulated by resinous flooring manufacturer for type of service and joint condition indicated.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine surfaces scheduled to receive coating for conditions that will adversely affect execution, permanence or quality of work and which cannot be put into an acceptable condition through preparatory work.
- B. Verification: Verify that all substrate and environmental conditions are in compliance with requirements discussed during Pre-installation conference.
- C. Notify the Design Builder immediately upon determination that surfaces scheduled to receive coating are unacceptable for proper adhesion or subsequent performance.
- D. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with surface preparation or coating application only after unsatisfactory conditions have been corrected.

3.2 PREPARATION OF SURFACES

- A. General: Prepare and clean substrates in accordance with manufacturer's written instructions for substrate indicated. Provide clean, dry, and neutral pH substrate for resinous floor/wall application.
- B. Mandatory Testing of Floor Slabs:
 - 1. Prior to the installation of flooring, it is mandatory that all surfaces are tested for moisture content, pH, and alkalinity levels that would be detrimental to the adhesion of coating materials. For tests to be accurate, temperatures and humidity levels should be stabilized for a minimum of 72 hours. NOTE: TESTING PERFORMED BY ANY METHOD IN UNCONDITIONED SPACES WILL NOT YIELD CONSISTENT RESULTS. Tests below must be completed in accordance with documented Test Methods:
 - a. Calcium Chloride Tests per ASTM F 1869
 - b. Relative Humidity Testing per ASTM F 2170
 - c. Others as required by manufacturer or unique job conditions. If additional testing is required, additional costs may be incurred by Owner.
 - 2. Do not proceed with installation if moisture levels exceed 5% or 3 lbs. per 1,000 sf per 24 hours or if ambient temperature is less than 5°F above dew point unless approved by material manufacturer.

Specifications

- C. Concrete Floors: Provide sound concrete surfaces free of laitance, glaze, efflorescence, curing compounds, form-release agents, dust, dirt, grease, oil, and other contaminants incompatible with resinous flooring. Floor slabs shall be prepared as follows:
1. Mechanically remove all finishes, mastics, adhesives and other compounds down to sound substrate. Demolition shall be in accordance with manufacturer's recommendations and written procedures. (Note: If during the demolition a setting bed is found beneath the existing flooring materials, manufacturer will provide written recommendation whether to remove it or leave it in place. If removal is required, installer will provide a change order to replace the setting bed with manufacturer's recommended material to provide proper sloping for drainage and to insure proper adhesion of the specified coating system.)
 2. Profile sound surfaces for proper adhesion. For thin-film coatings and floors under 1,000 sf or with limited access: Diamond grind to expose concrete matrix and profile concrete floor surfaces to a classification of ICRI CSP2.
 3. For all other floor systems: Shot blast all concrete floor surfaces to a classification of ICRI CSP5.
 4. Visually inspect shot blasted or grinded surfaces to make sure that profiled surfaces are free of contaminants. Areas that are stained or visually contaminated shall be treated with a 15% by volume solution of aqueous tri-sodium phosphate (TSP) or other de-greasing agent as recommended by the coatings manufacturer. Rinse and dry all floor surfaces scheduled to receive high performance floor system finish prior to commencement of resinous flooring application.
 5. Remove and legally dispose of all debris and contaminants produced by the demolition and surface preparation process. Steel media resulting from the shot blasted floor slab surface shall be removed from cracks, slab edges, construction joints, and corners by magnets, magnetic broom, air blast, vacuum, or stiff bristle broom.
- D. Concrete Walls, Existing Tile or Glazed Block: Abrasive Blast or mechanically abrade surfaces to achieve a ICRI CSP2 or ICRI CSP3 anchor profile for coating. Pre-patch as required.

3.3 APPLICATION

- A. General: Apply components of resinous coating system according to manufacturer's written instructions to produce a uniform, monolithic wearing surface at the specified thickness.
1. Coordinate application of components to provide optimum adhesion of resinous floor/wall system to substrate and intercoat adhesion.
 2. At substrate control, isolation, and expansion joints, provide joint as necessary in resinous flooring in compliance with manufacturer's directions and engineering details for each joint type.
 - a. Apply backer rod and elastomeric joint filler into isolation or expansion joints in compliance with manufacturer's directions.
- B. Unless directed by the Contract Documents do not install high performance coatings on:
1. Ferrous metals installed in concrete slabs
 2. Non-ferrous metals installed in or adjacent to concrete slabs.
 3. Pipe, conduit, floor drains, insulated conductors, or other electrical, mechanical or process-related equipment.
- C. Installation of EPOXY FLOORING SYSTEM

Specifications

1. Set in place zinc strips to divide/join flooring system.
2. Trowel apply cove base as required by using a mixture of resin and aggregate to form required cove base.
3. Pour a line of PC 352 SL Cretecoat mixed liquids and cement filler onto area to be coated and using a gauged rake, pull material back and forth in an "S" pattern to manipulate the material into an even layer and to pull the material tight against the zinc strips.
4. While material is wet and resin is open, broadcast to rejection PCA 331 standard broadcasting aggregate and allow to cure.
5. Vacuum up any excess aggregate and apply one full coat of PC 421 pigmented at 16-20 mils.
6. The flooring system components shall be considered as hazardous materials. Read and observe container label warnings and Material Safety Data Sheets for health and safety information prior to starting mixing operations.
7. Do not reseal mixed material. Permit final chemical set to occur in the container and when set has been achieved; dispose of hardened material by legal means.
8. Do not apply any material that has exceeded shelf and pot life as determined by manufacturer.

D. Installation of EPOXY WALL COATING SYSTEM

1. Primer/Filler Coat: Mix primer/thixotropic block fill PC 630 components with a Jiffy Mixer for a minimum of 2 minutes, then apply by roller or spray to floors, walls and ceilings. Back-roll epoxy material to force into pores. Note: Wall areas that are porous, i.e. concrete masonry units require a minimum of 12-20 mils while less porous substrates such as ceilings and floors require a minimum thickness of 6-8 mils.
2. Build Coat: Mix PC 200 fiberglass/Kevlar®-reinforced body coat with a Jiffy Mixer for a minimum of 2 minutes and apply to all previously primed floors, walls and ceilings with a 45:1 air-powered airless spray rig with gravity-fed hopper at and allow curing. Minimum thickness of 45 mils DFT.
3. Final Finish/Glaze Coat: After build coat is fully cured, abrade all surfaces to remove any exposed fiberglass and other imperfections. Mix PC 400 with PC 499 Additive and apply one full coat at 8-10 mils.
4. For all mixing operations, the flooring system components shall be considered as hazardous materials. Read and observe container label warnings and Material Safety Data Sheets for health and safety information prior to starting mixing operations.
5. Do not reseal mixed material. Permit final chemical set to occur in the container and when set has been achieved; dispose of hardened material by legal means.
6. Do not apply any material that has exceeded shelf and pot life as determined by manufacturer.

3.4 CURING

- A. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during curing processes.
1. Temperatures shall be maintained at 70°F – 80°F if at all possible.
 2. Water leaks must be prevented as they will compromise components ability to set properly. Water drips may compromise or stain finishes.
 3. Steam or any airborne contamination will adversely affect curing.

3.5 FIELD QUALITY CONTROL

Specifications

- A. Testing and Inspecting: Engage special inspectors to perform tests and inspections and prepare reports. Allow inspectors access to scaffolding and work areas as needed to perform tests and inspections. Retesting of materials that fail to comply with specified requirements shall be done at Design Builder's expense.
 - 1. Material Sampling: Owner's representative may at any time and any number of times during resinous coating application require the testing agency to collect additional material samples for testing for compliance with requirements.
 - a. Material samples will be taken, identified, sealed, and certified in presence of Installer.
 - b. Testing agency will test samples for compliance with requirements, using applicable referenced testing procedures in addition to testing procedures listed in manufacturer's product data.
 - 2. If test results show applied materials do not comply with specified requirements, Installer shall correct all deficiencies of coating system in a method and manner acceptable to the manufacturer's recommendations.

3.6 CLEANING

- A. Work area shall be left clean with all trash, equipment, and leftovers removed.
- B. Floor and walls may be cleaned prior to final inspection, providing complete curing has taken place. Generally, non-chlorinated detergents should be used for the first month after curing is complete.
- C. For optimum coating performance and cleanability, manufacturer recommends the use of liquid soaps to prevent caking on epoxy surfaces caused by bar soaps.
- D. Remove spilled, splashed, or splattered coating materials from all surfaces.
- E. Do not mar surface finish of items being cleaned.

3.7 PROTECTION

- A. Protect from damage and wear during the construction process. Comply with manufacturer's recommendations for protective materials and their method of application. Remove temporary protection prior to final inspection. Protection from welding, impact from heavy tools and other abuse is anticipated, the subcontractor doing the work shall take extra care in protecting the floor with impact resistance and if necessary, flame resistant coverings.

END OF SECTION 099800



Specifications

10 10 00 - VISUAL COMMUNICATIONS SPECIALTIES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM B221 (2012) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC (2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System

1.2 SYSTEM DESCRIPTION

The term visual display board when used herein includes marker boards and projection screens; submit manufacturer's descriptive data and catalog cuts plus manufacturer's installation instructions, and cleaning and maintenance instructions. Visual display boards shall be from manufacturer's standard product line. Submit certificate of compliance signed by Contractor attesting that visual display boards conform to the requirements specified.

1.3 SUSTAINABILITY REQUIREMENTS

Materials in this technical specification may contribute towards contract compliance with sustainability requirements.

1.3.1 LEED REQUIREMENTS

LEED DOCUMENTATION for project LEED NC local/regional materials, and recycled content requirements.

1.4 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data Visual Display

Board

SD-04 Samples

Aluminum Porcelain
Enamel Materials

SD-07 Certificates Visual Display

Board

SD-11 Closeout Submittals LEED

Specifications

Documentation**1.5 DELIVERY, STORAGE, AND HANDLING**

Deliver materials to the building site in the manufacturer's original unopened containers and store them in a clean dry area with temperature maintained above 50 degrees F. Stack materials according to manufacturer's recommendations. Visual display boards shall be allowed to acclimate to the building temperature for 24 hours prior to installation.

1.6 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that extend beyond a one year period.

PART 2 PRODUCTS**2.1 MATERIALS****2.1.1 Porcelain Enamel**

Provide marker board writing surface composed of porcelain enamel fused to a nominal 28 gauge thick steel, laminated to a minimum 1/4 inch thick core material with a steel or foil backing sheet. Writing surface shall be capable of supporting paper by means of magnets. Marker board surface for display track system may be a powder paint dry erase surface adhered to a nominal 18 gauge thick steel. Submit section showing porcelain enamel coating, steel, core material and backing.

2.1.2 Aluminum

Aluminum frame extrusions shall be alloy 6063-T5 or 6063-T6, conform to ASTM B221, and be a minimum 0.06 inches thick. Exposed aluminum shall have an anodized, satin finish. Straight, single lengths shall be used wherever possible. Joints shall be kept to a minimum. Corners shall be mitered and shall have a hairline closure. Submit sections of frame, map rail, and chalktray, and two map hooks.

2.2 MARKERBOARD

Markerboard shall have a porcelain enamel writing surface and a chalktray. Markerboard shall be a factory assembled unit complete in one piece, without joints whenever possible. When markerboard dimensions require delivery in separate sections, components shall be prefabricated at the factory, disassembled for delivery and jointed at the site. Frame shall be aluminum. Chalktray shall be the same material as the frame and extend the full length of the liquid markerboard. Dry erase markings shall be removable with a felt eraser or dry cloth without ghosting. Each unit shall come complete with an eraser and four different color compatible dry erase markers. The size shall be as shown in the drawings.

2.3 PROJECTION SCREEN

Motorized projection screen shall have 120V motor that is lubricated for life, quick reversal type, has overload protector, integral gears, and preset accessible limit switches. Recessed mount projection screens shall have an operable closure door and access panel. Screen shall be flame retardant, mildew resistant, and white matte with black masking borders. Bottom of screen fabric shall be weighted with metal rod. Roller shall be a rigid metal at least 3 inches in diameter mounted on sound absorbing supports. Motor will be end mounted or motor-in-roller design. Screen shall have a 3 position control switch to stop or reverse screen at any point. The switch shall be installed in a flush electrical box with cover plate, location(s) as shown on the electrical drawings. All conduit and wiring from the control switch to the projection screen shall be furnished and installed by the Contractor. Ceiling recessed case shall be extruded aluminum with metal lined motor compartment. Wall or Ceiling mounted case shall be aluminum. Screen shall be UL listed. The size shall be as shown in the drawings.



Specifications

2.4 COLOR

Finish colors for required items shall be as selected by Architect.

PART 3 EXECUTION

3.1 INSTALLATION

Perform installation and assembly in accordance with manufacturer's printed instructions. Use concealed fasteners. Visual display boards shall be attached to the walls with suitable devices to anchor each unit. Furnish and install trim items, accessories and miscellaneous items in total, including but not limited to hardware, grounds, clips, backing materials, adhesives, brackets, and anchorages incidental to or necessary for a sound, secure, complete and finished installation. Installation shall not be initiated until completion of room painting and finishing operations. Visual display boards shall be installed in locations and at mounting heights indicated. Visual display boards shall be installed level and plumb, and if applicable doors shall be aligned and hardware shall be adjusted. Damaged units shall be repaired or replaced as directed by the Architect.

3.2 CLEANING

Writing surfaces shall be cleaned in accordance with manufacturer's instructions.

-- End of Section --

10 22 39 - FOLDING PANEL PARTITIONS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A653/A653M	(2011) Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process
ASTM B221	(2012) Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes
ASTM E413	(2010) Rating Sound Insulation
ASTM E557	(2012) Installation of Operable Partitions
ASTM E90	(2009) Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements

1.2 SYSTEM DESCRIPTION

- a. No less than 30 calendar days prior to the scheduled commencement of installation, submit the following to the Architect:

Manufacturer's Qualifications
Manufacturer's Sample Warranty
Statement of Code Compliance
Statement of Standards Conformity
Verification of Field Measurements
Fabrication Drawings
Installation Instructions

- b. Supply and install manual operation, acoustical folding panel partitions, factory finished, supported from overhead track without floor guides, as shown on the drawings including all hardware, seals, track and rollers as needed to close the specified opening.
- c. Submit drawings to demonstrate that the system has been coordinated and will properly function as a unit. Show layout of the work; track and jamb fastening methods; seal and installation details; and equipment relationship to other parts of the work including clearances for maintenance and operation.

1.2.1 Manual Operation

The manual operation shall be a force no greater than 20 lbf to start movement at the rate of 3.33 ft/s (200 ft/min). Use a removable handle to extend and retract the bottom operable seals; vertical movement of seals shall be 2 inches. Closure to the lead wall shall be by use of a flexible bulb; accomplish final closing by means of a lever exerting pressure against the wall.

Specifications

1.2.2 Laboratory Acoustical Requirements

Provide partitions tested in accordance with ASTM E90, by a laboratory accredited by the U.S. Bureau of Standards, that have attained a sound transmission class (STC) of not less than 51 in a fully extended position. Partition tested shall be of the same construction, materials, and model number as the partition to be provided and be fully operable. Panel weight shall be a minimum of 10.0 psf for STC up to 53. Design panel thickness (3 inch nominal) and composition to provide the required STC rating in accordance with ASTM E90 and ASTM E413.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals

- Manufacturer's Qualifications
- Manufacturer's Sample Warranty
- Statement of Code Compliance
- Statement of Standards Conformity
- Verification of Field Measurements

SD-02 Shop Drawings

- Installation Layouts

SD-03 Product Data

- Folding Panel Partitions Installation Instructions

SD-04 Samples

- Folding Panel Partitions

SD-06 Test Reports

- Acoustical Test
- Flame and Smoke Development Tests

SD-07 Certificates

- Materials
- Folding Panel Partitions

SD-10 Operation and Maintenance Data Folding Panel

- Partitions

1.4 DELIVERY, STORAGE, AND HANDLING

Deliver materials to the jobsite in the manufacturer's original, unopened, and undamaged packages with labels legible and intact. Provide labels to indicate the manufacturer, brand name, size, finish, and placement location. Store partitions and accessories in unopened packages in a manner that will prevent damage. Handle partition materials in accordance with manufacturer's instructions. Protect materials from the weather, humidity and temperature variations, dirt and dust, or other contaminants.

Specifications

1.5 WARRANTY

Provide Manufacturer's standard performance guarantees or warranties that extend beyond a 1 year period. In addition, provide guarantee of the pantographs, trolleys and tracks for 10 years from date of acceptance for beneficial use.

PART 2 PRODUCTS**2.1 MATERIALS**

Provide material and equipment which are the standard products of a manufacturer regularly engaged in the manufacture of such products and essentially duplicate items that have been in satisfactory use for at least 2 year prior to bid opening. Submit Certificate attesting that the materials meet the requirements specified. Equipment shall be supported by a service organization that is, in the opinion of the Owner, reasonably convenient to the site. Provide heavy-duty type hardware standard with the manufacturer. Provide pulls and latches for all partitions. Provide partitions with magnetic contact latches. Provide anodized aluminum clear finish hardware.

2.2 FOLDING PANEL PARTITIONS

Provide folding panel partitions using top hung ball bearing carriers which support modular panels.

- a. Provide partitions made up of a series of rigid panels, each panel being a one-piece assembly. Unless otherwise specified, use the least number of panels. The mechanical seal of the panel shall actuate with a single operating action.
- b. Provide panels single omni-directional type as indicated.
- c. Submit six complete copies of maintenance instructions explaining routine maintenance procedures including inspection, adjustments, lubrication, and cleaning. List possible breakdown, methods of repair, and a troubleshooting guide. Include instructions for equipment layout and simplified wiring and control diagrams of the system as installed and also the manufacturer's name, model number, service manual, parts list, and brief description of all equipment and operating features. Include a complete list of parts and supplies, with current unit prices and source of supply, and a list of the parts recommended by the manufacturer to be replaced after 1 year and 3 years of service.
- d. Submit three Color samples of specified surfaces and finishes to match those specified. Finish and color requirements are not limited to manufacturer's standard selections in order to meet these requirements. Also submit certificate attesting that partitions have specified acoustical and flame retardant properties, as determined by test.

2.2.1 Panels

Provide panels of steel skin, laminated to appropriate structural acoustical backing, mounted in full perimeter protective frame. Steel for the panel frames shall be a minimum of 22 gauge thick steel with minimum 22 gauge thick face panels spot welded to the frame. Frame shall enclose and protect all edges of the surface material. Panels shall be not more than 4 feet wide, except for end closure panels, and be full height to track. Panels shall lock in place to form a stable, rigid partition; low profile hinges may not project more than 1/4 inch maximum from panel edge. Panel surfacing shall wrap around the vertical panel edges without vertical trim.

Specifications

2.2.2 Track

Provide recess extruded aluminum or enamel finish steel track as shown. Conform aluminum to ASTM B221. Steel shall conform to ASTM A653/A653M. Provide track that is the manufacturer's standard product designed for the weight of the finished partition, including door. Provide track sections in the maximum lengths practicable, and not less than 6 feet long except for narrow doors and at ends of runs where short length is required. Provide suitable joint devices such as interlocking keys at each joint to provide permanent alignment of track.

2.2.3 Suspension System

Provide a suspension system consisting of steel or heavy duty extruded aluminum track connected to the structural support by threaded rods, and trolleys designed to support the weight of the partition. Provide steel track of 7 gage minimum, phosphate treated or painted. Provide extruded aluminum track with minimum thickness of 1/8 inch. Provide center hung panel with 1 trolley with four ball bearing nylon or steel tired wheels per panel.

2.3 ACCESSORIES**2.3.1 Ceiling Guards**

Furnish partitions with ceiling guards or integral track and ceiling guards as recommended by the manufacturer.

2.3.2 Metal Soffit

Provide soffit when steel track is recessed. Provide metal soffit of adequate thickness to protect the ceiling from damage by door operation and with the door manufacturer's standard neutral-color applied finish. Soffit on aluminum track shall be an integral part of the track

2.4 SEALS AND SWEEPSTRIPS

Provide perimeter seals or sound insulation, of manufacturer's standard product, to achieve the sound transmission class specified and to pass the visual field test specified, without crack or craze when subjected to severe usage. Provide mechanical bottom seal that can be raised or lowered for positive control. Provide manufacturer's vertical seals between panels to ensure acoustical rating. Bottom seals shall consist of a vinyl sweep mechanical seal which will expand in place, or provide panels which can be lowered by a removable operating device. Provide vertical seal between panels which is anodized, architectural grade, aluminum extrusion with vinyl sound seal. Sweep strips shall be vinyl or other material that will not crack or craze with severe usage. Provide sweep strip STC to the specified rating.

2.5 COLOR

Color: selected from manufacturers standard colors by Architect.

PART 3 EXECUTION**3.1 INSTALLATION**

Install in accordance with the manufacturer's approved instructions.

3.1.1 Preparation Work

Verify dimensions and condition of openings scheduled to receive folding panel partitions. Install partitions in accordance with the approved partition layouts, manufacturer's directions, and ASTM E557. Provide structural support for the track support elements as indicated.



Specifications

3.1.2 Adjustment

Adjust manually operated partitions to open and close from any position with a maximum horizontal force as specified in paragraph Manual Operation applied to pendant pull, box or handle.

3.2 FIELD TESTS

3.2.1 Operational Test

In the presence of the Owner, operate partition at least three times to demonstrate that partition is capable of being moved from the stored position to the fully extended position smoothly and quietly. Activate mechanical seals top and bottom. Adjust partitions which do not operate properly and retest.

3.2.2 Visual Test

Conduct visual field tests for light leakage with all room lights turned on in the space on one side of the partition. Darken space on the other side of the partition. Light leakage from the lighted space to the darkened space is not acceptable. If light leakage does occur, adjust the partition to correct the problem and retest.

3.3 CLEANING

Clean any soiled parts of the partition in accordance with manufacturer's printed instructions.

-- End of Section --



10 26 13 - WALL AND CORNER GUARDS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Wall guards.
 - 2. Corner guards.
- B. Related Requirements:
 - 1. Division 7 Section "Security Joint Sealants" for requirements for and locations to receive security joint sealants.
 - 2. Division 11 Section "Tamper-Proof Metal Fasteners" for requirements for and locations to receive security fasteners.

1.3 ACTION SUBMITTALS

- A. Product Data: For each type of product.
 - 1. Include construction details, material descriptions, impact strength, dimensions of individual components and profiles, and finishes.
- B. LEED Submittals:
 - 1. Product Data for Credit MR 4: For products having recycled content, documentation indicating percentages by weight of postconsumer and preconsumer recycled content. Include statement indicating cost for each product having recycled content.
 - 2. Product Certificates for Credit MR 5: For products and materials required to comply with requirements for regional materials, certificates indicating location of material manufacturer and point of extraction, harvest, or recovery for each raw material. Include statement indicating distance to Project, cost for each regional material, and fraction by weight that is considered regional.
 - 3. Product Data for Credit IEQ 4.1: For adhesives, documentation including printed statement of VOC content.



Specifications

- C. Shop Drawings: For each impact-resistant wall protection unit showing locations and extent. Include sections, details, and attachments to other work.
 - 1. For installed products indicated to comply with design loads, include structural analysis data signed and sealed by the qualified professional engineer responsible for their preparation.
- D. Samples for Initial Selection: For each type of impact-resistant wall-protection unit indicated, in each color and texture specified.
 - 1. Include Samples of accent strips and accessories to verify color selection.
- E. Samples for Verification: For each type of exposed finish on the following products, prepared on Samples of size indicated below:
 - 1. Wall and Corner Guards: 12 inches (300 mm) long. Include examples of joinery, corners, and field splices.

1.4 INFORMATIONAL SUBMITTALS

- A. Material Certificates: For each type of exposed plastic material.
- B. Material Test Reports: For each impact-resistant material.
- C. Sample Warranty: For special warranty.

1.5 CLOSEOUT SUBMITTALS

- A. Maintenance Data: For each type of impact-resistant wall protection product to include in maintenance manuals.
 - 1. Include recommended methods and frequency of maintenance for maintaining best condition of plastic materials under anticipated traffic and use conditions. Include precautions against using cleaning materials and methods that may be detrimental to finishes and performance.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store impact-resistant wall-protection units in original undamaged packages and containers inside well-ventilated area protected from weather, moisture, soiling, extreme temperatures, and humidity.
 - 1. Maintain room temperature within storage area not less than 70 deg F (21 deg C) during the period plastic materials are stored.
 - 2. Keep plastic materials out of direct sunlight.
 - 3. Store plastic wall- and door-protection components for a minimum of 72 hours, or until plastic material attains a minimum room temperature of 70 deg F (21 deg C).
 - a. Store corner-guard covers in a vertical position.
 - b. Store wall-guard covers in a horizontal position.



Specifications

1.7 WARRANTY

- A. Special Warranty: Manufacturer agrees to repair or replace components of wall- and door-protection units that fail in materials or workmanship within specified warranty period.
 - 1. Failures include, but are not limited to, the following:
 - a. Structural failures including detachment of components from each other or from the substrates, delamination, and permanent deformation beyond normal use.
 - b. Deterioration of plastics and other materials beyond normal use.
 - 2. Warranty Period: Two years from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. Source Limitations: Obtain impact-resistant wall protection products from single source from single manufacturer.

2.2 PERFORMANCE REQUIREMENTS

- A. Surface Burning Characteristics: Comply with ASTM E 84 or UL 723; testing by a qualified testing agency. Identify products with appropriate markings of applicable testing agency.
 - 1. Flame-Spread Index: 25 or less.
 - 2. Smoke-Developed Index: 450 or less.
- B. Structural Performance: Handrails, including attachment to building construction, shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
 - 2. Concentrated load of 200 lbf (0.89 kN) applied in any direction.
 - 3. Uniform and concentrated loads need not be assumed to act concurrently.
- C. Regulatory Requirements: Comply with applicable provisions in the U.S. Architectural & Transportation Barriers Compliance Board's ADA-ABA Accessibility Guidelines for Buildings and Facilities and ICC A117.1.

2.3 WALL AND CORNER GUARDS (HDPE)

- A. Heavy-duty assembly consisting extruded 100% post-consumer HDPE. The guards are surface mounted with concealed hardware and designed to withstand impacts.

Specifications

B. Wall and Guards:

1. Manufacturers: Subject to compliance with requirements, provide products by one of the following :
 - a. Balco, Inc.
 - b. Construction Specialties, Inc.
 - c. IPC Door and Wall Protection Systems; Division of InPro Corporation.
 - d. Korogard Wall Protection Systems; a division of RJF International Corporation.
 - e. Musson Rubber Company.
 - f. WallGuard.com

C. Design Criteria:

1. Profile, dimensions, and mounting height:
 - a. Refer to details for actual sizes, locations, mounting height and anchorage requirements
2. Density: (ASTM D6111) .024-.027 lbs/cu-in
3. Modulus of Elasticity: (ASTM D6109) 114,000 psi at 1% strain
4. Ultimate Flexural Stress: (ASTM D6109) 2300 psi at 3% strain
5. Allowable Flexural Stress: (ASTM D6109) 1200 psi
6. Endwise Compressive Stress: (ASTM D6108) 1740 psi at 3% strain
7. Screw Withdrawal: (ASTM D6117 7) 90 lbs (#10 x 1 ½")
8. Water Absorption, 11 weeks: (ASTM D570) less than 0.1%
9. Coefficient of Thermal Expansion: (ASTM D6341) .000055 in/in/OF
10. Stock length: 12'-0"

D. Color and Texture: As selected by Owner from manufacturer's full range.

2.4 MATERIALS

- A. Aluminum Extrusions: Alloy and temper recommended by manufacturer for type of use and finish indicated, but with not less than strength and durability properties specified in ASTM B 221 for Alloy 6063-T5.
- B. High-Density Polyethylene (HDPE): High-density polyethylene shapes shall be extruded from high-percentage post consumer recycled plastic and reinforced with fiberglass. Product shall be fully recyclable.
- C. Fasteners: Aluminum, nonmagnetic stainless-steel, or other noncorrosive metal screws, bolts, and other fasteners compatible with items being fastened. Use security-type fasteners where exposed to view.
- D. Adhesive: As recommended by protection-product manufacturer and with a VOC content of 70 g/L or less.



Specifications

2.5 FABRICATION

- A. Fabricate impact-resistant wall protection according to requirements indicated for design, performance, dimensions, and member sizes, including thicknesses of components.
- B. Factory Assembly: Assemble components in factory to greatest extent possible to minimize field assembly. Disassemble only as necessary for shipping and handling.
- C. Quality: Fabricate components with uniformly tight seams and joints and with exposed edges rolled. Provide surfaces free of wrinkles, chips, dents, uneven coloration, and other imperfections. Fabricate members and fittings to produce flush, smooth, and rigid hairline joints.

2.6 FINISHES

- A. Protect finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- B. Appearance of Finished Work: Noticeable variations in same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates and wall areas, with Installer present, for compliance with requirements for installation tolerances, fire rating, and other conditions affecting performance of the Work.
- B. Examine walls to which wall and door protection will be attached for blocking, grounds, and other solid backing that have been installed in the locations required for secure attachment of support fasteners.
 - 1. For wall and door protection attached with adhesive, verify compatibility with and suitability of substrates, including compatibility with existing finishes or primers.
- C. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

- A. Complete finishing operations, including painting, before installing impact-resistant wall protection.
- B. Before installation, clean substrate to remove dust, debris, and loose particles.



Specifications

3.3 INSTALLATION

- A. Installation Quality: Install impact-resistant wall protection according to manufacturer's written instructions, level, plumb, and true to line without distortions. Do not use materials with chips, cracks, voids, stains, or other defects that might be visible in the finished Work.
- B. Mounting Heights: Install impact-resistant wall protection in locations and at mounting heights indicated on Drawings. Install guards accurately in location, alignment, and elevation.
- C. Wall and corner guards (HDPE) to be set in continuous bed of mastic and anchorage holes to be counter bored and then filled with plugs and plastic welder and finished smooth

3.4 CLEANING

- A. Immediately after completion of installation, clean plastic products and accessories using a standard ammonia-based household cleaning agent.
- B. Remove excess adhesive using methods and materials recommended in writing by manufacturer.

END OF SECTION 10 26 13



10 28 13 - TOILET ACCESSORIES

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM C1036 (2010; E 2012) Standard Specification for Flat Glass

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC (2009) Leadership in Energy and Environmental Design(tm)
New Construction Rating System

1.2 SUSTAINABILITY REQUIREMENTS

Materials in this technical specification may contribute towards contract compliance with sustainability requirements. See Section 01 33 29 LEED DOCUMENTATION for project LEED NC local/ regional materials, and recycled content requirements.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Finishes Accessory Items

SD-10 Operation and Maintenance Data

SD-11 Closeout Submittals

LEED Documentation

1.4 DELIVERY, STORAGE, AND HANDLING

Wrap toilet accessories for shipment and storage, then deliver to the jobsite in manufacturer's original packaging, and store in a clean, dry area protected from construction damage and vandalism.

1.5 WARRANTY

Provide manufacturer's standard performance guarantees or warranties that extend beyond a 1 year period.

PART 2 PRODUCTS

2.1 MANUFACTURED UNITS

Provide toilet accessories where indicated. Provide each accessory item complete with the necessary mounting plates of sturdy construction with corrosion resistant surface.

Specifications**2.1.1 Anchors and Fasteners**

Provide anchors and fasteners capable of developing a restraining force commensurate with the strength of the accessory to be mounted and suited for use with the supporting construction. Provide tamperproof design exposed fasteners with finish to match the accessory.

2.1.2 Finishes

Except where noted otherwise, provide the following finishes on metal:

Metal	Finish
Stainless steel	No. 4 satin finish
Carbon steel, copper alloy, and brass	Chromium plated, bright

2.2 ACCESSORY ITEMS

Conform to the requirements for accessory items specified below. Submit fasteners proposed for use for each type of wall construction, mounting, operation, and cleaning instructions and one sample of each other accessory proposed for use. Incorporate approved samples into the finished work, provided they are identified and their locations noted. Submit certificate for each type of accessory specified, attesting that the items meet the specified requirements.

2.2.1 Grab Bar (GB)

Provide an 18 gauge, 1-1/4 inch grab bar OD Type 304 stainless steel. Provide form and length for grab bar as indicated. Provide concealed mounting flange. Provide grab with peened non-slip surface. Furnish installed bars capable of withstanding a 500 pound vertical load without coming loose from the fastenings and without obvious permanent deformation. Allow 1-1/2 inch space between wall and grab bar.

2.2.2 Mirrors, Glass (MG)

Provide Type I transparent flat type, Class 1-clear glass for mirrors. Glazing Quality q1 1/4 inch thick conforming to ASTM C1036. Coat glass on one surface with silver coating, copper protective coating, and mirror backing paint. Provide highly adhesive pure silver coating of a thickness which provides reflectivity of 83 percent or more of incident light when viewed through 1/4 inch thick glass, free of pinholes or other defects. Provide copper protective coating with pure bright reflective copper, homogeneous without sludge, pinholes or other defects, of proper thickness to prevent "adhesion pull" by mirror backing paint. Provide mirror backing paint with two coats of special scratch and abrasion-resistant paint and baked in uniform thickness to provide a protection for silver and copper coatings which will permit normal cutting and edge fabrication.

2.2.3 Paper Towel Dispenser (PTD)

Provide paper towel dispenser constructed of a minimum 0.03 inch Type 304 stainless steel. Provide a towel compartment for each dispenser. Furnish tumbler key lock locking mechanism.

2.2.4 Soap Dispenser (SD)

Provide soap dispenser surface mounted, liquid type consisting of a vertical Type 304 stainless steel tank with holding capacity of 40 fluid ounces with a corrosion-resistant all-purpose valve that dispenses liquid soaps, lotions, detergents and antiseptic soaps.

Specifications

2.2.5 Shelf, Metal, Heavy Duty (SMHD)

Furnish a minimum 18 gauge stainless steel heavy duty metal shelf with hemmed edges. Provide shelves over 30 inch with intermediate supports. Provide minimum of 16 gauge supports, welded to the shelf, and spaced no more than 30 inch apart.

2.2.6 Toilet Tissue Dispenser (TTD)

Furnish toilet tissue holder with two rolls of standard tissue stacked vertically. Provide stainless steel, satin finish cabinet.

2.2.7 Mop and Broom Holder (MH)

Stainless steel with grip jaw cam mechanism securing 5 mop or broom handles. Also includes hooks and storage shelf.

PART 3 EXECUTION**3.1 INSTALLATION**

Provide the same finish for the surfaces of fastening devices exposed after installation as the attached accessory. Install accessories at the location and height indicated. Protect exposed surfaces of accessories with strippable plastic or by other means until the installation is accepted. After acceptance of accessories, remove and dispose of strippable plastic protection. Coordinate accessory manufacturer's mounting details with other trades as their work progresses. After installation, thoroughly clean exposed surfaces and restore damaged work to its original condition or replace with new work.

3.1.1 Recessed Accessories

Set anchors in mortar in masonry construction.

3.1.2 Surface Mounted Accessories

Mount on concealed backplates, unless specified otherwise. Conceal fasteners on accessories without backplates. Install accessories with sheet metal screws or wood screws in lead-lined braided jute, PTFE or neoprene sleeves, or lead expansion shields, or with toggle bolts or other approved fasteners as required by the construction. Install backplates in the same manner, or provide with lugs or anchors set in mortar, as required by the construction. Fasten accessories mounted on gypsum board and plaster walls without solid backing into the metal or wood studs or to solid wood blocking secured between wood studs, or to metal backplates secured to metal studs.

3.2 CLEANING

Clean material in accordance with manufacturer's recommendations. Do not use alkaline or abrasive agents. Take precautions to avoid scratching or marring exposed surfaces.

-- End of Section --



Specifications

10 44 16 - FIRE EXTINGUISHERS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

INTERNATIONAL CODE COUNCIL (ICC)

ICC IFC (2012) International Fire Code NATIONAL

FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 1 (2012; TIA 11-1) Fire Code

NFPA 10 (2013) Standard for Portable Fire Extinguishers

NFPA 101 (2012; Amendment 1 2012) Life Safety Code

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.157 (2003) Portable Fire Extinguishers

UNDERWRITERS LABORATORIES (UL)

UL 299 (2012) Dry Chemical Fire Extinguishers

1.2 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-01 Preconstruction Submittals Manufacturer's Data

SD-03 Product Data

Fire Extinguishers Cabinets
Replacement Parts

SD-04 Samples

Cabinet

SD-07 Certificates Fire

Extinguishers
Manufacturer's Warranty with Inspection Tag

1.3 DELIVERY, HANDLING, AND STORAGE

Protect materials from weather, soil, and damage during delivery, storage, and construction.



Specifications

Deliver materials in their original packages, containers, or bundles bearing the brand name and the name and type of the material.

1.4 WARRANTY

Guarantee that Fire Extinguishers are free of defects in materials, fabrication, finish, and installation and that they will remain so for a period of not less than 6 years after completion.

PART 2 PRODUCTS

Submit fabrication drawings consisting of fabrication and assembly details performed in the factory and product data for the following items:

Fire Extinguishers; Accessories, Cabinets, Wall Brackets.

2.1 TYPES

Submit certificates that show Fire Extinguishers comply with local codes and regulations.

Provide Fire Extinguishers conforming to NFPA 10. Provide quantity and placement in compliance with the applicable sections of ICC IFC, Section 1414 and ICC IFC, Section 906, NFPA 1, NFPA 101, and 29 CFR 1910.157.

Provide dry chemical type fire extinguishers compliant with UL 299.

Submit Manufacturer's Data for each type of Fire Extinguisher required, detailing all related Cabinet, Wall Mounting and Accessories information, complete with Manufacturer's Warranty with Inspection Tag.

2.2 MATERIAL

Provide enameled steel extinguisher shell.

2.3 SIZE

10 pounds extinguishers.

2.4 ACCESSORIES

Forged brass valve Pressure gage

2.5 CABINETS

2.5.1 Material

Provide enameled steel cabinets.

2.5.2 Type

Provide surface type cabinets.

2.5.3 Size

Dimension cabinets to accommodate the specified fire extinguishers.



Specifications

PART 3 EXECUTION

3.1 INSTALLATION

Install Fire Extinguishers where indicated on the drawings. Verify exact locations prior to installation.

Comply with the manufacturer's recommendations for all installations.

Provide extinguishers which are fully charged and ready for operation upon installation. Provide extinguishers complete with Manufacturer's Warranty with Inspection Tag attached.

3.2 ACCEPTANCE PROVISIONS

3.2.1 Repairing

Remove and replace damaged and unacceptable portions of completed work with new work at no additional cost to the Government.

Submit Replacement Parts list indicating specified items replacement part, replacement cost, and name, address and contact for replacement parts distributor.

3.2.2 Cleaning

Clean all surfaces of the work, and adjacent surfaces which are soiled as a result of the work. Remove from the site all construction equipment, tools, surplus materials and rubbish resulting from the work.

-- End of Section --

11 10 00 – COMMERCIAL LAUNDRY EQUIPMENT**PART 1 GENERAL**

- 1.1 DEFINITIONS The following definitions are intended to clarify the relationships involved in this document and are used as a definition throughout this foodservice specification.
- A. Laundry Equipment Contractor (L.E.C.) – The L.E.C. is responsible for supplying, delivering (including freight, staging and local warehousing as required), assembling, setting in place, installing, cleaning, sanitizing and/or the polishing of any further foodservice item(s) included in this contract, but not limited to all required materials and labor, pursuant to the guidelines and time lines scheduled and/or rescheduled by the Owner, Architect and/or SSA, Incorporated.
 - B. Sub-Contractors – The L.E.C. may contract Sub-Contractors to perform any portion of the contract, but the final responsibility for the proper performance of the contract rest solely with the L.E.C.
 - C. General Contractor (G.C.) – The G.C. / Construction Manager (C.M.) has the responsibility for overall installation, scheduling, deliveries, coordination of various trades, rough-in and connection of utilities, including but not limited to all labor and materials for said rough-ins and connections for all equipment in this contract unless otherwise specified, by item, within the equipment data specification sections of this contract. The L.E.C. must coordinate his/her activities and needs with the G.C. / C.M. in a timely manner as not to delay the project.
 - D. Laundry Facility Designer / Consultant – SSA, Incorporated (SSA) is the Laundry designer for this project.
 - E. The L.E.C. is the party responsible for all taxes, tariffs, duties and/or custom fees and permits where applicable, as may be required. The L.E.C. is contracted by the owner.
 - F. N.I.F.C. – Whenever the abbreviation N.I.F.C. is used in this contract, it shall mean the item or items are not part of the Laundry Equipment Contract.
 - G. The assignments and/or responsibilities as outlined in this section are subject to change at the Owner's discretion.
- 1.2 RELATED SECTIONS
- A. Section 15050 - Basic Mechanical Materials and Methods; mechanical connections.
 - B. Section 16050 - Basic Electrical Materials and Methods; electrical connections.
- 1.3 REFERENCES
- A. Energy Star - U.S. Environmental Protection Agency and U.S. Department of Energy, Energy Star Program.
 - B. EN 14065 - Textiles - Reprocessed Textiles in Laundries - Bio contamination Control System.
 - C. ISO 9001 - Quality Management of Systems.
- 1.4 SUBMITTALS
- A. Submit under provisions of Section 01300.

Project Specifications

- B. Product Data: Manufacturer's data sheets on each product to be used, including:
 - 1. Preparation instructions and recommendations.
 - 2. Cleaning and maintenance instructions.
 - C. Shop Drawings: Provide shop drawings indicating details of construction and installation including but not limited to plans, elevations, sections, roughing-in dimensions, fabrication details, utility service requirements, and attachments to other work.
 - D. Coordination Drawings: Indicate locations of laundry equipment and connections to utilities, and clearance requirements for equipment access and maintenance.
 - E. Operation and Maintenance Data: For laundry equipment to include in operation and maintenance manuals. Include a schedule with the following:
 - 1. Manufacturer's name and model number.
 - 2. List of factory-authorized service agencies including their addresses and telephone numbers.
- 1.5 DELIVERY, STORAGE AND HANDLING
- A. Deliver, store and handle materials and products in strict compliance with manufacturer's instructions and recommendations and industry standards. Store materials within absolute limits for temperature and humidity recommended by the manufacturer. Protect from damage.
 - B. Store products in manufacturer's labeled packaging until ready for installation.
- 1.6 PROJECT CONDITIONS
- A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.
- 1.7 SEQUENCING AND SCHEDULING
- A. Conference: Convene a pre-installation conference to establish procedures to maintain optimum working conditions and to coordinate this work with related and adjacent work.
- 1.8 WARRANTY
- A. Warranty: Manufacturer's standard limited warranty for materials and workmanship.

PART 2 PRODUCTS**2.1 BASIS OF DESIGN AND SPECIFICATION STANDARDS**

- A. The model number and product specifications of the named primary manufacturer, where more than one manufacturer is listed, was used for the basis of design and specification standards for this project with the respect to quality, performance, capacities, physical characteristics, appearance, aspect and function.
- B. All manufacturers listed for an item are subject to SSA's approval as a manufacturer for that item; however, the specifications of the primary manufacturer whose product is listed, as the basis of design and specification standards, with a model number and/or description will set the standard for that item. Other manufacturers may modify their product(s) if necessary to comply with the standards set forth herein.

Project Specifications

- C. Bidders who wish to use products by the alternate manufacturers must provide submittals to SSA, as set forth herein, for review of conformity and determination thereof.

STATUS CODES

- "A" Provided by Owner's L.E.C. and installed by General Contractor OR Construction Manager
"B" Provided by Owner and installed by General Contractor OR Construction Manager
"C" Provided and installed by Owner

2.2 SUBSTITUTIONS

- A. Substitution requests must be supplemented by sufficient information in the form of manufacturer's technical specifications, drawings, pictures and/or samples to evaluate equality, appearance and all other related conditions.
- B. Written substitution requests must be submitted to SSA in accordance with the guidelines and time lines as set forth by the Project Architect and/or Owner. Substitutions would not be considered if not submitted within these guidelines. Substitutions will not be allowed without prior written approval from SSA.
- C. All submittals for proposed substitutions must be submitted with an equipment data sheet for each item. The data sheet shall consist of the project name, the Project Architect, the Foodservice Consultant, the firm submitting, the item number, the manufacturer, the manufacturer's model number, a complete written description of what is to be provided, an accessories and options list of what is to be provided, finishes dimensions, utility requirements as provided (i.e. gas: nat or lp, electrical: voltage/phase and amps, plumbing/mechanical: water/sewer, etc.) as well as type of connection. The data sheet shall have a blank space (3-1/2" w x 5" h) in the lower right corner of the sheet for stamping, etc. This information must be submitted not less than fifteen days from the bid due date to be considered as an alternative.
- D. Where substitutions are made by the L.E.C. with the written approval of SSA / Project Architect, the L.E.C. shall be responsible for and pay all costs of any consequential modifications which may result from the substitution.
- E. If the L.E.C. decides to submit an alternate manufacturer and receives a written response from SSA / Project Architect accepting this change, then all resulting expenses incurred in the changes or additions to the Laundry equipment work as well as other contractors work shall be the sole responsibility of the L.E.C. and shall be considered as part of the base bid with no additional compensation permitted.
- F. The Manufacturer and model number of any article, device, material and/or form of construction listed in the "Itemized Specifications" as the "Primary Manufacturer" shall establish the "Basis of Design and Specification Standard", with respect to the physical dimensions, characteristics, aspects, capacities, performance and/or quantities required herein. If L.E.C. chooses to utilize one of the approved listed manufacturer's then they must provide submittal information to SSA's for analysis and conclusive determination with respect to that item.
- G. Accepted substitutions will be noted in an addendum issued by the PA/E. No other substitutions and/or deviations from the primary manufacturer will be permitted subsequent to the date of the Bid Opening, except by specific change order and only with sufficient cause. The approval of a substitution does not approve, relieve and/or change the Contractors responsibilities as outlined herein
- H. Requests for substitutions will be considered in accordance with provisions of Section 01600.

2.3 EQUIPMENT



Project Specifications

ITEM # L101 LAUNDRY SCALE

Dimensions:

Quantity: One (1)

BASIS OF DESIGN

Manufacturer: ARBEL-SOFT Custom Model: CASC-FL

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC	PCP
1	120	60	1				6.5					

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CASC-FL Laundry scale or similar

ITEM # L102 SOAK SINK

Dimensions:

Quantity: One (1)

BASIS OF DESIGN

Manufacturer: SWANSTONE

Model; MF2FFWH

Utilities:

WATER WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF
	CONDENSER INLET SIZE		CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE	
1	1/2"	1/2"			1	1-1/4"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model MF2FFWH Presoak sink or similar

ITEM # L103 EYEWASH STATION

BASIS OF DESIGN

Quantity: One (1) Manufacturer: HAWS

Model: 7260H-7220B

Utilities:

WATER WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF
	CONDENSER INLET SIZE		CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE	
1		1/2"			1	1-1/2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 7260H-7220B Eyewash station or similar.

ITEM # L104 DETERGENT SYSTEM

Model: BY VENDOR

Utilities:



Project Specifications

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC
1	120	60	1				20				

Furnish and set in place per manufacturer's standard specifications.
One (1) Model N/A Detergent system, by Vendor

ITEM # L105 MOBILE WORK TABLES

BASIS OF DESIGN

Quantity: Eight (8) Manufacturer: Emma Model: CUSTOM

Utilities:

Furnish and set in place per manufacturer's standard specifications.
Eight (8) Model CUSTOM Stainless steel mobile work table, sized and shaped as per plans. Table is to have a 14 gauge type 304 stainless steel top, stainless steel legs and no marking lockable casters.

ITEM # L106 SOILED LINEN CART

BASIS OF DESIGN

Quantity: Thirty-six (36) Manufacturer: LUXOR Model: HL14

Utilities:

Furnish and set in place per manufacturer's standard specifications.
Thirty-six (36) Model HL14 Soiled linen cart

ITEM # L107 CLEAN LINEN CART

BASIS OF DESIGN

Quantity: Twelve (12) Manufacturer: MEESE Model: 95PSL

Utilities:

Furnish and set in place per manufacturer's standard specifications.
Twelve (12) Model 95PSL clean linen cart

ITEM # L108 CONTINUOUS BATCH WASHER

SINGLE SOURCE

Quantity: Two (2)

Manufacturer: MILNOR

Model: 76028

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC
1	480	60	3				35				

WATER WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF
	CONDENSER	INLET SIZE	CONDENSER	OUTLET SIZE	INDIRECT	SIZE DIRECT	SIZE
1	2"				1	8"	

Furnish and set in place per manufacturer's standard specifications.
Two (2) Model 76028 Tunnel washer



Project Specifications

ITEM # L109 MEMBRANE PRESS
SINGLE SOURCE

Quantity: Two (2) Manufacturer: MILNOR Model: M1640CL
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC	PC
1	230	60	3				29					

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model M1640CL Membrane press

ITEM # L110 MILDATA CONTROL
SINGLE SOURCE

Quantity: Two (2)
Manufacturer: MILNOR
Model: M175
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC	PC
1	120	60	1				10					

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model M175 Mildata computer control



Project Specifications

ITEM # L111 LAUNDRY DRYER
SINGLE SOURCE

Quantity: Eight (8) Manufacturer: MILNOR Model: M170
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC
1	230	60	3				27				

WATER WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF
	CONDENSER	INLET SIZE	CONDENSER	OUTLET SIZE	INDIRECT SIZE	DIRECT SIZE	
1		3/4"			1		

Furnish and set in place per manufacturer's standard specifications.
Eight (8) Model M170

ITEM #L112 SHEET FEED CART
BASIS OF DESIGN

Quantity: Four (4)
Manufacturer: MEESE
Model: F026
Utilities:

GAS STEAM

	SIZE	MBTU	KW
1		550.0	

Furnish and set in place per manufacturer's standard specifications.
Four (4) Model F026 Sheet feed cart

ITEM # L113.1SHELVING
BASIS OF DESIGN

Quantity: Three (3) Manufacturer: Kelmax Model: 4H6977MOD

Furnish and set in place per manufacturer's standard specifications.
Three (3) Model 4H6977MOD Kelmax Shelving All Welded, Solid, 4 shelf unit, 72"H,48"W x 24"D,
aluminum construction, all shelves heavy duty, NSF-Modified Version



Project Specifications

ITEM # L113.1SHELVING

BASIS OF DESIGN

Quantity: Forty-one (41)
Manufacturer: KELMAX
Model: 4H6541MOD

Furnish and set in place per manufacturer's standard specifications.

Forty-one (41) Model 4H6541MOD Kelmax Shelving All Welded, Solid, 4 shelf unit, 72"H,60"W x 24"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # L113.2SHELVING

BASIS OF DESIGN

Quantity: Two (2) Manufacturer: Kelmax
Model: 4H6978MOD

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model 4H6978MOD Kelmax Shelving All Welded, Solid, 4 shelf unit, 72"H,42"W x 24"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # L114 SMALL PIECE FOLDER

BASIS OF DESIGN

Quantity: Two (2) Manufacturer: ChDryer
Model; AIR CHICAGO
Utilities:

ELECTRICAL

VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCF
1	208	60	3	8						

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model AIR CHICAGO Small piece folder



Project Specifications

ITEM # L115 LINT COLLECTOR

BASIS OF DESIGN

Quantity: One (1) Manufacturer: CLEAN CYCLE

Model: DLF

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC	PC
1	120	60	1				3					

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CLEAN CYCLE Lint collector

ITEM # L116 AIR COMPRESSOR

BASIS OF DESIGN

Quantity: One (1) Manufacturer: Ingresol rand

Model: 2-2545E7.5P

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC	PC
1	230	60	1						7.5			

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 2-2545E7.5P

ITEM # L117 Inmate break tables

BASIS OF DESIGN

Quantity: Three (3) Manufacturer: Fabricated Model: CUSTOM

Utilities:

Furnish and set in place per manufacturer's standard specifications.

Three (3) Model CUSTOM Inmate break table with benches.



Project Specifications

ITEM # L118 MOP SINK

BASIS OF DESIGN

Dimensions: 16(h) x 21(w) x 25(d)

Quantity: One (1) Manufacturer: Advance Tabco

Model: 9-OP-40

Utilities:

WATER WASTE

	HOT SIZE CONDENSER INLET SIZE	HOT AFF CONDENSER INLET SIZE	HOT GPH CONDENSER OUTLET SIZE	COLD SIZE CONDENSER OUTLET SIZE	COLD AFF INDIRECT SIZE	FILTERED SIZE DIRECT SIZE	FILTERED AFF DIRECT SIZE
1					1	2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 9-OP-40 Mop Sink, floor mounted, 20" L-R, 16" F-B, 12" high water level, free flow drain with 2" IPS outlet, stainless steel construction

ITEM # L119 SERVICE FAUCET

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Fisher

Model: 8261

Utilities:

WATER WASTE

	HOT SIZE CONDENSER INLET SIZE	HOT AFF CONDENSER INLET SIZE	HOT GPH CONDENSER OUTLET SIZE	COLD SIZE CONDENSER OUTLET SIZE	COLD AFF INDIRECT SIZE	FILTERED SIZE DIRECT SIZE	FILTERED AFF DIRECT SIZE
1	3/4"	3/4"			1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 8261 Service Sink Faucet, eccentric stops, with long spout and vacuum breaker, 1/2" inlet, polished chrome



Project Specifications

ITEM # L120 WALL PANELS

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Fabricated

Model: CUSTOM

Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Stainless steel wall panels

ITEM # L121 HOSE REEL

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Fisher

Model: 29629

Utilities:

WATER WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF
	CONDENSER INLET SIZE		CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE	
1		1/2"			1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 29629 Hose Reel Assembly, stainless steel covered reel rinse with spray gun, 50 feet of 5/8" ID, 3 ply, pressure of 150 PSI, 1/2" NPT female inlet or 3/4" F garden hose inlet



Project Specifications

ITEM # L122 FLOOR TROUGH

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Fabricated

Model: CUSTOM

Utilities:

WATER WASTE

HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF
CONDENSER INLET SIZE		CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE	

1	3"					
---	----	--	--	--	--	--

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM

ITEM # L123 DISCHARGE CONVEYOR

SINGLE SOURCE

Quantity: One (1)

Manufacturer: MILNOR

Model: BFVUUF01

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCF
1	240	60	3				15				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model BFVUUF01 Discharge conveyor



Project Specifications

ITEM # L124 WASHER EXTRACTOR

EXISTING- RELOCATE

Quantity: One (1) Manufacturer: Washex Model: 125 lb.

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOC	PC
1	230	60	3				VERIFY					
WATER WASTE												
	HOT	SIZE	HOT	AFF		HOT	GPH	COLD	SIZE	COLD	AFF	FILTERED
	CONDENSER	INLET	SIZE			CONDENSER	OUTLET	SIZE				INDIRECT
		SIZE										SIZE
1	2"									1		2"

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 125 lb. Unit to be selected from present stock and relocated to new laundry facility.

PART 3 EXECUTION

3.1 PREPARATION

- A. Prepare rough-in provisions and substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
- B. Do not proceed with installation until rough-in provisions and substrates have been properly prepared and deviations from manufacturer's recommended tolerances are corrected. Commencement of installation constitutes acceptance of conditions.
- C. If preparation is the responsibility of another installer, notify Architect in writing of deviations from manufacturer's recommended installation tolerances and conditions.

3.2 INSTALLATION

- A. Install in accordance with manufacturer's written instructions and recommendations.
- B. Test for proper operation and adjust until proper operation is achieved.
- C. Instruct Owner's personnel in proper operation and routine maintenance procedures.

3.3 CLEANING, MAINTENANCE AND PROTECTION

- A. Protect installed products until completion of project.
- B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION 11 10 00



Specifications

11 13 10 - DOCK LEVELERS

PART 1 GENERAL

1.1 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WELDING SOCIETY (AWS)

AWS C2.18 (1993; Errata 1993; R 2001) Guide for the Protection of Steel with Thermal Sprayed Coatings of Aluminum and Zinc and Their Alloys and Composites

ASTM INTERNATIONAL (ASTM)

ASTM A123/A123M (2012) Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products

ASTM A143/A143M (2007) Standard Practice for Safeguarding Against Embrittlement of Hot-Dip Galvanized Structural Steel Products and Procedure for Detecting Embrittlement

ASTM A153/A153M (2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware

ASTM D2000 (2012) Standard Classification System for Rubber Products in Automotive Applications

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA ICS 2 (2000; R 2005; Errata 2008) Standard for Controllers, Contactors, and Overload Relays Rated 600 V

NEMA ICS 6 (1993; R 2011) Enclosures

NEMA MG 1 (2011; Errata 2012) Motors and Generators

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 70 (2011; Errata 2 2012) National Electrical Code

UNDERWRITERS LABORATORIES (UL)

UL 943 (2006; Reprint Jun 2012) Ground-Fault Circuit-Interrupters

1.2 DEFINITIONS

1.2.1 Industrial Dock Leveler

A manufactured structure designed to span and compensate space and height differentials between a loading dock and freight carrier to facilitate safe, efficient, freight transfer.

Specifications

1.2.2 Adjustable Loading Ramp

Synonym for Fixed Type Industrial Dock Leveler.

1.2.3 Fixed Type Industrial Dock Leveler

A dock leveler that is permanently affixed to the dock structure, and usually incorporating a mechanical system to position the dock leveler with respect to the freight carrier at the lip end while being fixed at the opposite hinged end.

1.2.4 Velocity Fuse

A valve or similar device that goes into the hydraulic line. If the dock leveler becomes inadvertently or accidentally unsupported, this fuse will freeze the movement of dock leveler within 4 inches of the dock leveler original position.

1.2.5 Carrier

A wheeled, enclosed trailer or container that, when attached to a heavy-duty truck or van, is used to carry bulk freight over long distances.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings Detail

Drawings

SD-03 Product Data

Loading Dock Levelers Dock Bumpers Restraining Device

SD-10 Operation and Maintenance Data

Loading Dock Levelers Restraining Device

SD-11 Closeout Submittals Record Drawings

1.4 QUALITY ASSURANCE

1.4.1 Manufacturer's Representative

Furnish services of Fixed Type Industrial Dock Leveler technicians, experienced in installation and operation of the type of system being provided, to supervise installation, testing, adjustment of system, and instruction to Owner personnel.

1.4.2 Detail Drawings

Submit drawings depicting dimensions, tolerances, surface finishes, hardnesses, flush edge angles, method of mounting and anchoring, and control schematics and diagram. Show complete wiring, schematic diagrams, and any other details required to demonstrate that the system has been coordinated and will properly function as a unit. Show proposed layout and anchorage of equipment and appurtenances. Show the

Specifications

concrete pit details including flush edge angles, dock bumpers including fastening materials in compliance with ASTM A123/A123M and ASTM D2000, and sloped pit bottom; method of mounting and anchoring; and location of control stations and disconnect switches. Show all proposed dock bumper locations on drawings.

1.4.3 Record Drawings

Submit record as-built drawings depicting dimensions, tolerances, surface finishes, hardnesses, flush edge angles, method of mounting and anchoring, and control schematics and diagram, including mechanical and electrical components, testing and acceptance for each industrial dock leveler.

1.5 DELIVERY, STORAGE, AND HANDLING

Matchmark and tag parts which are disassembled for shipment with metal tags. Provide waterproofed tags and markings. Protect the delivered equipment in storage from the weather, humidity and temperature variation, dirt and dust, or other contaminants.

1.6 EXTRA MATERIALS

After approval of the detail drawings, and not later than 1 month prior to the date of beneficial occupancy, provide spare parts data for each different item of material and equipment specified. Furnish a complete list of parts and supplies, with current unit prices and source of supply and a list of the parts recommended by the manufacturer to be replaced after 1 and 3 year(s) of service.

PART 2 PRODUCTS

2.1 MATERIALS

2.1.1 Standard Products

Submit data including a complete list of equipment and materials, manufacturer's descriptive and technical literature, performance charts and curves, catalog cuts, and installation instructions. Provide materials and equipment, which are the standard products of a manufacturer regularly engaged in the manufacture of the products, and that essentially duplicate items that have been in satisfactory use for at least 2 years prior to bid opening. Equipment shall be supported by a service organization that is, in the opinion of the Owner, reasonably convenient to the site.

2.1.2 Exposed Surfaces

All exposed metal surfaces and fastening materials shall fully comply with the minimum requirements of ASTM A123/A123M, ASTM A143/A143M, and ASTM A153/A153M.

2.1.3 Nameplate

Attach corrosion-resistant metal plate securely and legibly on the exterior surface of the dock leveler. Include the following information indented or embossed on the plate:

- a. Description of the equipment: Describe procedures for operating and services equipment, and warnings or cautions of hazardous procedures.
- b. Name of the manufacturer.
- c. Serial and model number.
- d. Rated capacity in pounds.
- e. Shipping weight.

Specifications

- f. Date of manufacture (month and year).

2.1.4 Toe Guards or Skirts

Provide sides or edges, except front and rear edges, of the ramps which rise above the surrounding loading dock with sheet carbon steel skirts or toe guards of minimum 14 U.S.S. gage nominal thickness. Furnish smooth faced toe guards or skirts and mount flush with the edges of the ramp surface. Ensure sufficient depth of toe guards or skirts to protect the full operating range of dock travel. Ensure the construction capable of resisting a minimum lateral force of 10 pounds with a maximum deflection of 1/2 inch.

2.2 LOADING DOCK LEVELERS

Provide permanent loading dock levelers with minimum performance characteristics based on the following. Design Builder to review performance characteristics with the County.

- a. Service Period:
 - (1) Number of shift operations.
 - (2) Maximum number of trucks per shift opening.
 - (3) Maximum number of days per week.
- b. Fork Lift Loads:
 - (1) Design levelers to accommodate wheeled fork trucks.
 - (2) Design levelers to handle gross dynamic load.
 - (3) Base load leveler design on number of cycles per loading/unloading operation per truck.

Provide loading dock leveler with mechanical type which is manually released at dock leveler and raises by spring action and is lowered by walk-on of dock operator. Coordinate a truck restraint system with the dock leveler via an interconnect function such that the restraint and dock leveler will engage with a single push-button, if a powered trailer restraint is selected to lock truck or trailer into position during loading and for overnight security. Incorporate a visual signal to inform dock operator and driver of locked or unlocked status. Make provision for maintenance access to understructure and lifting mechanism. Provide steel tread plate lip and platform, hinged and supported from beneath by steel framework that contains lifting, positioning, and lowering assembly. Ensure that platform surface is flush with surrounding floor surface of loading dock when not in service. Provide integral positive restraint when leveler is in maintenance position.

2.2.1 Design Requirements

Design, fabricate, and finish loading ramp to permit washing with water and detergents, and operating in an ambient temperature from 0 to plus 110 degrees F.

2.2.2 Dock Leveler Height Adjustment

Provide a ramp whose incline can be adjusted to suit the height of the freight carrier. Allow the loading ramp a minimum of 24 inches of vertical adjustment. Divide height adjustments 12 inches above and 12 inches below the dock level to provide coverage between 30 inches and 54 inches above grade.

2.2.3 Dock Leveler Extension and Retraction

Extend non-fixed end of the dock leveler from a retracted position behind the line of the loading dock platform bumpers to at least 12 inches beyond the forward edge of the dock platform bumpers so as to rest on the bed of the freight carrier. The difference in length of the platform from its fully retracted position to its fully extended position shall be practically constant throughout the ramp, including the ramp extension.

Specifications

2.2.4 Loading Ramp Compensation

Provide automatic compensation with ramp platform loaded or unloaded for:

2.2.4.1 Freight Carrier Out of Level

Out of level freight carrier bed condition (difference in elevation from side to side at the rear of the carrier bed): Allow a minimum correction of one inch for each 18 inches and maximum 4 inch correction of ramp width over the width of the ramp. Ensure the rear edge of the ramp parallel with the rear of the frame in order to prevent tripping or be a pinching hazard.

2.2.4.2 Loading and Unloading of the Freight Carrier

When the lip is extended so as to rest on the bed of motor truck or trailer, provide compensation of 4 inches for carrier spring deflection so that contact will be maintained between lip and carrier bed.

2.2.5 Safety Devices

2.2.5.1 Mechanical System

Include a three-position safety system to limit platform fall to dock level and 4 and 8 inches below dock level by means of double structural steel safety legs. Safety legs shall not be deactivated by dock leveler. This ensures that safety legs are independent of dock leveler motion and retractable from the top of the platform for below dock level control.

2.2.5.2 Dock Bumpers

Submit certificates showing conformance with the referenced standards contained in this section. Provide ramp and load dock face with laminated rubber, tire-fabric, or equivalent dock bumpers recommended by the dock leveler manufacturer. Solid Rubber pieces conforming to ASTM D2000, Grade 4AA612A13B13F17 may be used instead of rubberized fabric.

2.2.6 Rated Capacity

Minimum 20,000 pounds roll over capacity.

2.2.7 Ramp Load Carrying Surface

The live load carrying surface of the ramp shall be minimum 6 feet plus or minus 3 inch wide and 10 feet plus or minus 9 inch long with the dock leveler lip retracted.

2.3 OPERATION

2.3.1 Mechanical Control

Mechanical chain-activated, with extension-spring operation and counter-balance non-manual, raising and lowering system. Once the freight carrier has departed, manually return the platform to the stored, level position. Ensure the ramp, in its stored position capable of being lowered below dock platform level without extending the lip of the ramp.

2.4 CONSTRUCTION AND MATERIALS

Construct all load carrying parts of forged or welded steel. The entire live load carrying surface of the ramp and rear attachment shall be not less than 1/4 inch thick, 55 ksi minimum yield strength, low alloy, nonskid

Specifications

steel tread plate. Provide minimum 5/8 inch vertical projections on the live load carrying surface. Bevel the lip or ramp extension. Design load carrying surfaces to permit free movement of powered hand or platform trucks, low lift pallet trucks, and fork lift trucks. Fabricate lip hinge of not less than 1/4 inch wall seamless steel tubing.

2.5 ACCESSORIES**2.5.1 Restraining Device**

Self-aligning device. Mount this device as recommended by the manufacturer to engage the ICC bar of the truck/trailer with a positive restraining force of not less than 18,000 pounds. This device shall be able to service all truck or trailers having ICC bars located between 12 and 30 inch above ground level (when truck or trailer is unloaded) and recessed up to 9 inch from the rear of truck or trailer. Provide a means to protect the device from disabling damage in the event that more than 18,000 pounds of force is exerted by the restrained truck or trailer. Manually control activation and deactivation from inside the building.

2.5.2 Dock Bumpers

Provide bumpers capable of sustaining repeated impacts from trucks or trailers without damage to the dock, dock levelers, or bumpers.

PART 3 EXECUTION**3.1 EXAMINATION**

After becoming familiar with all details of the work, verify all dimensions in the field, and advise the Owner of any discrepancy before performing the work.

3.2 INSTALLATION

Install and adjust in accordance with NFPA 70, manufacturer's approved detail drawings, and as-built system assembly drawings. Install controls so operator can see dock leveler while manipulating controls. Do not pour the pit for the adjustable loading ramp until the design and detail drawings have been approved. If the pit size is limited by construction conditions involved, alter the dock leveler equipment to fit the pit. Clearly indicate these alterations or modifications on the drawings. Check and verify the appropriate measurements at the building. Do not exceed 2 inch clearances between the ramp and pit.

3.3 CLEANING, TREATMENT AND PAINTING

In accordance with manufacturer's standard practice, shop clean, treat and paint ferrous surfaces including platform, lip, frame, motor, pump, cylinders, valves, and any other non-cadmium plated or non-galvanized surface (but not including bearings, gear contact surfaces, parts protected by lubrication, or other surfaces not usually painted or coated). Clean ferrous surfaces, shot pen, and protect the base metal with an application of 99.9 percent pure zinc coating with a thickness of 0.010 to 0.012 in accordance with AWS C2.18. Protect nonferrous parts against corrosion as necessary.

3.3.1 Workmanship

Conduct field touch-up work as to avoid damaging other surfaces and public property in the area. Do not apply field applied paint during foggy, damp, rainy weather, or the ambient temperatures below 45 degrees F and above 95 degrees F.

3.3.2 Dissimilar Metals Protection

Insulate control surfaces by electrolytically inactive materials.

Specifications

3.3.3 Finish Coat Color

Brilliant yellow and black. Paint 3 inch wide black and yellow diagonal stripes on all vertical surfaces of pit, skirts, and platform edges exposed above adjacent surfaces at any ramp position. Paint similar stripes on top of ramp surfaces in 6 inch wide band around outside edges (except for fixed edge).

3.4 FIELD TESTS

Provide personnel, instruments, materials, and equipment, including test vehicles, for the administration and direction of the tests. Correct defects and repeat tests under the cognizance of the Owner and the dock leveler manufacturer. The Owner is responsible for certifying the test load.

3.4.1 Roll-Over Load Tests

Move roll-over load of 20,000 pounds over the dock leveler between the bed of a freight carrier and the building loading dock surface for 10 cycles. With the ramp extension retracted and the ramp platform leveled with the building loading dock surface, run a 20,000 pound roll-over load over the ramp in various directions for 20 cycles. Do not allow permanent deformation or hydraulic system leakage to occur subsequent to examination after these roll-over tests.

3.4.2 Drop Tests

Twice, drop test the dock leveler at the indicated rated capacity as follows: With the load on the platform and the lip resting on a vehicle carrier bed not less than 10 inches above loading dock surface, pull the carrier or pull away from the lip, leaving the loading ramp unsupported. Do not exceed 4 inch for the measured vertical drop of the dock leveler taken at the point where the lip rests on the vehicle carrier during each of the drop tests. Inspect the loading ramp after each drop and ensure no damage or distortion to the mechanical, or structural components. Do not allow leakage from the hydraulic system.

3.4.3 Acceptance Tests

Perform an acceptance test in the presence of the dock leveler manufacturer and the Owner subsequent to roll-over load tests and drop tests. Conduct operation of the equipment through all of its motions and specified checks as follows: (a) extend lip to rest on a variety of freight carriers with beds up 12 inch above and below dock level; (b) test 4 inch drop limitation with 7000 pound load on ramp, evenly distributed; (c) test level compensation with the ramp, loaded with a minimum of 7000 pounds; and (d) test proper compensation (float) for various compression of countersprings, with ramp loaded and unloaded.

3.5 INSTRUCTION TO OWNER PERSONNEL

Upon completion of the work and at a time designated by the Owner, provide the services of a competent Technician regularly employed or authorized by the manufacturer of the dock leveler to instruct Owner personnel in the proper operation, maintenance, safety, and emergency procedures of the dock leveler. A minimum of one and no more than two four-hour sessions of instruction is required. Conduct the training at the job site or at any other location mutually satisfactory to the Owner and the Contractor.

3.6 OPERATING MANUALS

Operating manuals shall detail the step-by-step procedures required for system startup, operation, and shutdown. Operating manuals shall include the manufacturer's name, model number, parts list, and brief description of all equipment and their basic operating features. List routine maintenance procedures, possible breakdowns and repairs, and troubleshooting guides in the maintenance manuals. Also include piping and equipment layout and simplified wiring and control diagrams of the system as installed.

END OF SECTION 11 13 10



11 19 00 - GENERAL PROVISIONS FOR DETENTION WORK

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the responsibilities for a single-source Detention Equipment Contractor for Detention Work.
- B. Detention Work required by, but not specified in, this Section work includes the following:
 - 1. Division 11 Section "Detention Hollow Metal Doors and Frames"
 - 2. Division 11 Section "Detention Enclosures"
 - 3. Division 11 Section "Detention Hardware"
 - 4. Division 11 Section "Detention Sliding Door Locks Devices"
 - 5. Division 11 Section "Detention Furnishings and Equipment"

1.2 DESCRIPTION OF WORK

- A. General Contractor:
 - 1. The General Contractor shall employ a single pre-approved Detention Equipment Contractor having met all the requirements listed in this Section. The General Contractor shall list his Detention Equipment Contractor. Contracting by the General Contractor for separate portions of work under Sections 11190 through 11199 is prohibited.
- B. Detention Equipment Contractor (DEC):
 - 1. The Detention Equipment Contractor shall be responsible for submitting an aggregate bid to the General Contractor for all Division 11 Detention and Security work described herein and elsewhere in the Contract Documents.
 - 2. The Detention Equipment Contractor shall be responsible for the interfacing and integration of products and systems with the General Contractor and the Security Electronics Contractor (SEC) to ensure that the entire work of this project will be carried out in an orderly, complete and coordinated fashion.
 - 3. The Detention Equipment Contractor shall provide a full time Superintendent to supervise the work in this section. The Superintendent shall be at the site when the Detention Equipment Contractor's work is being performed at the site.

1.3 QUALITY ASSURANCE

- A. The Detention Equipment Contractor (DEC) shall furnish detention equipment as described in these sections, and shall coordinate this equipment with his manufacturers, fabricators, installers, and with work by others. Questions on the detention equipment must be directed to the Detention Equipment Contractor before being directed to the General Contractor, Architect/Engineer or Owner.
- B. Acceptable Pre-qualified Detention Equipment Contractors:
 - 1. Pauly Jail Building Co., Inc.; St. Petersburg, FL 33711; 727/623-4938
 - 2. Cornerstone Detention Products, Inc.; Decatur, AL 35601; 256/355-2396
 - 3. Willo Products Company Inc.; Decatur, AL 35602; 256/353-7161
 - 4. CCC Group Inc.; San Antonio, TX 78220; 210/661-4251

Specifications

5. Chief Industries, Inc.; Grand Island, NE 68803; 308/389-7390
 6. Norment Industries, Inc.; Montgomery, AL 36108; 334/281-8440
 7. Securtec Inc.; Baton Rouge, LA 70817; 225/752-3996
 8. Southern Steel Company; San Antonio, TX 78223; 210/533-1231
- C. Other [All] Detention Equipment Contractor who intends to submit a bid on this section of the Specifications shall submit the following data to the Architect in writing twenty (20) days prior to bid date and shall be approved by addendum ten (10) days prior to bid date. Verbal approval will not satisfy this requirement. Grounds for disqualification shall exist if it is proven that the information submitted is inaccurate or, in the opinion of the Architect, does not satisfy the requirements.
1. Contractor Qualification Statement AIA-305A.
 2. List of projects under construction. The list shall include the following information for each project:
 - a. Name and location of installation
 - b. General Project Description
 - c. Name of Owner's representative and phone number
 - d. Name of Architect/Engineer and phone number
 - e. Name of General Contractor and phone number
 - f. Contract amount
 - g. Percent Complete
 - h. Scheduled completion date
 3. Evidence that this firm or principal members have a minimum of ten (10) years experience in successfully completing projects which include detection equipment renovation of existing facilities of similar scope, products and magnitude. Submit a list of five (5) projects of similar scope that have been completed and operational for a minimum of three (3) years. The list shall include the following information for each project:
 - a. Name and location of installation
 - b. General Project Description
 - c. Date of occupancy by Owner
 - d. Name of Owner's representative and phone number
 - e. Name of Architect/Engineer and phone number
 - f. Name of General Contractor and phone number
 - g. Contract amount
 - h. Percentage of the cost of the work performed with your own forces.
 4. List of key personnel and qualifications.
 5. List of all projects in the past five (5) years in which this firm has been involved in litigation with a City, County, State or Federal government agency. Include the current status of each legal action, and the other parties to the litigation.
 6. Letter from an approved and A-15 rated bonding company stating that the Detention Equipment Contractor can be bonded for this complete project if awarded the Contract.
 7. Financial Statement for previous fiscal year.
 8. List of manufacturers of all equipment intended to be bid as part of your work.
 9. Letters from manufacturers of detention hollow metal door and frames, detention hardware and detention sliding door locking devices stating that your firm will be able to purchase all materials required for this project.
 10. Letters from specified detention hardware and detention sliding door locking devices manufacturers that your firm is a qualified installer of their products.
- D. Materials required for installation by the Detention Equipment Contractor may be provided by any of the detention equipment manufacturers included in the Project Manual. The Detention Equipment Contractor shall receive the materials and assume complete responsibility for the detailing, coordination, erecting, installation and performance and warranty of such work.

Specifications

- E. The Detention Equipment Contractor shall be required to provide a labor and materials payment bond in the amount of 100% of the contract sum.

1.4 COORDINATION

- A. Coordinate detention work to ensure efficient and orderly installation of each part of detention work. Coordinate detention work that depends on each other for proper installation, connection, and operation.
 - 1. Develop special procedures required for coordination of detention work.
 - 2. Coordinate installation of different detention components to ensure maximum accessibility for required maintenance, service, and repair.
 - 3. Coordinate provisions to accommodate detention work scheduled for later installation.
- B. Coordinate selection of detention products for compatibility.
- C. Assemble and coordinate Shop Drawings for detention work provided by separate entities responsible for detention work. Submit detention work submittals simultaneously as a group along with applicable Coordination Drawings.
- D. Coordinate installation of anchorages and embedments for detention work. Obtain and distribute, to parties involved, setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.
 - 1. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing detention work to comply with indicated requirements.
- E. Coordinate protection of detention work.
- F. Coordinate preparation of Project Record Documents for detention work and integrate information from entities responsible for detention work to form one combined record.
- G. Coordinate preparation of operation and maintenance manuals for detention work and integrate information from entities responsible for detention work to form one combined record.

1.5 WARRANTY

- A. The Detention Equipment Contractor shall warrant materials furnished under this Section to be free from defects in material and workmanship. The Detention Equipment Contractor shall provide all labor and materials to repair or replace defective detention equipment work or components.
- B. The Detention Equipment Contractor shall maintain the quantities of spare parts provided to the Owner in the original inventory during the warranty period. Components used for repair shall be replaced immediately and Owner shall not be charged for shipping or other costs unless failure is due to abuse or negligence.
- C. The Owner and/or Owner's Representative shall notify the Detention Equipment Contractor on a twenty-four (24) hour phone number (supplied by the Detention Equipment Contractor), outlining defects in the detention equipment. The Detention Equipment Contractor shall respond to this call within two hours with a return call by a service technician.

Specifications

- D. The warranty shall exclude vandalism, misuse, acts of nature or abuse.
- E. The warranty shall provide for a maximum response time (service technician on the site) of twenty-four (24) hours on the first occurrence and twelve (12) hours on the second occurrence. The Detention Equipment Contractor shall also guarantee shipment of any part request within twenty-four (24) hours during the warranty period.
- F. Record maintenance and service calls by signing the Owner's project logbook maintained on the premises.
- G. Warranty period shall be as defined during the Design Build development.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention work.
 - 1. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention work connections before detention work installation.
 - 2. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention work.
- B. Inspect built-in and cast-in anchor installations before installing detention work to verify that anchor installations comply with requirements. Prepare inspection reports.
 - 1. Where inspections indicate that anchors do not comply with specified requirements, reinspect after repairs or replacements are made.
 - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- C. Verify locations of detention work with those indicated on Coordination Drawings.

3.2 FIELD QUALITY CONTROL

- A. Observe field welding of detention work and anchorages.
- B. Provide guidance to the GC for Detention Hollow Metal frame setting.
- C. Verify that detention work is installed and connected according to the Contract Documents.
- D. Observe startup service of detention work.
- E. Observe installation and startup checks of detention work according to manufacturer's written instructions.

Specifications

- F. Inspect installed detention work to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
 - 1. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
 - 2. Prepare field quality-control certification that states installed detention work and its installation complies with requirements in the Contract Documents.

- G. Testing: After installing detention work and after electrical circuitry has been energized, test detention work for compliance with requirements.
 - 1. When testing reveals detention work not in compliance with requirements, perform additional random testing to determine extent of noncompliance.
 - 2. Where test results indicate that detention work does not comply with specified requirements, retest after repairs or replacements are made.
 - 3. Perform additional testing and inspecting, at Contractor's expense, to determine compliance of replaced or additional work.

END OF SECTION 11 19 00

11 19 13 - DETENTION HOLLOW METAL DOORS AND FRAMES

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Detention hollow metal swinging doors.
 - 2. Detention hollow metal sliding doors.
 - 3. Detention hollow metal door frames.
 - 4. Detention hollow metal sidelight frames.
 - 5. Detention hollow metal borrowed-light frames.
 - 6. Detention hollow metal window frames.
 - 7. Detention Stainless Steel doors and frames.
 - 8. Hurricane-Security Windows Systems.

1.2 PERFORMANCE REQUIREMENTS

- A. Detention doors and frames for this Project shall be specified to be constructed to meet the following tests and specifications. An independent testing laboratory shall perform the tests described below, with data attesting to construction of the door and frame. Test data shall have been performed within the past five (5) years and shall be submitted with the shop drawing submittal.
 - 1. Doors, frames are to be specified as indicated in ANSI/NAAMM HMMA 863: Guide Specifications for Detention Security Hollow metal Doors and Frames.
 - 2. Doors tested in accordance with Standard UL-752, "Bullet Penetration".
 - 3. Doors tested in accordance with ASTM F 1450, "Standard Test Methods for Hollow Metal Swinging Door Assemblies for Detention Facilities"
 - 4. Window Frames tested in accordance with ASTM F1592, "Standard Test Methods for Detention Hollow Metal Vision Systems"
 - 5. Doors tested in accordance with Methods E152, Standard UL-10 (B), or Methods NFPA 252, "Door Assembly Fire Test".
 - 6. Hurricane Wind Load.
 - 7. Hurricane Impact.

1.3 QUALITY ASSURANCE

- A. Provide detention hollow metal products manufactured by a single firm specializing in the production of this type of product.
- B. Installation shall be under supervision of manufacturer-approved personnel.
- C. When a fire resistance classification is shown or scheduled for steel doors and frames, provide fire rated doors investigated and tested as a fire door assembly, complete with type of hardware to be used. Identify each fire door with recognized testing laboratory labels, indicating applicable fire rating of steel doors.
- D. Uniform Building Code:
 - 1. Comply with project codes.

Specifications

- E. Temperature rise rated assemblies: Provide assemblies rated for 450 degree F maximum temperature rise at 30 minutes at doors to stairwells, exit passageways, horizontal exits and other locations indicated on Drawings.
- F. Door identification label to include: Fire protection rating under positive pressure, minimum latchbolt throw and maximum temperature rise.
- G. Include supplemental "S" label on 20 minute doors and other openings where doorway occurs in a 1-hour rated exit access corridor.
- H. Hardware: Coordinate products used during fire tests meeting UBC 7-2 including component gasket systems for "S" label.
- I. When a fire resistance classification is shown or scheduled for steel doors and/or frames containing components that have not been tested as an assembly, the manufacturer shall construct the door and frame components of the assembly in accord with the requirements of the testing laboratory for the desired fire resistance rating, and certify in writing to the Owner, Enforcing Authority, Contractor and the Architect that the door and frame components have been constructed in accord with the testing laboratory requirements in lieu of label.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle hollow metal work per manufacturer's requirements.

1.5 WARRANTY

- A. See 11 19 13 General Provision for Detention Work

PART 2 - PRODUCTS

2.1 MANUFACTURERS

- A. All items shall be the product of well known manufacturers regularly engaged in the making of products and have been in business for at least 10 years.
- B. Detention Hollow Metal
 - 1. Willo Products; Decatur, AL
 - 2. Trussbilt Inc.; St.Paul, MN
 - 3. Chief Industries; Grand Island, NE
 - 4. Habersham Metal Product Co.; Cornelia, Georgia
- C. Hurricane-Security Window Systems
 - 1. CM Security
 - 2. See structural documents for required Hurricane ratings.

Specifications

2.2 GRADE CRITERIA

All Detention Hollow Metal and Detention Stainless steel doors, door frames and window frames to be Grade 1.

ASTM F 1450, TABLE 1: SECURITY GRADES AND TEST LOAD REQUIREMENTS							
Grade No.	Recommended Door Face Sheet and Frame Thickness In. (mm) gage, Minimum	Static Load Test B Lbf. (N)	Rack Load Test C Lbf. (N)	Impact Test A Impact Energy – 200 Ft. Lbf. (271.2 J)			ASTM Reference Standards
				Lock Impacts	Hinge Impacts	Glazing Impacts	
1	0.093 (2.3) 12	14000 (62 272)	7500 (33 360)	600	200	100	F 1450, F 1577 F 1643

ASTM F 1592, TABLE 1:			
SequenceA	Number of Blows Grade 1	Impact Energy Of Each Blow Ft. Lbf. (J)	Location of Blows
1	600	200 (271.2)	Frame On the frame joint between the vertical mullion and the sill or head (test agent to select at time of test).
2	600	200 (271.2)	On the frame joint between the horizontal mullion and the jamb (either side, test agent to select at time of test).
3	600	200 (271.2)	On the frame joint where the vertical and horizontal mullions cross.
4	600	200 (271.2)	On the frame joint between the jamb and sill or head (either side, test agent to select at time of test).
5	600	200 (271.2)	Glazing On the glazing/panel at the corner of the glazing/panel within 6 in. (15.2 cm) of the frame stop. Corner selected by the test agent at time of test.
6	600	200 (271.2)	On the glazing/panel at the center

Specifications

			of the glazing/panel. Glazing/panel to be selected by the test agent at time of test.
Cyclic Sequence	200		

ASTM F 1592, TABLE 2:

SequenceA	Number of Blows Grade 1	Impact Energy Of Each Blow Ft. Lbf. (J)	Location of Blows
1	600	200 (271.2)	Frame On the frame joint between the side-light sill and the strike mullion.
2	600	200 (271.2)	On the frame joint between the strike mullion and the header.
3	600	200 (271.2)	Glazing On the glazing/panel at the corner of the glazing/panel closest to the joint between the side-light sill and the strike mullion, within 6 in. (15.2cm) of the frame stop.
4	600	200 (271.2)	On the glazing/panel at the corner of the glazing/panel closest to the joint between the strike mullion and the header within 6 in. (15.2cm) of the frame stop.
5	600	200 (271.2)	On the glazing/panel at the center of the glazing/panel.
Cyclic Sequence	200		

2.3 DETENTION HOLLOW METAL DOORS

A. Materials:

- Due to the projects proximity to marine environment, both interior and exterior Detention Hollow Metal (DHM) doors shall be completely manufactured from Galvanized steel sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 653/A 653M, A60 zinc coating.
- Steel shall be free of scale, pitting, coil breaks or other surface blemishes. It shall be free of buckles, waves or any other defects caused by the use of improperly leveled sheets.
- Where required, Detention Stainless Steel (DSS) doors and frame shall be entirely made of material meeting ASTM A 666-00, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel. Finishes for steel stiffened stainless steel detention doors shall comply with ANSI/NAAMMHHMA 866, required polish not to exceed #4.

B. Construction:

- Provide detention hollow metal doors of the types and sizes indicated on the drawings and schedules. Doors shall be constructed in accordance with the manufacturers tested standards and these specifications and shall meet the performance requirements.
- Doors shall be neat in appearance and free from warpage or buckle. Edge bends shall be true and straight and of minimum radius for the thickness of material used.

Specifications

3. Internal Core Construction: One of the following two (2) types may be used:
 - a. Steel stiffened by continuous vertically formed steel hat sections which, upon assembly, shall span the full thickness, full height and full width of the interior space between door faces. These stiffeners shall be no less than minimum thickness to meet the performance standards established in the quality control section of this specification, spaced such that the vertical interior webs shall be no more than 4" o.c. and securely fastened to both face sheets by spot welds spaced a maximum of 3" o.c. vertically. Hat sections shall be welded together, both sides, by welds spaced a maximum of 6" vertically. Spaces between stiffeners shall be filled with 6.0 lbs./cu. ft. fiberglass or mineral rockwool batt-type material.
 - b. Continuous, inner-reinforcement full height and width shall be true truss design with triangular form, the shape of which cannot be altered without changing the length of the sides. Flat apexes shall be resistance spot welded on 2 3/4" centers horizontally and 3" centers vertically. Each flute of reinforcement to be fire and sound insulated with six (6) pound density Rock Wool.
4. The vertical edges shall be reinforced by a continuous steel channel.. The top and bottom edges shall be closed with a continuous steel channel, spot welded to both face sheets. The closing end channel shall be continuously welded to the vertical reinforcing channel at all four corners producing a fully welded perimeter reinforcing channel.
5. Metal doors shall have a flush top and bottom edge channel and shall be welded to the closing channel at the corners .
6. Door face sheets shall be joined at their vertical edges by a continuous weld extending the full height of the door and finished smooth such that there are no visible seams.
7. Doors shall be smooth, flush surfaces without visible joints or seams on exposed faces or stile edges, except around glazed or louvered panel inserts.
8. Edge profiles shall be provided on both vertical edges of doors as follows:
 - a. Single acting doors - beveled 1/8 in. in 2 in profile.
 - b. Sliding doors or equivalent - square profile.
9. Hardware reinforcements and preparation:
 - a. Doors shall be mortised, reinforced, drilled and tapped at the factory for hardware, in accordance with the final approved hardware schedule and templates provided by the hardware supplier.
10. Glass moldings and stops:
11. Removable glazing stops:
 - a. Removable glass stops shall consist of 10 gauge galvanealed angle. Angle stops shall be mitered or notched and tight fitting at the corner joints.
 - b. Removable glass stops shall be on the side opposite the area of inmate confinement or where they are likely to be supervised.
 - c. During shipment, and for use while frames are being painted, non-security fasteners shall be substituted to hold glass stops in place. The security fasteners shall then be included in the same shipment but packaged separately for protection until used to stop in the required glazing.
 - d. Final fasteners for use after frames are painted shall be zinc plated torx pin-head security screws of the size, strength and spacing necessary to satisfy impact performance criteria.
12. Removable lock cover plate to be on the hinge side, unless door swings into a room and there is no other access to the room, then removable lock cover plate is to be on the stop side.
13. Provide dust box (welded to interior of door edge) at bolt receiver hole.
14. Provide weep hole openings in the bottom of exterior doors to permit the escape of entrapped moisture.

Specifications

15. Flush style Food pass / cuff port openings:
 - a. When required, the food pass opening shall be a flush opening fabricated using interior channels, 12 gauge minimum, securely welded to the inside of both face sheets and dressed smooth. The four corner seams shall be continuously arc welded and dressed smooth. The finished opening shall be constructed such that it cannot be dismantled or otherwise affected by tampering. Lock preparation shall be flush mounted into the door also.
 - b. The food pass shutter door shall be of similar construction as the hollow metal door panel. Welds shall be ground smooth. The food pass shutter and hinge shall be factory installed.
 - c. The food pass shall be furnished with a full width factory installed hinge, shutter bumpers, a food pass lock preparation, and escutcheon.

2.4 DETENTION HOLLOW METAL DOOR AND WINDOW FRAMES

A. Materials:

1. Due to the projects proximity to the ocean, both interior and exterior frames shall be completely manufactured from Galvanized steel sheets: Zinc-coated carbon steel sheets of commercial quality, complying with ASTM A 653/A 653M, A60 zinc coating.
2. Steel shall be free of scale, pitting, coil breaks or other surface blemishes. It shall be free of buckles, waves or any other defects caused by the use of improperly leveled sheets.
3. Where required, Detention Stainless Steel (DSS) frames shall be entirely made of material meeting ASTM A 666-00, Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel. Finishes for steel stiffened stainless steel detention doors shall comply with ANSI/NAAMMHHMMA 866, required polish not to exceed #4.

B. Construction:

1. Frames shall be constructed in accordance with the specifications and shall meet the performance requirements.
2. Frames shall be neat in appearance, square, and free of defects, warpage and buckles. Press steel members shall be straight and of uniform profile throughout their lengths.
3. Jamb, header, and sill profiles shall be as indicated on the drawings.
4. Fabricate frames with mitered corners continuously welded through head inside corner and miter ground smooth.
5. When shipping limitations so dictate, frames for large openings shall be fabricated in sections designated for splicing in the field by others. Where splicing is necessary, angle splices shall be installed at the corners of the profile, and shall extend at least 4 in. on either side of the joint. Splicing angles shall be the same gage thickness as the frame. Field splices shall be made in accordance with approved submittal drawings.
6. Frames for multiple openings shall have mullion members which, after fabrication, are closed tubular shapes conforming to profiles shown on the drawings, and having no visible seams or joints. All joints between faces of abutted members shall be continuously welded and finished smooth. All joints between stops of abutted members shall be welded along the soffit and shall be left neat and uniform in appearance. The General Contractor shall provide for welding and finishing all field joints between faces of abutted members.
7. Hardware reinforcements and preparation:
 - a. Frames shall be mortised, reinforced, drilled and tapped at the factory for hardware, in accordance with the final approved hardware schedule and templates provided by the hardware supplier.
8. Floor anchors:
 - a. Floor anchors with two holes for fasteners shall be fastened inside jambs with at least four (4) spot welds per anchor.

Specifications

- b. Where so scheduled, adjustable floor anchors, providing not less than 2 in. height adjustment, shall be fastened inside jambs with at least four (4) spot welds per anchor.
 - c. Thickness of floor anchors shall be the same as frame.
- 9. Jamb anchors:
 - a. Anchor spacing:
 - 1) The number of jamb anchors provided on each jamb shall be as follows:
 - a) For borrowed lite frames provide two (2) anchors plus one (1) for each 18" or fraction thereof over 3'-0", spaced at 18" maximum between anchors.
 - b) For door frames provide two (2) anchors plus one (1) for each 18" or fraction thereof over 4'-6", spaced at 18" maximum between anchors (U.L. fire ratings may require additional anchors).
 - b. Masonry types:
 - 1) Frames for installation in masonry walls shall be provided with loose "T" anchors or adjustable strap and yoke type made from the same thickness steel as the frame. Straps shall be no less than 2 in. x 10 in. in size, corrugated and/or perforated.
 - c. Expansion bolt type:
 - 1) Frames for installation in existing masonry or concrete walls shall be prepared for expansion bolt type anchors. The preparation shall consist of a countersunk hole for a 0.5 in. diameter bolt and a tube spacer from the unexposed surface of the frame to the wall. The spacer shall be welded to the frame and spaced as described.
 - 2) After sufficient tightening of the bolt, the bolt head shall be welded by the installation contractor so as to provide a non-removable condition. The welded bolt head shall be ground, dressed and finished smooth.
- 10. Grout guards shall be provided at hardware preparations, glazing stop screws and silencer preparations on frames to be set in masonry or concrete openings. Grout guards shall be sufficient to protect preparations from grout of a 4 in. maximum slump consistency which is hand troweled in place.
 - a. Glass stop screws shall be protected from grout by a steel threaded receptacle welded to the frame.
 - b. Door silencers preparations shall be protected by steel grout guards.
- 11. Frames shall be provided with two (2) temporary steel spreaders welded to the bottom of the jambs to serve as bracing during shipping and handling. The installation contractor shall be responsible for finishing and touch-up of marks caused by spreader removal.
- 12. Removable lock cover plate to be on the hinge side, unless door swings into a room and there is no other access to the room, then removable lock cover plate is to be on the stop side.
- 13. Provide grout openings for vertical hollow metal frames sections that are not accessible for grouting due to steel lintels or other obstructions.
- 14. For new frames at existing walls, provide grout openings. Grout openings are factory prepared, recessed holes with coverplates shipped loose for field welding to frame. Coverplates fit into a recessed portion of the frame.
- 15. Provide factory installed backboxes and conduit systems for door control, intercom, etc., within hollow metal frames. Each system has its own separate raceway.
- 16. Doors frame for use in existing walls shall have handhole access to the conduits at top and bottom of frame.
- 17. Removable glazing stops:
 - a. Removable glass stops shall consist of 10 gauge galvanealed angle. Angle stops shall be mitered or notched and tight fitting at the corner joints.
 - b. Removable glass stops shall be on the side opposite the area of inmate confinement or where they are likely to be supervised.

Specifications

- c. During shipment, and for use while frames are being painted, non-security fasteners shall be substituted to hold glass stops in place. The security fasteners shall then be included in the same shipment but packaged separately for protection until used to stop in the required glazing.
 - d. Final fasteners for use after frames are painted shall be zinc plated torx pin-head security screws of the size, strength and spacing necessary to satisfy impact performance criteria.
 - C. Hurricane-Security Window System.
 - 1. CM Security 3000 series as basis of design.
- 2.5 CLEARANCES AND TOLERANCES
 - A. Manufacturing clearances and tolerance shall be as defined by ANSI/NAAMM HMMA 863.
- 2.6 FINISH
 - A. After fabrication, doors and frames shall be thoroughly cleaned, degreased, bonderized and provided with one coat of primer.
 - B. Shop Applied Primer: Manufacturer's standard rust inhibitive enamel. Verify compatibility with finish coats as specified in Section 09900, Painting. If compatibility is not ascertained during the bidding period, Contractor shall provide primer as specified in Section 09900, Painting.
- PART 3 - EXECUTION
 - 3.1 EXAMINATION
 - A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
 - B. Examine roughing-in for embedded and built-in anchors to verify actual locations before installation.
 - C. Notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work.
 - D. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
 - E. Proceed with installation only after unsatisfactory conditions have been corrected.
 - 3.2 INSTALLATION
 - A. Expenses carried by the Architect/Engineer, Project Manager or Owner in troubleshooting equipment problems caused by inadequate workmanship or other form of poor performance on the part of the Contractor, shall be borne by the Contractor.

Specifications

- B. Install Detention Hollow Metal Doors and Frames in accordance with shop drawings, manufacturer's written installation instructions, and as herein specified.
- C. Place detention hollow metal frames prior to construction of enclosing walls. Set frames accurately in position, plumbed and aligned (using metal shims), and braced securely until permanent anchors are set. After wall construction is completed, remove temporary braces and spreaders leaving surfaces smooth and undamaged.
- D. Prior to installation, frames shall be checked for size, and swing, and with temporary spreaders removed, corrected for squareness, alignment, twist and plumb. Permissible installation tolerances shall not exceed the following:
 - 1. Squareness $\pm 1/16$ in.: Measured on a line, from jamb perpendicular to frame head.
 - 2. Alignment $\pm 1/16$ in.: Measured at jambs on a horizontal line parallel to the plane of the face.
 - 3. Twist $\pm 1/16$ in.: Measured at opposite face corners of jambs on parallel lines, perpendicular to the plane of the door rabbet.
 - 4. Plumb $\pm 1/16$ in.: Measured at jambs on a perpendicular line from the head to the floor.
- E. Install fire-rated frames in accordance with NFPA Standard No. 80.
- F. Grout fill solid detention hollow metal frame jambs, sill and head sections. Sill shall be packed solid with mortar before setting of frame. Provide grout openings in detention hollow metal frames where access to fill frames may be restricted due to steel lintels or other obstructions.
- G. Touch-up painting of factory finished or factory primed items is the Installer's responsibility.
- H. Fill voids between materials of the detention equipment and embeds or other physical construction with low-mod gel, equal to Sikadur 23, by Sika and paint equipment to match surrounding materials.

3.3 ADJUSTMENT AND CLEANING

- A. Check and readjust Detention Hollow Metal Doors and Frames just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including doors or frames which are warped, bowed or otherwise damaged.
- B. Clean equipment thoroughly prior to Substantial Completion.

3.4 PROTECTION

- A. Protect equipment and finishes until Substantial Completion.
- B. Replace damaged equipment as directed by the Architect.

END OF SECTION 111913

11 19 43 - DETENTION ENCLOSURES**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Bar-grate assemblies.
 - 2. Woven-rod-mesh assemblies.
- B. Related Sections:
 - 1. Section "Special Project Procedures for Detention Facilities" for general requirements for detention work, including responsibilities of a single-source detention specialist.
 - 2. Section "Cast-in-Place Concrete" for building anchors into concrete construction.
 - 3. Section "Exterior Painting" for field painting of detention enclosures.
 - 4. Section "Interior Painting" for field painting of detention enclosures.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated. Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for detention enclosures.
- B. Shop Drawings: For detention enclosures. Include plans, elevations, sections, details, and attachments to other work.
 - 1. Indicate location, plan, and dimension of each detention enclosure.
 - 2. Indicate type of steel for each detention enclosure component.
 - 3. Indicate requirements for cast-in anchors to be installed as work of other Sections.
 - 4. Show elevations of each detention enclosure door and indicate location, dimensions, door swing/slide direction, details of detention door hardware and accessories, and preparations for power, signal, and control systems.
- C. Samples for Initial Selection: For units with factory-applied color finishes.
- D. Samples for Verification: For each type of detention enclosure indicated.
 - 1. Include 12-by-12-inch (305-by-305-mm) cut-away corner section of bar-grille assembly, constructed of specified round and flat bars, showing fabrication techniques and workmanship.

Specifications

2. Include 12-by-12-inch (305-by-305-mm) cut-away corner section of woven-rod-mesh assembly, constructed of specified framing and woven-rod panel, showing fabrication techniques and workmanship.
- E. Qualification Data: For qualified [Installer] [manufacturer] [and] [testing agency].
 1. Welding certificates.
 2. Material Certificates: For tool-resisting steel indicating compliance with the performance requirements for complete test sequence according to applicable ASTM standard, from manufacturer.
 3. Material Test Reports: For tool-resisting steel.
 4. Mill Certificates: For tool-resisting steel rods, certifying that rods were fabricated from material with same chemical and physical properties as material used to fabricate tool-resisting steel round bars.
 5. Maintenance Data: For doors in detention enclosures to include in maintenance manuals.

1.4 QUALITY ASSURANCE

- A. Installer Qualifications: Manufacturer's authorized representative who is trained and approved for installation of units required for this Project.
- B. Testing Agency Qualifications: Qualified according to ASTM E 329 for testing tool-resisting steel.
- C. Source Limitations for Detention Enclosures: Obtain each type of detention enclosure from single source from single manufacturer.
- D. Welding Qualifications: Qualify procedures and personnel according to the following:
 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.3, "Structural Welding Code - Sheet Steel."
 3. AWS D1.6, "Structural Welding Code - Stainless Steel."
- E. Preinstallation Conference: Conduct conference at project site.

1.5 PROJECT CONDITIONS

- A. Field Measurements: Where work occurs in existing buildings, verify actual dimensions of construction contiguous with detention enclosures by field measurements before fabrication.

1.6 COORDINATION

- A. Coordinate installation of anchorages for detention enclosures. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors that are to be embedded in adjacent construction. Deliver such items to Project site in time for installation.



Specifications

1.7 EXTRA MATERIALS

- A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
 - 1. Security Fasteners: Furnish not less than one box for every 50 boxes or fraction thereof, of each type and size of security fastener installed.
 - 2. Tools: Provide [two] <Insert number> sets of tools for installing and removing security fasteners.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Mild Steel Plates, Shapes, and Bars: ASTM A 36/A 36M.
- B. Cold-Rolled Steel Sheet: ASTM A 1008/A 1008M, CS (Commercial Steel), Type B, suitable for exposed applications.
- C. Hot-Rolled Steel Sheet: ASTM A 1011/A 1011M, CS (Commercial Steel), Type B; free of scale, pitting, or surface defects; pickled and oiled.
- D. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, CS (Commercial Steel), Type B; with G60 (Z180) zinc (galvanized) or A60 (ZF180) zinc-iron-alloy (galvannealed) coating designation.
- E. Steel Tubing: ASTM A 501 or ASTM A 513, Type B unless otherwise indicated.
- F. Tool-Resisting Composite Steel Round and Flat Bars: ASTM A627
- G. Tool-Resisting Homogenous Steel Round and Flat Bars: ASTM A627.
- H. Stainless-Steel Sheet, Strip, Plate, and Flat Bars: ASTM A 666 or ASTM A 240/A 240M, austenitic stainless steel, Type 304.
- I. Cast-in-Place Anchors in Concrete: Fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to [four] <Insert safety factor> times the load imposed, as determined by testing per ASTM E 488, conducted by a qualified testing agency; of type indicated below.
 - 1. Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed; hot-dip galvanized per ASTM A 153/A 153M or ASTM F 2329.
- J. Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16 inch (4.8 mm) thick; with minimum 1/2-inch- (12.7-mm-) diameter, headed studs welded to back of plate.
- K. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

Specifications

2.2 BAR-GRATE ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, **[provide products by one of the following]** **[available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
1. American Jail Products, LLC.
 2. DDS Group; Detention Products Division.
 3. G-S Company (The).
 4. Kenco Wire & Iron Products Inc.
 5. Maximum Security Products Corp.
 6. Sweeper Metal Fabricators Corp.
 7. Willo Products Company, Inc.
- B. Tool-Resisting Steel Bar Grate: ASTM A 627, **[Grade 1]** **[Grade 2]**.
1. Vertical Bars: 1-inch- (25.4-mm-) diameter, **[double-ribbed, round]** **[hexagonal]** composite tool-resisting steel bars at **[4 inches (102 mm)]** **[5 inches (127 mm)]** **[6 inches (152 mm)]** o.c.
 2. Horizontal Flat Bars: 3/8-by-2-1/2-inch (9.6-by-63.5-mm) composite tool-resisting steel flat bars at **[12 inches (305 mm)]** **[18 inches (457 mm)]** o.c.
 3. Perimeter Framing: 3/8-by-2-1/2-inch (9.6-by-63.5-mm) composite tool-resisting steel flat bars.
- C. Tool-Resisting Steel Bar Grilles: ASTM A 627, Grade 3.
1. Vertical Bars: 1-inch- (25.4-mm-) diameter, double ribbed or **hexagonal** homogeneous tool-resisting steel bars at **6 inches** o.c.
 2. Horizontal Flat Bars: 5/16-by-2-1/4-inch homogeneous tool-resisting steel flat bars at **12 inches** o.c.
 3. Perimeter Framing: 5/16-by-2-1/4-inch homogeneous tool-resisting steel flat bars.
- D. Finish: Factory primed for field painting.
- E. Fabricate bar-grille assemblies with materials and to sizes and configurations indicated, complete with mounting flanges and anchors.
1. Pass vertical round bars through, and positively interlock them with, horizontal flat bars at each intersection without reducing circumference of round bars at these intersections and without using pipe sleeves, swedging, calking, or interlocks that depend on friction. No welded connections are allowed as the heat would compromise the tool resistance.
 2. Pass ends of round bars at least 1 inch (25 mm) through framing, and weld bars to framing from back side of framing. Control heat build up by spot welding each connection in increments while cycling around the perimeter of the partition or door.
 3. Fabricate cutouts and openings in bar-grille assemblies for penetrations of sizes and at locations indicated. Frame openings with flat bars of same material and size as horizontal flat bars.
 4. Frame connections with plates; use flat bars of same material and size as horizontal flat bars.

Specifications

2.3 WOVEN-ROD-MESH ASSEMBLIES

- A. Manufacturers: Subject to compliance with requirements, **[provide products by one of the following]** **[available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:**
1. Kane Manufacturing Corp.
 2. Maximum Security Products Corp.
 3. Norment Security Group, Inc.; a CompuDyne company.
 4. Willo Products Company, Inc.
- B. Main Framing: Formed from 1-3/4-by-2-1/2-inch built-up tubular steel consisting of an open channel with fixed concealment plates.
1. Open Channel: Formed from **0.105-inch (12 GA.)** nominal-thickness steel sheet or channel with individual slots along inner edges to support woven-rod panels.
 2. Concealment Plates: Steel sheet to match open channel.
 3. Steel for exterior locations shall be A60 galvanized.
- C. Supplementary Framing: Formed from 2-inch-square by 3/16-inch thick steel tubing.
- D. Braces: Formed from same material as main framing.
- E. Woven-Rod Infill: Formed from, locking double crimped, **1/4-inch** diameter low carbon mild steel rod, woven horizontally and vertically into a rigid grille with rods at 2 inches open space.
1. Steel rod for exterior locations shall be A60 galvanized.
- F. Perimeter mounting channel, angles and closure plates. A60 galvanized 1-3/4 x 2-1/16 x 12 GA.-3/16-inch
- G. Finishes:
1. Exterior Locations: Factory powder coat 2.5 mil minimum thickness.
 2. Interior Locations: Factory powder coat 2.5 mil minimum thickness.
- H. Woven Rod Fabrication:
1. Main Framing: Before inserting woven-rod panels, weld and grind smooth corners of open channel elements. Fabricate partitions taller than 12 feet from multiple panels stacked on top of one another.
 2. Woven-Rod Panels: Insert panels symmetrically in main framing. Extend end of each rod at least 1 inch (25 mm) into main framing and, from inside of channel, weld into each slot where it contacts main framing.
 3. Concealment Plates: Weld plates to main framing with minimum 1 inch (25 mm) welds at minimum 10 inches (254 mm) o.c., staggered side to side and ground smooth, to form a fully enclosed tubular steel frame.
 4. Anchor Clips: For each enclosure panel, weld one anchor clip to secure side of main framing in line with vertical framing.
 5. Swinging Doors: Fabricate doors with framing on four sides of door from same material as adjacent panels and with 2-by-1/4-inch (51-by-6-mm) flat steel bar astragal continuous on lock jamb. Align bottom of door with bottom of adjacent panels. Factory prepare frames and doors for hardware being provided by Detention Equipment Contractor. Comply with requirements in Division 08 Section "Detention Door Hardware" for detention hinges and detention locks and latches.

Specifications

6. Fabricate joints that will be exposed to weather in a manner to exclude water, and provide weep holes where water may accumulate.

2.4 FABRICATION, GENERAL

- A. Shop Assembly: Preassemble items in shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Use connections that maintain structural value of joined pieces. Clearly mark units for reassembly and coordinated installation.
- B. Coordinate dimensions and attachment methods of detention enclosures with those of adjoining construction to produce integrated assemblies with closely fitting joints and with edges and surfaces aligned unless otherwise indicated.
- C. Shear and punch metals cleanly and accurately. Remove burrs.
- D. Form and grind edges and corners to be free of sharp edges or rough areas.
- E. Form metal in maximum lengths to minimize joints. Form sheet-metal corners to smallest radius possible without causing grain separation or otherwise impairing the Work.
- F. Weld corners and seams continuously to comply with referenced AWS standard and the following:
 1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
 2. Obtain fusion without undercut or overlap.
 3. Remove welding flux immediately.
 4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no roughness shows after finishing and contour of welded surface matches that of adjacent surface.
 5. Weld before finishing components to greatest extent possible. Remove weld spatter and welding oxides from exposed surfaces by descaling or grinding.
- G. Provide for anchorage of type indicated; coordinate with supporting structure. Fabricate and space anchoring devices to secure detention enclosures rigidly in place and to support indicated loads. Build in straps, plates, and brackets as needed to support and anchor fabricated items to adjoining construction. Reinforce formed-metal units as needed to attach and support other construction.
- H. Cut, reinforce, drill, and tap detention enclosures as indicated to receive hardware, security fasteners, and similar items.
- I. Form exposed work true to line and level with accurate angles, surfaces, and straight sharp edges.
- J. Form exposed connections with hairline joints flush and smooth using concealed fasteners where possible. Use exposed security fasteners of type indicated or, if not indicated, flat-head (countersunk) security screws. Locate joints where least conspicuous.



Specifications

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer[**and Detention Specialist**] present, for compliance with requirements for installation tolerances and other conditions affecting performance of detention enclosures.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of detention enclosure connections before installation.
- C. Prepare written report, endorsed by Installer, listing conditions detrimental to performance of detention enclosures.
- D. Inspect built-in and cast-in anchor installations, before installing detention enclosures, to verify that anchor installations comply with requirements. Prepare inspection reports.
 - 1. Remove and replace anchors where inspections indicate that they do not comply with specified requirements. Reinspect after repairs or replacements are made.
 - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- E. Verify locations of detention enclosures with those indicated on Shop Drawings.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION, GENERAL

- A. Install detention enclosures plumb, rigid, properly aligned, and securely fastened in place, complying with manufacturer's written recommendations.
- B. Fastening to In-Place Construction: Provide anchorage devices and fasteners where necessary for securing detention enclosures to in-place construction. Include threaded fasteners for inserts, security fasteners, and other connectors.
 - 1. Proprietary Built-in Masonry Anchors: Install integral with unit masonry. Comply with requirements in Division 04 Section "Unit Masonry."
- C. Cutting, Fitting, and Placement: Obtain manufacturer's written approval for cutting, drilling, and fitting required for installing detention enclosures. Set detention enclosures accurately in location, alignment, and elevation; with edges and surfaces level, plumb, true, and free of rack; and measured from established lines and levels.
- D. Provide temporary bracing or anchors in formwork for items that are to be built into adjacent construction.
- E. Fit exposed connections accurately together to form hairline joints. Weld connections that are not to be left as exposed joints but cannot be shop welded because of shipping size limitations. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication and are for bolted or screwed field connections.

Specifications

F. Field Welding: Comply with the following requirements:

1. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
2. Obtain fusion without undercut or overlap.
3. Remove welding flux immediately.
4. Finish exposed welds and surfaces smooth and blended at exposed connections so that no roughness shows after finishing and contour of welded surface matches that of adjacent surface.

3.3 INSTALLATION OF BAR-GRILLE ASSEMBLIES

- A. Wall and Ceiling Anchorage: Weld framing to continuous angles with continuous welds. Anchor angles to embedded anchors by **[bolting]** **[welding]**.
- B. Partitions: Weld adjacent framing members to each other with continuous 1/4-inch- (6-mm-) deep welds on both sides; grind smooth.
- C. Doors: Install 2 inches (51 mm) above finish floor. Adjust to operate easily without binding.

3.4 INSTALLATION OF WOVEN-ROD-MESH ASSEMBLIES

- A. Floor Anchorage: Fasten anchor clips to floor with 3/8-inch diameter concrete anchors.
- B. Wall and Ceiling Anchorage: Anchor continuous angle to walls and ceilings with 3/8-inch- (9.5-mm-) diameter masonry or concrete anchors as required by wall type.
 1. Weld main framing to wall and ceiling angles with 1-inch welds at 12 inches (305 mm) o.c.
- C. Weld adjacent main framing members to each other with 1/4-inch-deep by 3/4-inch long welds at 12 inches (305 mm) o.c. on both sides of framing.
- D. Provide supplementary framing at **[three-way connections]** **[and]** **[multiple-panel-height partitions]**. Weld main framing to supplementary framing with 1/8-inch (3-mm) fillet welds 1 inch (25 mm) long at 12 inches (305 mm) o.c. on both sides of framing.
- E. Provide additional field bracing as shown or as necessary for rigid, secure installation.
- F. Adjust doors to operate easily without binding.

3.5 INSTALLATION OF SECURITY GRILLES AND VENTS

- A. Locations: Unless otherwise indicated, install security grilles and vents in penetrations and openings with dimensions exceeding **[8 inches (203 mm)]** **<Insert dimension>** in **[either direction]** **[diameter]**.
- B. Support Frames: Set support frames in adjacent construction.
- C. Grilles: Weld vertical bar supports to support frame.
- D. Field weld perimeter frames to duct sleeves.



Specifications

3.6 FIELD QUALITY CONTROL

- A. **[Detention Specialist shall inspect] [Inspect]** installed products to verify compliance with requirements. Prepare inspection reports and indicate compliance with and deviations from the Contract Documents.
- B. Remove and replace detention work if inspections indicate that work does not comply with specified requirements. Remove malfunctioning units; replace with new units.
- C. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- D. Prepare field quality-control certification[**endorsed by Detention Specialist**] that states installed products and their installation comply with requirements in the Contract Documents.

3.7 CLEANING AND PROTECTION

- A. Touchup Painting: Immediately after erection, clean bolted connections and abraded areas of shop paint, and paint exposed areas with same material used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.
- B. Touchup Painting: Cleaning and touchup painting of bolted connections and abraded areas of shop paint are specified in Division 09 painting Sections.
- C. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas; repair galvanizing to comply with ASTM A 780.

END OF SECTION 055963

11 19 53 - DETENTION HARDWARE

PART 1 - GENERAL

1.1 SUMMARY

- A. This Section includes the following:
 - 1. Detention Hinges.
 - 2. Detention Electromechanical Locks.
 - 3. Detention Mechanical Locks.
 - 4. Closers.
 - 5. Position Switches.
 - 6. Other miscellaneous Door Hardware
- B. Existing Locks. This existing facility uses Southern Steel Products, LCN, and Corbin Russwin products.. Only these manufacturer's products are acceptable.

1.2 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of detention door hardware.
- B. Shop Drawings: For each type of detention door hardware. Include openings by door number and location, manufacturer's names, catalog numbers, keying information, materials, and finish. The Architect/Engineer's approval of schedule will not relieve Contractor or Supplier of responsibility for errors or omissions which it might contain.
- C. Certification by Manufacturer: That products supplied complies with performance requirements specified.
- D. Qualification Data: For Installer.
- E. Product Test Reports: Showing compliance with specified requirements.
- F. Maintenance Data: For each type of detention door hardware to include in maintenance manuals.
- G. Warranties: Special warranties specified in this Section.
- H. Detention Keying Schedule: Coordinate a Detention Keying Meeting with the Architect, User, and hardware supplier so as not to delay the manufacturer and delivery of the required detention locks. Submit keying system schedule after signed approval by User.

1.3 QUALITY ASSURANCE

- A. Provide all detention locks manufactured by a single firm specializing in the production of this type of work.
- B. Installation and maintenance of the detention hardware shall be performed by manufacturer approved

Specifications

personnel. Submit certification of manufacturer training with shop drawings.

- C. Provide hardware for Fire- Rated Openings conforming to UBC Standard 7-2.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle detention hardware per manufacturer's requirements.
- B. Delivery: Deliver items in manufacturer's original package. Each item individually packaged and carefully marked for intended opening and use. Each item complete with all necessary screws, bolts, keys, instructions, and where necessary, installation templates.
- C. Storage: Store off floor in dry area of building out of way of other work in progress. Provide maximum protection against loss and damage.
- D. Handling: Handle items in a manner to prevent damage. Marred, defaced, damaged and defective items will be rejected.

1.5 WARRANTY

- A. See 11 19 13 General Provision for Detention Work

1.6 MAINTENANCE SERVICE

- A. Maintenance Manual: Furnish a bound complete set of maintenance instructions as needed for Owner's continued adjustment, maintenance, repair, and removal and replacement of detention door hardware.
- B. Training: Provide on site review of Operational and Maintenance manuals and spare parts with the Owner's designated personnel. Provide sixteen hours of training on repair and maintenance of the detention door hardware.

PART 2 - PRODUCTS

2.1 MANUFACTURER

- A. Catalog numbers of the manufacturers listed have been used to establish the quality required.

2.2 DETENTION ELECTRIC LOCK TYPES

- A. Type: **50**: Maximum Security - Electrical Operation (Pedestrian Swing Gate):
 - 1. Series/Manufacturer:
 - a. 1050D/Southern Steel
 - 2. Fence post mounted 120VAC, continuous-duty solenoid actuated.
 - 3. Deadlocks automatically when gate is closed.
 - 4. Bolt is retracted electrically by push button at control panel and remains retracted until door is

Specifications

- opened.
 - 5. Bolt is retracted manually by paracentric key on outside and/or inside.
 - 6. Bolt is retracted until relocked by key.
 - 7. Internal switches monitor deadlocked condition of the deadbolt.
 - 8. Furnished galvanized.
 - 9. Provide with interlock feature as required.
 - 10. Galvanized case and cover.
- B. Type **120-S**: Maximum Security - Electromechanical solenoid for swing doors
- 1. Series/Manufacturer:
 - a. 10120AE/Southern Steel
 - 2. Frame mounted 115VAC continuous duty solenoid operated.
 - 3. Bolt is retracted electrically by icon at the control panel and remains retracted until door is opened.
 - 4. Bolt is retracted manually by mogul key on outside and/or inside.
 - 5. Internal switches monitor status of bolt to show deadlocked and unlocked conditions.
 - 6. Provide galvanized case at exterior installations.
 - 7. Provide a key cylinder extension for locks keyed both sides or keyed stop side.
- C. Type **120-M**: Maximum Security - Electromechanical motor for swing doors
- 1. Series/Manufacturer:
 - a. 10120AM/Southern Steel
 - 2. Frame mounted 115 VAC, motor operated.
 - 3. Bolt is retracted electrically by icon at the control panel and remains retracted until door is opened.
 - 4. Bolt is retracted manually by mogul key on outside and/or inside.
 - 5. Internal switches monitor status of bolt to show deadlocked and unlocked conditions.
 - 6. Provide a key cylinder extension for locks keyed both sides or keyed stop side.
- D. Type **300-S**: Medium Security - Electromechanical solenoid for swing doors
- 1. Series/Manufacturer:
 - a. 10300AE/Southern Steel
 - 2. Frame mounted, 24 V DC motor with operation range and overload protection.
 - 3. Bolt is retracted electrically by icon at the control panel and remains retracted until door is opened.
 - 4. Bolt is retracted manually by Corbin Russwin key on outside and/or inside.
 - 5. Internal switches monitor status of bolt to show deadlocked and unlocked conditions.
 - 6. Provide a key cylinder extension for locks keyed both sides or keyed stop side.

2.3 DETENTION MECHANICAL LOCK TYPES

- A. Type **70**: Maximum Security - Mechanical Operation:
- 1. Series/Manufacturer:
 - a. 1070A/Southern Steel
 - 2. Door mounted, paracentric key deadlocking latchbolt with three hardened steel pins.
 - 3. Bolt is retracted manually by paracentric key on outside and/or inside.
 - 4. Supply with hollow metal lock mounting, escutcheon and security screws.
 - 5. Provide strike as scheduled
 - 6. Provide galvanized case and cylinder shields at exterior installations.
- B. Type **380-A**: Maximum Security Pair of doors - Mechanical Operation:

Specifications

1. Series/Manufacturer:
 - a. 10380A/Southern Steel
2. Door mounted, paracentric key deadlocking deadbolt with three hardened steel pins.
3. Bolt is retracted manually by paracentric key on outside and/or inside.
4. Stainless steel locking bars retracted by lever handle on either door lead.
5. Locking bars deadlocked by key at door.
6. Three point locking.
7. Supply with hollow metal lock mounting, escutcheon and security screws.
8. Provide with top, bottom and jamb strikes.
9. Provide galvanized case and cylinder shields at exterior installations.

C. Type **500**: Minimum Security - Mechanical Operation:

1. Institutional Mortise Series/Acceptable Manufacturer:
 - a. 10500/Southern Steel
2. Install mortise in door.
3. Mogul cylinders.
4. Provide strike as scheduled.

2.4 DETENTION HINGES

A. Heavy Duty, 4 1/2 FM:

1. Series/Manufacturer:
 - a. 204FMSS/Southern Steel
 - b. Cast stainless steel leaves with integral security studs, non-removable stainless steel pins, stainless steel ball bearings, three knuckle with "HT" hospital tips.
2. Provide quantities as follows:
 - a. Doors less than 5 feet high provide 1 Pair.
 - b. Doors over 5 feet to 7 feet 6 inches provide 1-1/2 Pair.
 - c. Doors over 7 feet 6 inches to 10 feet provide 2 Pair.
 - d. Doors over 3 feet wide provide 2 Pair.

2.5 CLOSERS

A. Manufacturers:

1. LCN

B. Concealed Door Closer:

1. Overhead concealed door closers shall be one manufacturer and carry a two year warranty.
2. A factory representative shall inspect closers after installation to insure proper adjustment and operation.
3. Closers shall have full hydraulic, rack and pinion action with high strength cast iron cylinder.
4. Spring power shall be adjustable. Spring power shall provide an opening force range of 8 to 15 pounds from 0 degrees to 90 degrees.
5. Closers shall have separate adjustments for latch speed, general speed and back check.
6. Provide with Door Position Switch option for monitored doors.
7. Adjustments screws shall be accessible through a heavy duty mounting plate when finish plates are removed.
8. Closers shall be field adjustable to allow precise setting for each door and fitted with a protective shield.
9. Install of the finish plate shall fully conceal all adjustment mechanisms.

Specifications

10. Closers shall have an extra heavy duty, forged steel concealed arm.
11. The low friction track roller shall be attached to the arm by a threaded mounting.
12. Closers shall have a metal track designed to prevent jamming and to eject foreign objects placed in the track mortised into the top of the door.
13. Provide brackets, spacer blocks and any accessory required to insure proper installation.
14. Attach with stainless steel security screws.

2.6 POSITION SWITCHES

- A. Concealed Door Position Switch:
 1. Manufacturer:
 - a. 200MRS/Southern Steel
 2. Mortise installation overhead mounting with switch contacts housed in the door frame and actuating magnet mortised into the top of the door.
 3. Adjust switch for minimum movement to activate.
 4. Locate position switches in frame head, six inches (center of switch) from lock edge of door.
 5. Fasteners shall be torx-head (star design with center pin) security fasteners.
- B. Keeper Switches:
 1. Manufacturer:
 - a. Southern Steel
 2. SPDT limit monitoring switch, rating 10 amps at 120 VAC.
 3. All manual locks where monitoring of door is required shall utilize keeper switches.
 4. Fasteners shall be torx-head (star design with center pin) security fasteners.

2.7 DOOR ACCESSORIES

- A. Push Plates:
 1. Series/Manufacturer:
 - a. 1456/Hiwatha
 2. 3/16" thick stainless steel.
 3. 3 2" W. x 16" H. with 7/8" lip projection at bottom.
 4. Attach with stainless steel security rivets.
- B. Pull - Loop:
 1. Series/Manufacturer:
 - a. 212/Southern Steel
 2. Cast bronze, satin chrome plated.
 3. Dimensions 8 3/4" long x 1 2" clearance.
 4. Fasteners shall be torx-head (star design with center pin) security fasteners.
- C. Pull - Flush:
 1. Series/Manufacturer:
 - a. 214/Southern Steel
 2. Cast bronze, satin chrome plated.
 3. Dimensions 4" wide x 5" high x 1" depth.
 4. Fasteners shall be torx-head (star design with center pin) security fasteners.
- D. Kickplates:
 1. Manufacturer:

Specifications

- a. Rockwood
2. Kickplates shall be .050 stainless steel with eased edges.
3. 10 inches high (except reduce height 2 inch less than bottom rail when required) x 2 inches less than door width on singles and 1 inch less on pairs.
4. Attach with stainless steel security rivets.
- E. Door Stops:
 1. Black silicone rubber bumper 2" diameter, mounted on a 5/8" x 2 1/2" steel shank for permanent attachment in grout filled masonry or concrete.
- F. Thresholds:
 1. Manufacturer:
 - a. Pemko
 - b. Reese
 - c. National
 2. Fasteners shall be stainless steel torx-head (star design with center pin) security fasteners with expansion anchors.
- G. Weatherstripping/Smoke Seals:
 1. Model/Manufacturer:
 - a. 315CR/Pemko
 - b. DS78C/Reese
 - c. 130NA/National
 2. Extruded clear anodized aluminum with neoprene seal.
 3. Secured with stainless steel, torx-head (star design with center pin) security screws.
- H. Automatic Door Bottom:
 1. Model/Manufacturer:
 - a. 4131/Pemko
 2. Surface mounted type, clear anodized aluminum, cam-actuated drop down vinyl seal, with spring mechanism return.
 3. Secured with stainless steel, torx-head (star design with center pin) security screws.
- I. Head Drip:
 1. Model/Manufacturer:
 - a. R201/Reese
 2. Extruded clear anodized aluminum.
 3. Secured with stainless steel, torx-head (star design with center pin) security screws.
 4. All exterior doors shall have head drips, whether or not scheduled.

2.8 FINISHES

	US	ANSI	
	<u>Symbol</u>	<u>Symbol</u>	<u>Description</u>
Hinges, Exterior	US32D	630	Satin Stainless Steel
Hinges, Interior	US26D	626	Satin Chrome
Locks & Pulls	US26D	626	Satin Chrome
Closers	AL	689	Aluminum Painted
Push & Kick plates	US32D	630	Satin Stainless Steel
Strike Plates	US32D	630	Satin Stainless Steel

Specifications

2.9 CYLINDERS, KEYS AND KEYING

- A. The detention locks will incorporate two (2) separate keying systems; one for lever tumbler (Paracentric) and one for pin tumbler (mogul cylinder) locks. Each keying system's keys shall be stamped for identification; corresponding to the Detention Equipment Contractor's final schematic keying chart.
- B. Lever tumbler locks shall be keyed alike or different as directed. Provide cut keys as required.
- C. Mogul cylinder locks shall be master keyed as directed. Provide cut change keys, and master keys as required.

2.10 KEY CONTROL

- A. Key control system shall be furnished only and have a capacity of 1.75 times the number of individual key designations and shall be a complete dual tag system. Similar to TelKee Big Head system, consists of a cabinet, tabs, hook labels, receipt forms, visible index software.
- B. Cabinet shall have concealed-type hinge and rounded sides, lock with keys.
- C. Panels must have individual hook and label pockets formed as an integral part of the panel, for both paracentric and mogul key types, as required.
- D. Tags of two types shall be provided, one set for permanent attachment of file key without the use of tools and the other set with snaphook holding at least four keys.
- E. Indexing software shall be provided only for owners installation and use.
- F. Permanent Loan Registry shall be furnished to protect identity of key borrowers while Receipt Tabs shall be supplied for temporary loan.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before installation.
- C. Notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work.
- D. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

Specifications

3.2 INSTALLATION

- A. Expenses carried by the Architect/Engineer, Project Manager or Owner in troubleshooting equipment problems caused by inadequate workmanship or other form of poor performance on the part of the Contractor, shall be borne by the Contractor.
- B. Install Detention Hardware in accordance with shop drawings, manufacturer's written installation instructions, and as herein specified.
- C. Installation shall be under supervision of manufacturer approved personnel.
- D. Fitting: Fit hardware accurately and properly. Remove exposed parts until after painter's finishing is completed, then reinstall. Securely fasten all fixed parts. Fit faces of mortised parts snug and flush. Make sure operating parts move freely and smoothly without binding, sticking or excessive clearance.
- E. Adjusting and Finishing: After work has been otherwise completed, examine hardware for complete and proper installation. Lubricate bearing surfaces of moving parts. Adjust latching and holding devices to proper function. Adjust door control devices to proper speed and power. Test keys for conformance to approved keying system. Clean exposed surfaces, check for surface damage and polish.
- F. Thresholds: Install in one continuous piece, full width of opening. Set in full bed of mastic and fasten with countersunk anchors at 6 inches on center.

3.3 DEFECTIVE WORK

- A. Where hardware is found defective in materials or installation; rework, restore, replace or otherwise correct as directed.
- B. Following will be considered as defective materials:
 - 1. Unauthorized substitutes.
 - 2. Items delivered with missing, broken, damaged or defaced parts.
 - 3. Items of incorrect hand or function.
- C. Following will be considered as defective installation:
 - 1. Items broken, damaged, or defaced after delivery.
 - 2. Items incomplete, misaligned or incorrectly located.

3.4 SPARE PARTS

- A. Shall be provided for the Owners' stock as follows:
 - 1. 6 Locks 10120AP
 - 2. 6 Mogul Cylinders
 - 3. 12 Solenoid valves
 - 4. 6 Swing door Position Switches
 - 5. 6 Keeper Switches
 - 6. Six complete repair parts kit for the 10120 Series locks, containing: Springs, micro switches, screws, nuts, solenoid valves, washers and miscellaneous parts.

3.5 HARDWARE SCHEDULE



Specifications

- A. Provide hardware, conforming to Project Specifications as scheduled on drawings:

END OF SECTION 11 19 53

11 19 56 - DETENTION SLIDING DOOR LOCKING DEVICES

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Electromechanical-Locking, Electromechanical-Door-Movement, Sliding Door Device Assemblies:
- B. Existing Locking systems. This existing campus uses Southern Steel Products. Only Southern Steel devices are acceptable.

1.3 SUBMITTALS

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles for each type of detention sliding door locking device.
- B. Shop Drawings: For each type of detention sliding door locking device. Include openings by door number and location, catalog numbers, keying information, materials, elevations, dimensioned construction details, opening conditions, and installation requirements of reinforcement, and connections to detention hollow metal doors. The Architect/Engineer's approval of schedule will not relieve Contractor or Supplier of responsibility for errors or omissions which it might contain.
- C. Certification by Manufacturer: That products supplied complies with performance requirements specified.
- D. Qualification Data: For Installer.
- E. Product Test Reports: Showing compliance with specified requirements.
- F. Maintenance Data: For each type of detention door hardware to include in maintenance manuals.
- G. Warranties: Special warranties specified in this Section.
- H. Detention Keying Schedule: Coordinate a Detention Keying meeting with the Architect, User, and hardware supplier so as not to delay the manufacturer and delivery of the required detention locks. Submit keying system schedule after signed approval by User.

1.4 QUALITY ASSURANCE

- A. Detention Equipment Contractor (DEC) Qualifications
 - 1. General: Refer to Section 111900.

Specifications

- B. Provide detention sliding door locking devices manufactured by a single firm specializing in the production of this type of work.
- C. Installation and maintenance of the detention sliding door locking devices shall be performed by manufacturer approved personnel. Submit certification of manufacturer training with shop drawings.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle detention sliding door locking devices per manufacturer's requirements.
- B. Delivery: Deliver items in manufacturer's original package. Each item individually packaged and carefully marked for intended opening and use. Each item complete with necessary screws, bolts, keys, instructions, and where necessary, installation templates.
- C. Storage: Store off floor in dry area of building out of way of other work in progress. Provide maximum protection against loss and damage.
- D. Handling: Handle items in a manner to prevent damage. Marred, defaced, damaged and defective items will be rejected.

1.6 COORDINATION

- A. Electrical System Roughing-in: Coordinate layout and installation of electrified detention sliding door locking devices with connections to power supplies and detention monitoring and control system.

1.7 WARRANTY

- A. General Warranty: The special warranty specified in this Article shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by the Contractor under requirements of the Contract Documents.
- B. Special Warranty: Submit a written warranty executed by the manufacturer and installer agreeing to repair or replace materials furnished under this Section that fail in materials or workmanship within the specified warranty period. Submit the warranty to the Architect for approval. The spare part provided to the Owner in the original inventory shall be maintained during the warranty period. Components used for repair shall be replaced immediately and the Owner shall not be charged for shipping or other costs unless failure is due to abuse or negligence.
- C. Warranty Period: As defined by the DPE during design.

1.8 MAINTENANCE SERVICE

- A. Maintenance Manual: Furnish a bound complete set of maintenance instructions as needed for Owner's continued adjustment, maintenance, repair, and removal and replacement of detention sliding door locking devices.

Specifications

- B. Training: Provide on site review of Operational and Maintenance manuals and spare parts with the Owner's designated personnel. Provide sixteen hours of training on repair and maintenance of the detention sliding door locking devices.
 - 1. Provide a professionally produced video tape on the repair and maintenance of the detention sliding door locking devices.
- C. Initial Maintenance Service: Beginning at Substantial Completion, provide at six (6) month intervals (coordinate exact time with the User) per year for the basic warranty period full maintenance by skilled employees of detention sliding door locking devices Installer. Include preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper detention sliding door locking device operation. Provide parts and supplies as used in the manufacture and installation of original products.

PART 2 - PRODUCTS

2.1 SLIDING DETENTION DOOR DEVICE ASSEMBLIES, GENERAL

- A. Performance Requirements: Provide sliding detention door device assemblies, including locking device, receiver, overhead door hanger, bottom door guide, lock column, and enclosure, as a complete assembly, complying with Grade 1 according to ASTM F 1643, as determined by testing manufacturers' standard units representing those indicated for this Project.
- B. Assembly Construction: As follows:
 - 1. Enclosure: Fabricated from 0.167-inch- (4.2-mm-) thick steel plate, with 0.123-inch- (3.1-mm-) thick, steel [removable] [hinged] cover. Baffle openings in enclosure. Provide closures for ends of housings.
 - a. Provide sloping-top housings. Flat-top housings may be provided for operators mounted touching ceiling.
 - 2. Lock Column: Vertical tube enclosure fabricated from steel, providing mechanical locking control of detention sliding door at door location; operated by key.
 - 3. Hanger Assembly: Extend steel carrier full width of door and door travel required for clear door opening. Provide antifriction ball-bearing steel rollers with hardened members and grease shield.
 - 4. Finish: Factory prime painted.

2.2 Type **3165**: ELECTROMECHANICAL-LOCKING, ELECTROMECHANICAL-DOOR-MOVEMENT, SLIDING DOOR DEVICE ASSEMBLIES

- A. Operated from remote-control system that activates electric motors to unlock sliding doors and motorized rack-and-pinion drive mechanisms to open and close doors. Doors lock in open position and deadlock when closed. Provide factory-wired cable harness with plug connectors for each motor unit.
 - 1. Single-Door Function: In an emergency or if power fails, individual doors can be unlocked by key at the door in the pilaster and manually moved; doors relock in either fully open or fully closed position.
 - 2. Products:
 - a. Southern Steel Company, Model 3165 series.

Specifications

2.3 DETENTION EQUIPMENT ACCESSORIES

- A. Provide accessories, anchorage inserts and security fasteners for a complete, tamper-proof installation.
- B. Exposed Security Fasteners:
 - 1. Provide torx-head (star design with center pin) security fasteners for anchoring work in exposed detention areas. Comply with specification section 11199.
 - 2. Finish shall match that specified of the item anchored.

PART 3 - EXECUTION**3.1 EXAMINATION**

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for electrical power systems to verify actual locations of wiring connections before installation.
- C. Notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work.
- D. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Expenses carried by the Architect/Engineer, Project Manager or Owner in troubleshooting equipment problems caused by inadequate workmanship or other form of poor performance on the part of the Contractor, shall be borne by the Contractor.
- B. Install detention sliding door locking devices in accordance with shop drawings and manufacturer's written installation instructions for proper functioning of sliding door devices.
- C. Installation shall be under full time supervision of manufacturer approved personnel.
- D. Touch-up painting of factory finished or factory primed items is the Installer's responsibility.
- E. Fill voids between materials of the detention equipment and embeds or other physical construction with low-mod gel, equal to Sikadur 23, by Sika and paint equipment to match surrounding materials.

3.3 ADJUSTMENT AND CLEANING

- A. Check and readjust doors and devices just prior to final inspection. Leave work in complete and proper operating condition. Remove and replace defective work.

Specifications

- B. Clean equipment thoroughly prior to Substantial Completion.

3.4 PROTECTION:

- A. Protect equipment and finishes until Substantial Completion.
- B. Replace damaged equipment as directed by the Architect.

3.5 SPARE PARTS

- A. Shall be provided for the Owners' stock as follows:
 - 1. Two complete repair parts kit for corridor sliding door locking device, containing: Springs, micro-switches, screws, nuts, solenoid valves, fittings, washers and miscellaneous hardware.
 - 2. Six complete repair parts kit for cell sliding door locking device, containing: Springs, micro-switches, screws, nuts, solenoid valves, fittings, washers and miscellaneous hardware.
 - 3. Two of each type of air cylinders.

END OF SECTION 11 19 56

11 19 63 - DETENTION FURNISHINGS AND EQUIPMENT**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY**1.3 SUBMITTALS**

- A. Product Data: Include construction details, material descriptions, dimensions of individual components and profiles, and finishes for each type of detention furnishing indicated.
- B. Shop Drawings: For each type of detention furnishing. Include plans, elevations, sections, details, and attachments to other Work.
- C. Coordination Drawings: Drawings of each built-in anchor supporting detention furnishings, including those to be installed as work of other Sections, drawn to scale and coordinating anchorage with detention furnishings. Show the following:
 - 1. Locations, dimensions, and profiles of wall and floor reinforcements.
 - 2. Locations and installation details of built-in anchors.
 - 3. Elevations of each detention furnishing showing dimensions of furnishing, preparations for receiving anchors, and locations of anchorage.
 - 4. Details of attachment of each detention furnishing to built-in anchors.
- D. Samples: For each type of detention furnishing with factory-applied color finishes.

1.4 QUALITY ASSURANCE

- A. Detention Equipment Contractor (DEC) Qualifications
 - 1. General: Refer to Section 111900.
- B. Provide detention furnishings and equipment manufactured by a single firm specializing in the production of this type of work.

1.5 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle detention furnishings and equipment per manufacturer's requirements.

Specifications

PART 2 - PRODUCTS

2.1 RECESSED, DETENTION TOILET TISSUE DISPENSER

- A. Minimum **5-inch diameter by 4-1/2 inches** deep; formed from **0.062-inch** thick, stainless-steel sheet. Secure to wall with rear-mounting steel strap and adjustment bolts. Provide No. 4 finish.
 - 1. Products: Subject to compliance with requirements, provide the following:
 - a. A & J Washroom Accessories Inc.; Security Toilet Paper Holder, US74.
 - b. American Specialties, Inc.; Security Recessed Toilet Paper Holder, Model No. **110**
 - c. Bradley Corporation; Security Recessed Toilet Tissue Roll Holder, Model SA11.
 - d. General Accessory Manufacturing Company; Toilet Tissue Dispenser, MSA-1.
 - e. Maximum Security Products Corp.; Model TP 970.
 - f. Panel Specialties, Inc.; Recessed Toilet Paper Holder, Model TPH-600.
 - g. Willoughby Industries, Inc.; Rear Mounted Tissue Holder, Model No. RTH-1.

2.2 DETENTION GRAB BARS

- A. Grab Bars: **1-1/2 inches** in diameter; formed from **0.038-inch** thick, stainless-steel tubing, with **3-inch** diameter flanges formed from **0.125-inch** thick, stainless steel. Closure plates formed from **0.125-inch** thick, stainless steel. All-welded construction. Provide No. 4 finish.
 - 1. Products: Subject to compliance with requirements, [provide the following] [provide one of the following] [available products that may be incorporated into the Work include, but are not limited to, the following]:
 - a. A & J Washroom Accessories Inc.; US130.
 - b. American Specialties, Inc.; 165.
 - c. Bradley Corporation; SA70.
 - d. General Accessory Manufacturing Company; MSA-13.
 - e. Panel Specialties, Inc.; GB-600.
 - 2. Length: As indicated on Drawings
 - 3. Mounting: Front mounting with security fasteners.

2.3 MIRROR

- A. Mirror:
 - 1. One piece stainless steel. Mirror shall be made of 20 gauge stainless steel polished for high reflectivity.
 - 2. Include chromium plated security fasteners.
- B. Mount top of mirror at 6'-2" above finish floor typically, in handicap areas mount bottom of mirror at 3'-4" above finish floor.
- C. Provide low-mod gel, equal to Sikadur 23 by Sika, around perimeter of frame and embed.

2.4 RECESSED SHELF

- A. Model/Manufacturer:
 - 1. No. 1820/Acorn Engineering Co.
 - 2. No. S565-550/Norix Group, Inc.

Specifications

3. No. RS-515/PSI LLC.

B. Construction:

1. Shelf Size: Inside Dimensions: 16" wide x 5" high x 4" deep.
2. Shelf Material: Type 304 Stainless Steel, 16 gauge, #4 finish.
3. Wall mounting hardware as provided by manufacturer.

C. Mount top of shelf opening at 48" above finish floor.

D. Provide low-mod gel, equal to Sikadur 23 by Sika, around perimeter of recessed shelf.

2.5 FIXED BENCH

A. Construction:

1. Size of dayroom bench table unit to be 50" wide x 96" long with table height of 30".
2. Tabletops and seats to be smooth, true, level, and free of sharp edges.
3. Fabricate tabletop from 10 gauge steel and bench seat from 16 gauge stainless steel.
4. Structural framing made from 3/16" thick steel.
5. Foot angles at floor to be 2" x 2" x 1/4" angle drilled for security fasteners for anchoring table to the floor.

B. Provide anchorage devices and security fasteners as detailed.

C. Table to be continuous welded and finish ground, eliminating sharp corners and edges.

D. Steel components shall be provided with one (1) shop coat of primer. Field finish paint by Section 09900, color as selected by Architect. Verify primer compatibility with finish paint as specified in Section 09900. Stainless steel shall be type 304 with a No. 3 finish.

2.6 CLOTHES HOOK AND EMBED PLATE

A. Model/Manufacturer:

1. No. 1829-1/Acorn Engineering Co.
2. No. B-983/Bohrick Washroom Equipment Inc.

B. Construction:

1. Provide 14 gauge, satin finish, type 304 stainless steel plate with stainless steel, ball-type collapsible hooks.
2. Provide embed plate, drilled and tapped for security fasteners, with anchor straps.

C. Mount top of plate at 48 - 1/2" above finish floor.

D. Provide low-mod gel, equal to Sikadur 23 by Sika, around perimeter of plate and embed.

E. Embed plate shall be provided with one (1) shop coat of primer. Field finish paint by Section 09900, color as selected by Architect. Verify primer compatibility with finish paint as specified in Section 09900.

2.7 CLOTHES HOOK STRIP (4 HOOKS) AND EMBED PLATE

Specifications

- A. Model/Manufacturer:
 - 1. No. 129/ASI Co.
 - 2. No. B-985/Bohrick Washroom Equipment Inc.
- B. Construction:
 - 1. Provide 14 gauge, satin finish, type 304 stainless steel plate with stainless steel, ball-type collapsible hooks.
 - 2. Provide embed plate, drilled and tapped for security fasteners, with anchor straps.
- C. Mount top of plate at 48 - 1/2" above finish floor.
- D. Provide low-mod gel, equal to Sikadur 23 by Sika, around perimeter of plate and embed.
- E. Embed plate shall be provided with one (1) shop coat of primer. Field finish paint by Section 09900, color as selected by Architect. Verify primer compatibility with finish paint as specified in Section 09900.

2.8 PASS HOPPER

- A. Product/Manufacturer:
 - 1. Model PHE-1/Creative Industries Inc., Indianapolis, Ind.
- B. Construction:
 - 1. Size: 16" wide x 10-1/8" high x 7-3/4" deep
 - 2. Material: Stainless steel
 - 3. Class 1 bullet-resistant
 - 4. Hopper locks on staff side with a latch.
 - 5. Handle: Stainless steel.
 - 6. Provide hopper model to match wall sizes.
 - 7. Fire rated when installed in rated walls.

2.9 FIXED DETENTION BENCH

- A. Construction:
 - 1. Fabricate seat from 16 x 4 structural tubing with a 1/4" closure plate fully welded at each end.
 - 2. Fabricate seat support from 2 x 2 x 3/16 structural tubing.
 - 3. Continuously weld seat to seat support.
 - 4. 1" O.D. pipe armrests welded to seat.
- B. Size: 1'-4" W. x 6'-4" L. x 2'-0" H.
- C. Provide security-type, wedge anchor for fastening to floor.
- D. Provide low-mod gel, equal to Sikadur 23 by Sika, around perimeter of seat support and floor.
- E. Assembly shall be provided with one (1) shop coat of primer. Field finish paint by Section 09900, color as selected by Architect. Verify primer compatibility with finish paint as specified in Section 09900.

2.10 TOILET GRAB BARS

Specifications

- A. Grab Bar Embed:
 - 1. Embed for grab bar shall be constructed of 3/16" x 11" long x continuous steel plate with 3/16" x 2" wide embedment anchors at 16" on centers.
 - 2. Provide low-mod gel, equal to Sikadur 23 by Sika, around perimeter of embed.
- B. Grab Bar Construction:
 - 1. Grab bar tubing shall be constructed of 1 1/4" I.D. x .140 wall thickness pipe with continuously welded end caps.
 - 2. Grab bar support shall be constructed of a 3/16" steel bent plate.
 - 3. Length as indicated on the elevations or drawings.
- C. Embed and grab bar assembly shall be provided with one (1) shop coat of primer. Field finish paint by Section 09900, color as selected by Architect. Verify primer compatibility with finish paint as specified in Section 09900.

2.11 DETENTION EQUIPMENT ACCESSORIES

- A. Provide accessories, anchorage inserts and security fasteners for a complete, tamperproof installation.
- B. Exposed Security Fasteners:
 - 1. Provide torx-head (star design with center pin) security fasteners for anchoring work in exposed detention areas. Comply with specification section 11199.
 - 2. Finish shall match that specified of the item anchored.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of the Work.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations before installation.
- C. Notify the General Contractor in writing of conditions detrimental to the proper and timely completion of the work.
- D. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of the Work.
- E. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 INSTALLATION

- A. Expenses carried by the Architect/Engineer, Project Manager or Owner in troubleshooting equipment problems caused by inadequate workmanship or other form of poor performance on the part of the Contractor, shall be borne by the Contractor.
- B. Comply with manufacturer's printed installation instructions.



Specifications

- C. Touch-up painting of factory finished or factory primed items is the Installer's responsibility.
- D. Fill voids between materials of the detention equipment and embeds or other physical construction with low-mod gel, equal to Sikadur 23, by Sika.

3.3 CLEANING

- A. Clean equipment thoroughly prior to Substantial Completion.

3.4 PROTECTION

- A. Protect equipment and finishes until Substantial Completion.
- B. Replace damaged equipment as directed by the Architect.

END OF SECTION 111963

11 19 65 - SECURITY CEILING SYSTEMS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. Section Includes:
 - 1. Downward-locking-panel security ceiling systems. **(MCT)**
 - 2. Security-plank security ceiling systems. **(AMD)**
- B. Related Sections:
 - 1. Division 1 Section "Special Project Procedures for Detention Facilities" for additional requirements for detention facilities.
 - 2. Division 3 Section "Cast-in-Place Concrete" for installing built-in anchors for attaching suspension system to concrete roof slabs and for attaching perimeter supports to walls.
 - 3. Division 4 Section "Unit Masonry Assemblies" for built-in anchors for perimeter supports in masonry construction.
 - 4. Division 5 Section "Steel Deck" for installing hanger accessories for attaching suspension systems to steel decks.
 - 5. Division 9 painting Sections for field painting security-plank security ceiling systems.
 - 6. Division 15 and 16 Sections for mechanical and electrical work penetrating security ceiling systems.

1.3 PERFORMANCE REQUIREMENTS

- A. General Performance: Security ceiling systems shall withstand normal thermal movement and structural loads without failure, including permanent deformation of security ceiling system components including pans and suspension system; noise or metal fatigue caused by vibration, deflection, and displacement of security ceiling units; and permanent damage to fasteners and anchors.
- B. Acoustical Performance: Provide security ceiling systems with acoustical ratings indicated, as determined according to ASTM E 1264 and the following:
 - 1. Noise Reduction Coefficient: ASTM C 423 and ASTM E 795 in Type E-400 mounting.
 - 2. Ceiling Attenuation Class: ASTM E 1414.
- C. Structural Performance: Security ceiling systems shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
 - 1. Vertical Load for Security Ceiling Systems: **<Insert load>**, acting upward or downward.

Specifications

2. Live Load for Security Ceiling Systems: Panel dead weight plus a uniform load of **<Insert load>**, acting upward or downward, with a deflection not more than $L/360$.

1.4 SUBMITTALS

- A. Product Data: For each type of product indicated.
- B. Samples for Verification, provide for each type used.
- C. Coordination Drawings: Reflected ceiling plans drawn, on which the following items are shown and coordinated with each other, using input from installers of the items involved:
 1. Layout of panels, joint pattern, transitions.
 2. Security ceiling system suspension assembly members.
 3. Method of attaching hangers to building structure.
 4. Size and location of access panels.
 5. Ceiling-mounted items including light fixtures, diffusers, grilles, speakers, sprinklers, access panels, and special moldings.
- D. Qualification Data: For qualified Installer.
- E. Welding certificates.
- F. Product Test Reports: Based on evaluation of comprehensive tests performed by a qualified testing agency, for each security ceiling system.
- G. Field quality-control reports documenting inspections of installed products.
- H. Other Informational Submittals:
 1. Examination reports documenting inspection of substrates, areas, and conditions.
 2. Anchor inspection reports documenting inspections of built-in and cast-in anchors.
 3. Field quality-control certification signed by Contractor[**and Detention Specialist**].

1.5 QUALITY ASSURANCE

- A. Installer Qualifications: An employer of workers trained and approved by manufacturer.
- B. Source Limitations: Obtain each security ceiling system from single source from single manufacturer.
- C. Welding Qualifications: Qualify procedures and personnel according to the following:
 1. AWS D1.1/D1.1M, "Structural Welding Code - Steel."
 2. AWS D1.2/D1.2M, "Structural Welding Code - Aluminum."
 3. AWS D1.3, "Structural Welding Code - Sheet Steel."
 4. AWS D1.6, "Structural Welding Code - Stainless Steel."
- D. Seismic Standard: Provide ceilings designed and installed to withstand the effects of earthquake motions according to the following:

Specifications

1. Standard for Ceiling Suspension Systems Requiring Seismic Restraint: Comply with ASTM E 580.
2. CISCA's Recommendations for Acoustical Ceilings: Comply with CISCA's "Recommendations for Direct-Hung Acoustical Tile and Lay-in Panel Ceilings - Seismic Zones 0-2."
3. CISCA's Guidelines for Systems Requiring Seismic Restraint: Comply with CISCA's "Guidelines for Seismic Restraint of Direct-Hung Suspended Ceiling Assemblies - Seismic Zones 3 & 4."
4. UBC Standard 25-2, "Metal Suspension Systems for Acoustical Tile and for Lay-in Panel Ceilings."
5. SEI/ASCE 7, "Minimum Design Loads for Buildings and Other Structures": Section 9, "Earthquake Loads."

E. Preinstallation Conference:

F. Coordination Meetings: Conduct coordination meetings at Project site to comply with requirements in Division 1 Section "Special Project Procedures for Detention Facilities."

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Deliver acoustical metal panels, suspension system components, and accessories to Project site in original, unopened packages and store them in a fully enclosed, conditioned space where they will be protected against damage from moisture, humidity, temperature extremes, direct sunlight, surface contamination, and other causes.
- B. Handle acoustical metal panels, suspension system components, and accessories carefully to avoid damaging units and finishes in any way.

1.7 COORDINATION

- A. Coordinate layout and installation of security ceiling systems with other construction that penetrates ceilings or is supported by them, including light fixtures, HVAC equipment, fire-suppression system, and partition assemblies.

1.8 EXTRA MATERIALS

- A. Furnish extra materials, components, fasteners and tools that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

PART 2 - PRODUCTS

2.1 MATERIALS

- A. Recycled Content: Provide products made from steel with average recycled content such that postconsumer recycled content plus one-half of preconsumer recycled content is not less than [25] <Insert number> percent.
- B. Metallic-Coated Steel Sheet: ASTM A 653/A 653M, CS (Commercial Steel), Type B; A60 (ZF180) zinc-iron-alloy (galvannealed) coating designation.
- C. Steel Tubing: ASTM A 513, Type B.

Specifications

- D. Concealed Bolts: ASTM A 307, Grade A, unless otherwise indicated.
- E. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.
- F. Attachment Devices: Size for required times the design load indicated in ASTM C 635, Table 1, Direct Hung, unless otherwise indicated.
 - 1. Cast-in-Place and Postinstalled Expansion Anchors in Concrete: Anchors of type and material indicated below, with holes or loops for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 5 times the load imposed by security ceiling construction, as determined by testing per ASTM E 488, conducted by a qualified testing agency.
 - a. Corrosion Protection: Carbon-steel components zinc plated to comply with ASTM B 633, Class Fe/Zn 5 (0.005 mm) for Class SC service condition (mild).
 - b. Corrosion Protection: Stainless-steel components complying with **ASTM F 593 and ASTM F 594, Alloy Group 1 or 2** for bolts and nuts; ASTM A 666 or ASTM A 276, Type 304 or 316, for anchors.
 - c. Corrosion Protection: Components fabricated from nickel-copper-alloy rods complying with ASTM B 164 for UNS No. N04400 alloy.
 - 2. Powder-Actuated Fasteners in Concrete: Fastener system of type suitable for application indicated, fabricated from corrosion-resistant materials, with clips or other accessory devices for attaching hangers of type indicated and with capability to sustain, without failure, a load equal to 5 times the load imposed by security ceiling construction, as determined by testing per ASTM E 1190, conducted by a qualified testing and inspecting agency.

2.2 DOWNWARD-LOCKING-PANEL SECURITY CEILING SYSTEM, MCT.

- A. Provide a complete, integrated system, including security ceiling panels, suspension system, perimeter supports, and accessories.
 - a. Basis of design is Trussbilt SecureDek perforated steel pan type suspended acoustical system. White powder coat finish.

2.3 SECURITY-PLANK SECURITY CEILING SYSTEM, AMD

- A. Provide a complete, integrated system, including security ceiling panels, suspension system, perimeter supports, and accessories.
 - a. Basis of design is Trussbilt BarrierDek single skin, interlocking 16 gauge steel plank type system. White powder coat finish.

2.4 SECURITY FASTENERS

- A. Security Fasteners: Operable only by tools produced for use on specific type of fastener by fastener manufacturer or other licensed fabricator.

2.5 FABRICATION

- A. Panels: Form metal panels from sheet metals selected for their surface flatness, smoothness, and freedom from surface blemishes where exposed to view in finished unit. Do not use materials whose

Specifications

exposed surfaces exhibit pitting, seam marks, roller marks, or variations in flatness exceeding those permitted by referenced standards for stretcher-leveled metal sheet.

2.6 GENERAL FINISH REQUIREMENTS

- A. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.
- B. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.
- C. Appearance of Finished Work: Noticeable variations in the same piece are not acceptable. Variations in appearance of adjoining components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 3 - EXECUTION

3.1 EXAMINATION

- A. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of security ceiling systems.
- B. Examine roughing-in for embedded and built-in anchors to verify actual locations of security ceiling system connections before security ceiling system installation.
- C. For the record, prepare written report, endorsed by Installer, listing conditions detrimental to performance of security ceiling systems.
- D. Inspect built-in and cast-in anchor installations before installing security ceiling systems to verify that anchor installations comply with requirements. Prepare inspection reports.
 - 1. Remove and replace anchors where inspections indicate noncompliance with specified requirements. Reinspect after repair or replacement.
 - 2. Perform additional inspections to determine compliance of replaced or additional work. Prepare inspection reports.
- E. Verify locations and layouts of security ceiling systems with those indicated on reflected ceiling plans and Coordination Drawings.
- F. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 GENERAL INSTALLATION

- A. Comply with CISCA's "Ceiling Systems Handbook" for installation of security ceiling systems.
- B. Comply with manufacturers installation guide.

Specifications

3.3 CLEANING

- A. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage, including dented and bent units.
- B. Touchup Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with same material as that used for shop painting; comply with SSPC-PA 1 for touching up shop-painted surfaces.
 - 1. Apply by brush or spray to provide a minimum dry film thickness of **2 mils (0.05 mm)**.
- C. Touchup Painting: Cleaning and touchup painting of field welds, bolted connections, and abraded areas of shop paint are specified in Division 9 painting Sections.
- D. Metallic-Coated Steel Surfaces: Clean field welds, bolted connections, and abraded areas and repair zinc or zinc-iron coating to comply with ASTM A 780.

END OF SECTION 11 19 65

11 19 93 - TAMPER-PROOF METAL FASTENERS**PART 1 - GENERAL****1.1 RELATED DOCUMENTS**

- A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

1.2 SUMMARY

- A. This Section includes the following:
 - 1. Tamper-proof metal fasteners.
 - 2. Accessories.

1.3 SUBMITTALS

- A. Product Data: For each type of product indicated.

1.4 DELIVERY, STORAGE AND HANDLING

- A. Deliver, store and handle per manufacturer's requirements.

PART 2 - PRODUCTS**2.1 TAMPER-PROOF METAL FASTENERS**

- A. Exposed Security Fasteners:
 - 1. Torx-head (star design with center pin) security fasteners.
 - 2. Finish shall match that specified of the item anchored.
- B. Fabrication:
 - 1. Fabricate removable tamper-proof fasteners to allow removal only by tools produced by fastener manufacturer or other licensed fabricator specifically for individual tamper-proof fastener design.
 - 2. Plating: Cadmium, zinc, nickel, phosphate and chrome to match adjacent materials.
 - 3. Limit size and shape variations such that no more than six (6) different tools are required for each type of tamper-proof fastener used on project.

Specifications

2.2 ACCESSORIES

- A. Screw-thread Adhesive Sealant: Loctite No. 271 or acceptable substitute.

2.3

- a Security Fasteners: Operable only by tools produced by fastener manufacturer or other licensed fabricator for use on specific type of fastener. Drive-system type, head style, material, and protective coating as required for assembly, installation, and strength, and as follows:
 - 1) Manufacturers: Subject to compliance with requirements, [provide products by the following] [available manufacturers offering products that may be incorporated into the Work include, but are not limited to, the following]:
 - a) Holo-Krome; a Danaher corporation.
 - b) Safety Socket LLC.
 - c) Tamper-Pruf Screws.
 - d) Textron Fastening Systems; Textron Inc.
 - e) <Insert manufacturer's name>.
 - 2) Drive-System Type: [Pinned Torx-Plus] [Pinned Torx] <Insert system>.
 - 3) Fastener Strength: 120,000 psi (827 MPa).
 - 4) Socket Button Head Fasteners:
 - a) Heat-treated alloy steel, ASTM F 835 (ASTM F 835M).
 - b) Stainless steel, ASTM F 879 (ASTM F 879M), Group 1 CW.
 - 5) Socket Flat Countersunk Head Fasteners:
 - a) Heat-treated alloy steel, ASTM F 835 (ASTM F 835M).
 - b) Stainless steel, ASTM F 879 (ASTM F 879M), Group 1 CW.
 - 6) Socket Head Cap Fasteners:
 - a) Heat-treated alloy steel, ASTM A 574 (ASTM A 574M).
 - b) Stainless steel, ASTM F 837 (ASTM F 837M), Group 1 CW.
 - 7) Protective Coatings for Heat-Treated Alloy Steel:
 - a) Zinc and clear trivalent chromium where indicated.
 - b) Zinc phosphate with oil, ASTM F 1137, Grade I, or black oxide unless otherwise indicated.
- b Concealed Bolts: ASTM A 307, Grade A unless otherwise indicated.
- c Cast-in-Place Threaded Insert Anchors in Concrete: Fabricated from corrosion-resistant materials capable of sustaining, without failure, a load equal to 4 times the load imposed, as determined by testing per ASTM E 488, conducted by a qualified testing agency; of type indicated below.
 - 1) Threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed; hot-dip galvanized per ASTM A 153/A 153M or ASTM F 2329.
- d Embedded Plate Anchors: Fabricated from mild steel shapes and plates, minimum 3/16 inch (4.8 mm) thick; with minimum 1/2-inch- (12.7-mm-) diameter, headed studs welded to back of plate.
- e Concrete or Masonry Anchors. Hilti or equal wedge stud- anchors for securing to existing walls or floors. Use a conical type nut such as break away or Trident drive type.



Specifications

PART 3 - EXECUTION

3.1 LOCATIONS

- A. Provide tamper-proof metal fasteners to work under the General, Mechanical, and Electrical Contracts. This shall include fasteners for equipment, furnishings, fixtures, doors, windows, exposed structural connections, attachments and hardware.
- B. Tamper-proof metal fasteners shall be used for fastenings, except in the following areas:
 - 1. Mechanical and electrical rooms.
 - 2. Areas above suspended ceilings, behind access panels and within pipe and duct chases.

3.2 INSTALLATION

- A. Install work using proper sized tamper-proof fastener, matched to configuration, structural loading, and size.
- B. Install fasteners with the proper amount of torque as recommended by the manufacturer.
- C. Set tamper-proof fasteners with screw thread adhesive sealant in accordance with manufacturer's instructions.
- D. Store and maintain inventory control for each installing tool used for installation of security fasteners. After use, installers shall return tools for inventory control. At completion of the project, installing tools shall be turned over to the facility.

3.3 SPARE PARTS

- A. Provide five (5) security fastener kits to the Owner. Kits shall contain all fasteners found on project and a tool with bits.

END OF SECTION 11 19 93

Project Specifications

11 40 00 – FOOD SERVICE EQUIPMENT

PART 1 GENERAL

1.1 **DEFINITIONS** The following definitions are intended to clarify the relationships involved in this document and are used as a definition throughout this foodservice specification.

- A. Food Service Equipment Contractor (F.E.C.) – The F.E.C. is responsible for supplying, delivering (including freight, staging and local warehousing as required), assembling, setting in place, installing, cleaning, sanitizing and/or the polishing of any further foodservice item(s) included in this contract, but not limited to all required materials and labor, pursuant to the guidelines and time lines scheduled and/or rescheduled by the Owner, Architect and/or SSA, Incorporated.
- B. Sub-Contractors – The F.E.C. may contract Sub-Contractors to perform any portion of the contract, but the final responsibility for the proper performance of the contract rest solely with the F.E.C.
- C. General Contractor (G.C.) – The G.C. / Construction Manager (C.M.) has the responsibility for overall installation, scheduling, deliveries, coordination of various trades, rough-in and connection of utilities, including but not limited to all labor and materials for said rough-ins and connections for all equipment in this contract unless otherwise specified, by item, within the equipment data specification sections of this contract. The F.E.C. must coordinate his/her activities and needs with the G.C. / C.M. in a timely manner as not to delay the project.
- D. Food Service Facility Designer / Consultant – SSA, Incorporated (SSA) is the food service designer for this project.
- E. The F.E.C. is the party responsible for all taxes, tariffs, duties and/or custom fees and permits where applicable, as may be required. The F.E.C. is contracted by the owner.
- F. N.I.F.C. – Whenever the abbreviation N.I.F.C. is used in this contract, it shall mean the item or items are not part of the Food Service Equipment Contract.
- G. The assignments and/or responsibilities as outlined in this section are subject to change at the Owner's discretion.

1.2 **RELATED DOCUMENTS**

All drawings, general, special and/or supplementary conditions, Division 1, specifications and related documents apply to this specification. The Foodservice Consultant for this project is SSA. The consultant is responsible to the Project Architect and the Owner at ascertain that the F.E.C. complies with all the requirements of the section.

1.3 **INTERPRETATIONS**

A. **PLANS AND SPECIFICATIONS**

- 1. Should it appear that the work intended to be described or any of the matters relative thereto are not sufficiently detailed or explained on the drawings or in the specifications, the Contractors shall apply to SSA / Architect for such drawings or explanations as maybe necessary and shall conform to them as far as they shall be consistent with original drawings.

Project Specifications

-
2. If any question arises regarding the true meaning of the drawings, specifications and/or typographical errors reference shall be made to SSA / Architect whose decision shall be conclusive.
- B. In no instance shall a bid be submitted or any work started with any uncertainty.
 - C. Before doing any work or ordering any materials, the Contractors shall verify all measurements of any work and shall be responsible for their correctness. Any differences which may be found shall be submitted to SSA / Architect for consideration before proceeding with the work.
 - D. Extra compensation will not be allowed because of differences between actual dimensions and measurements indicated on the working drawings.
 - E. Where a conflict occurs between or within standards, specifications. Codes, ordinances and/or working drawings the more stringent or higher quality requirements shall apply.

1.3.2 APPLICABLE DOCUMENTS

- A. Bidding documents, Contract Forms and related materials issued by SSA, the Project Architect, G.C./C.M. and/or the Owner before awarding a contract apply to this section.
- B. Architectural, Mechanical, Electrical and Structural Plans and other Specifications including all supplements issued thereto and other pertinent documents issued by SSA, the Project Architect, C.M. and/or the Owner, are a part of these Specifications and the accompanying food service equipment plans and shall be complete within every respect. All the above included herewith, will be issued separately by C.M., or is on file at SSA/Project Architect's office and shall not relieve the Contractors of responsibility or be used as a basis for additional compensation due to omission(s) of Architectural, Structural, Mechanical, Plumbing or Electrical details from food service equipment documents.

1.3.3 SUBSTITUTIONS

- A. Substitution requests must be supplemented by sufficient information in the form of manufacturer's technical specifications, drawings, pictures and/or samples to evaluate equality, appearance and all other related conditions.
- B. Written substitution requests must be submitted to SSA in accordance with the guidelines and time lines as set forth by the Project Architect and/or Owner. Substitutions would not be considered if not submitted within these guidelines. Substitutions will not be allowed without prior written approval from SSA.
- C. All submittals for proposed substitutions must be submitted with an equipment data sheet for each item. The data sheet shall consist of the project name, the Project Architect, the Foodservice Consultant, the firm submitting, the item number, the manufacturer, the manufacturer's model number, a complete written description of what is to be provided, an accessories and options list of what is to be provided, finishes dimensions, utility requirements as provided (ie gas: nat or lp, electrical: voltage/phase and amps, plumbing/mechanical: water/sewer, etc.) as well as type of connection. The data sheet shall have a blank space (3-1/2"w x 5"h) in the lower right corner of the sheet for stamping, etc. This information must be submitted not less than fifteen days from the bid due date to be considered as an alternative.
- D. Where substitutions are made by the F.E.C. with the written approval of SSA / Project Architect, the F.E.C. shall be responsible for and pay all costs of any consequential modifications which may result from the substitution.

Project Specifications

- E. If the F.E.C. decides to submit an alternate manufacturer and receives a written response from SSA / Project Architect accepting this change, then all resulting expenses incurred in the changes or additions to the food service equipment work as well as other contractors work shall be the sole responsibility of the F.E.C. and shall be considered as part of the base bid with no additional compensation permitted.
- F. The Manufacturer and model number of any article, device, material and/or form of construction listed in the "Itemized Specifications" as the "Primary Manufacturer" shall establish the "Basis of Design and Specification Standard", with respect to the physical dimensions, characteristics, aspects, capacities, performance and/or quantities required herein. If F.E.C. chooses to utilize one of the approved listed manufacturer's then they must provide submittal information to SSA's for analysis and conclusive determination with respect to that item.
- G. Accepted substitutions will be noted in an addendum issued by the PA/E. No other substitutions and/or deviations from the primary manufacturer will be permitted subsequent to the date of the Bid Opening, except by specific change order and only with sufficient cause. The approval of a substitution does not approve, relieve and/or change the Contractors responsibilities as outlined herein.

1.3.4 INTENT

- A. It is the intent of the Contract Documents for each and every item and/or component to be complete with all required devices and standard features necessary for that item and/or component to properly function.
- B. It is the intent of the Contract Documents for each and every item and/or component to function and perform in a manner equal to the Primary Manufacturer's intent. F.E.C. is required to notify SSA / Project Architect in writing of any or all discrepancies or omissions of any components prior to submitting bid.
- C. Failure of the F.E.C. to report any discrepancies and/or omissions prior to submitting his bid shall not relieve the F.E.C. of his responsibilities for providing complete, functioning, workable systems in full accordance with the intent of the Contract Documents.

1.3.5 BASIS OF DESIGN AND SPECIFICATION STANDARDS

- A. The model number and product specifications of the named primary manufacturer, where more than one manufacturer is listed, was used for the basis of design and specification standards for this project with the respect to quality, performance, capacities, physical characteristics, appearance, aspect and function.
- B. All manufacturers listed for an item are subject to SSA's approval as a manufacturer for that item; however, the specifications of the primary manufacturer whose product is listed, as the basis of design and specification standards, with a model number and/or description will set the standard for that item. Other manufacturers may modify their product(s) if necessary to comply with the standards set forth herein.
- C. Bidders who wish to use products by the alternate manufacturers must provide submittals to SSA, as set forth herein, for review of conformity and determination thereof.

STATUS CODES

- "A" Provided by Owner's F.E.C. and installed by General Contractor OR Construction Manager
- "B" Provided by Owner and installed by General Contractor OR Construction Manager
- "C" Provided and installed by Owner

Project Specifications

NOTES

General Contractor OR Construction Manager is to provide secured, on-site storage for all existing and/or new food service equipment items that are provided by the Owner and/or their contractor.

PART 2 SCOPE

2.1 Work Included

- A. Work required under this section consists of providing all necessary services, tools, equipment, material and labor required to provide the continuous installation (the term installation shall mean the complete installation including but not limited to the delivery of all food service equipment items and necessary components complete with transportation charges and taxes prepaid by the F.E.C. to the job site's location) as designated on the food service equipment plan, uncrated, erected, set in place, leveled and made ready for final connection, by G.C., to plumbing, gas, electrical and/or steam utilities and properly anchored and/or trimmed as may be required.
- B. F.E.C. is to deliver all parts and/or components, which are to be built into cast-in-place concrete and/or masonry in ample time for inclusion in the concrete and/or masonry work. Furnish necessary setting plans and/or instructions, oversee the installation of all parts in the masonry and/or concrete and be responsible for the correctness and accuracy of the location and installation.
- C. F.E.C. to provide holes, ferrules and/or stainless steel chases on equipment for pipes, drains, electrical outlets, conduits and similar items as may be required to coordinate and accommodate the installation of the food service equipment in connection with the work of the other contractors.
- D. F.E.C. to provide the necessary materials, labor, services and incidentals necessary for the completion of these sections of work including but not limited to adhesive, caulking, sealing, trim strips, chases, corner guards, corner trims and/or closure panels.
- E. F.E.C. to provide items and components hereinafter specified and/or shown on plans, completely assembled or erected in locations indicated, ready for final connections to service, by the respective trades. The labor and material(s) required for final connections are the responsibility of G.C. / C.M.
- F. F.E.C. to provide and install where required fasteners, flashing, trim strips, filler panels, cant strips and caulking and/or sealant required to complete the installation.
- G. All roof, wall and/or floor assemblies including finishes (as specified herein) penetrations, openings, curbs, platforms and/or dunnage pursuant to the requirements of the food service ventilation and/or refrigeration items are to be provided and installed by the G.C. unless specified otherwise.
- H. Keep premises clean and remove from the site all crates, cartons and other debris resulting from the work. Leave all areas "broom cleaned" and all equipment items and furnishings "construction clean." Final cleaning, sanitizing and polish of all equipment items and furnishings shall be done by the F.E.C. Further, it is the F.E.C.'s responsibility to provide protective coverings for all equipment items delivered to the job site during construction.

2.2 RELATED WORK OF OTHER CONTRACTORS

- A. General Construction by G.C.
 - 1. All floor assemblies including finishes, openings, depressions, sleeves, curbs and base;
 - 2. All wall and/or partition assemblies including finishes, openings, recesses, sleeves, furring and backing;

Project Specifications

-
3. All ceiling assemblies including finishes, openings, soffits, access panels, fire separation and sleeves;
 4. All roof assemblies including finishes, openings, curbs, platforms and dunnage;
 5. All structural supports or grounds for hanging or fastening of food service equipment assemblies as may be described in this section;
 6. G.C. to provide on-site storage trailer(s) and security for Owner's existing and/or provided food service equipment to be used on this project, if applicable.
- B. Plumbing by G.C. / C.M.
1. Water, gas and steam supply systems, as required.
 2. Sanitary and grease laden drainage systems.
 3. Final plumbing connections including mounting of drains, faucets and piping from point of connection on equipment to building plumbing systems and interconnections between equipment components.
 4. Grease traps.
 5. Indirect drain line runs from equipment items to nearest floor drain or floor sink as required;
 6. Gas shut off valve(s) as required for ventilator fire suppression system and gas regulators on individual pieces of gas fired equipment in accordance with the manufacturer's recommendations are to be provide by the F.E.C and installed by the G.C.;
 7. F.E.C to furnish faucets with nipples, elbows, supply lines and valve stops, drains and/or splash mounted vacuum breakers, etc. for each equipment item as specified herein. Items to be installed by the G.C.;
 8. All exposed plumbing related to or in connection with food service items to be chrome plated;
 9. Indirect wastes shall be chrome plate and are to drip over and into drains. Where drains and/or supply lines run under equipment provide proper support from the underside of the equipment to eliminate interference with cleaning and or maintenance.
- C. H.V.A.C.
1. G.C. to provide and install all necessary components as may be required for the exhaust/make-up air system(s) and condensate make-up air system including but not limited to the fans as provided by the F.E.C., ducting. Gas shut-off valve(s), curbs, penetrations, dampers, controls and/or switches unless otherwise specified herein;
 2. G.C. to provide and install as required rated chase(s) as well as other separations as may be required.
 3. G.C. to provide and install all heating, ventilating and air conditioning systems except as otherwise specified in this section.
- D. Electrical by G.C.
1. All electrical distribution, lighting and power systems except otherwise specified in this section;
 2. Final electrical connections and inter-connections including labor and materials from point of connection on equipment to building electrical systems and required interconnections between equipment components;

Project Specifications

3. All electrical materials including wire, conduit, over current protection, main switches, safety cut-outs, shunt-trip breakers, disconnect switches, lightning control devices, surge protectors, uninterruptable power units and controllers;
4. Shunt-trip breakers and/or contactors and all conduits and for shut down of electrically operated cooking equipment and/or ventilation equipment as required for ventilator fire suppression system.
5. Empty conduit systems for refrigeration system, as specified and/or shown on food service drawings.
6. Empty conduit system for point-of-sale system, as specified and/or shown on food service drawings.
7. Empty conduit system for fire suppression system as specified and/or shown on food service drawings.
8. F.E.C. shall furnish all electrically operated portable and/or moveable equipment items with factory installed 3-wire or 4-wire heavy duty insulated cord with a grounded plug, with one leg of the cord grounded to a conductible portion of the items frame;
9. Furnish and install switches and/or disconnects within equipment, contactors combination starters with fused disconnects, controls and similar items necessary for the safe and proper operation of the equipment and for compliance with all N.E.C. and/or local AHJ requirements.
10. All switches, disconnects and/or control devices shall be safely accessible without reaching across or over any hot and/or hazardous equipment items.
11. F.E.C. to secure cords, to the underside of the equipment, on portable and/or moveable equipment as to allow ease of maintenance or as required by the Owner.

2.3 RELATED WORK BY OTHERS

Install Owner furnished equipment in accordance with the installation section of this document, unless otherwise specified herein.

PART 3 QUALITY ASSURANCE

3.1 FOOD SERVICE CONSULTANT

The Owner has employed SSA, Incorporated as the Food Service Consultant. The “chain of command” shall be the Food Service Equipment Contractor, to the General Contractor / Construction Manager, to the Project Architect (PA / E), to the Food Service Consultant, and vice versa in all matters concerning the food service equipment.

3.2 EQUIPMENT

Equipment, with the exception of “buy-out” or standard catalogue items, shall be fabricated in a plant bearing the name of a recognized food service equipment fabricator. This fabricating firm shall have been in business at least five years, with a suitable organization to design, engineer, manufacturer, deliver and install the equipment. Said installation shall be in accordance with local union conditions when applicable. Such firms shall be able to refer to other successful installations of similar operating conditions. Further the fabricator shall be able to UL classify and list the items that they fabricated. Under no circumstances shall the F.E.C. sublet any portion of the fabricated equipment to any sub-contractor without the SSA’s written approval. All fabricated food service equipment with inter-wiring and/or pre-wired equipment and/or refrigeration shall be manufactured by a fabricator that can UL list (or other applicable AHJ listing) and/or classify their work.

Project Specifications

3.3 LABOR

All labor shall be performed by experienced mechanics in this type of work. All work on the premises shall be done at such time as to promote the proper conduct of the project. Provide a competent on-site superintendent to supervise the work and to provide other trades with such information necessary to maintain proper conduct and timely completion of the work.

3.4 FOOD SERVICE EQUIPMENT CONTRACTORS

1. Custom fabricated equipment shall be constructed in strict accordance with the contract documents. Recommended fabricators for projects in the U.S.:

- A. Emjac Industries, Inc.
1075 Hialeah Drive
Hialeah, FL 33010
(888) 767-8339
Fax (305) 883-3219
- B. Florida Stainless Fabrication
575 Econ River Place
Oviedo, FL 32765
(800) 651-2763
- C. Southern Fabricators
5010 126th Ave. N.
Clearwater, FL
(727) 573-4846

Note: All equipment items containing electrical and/or refrigeration components must be manufactured by a fabricator that can UL list and/or certify their own products (or other listings and/or certifications required by the local Authority Having Jurisdiction [AHJ]). All fabricated equipment must be manufactured by a fabricator that can NSF list and/or certify their own product.

PRE-APPROVED FOODSERVICE EQUIPMENT CONTRACTORS

1. Beltram Supply – (800) 940-1136, FAX (813) 237-0851
2. Designs, Furnishings & Equipment – (386) 252-4728, FAX (386)253-8059
3. Gill Group – (407) 798-0210, FAX (407) 798-0211
4. Johnson Lancaster – (727) 793-5622, FAX (727)796-0892
5. Lace Foodservice – (305) 513-5223, FAX (305) 513-5229
6. Strategic Equipment & Supply Corp, - (813) 873-2402, FAX (813)871-2664
7. R.W. Smith & Co. – (714) 540-6633, FAX (714) 540-9523

PART 4 CODES, LAWS AND STANDARDS

4.1 GENERAL REQUIREMENTS

- A. Manufacture and install equipment in conformance with the Williams-Steiger Occupational Safety and Health Act of 1970, or other Local/National safety and health regulations as applicable.

Project Specifications

- B. Except as modified by governing codes and by the Contract Documents, comply with the applicable provisions and recommendations of the following:
1. National Fire Protection Association (NFPA)
 - a. NFPA 96 – Installation of equipment for removal of smoke and grease-laden vapors from commercial cooking equipment, current edition.
 - b. NFPA 17 – Dry chemical extinguishing systems, current edition.
 - c. NFPA 17A – Wet chemical extinguishing systems, current edition.
 - d. NFPA 70 – National Electric Code.
 2. National Sanitation Foundation (NSF)
 3. Underwriter’s Laboratories, Inc. (UL), including but not limited to UL-300
 4. National Electric Manufacturer’s Association (NEMA)
 5. American Gas Association (AGA)
 6. American Society for Mechanical Engineers for Steam Equipment
 7. National Fuel Gas Code (NFGC)
 8. Florida Administrative Code 64E-11.006
- C. All electrically operated and/or heated equipment, fabricated or otherwise, shall conform to the latest standards of the National Electric Manufacturer’s Association and the Underwriter’s Laboratories, Inc., where applicable standards have been set up by that agency, or otherwise, such as to be acceptable to authorities having jurisdiction.
- D. Note: For projects outside the U.S., compliance is required for any and/or all governing codes and regulations as may be required by the local AHJ.

PART 5 SUBMITTALS

5.1 GENERAL REQUIREMENTS

- A. Shop Drawings, samples and brochures must be submitted at the same time, in pne complete submittal, within sufficient time not to delay work on the project and/or not over 15 days after the G.C. / C.M. has been awarded a contract by the Owner. Partial submittals will not be accepted.
- B. Equipment List: Submit for approval, within 15 days after notification of the Owner’s award of contract, an itemized list of equipment to be furnished under this contract, to include manufacturer’s name and model number, along with all necessary and/or required options and/or components, for each piece of equipment – necessary only if not using primary manufacturer and if prior approval for a substitute has been let.

5.2 SAMPLES

- A. Provide all samples of materials requested by SSA / Architect for test purposes or comparisons.
- B. Samples used for testing shall not be used on the work without written approval of SSA / Architect.
- C. Samples may be retained by SSA, the Project Architect or the Owner as a matter of record without any additional compensation to the Contractors.

Project Specifications

5.3 BROCHURES

- A. Provide SSA / Project Architect, for approval, three (3) complete brochures for review showing each piece of standard manufactured equipment, only if primary manufacturer(s) are not used, complete with all details and/or descriptions of the manufacturer's specifications. Contractors will return one (1) brochure (set) with comments noted for further action. Continue submitting until final approval from SSA / Project Architect is achieved. After approval provide ten (10) record copies in a three ring binder with such details and specifications clearly numbered with the item number as per the food service equipment plans with operators manuals, service agency information and local representative details for each item specified.
- B. Record copy brochures, shall be delivered at the demonstration and start-up, are to be bound in booklet form, in three ring binders, and shall include the following:
 - 1. A separate data sheet for each component or item of equipment indicating item number. Description, quantity, manufacturer, model number, finishes, modifications, options and utility requirements.
 - 2. Catalog specification sheet and/or manufacturer's specifications and drawings complete including accessories. Arrange booklets so those items are in numeric order in accord with the contract documents with each page numbered in relation to that item. Further, include with each specification sheet and/or drawings a copy of the warranty information, operations manual and service information; as well as, a completed contractor's and the food service equipment contractor's guarantee and warranty.

5.4 SHOP, ROUGH-IN AND/OR MECHANICAL CONNECTION DRAWINGS

- A. F.E.C. is to provide SSA / Project Architect (4) sets of shop drawing prints for review and comment by SSA. One (1) print with comments noted will be returned for correction. Continue resubmitting until final approval by the PA/E or SSA is achieved. Resubmit (4) revised and (1) CADD disk of approved prints to the PA/E after final approval for distribution. Distribution to include but not be limited to the G.C. / C.M., PA/E, Owner's Inspector/ Owner's Representative, the Manufacturer, the F.E.C. and the plumbing and electrical contractors.
- B. F.E.C. to prepare rough-in drawings locating all equipment (new, existing or as provided by Owner) shown on the contract documents. The rough-in requirement drawing included in these documents are provided as an instrument of service and are not to be used for construction and/or reproductions. Provide drawings, only if primary manufacturers are not used, in ¼"=1'-0" scale on sheets the size as the contract documents, showing, with vertical and horizontal dimensions, the required rough-ins (including sleeves and conduits) for electric, gas, water, steam, sanitary waste, refrigeration, ventilation, condensation drain lines, air and exhaust connection and wood backing for wall mounted fixtures and equipment. Show details, sections and characteristics for slab depressions and/or other features and/or installation including data for all services in each area. Locations of equipment shall allow for traps, switches, and/or other final connection requirements. All drawings shall include floor plans shown equipment as per the contract documents, elevations, details and sections as may be required-only required if not utilizing primary specified manufacturer. Provide this document if not using the primary specified manufacturer then provide the above plans showing only the items that have changed their respective requirements.

Project Specifications

- C. Provide complete plans with dimensions showing locations and elevations of all plumbing, electrical and mechanical rough-ins if not using the primary specified manufacturer and item. Use same symbols, connection numbers, and dimensioning system as indicated in Contract Documents (scale shall be $\frac{1}{4}''=1'-0''$). Provide the above plans showing only the items that have changed and their respective requirements.
- D. In the event rough-ins have been accomplished before the award of the contract, the Food Service Equipment Contractor shall check the existing facility and furnish all, approved equipment to suit building conditions and utilities. No extra charges shall be allowed for utility changes to fit equipment during installation and connection.
- E. Provide complete plans and details showing locations and elevations of all depressions, bases, curtain walls and hoods and any critical wall dimensions. Use same dimensioning system as indicated in Contract Documents. (scale shall be $\frac{1}{4}''=1'-0''$)
- F. Plumbing, electrical and mechanical rough-ins all shown on the same sheet will not be accepted.
- G. Provide complete details on each piece of custom built equipment plans, elevations and sections (scale shall be $\frac{3}{4}''=1'-0''$)
- H. Fabrication details must identify all metal gauges, hardware, trim, electrical parts, special fitting and other components by manufacturer's name and model number.

5.5 CHECKING

Checking of all rough-in drawing, shop drawing, details and equipment by SSA is for design concept only and does not relieve the F.E.C. or G.C. / C.M. of responsibility for compliance with design drawings, details and specifications, verification of utilities with equipment requirements for conformity and location and verification of all dimensions of equipment, building conditions or reasonable adjustments due to deviations. Drawings shall be prepared on the Food Service Equipment Contractor's sheets and by his employees. Drawings of any part thereof created by photograph, paste-up, or other methods using SSA and/or Architect's drawing(s) and/or details is a violation of federal copyright laws and will be returned for re-submittal. F.E.C. will assume responsibility for the proper locations and sizing of sleeves, conduits, and depressions for the various equipment requirements. F.E.C. is responsible for making multiple field inspections to verify the rough-in locations prior to the pouring of concrete, the closing walls, etc.. F.E.C. shall compensate other trades for any relocation of rough-ins.

5.6 CHECKING

All transparencies and/or prints shall be delivered in a mailing tube. Folded transparencies and/or prints shall be returned for re-submittal. After checking, supply the specified number of distribution prints for record purposes. All cad diskettes shall be on compact disc (CD) or DVD with all drawings formatted as a *.dwg in AutoCAD 2004 or later.

PART 6 PRODUCTS

6.1 PREFABRICATED EQUIPMENT

- A. Where reference is made to a manufacturer's model number and/or manufacturer's specifications, it is intended that the specifications of that primary manufacturer is utilized as a basis of design and specification standard and has become a part of these Specifications and documents.
- B. Items and/or component parts of any item referred to by manufacturer's name and model number shall be furnished complete with all standard equipment of the manufacturer used as a basis of design and specification standards plus all extras and/or modifications hereinafter specified and/or required.

Project Specifications

- C. Similar type items and/or similar components shall be the product by the same manufacturer to facilitate maintenance, convenience and reduce the Owner's spare parts inventory.
- D. Modifications to standard equipment specified shall be made by the original manufacturer, when required.

6.2 PRODUCT OR MANUFACTURER APPROVAL

- A. The product of the primary manufacturer named, where more than one manufacturer is listed, was used for the basis of design and specification standard and sets the standard of quality, appearance, performance, aspect, capacities, and function for that item.
- B. Only products of listed primary manufacturers will be acceptable unless requests for substitutions and/or submittals of alternate manufacturers are submitted to SSA in accordance with stated conditions. Alternate manufacturers are approved as a manufacturer; however, each item for an alternate manufacturer must be submitted to SSA for approval/rejection.
- C. Other manufacturers must modify their product if necessary with the quality, physical and functional characteristics of the primary manufacturer and must be approved by SSA.
- D. All manufacturers listed may not be able to supply an equipment item, pursuant to the specifications, as standardized by the primary manufacturer whose name and model number was utilized herein as the basis of design standard for this project, in which case, the listed alternate manufacturers may elect to modify an item to meet the specifications.

6.3 CONSTRUCTION**6.3.1 GENERAL**

- A. The materials, components and techniques describe the construction of items of the Food Service Equipment.
- B. Deviation and extra refinements peculiar to any one item will be described and/or indicated.
- C. It is required that all custom/fabricated items in these plans and specifications, other than by manufacturer name and model number, will be constructed of 300 series stainless steel and be manufactured by a fabricator that can UL list and/or classify their own products.
- D. All exposed surfaces of equipment shall be free of bolts, screws and rivets. Wherever these fasteners are used they shall be an approved type constructed of stainless steel.

6.3.2 TOPS

- A. All table tops, counter tops, sink bowls, drain boards and troughs are to be fabricated with 14 gauge, 300 series stainless steel.
- B. Where the tops are adjacent to walls, columns, equipment, enclosures, etc. they shall have a splash. The standard splash shall be 8" and will be formed by turning up with a 2-1/2" flange at 45 degrees and a 1" turndown.
- C. Lights shall be installed below each shelf, with a stainless steel cover, unless specified otherwise.
- D. Ends adjacent to similar equipment shall have common end post.

6.3.3 ENCLOSED BASES

- A. Closed base fixtures shall have rigid welded frame.
- B. Tops shall be cross-based with 1-1/2" x 1-1/2" x 1/8" galvanized angles spaced at 2'0" O.C. maximum.

Project Specifications

- C. Leg channels shall be 1" x 4" x 14 gauge galvanized channels spaced 4'0" O.C. maximum, on bottom, to receive legs.
- D. Closed based fixtures shall be mounted on casters, or No. CS-58B United Show Case, Keil or Haralson stainless steel adjustable counter legs, as indicated on plans and/or specifications.
- E. Shelf supports shall be continuous 1-1/2" x 1-1/2" x 1/8" galvanized angles welded to frame. There shall be no exposed galvanized steel channels or supports.
- F. Utility chases shall be 18 gauge stainless steel with removable access or service panels.
- G. Partitions shall be 18 gauge stainless steel.
- H. Exterior panels shall be FRP plastic laminate when a part of millwork, or stainless steel with vertical grain as specified in item specifications.
- I. Non-exposed panels adjacent to walls or closed base fixtures shall be 20 gauge galvanized steel.
- J. Interior shelf units shall be 18 gauge stainless steel, edges turned up 1-1/2" at sides and rear, down 1-1/2" at front and where shelves butt together, corners to be welded. Construct in removable section (2'-0" maximum) for ease of removal and cleaning.
- K. Compressor compartments shall have removable louvered panels with 2" x 3/4" x 18 gauge stainless steel double channel perimeter frames, 1/2" x No. 16 Niles flat stainless steel expanded metal guards, 14 gauge galvanized steel compressor mounting channels, enclosure panels.
- L. Recessed areas shall be lined with 18 gauge stainless steel.
- M. Plastic laminated panels shall have a 3/4" thick exterior plywood base veneered on all exposed sides and edges with Wilsonart, Formica or Westinghouse Micarta plastic applied or laminated in strict accordance with manufacturer's recommendations. Plastic laminated panels shall be without joints and grain and pattern material, color, pattern and/or texture shall be approved by Project Architect.
- N. Trim shall be 18 gauge stainless steel with vertical grain.
- O. Stainless steel and brass trim shall have flush welded joints.
- P. Control panel recesses, valve handle recesses and individual control knob recesses shall be 18 gauge stainless steel. Depth must be sufficient to prevent control from protruding past face of body panel.
- Q. Legs shall be No. CS-688 United Show Case, Keil or Haralson. Weld to framing members of counter. Provide 3-1/2" square 12 gauge galvanized steel top plate welded on legs that are bolted onto equipment. Secure with (4) 1/4"-20 stainless steel bolts.

6.3.4 COLD PANS

- A. Interior shall be 16 gauge stainless steel one (1) piece construction with all corners coved on a 3/4" radius pitched to a 1" stainless steel drain fitting welded to the shell. Pipe drain line to bottom of cabinet.
- B. Exposed exteriors shall be 18 gauge stainless steel, concealed exteriors shall be 18 gauge galvanized steel.
- C. Entire pan shall insulated with 2" thick urethane foam. Provide a non-toxic high-impact plastic breaker strip around the entire opening to prevent condensation.
- D. Refrigerated cold pan coils shall be 1/2" O.D., type K copper tube with wrought copper fittings and silver soldered joints. Space runs of coil at 1-1/2" O.C. parallel to the long access of the cold pan bottom and solder in place. Runs equally spaced at 4" O.C. securing the coils to the pan. After the coils are secured to the pan, cover the entire bottom with thermal mastic and apply waterproof covering.

6.3.5 COOLER/FREEZER ASSEMBLIES

- A. Wall, ceiling and floor section insulation shall be 4" thick rigid urethane. Urethane foam to

Project Specifications

-
- have a thermal conductivity (K factor) of not more than 0.118 BTU/hr./sq. ft. per degrees Fahrenheit/inch: and an overall coefficient of heat transfer (U factor) of not more than .029 "R" factor shall be 34. Urethane foam when fabricated in panels shall be supplied with a fire hazard classification according to ASTM-E-84 as performed by Factory Mutual Insurance System test procedure. Panel cores shall have a flame spread rating of 25 or less and a smoke density of no greater than 450. Every panel shall bear a certifying Factory Mutual label.
- B. Sectional assemblies: size/shapes indicated on drawings: 9'0" overall height unless otherwise specified. Door locations shall be exactly as shown, sized as specified.
 - C. Panel skin material/finish: Interior shall be .040" stucco-embossed aluminum with white baked on enamel. Exterior shall be .040 stucco-embossed aluminum except where exposed to the kitchen shall be 22 gauge stainless steel.
 - D1. Integral Floor Panels:
 - 1. Sandwich type panels, same construction as walls/ceilings surface, with 14 gauge stainless steel interior floor surface, sealed watertight and coved at all wall lines.
 - 2. Field-apply ¼" thick hard-alloy aluminum tread plate No. 6061-T6, with all joints caulked.
 - 3. Shop-install ¾" marine-grade plywood sub floor below the metal skin with all surfaces sealed watertight and all joints and/or seams caulked.
 - 4. Treat exterior panel surfaces for concrete exposure.
 - 5. Sloping interior floor ramp at entrance doors.
 - D2. "Floorless" Assemblies (Cooler/Freezer):
 - 1. F.E.C. shall provide and install prefabricated mounting floor screed for perimeter and partition walls. Anchor floor screed to slab recess as recommended by manufacturer. Floor screed shall be level and square.
 - 2. General Contractor shall provide and install approved vapor barrier.
 - 3. General Contractor shall provide and install two (2) layers 2" thick slab Urethane, stagger each layer, and seal with an approved mastic.
 - 4. General Contractor shall provide a concrete slab over insulation with adequate reinforcing to receive specified finish floor and setting materials.
 - 5. General Contractor shall provide and install floor finish to match kitchen floor, coved base (5") high at all wall lines, in setting bed, as specified by the architect.
 - E. Provide 120 volt thermostatically controlled defrosters that shall be around the perimeter to door and door openings.
 - F. Doors shall have self-closing hinges and hand latches with inside safety releases, (panic hardware).
 - G. Electric system shall be watertight installation with non-metallic conduit, fittings, junction boxes and face plates.
 - H. Reinforce prefabricated wall panels to rigidly support the door assemblies. Doors to be standard 34" wide. Interior door finishes in multiple compartment assemblies shall be same material as adjacent wall panels.
 - I. All hinged doors shall have 12" high 16 gauge stainless steel kick plates at exterior and interior.
 - J. Special size sections shall be constructed if changes in building dimensions, columns or other physical obstructions will not permit standard size panel sections to be assembled as indicated on plans.
 - K. Provide with Cole Model No. FS-7085-Sg enclosed/gasketed surface-mounted light fixtures with extended service lamps, in quantity and arrangement shown on drawings.

Project Specifications

- L. Light fixtures: Wired to interior and exterior compartments, 3-way Hubbel press switch per compartment, mounted in "FS" boxes with Hypalcon covers and pilot lights. Compartments with multiple entrances. Provide 4-way switches.
- M. Provide removable closure panel at exposed top front and sides of box as required, same material as exterior panel finish, complete with removable access panel.
- N. Provide sleeves through ceiling and walls for refrigerant lines, electric sleeves and drain line, seal the balance of opening with urethane and sealant.
- O. Ceiling panels where the coils are located shall be reinforced. Coils shall be located where shown on the kitchen drawings.
- P. 4-1/2" diameter chrome plated, flush mounted thermometer that shall be capable of calibration. All thermometers furnished with sufficient capillary tubing to extend from exterior front of the assembly to a mounting position of the sensor bulb and glycerin container within evaporator return air-stream with tubing clipped to panel.
- Q. Assembly shall be N.S.F. constructed and U.L. rated and carry certifying labels (or other ratings and certifications as may be required by local AHJ).
- R. Provide in freezer assembly a heated pressure relief port. Install pressure relief port in a wall panel from the direct air stream flowing from the coils.

6.3.6 COOLER/FREEZER COMPONENTS

Condensing units shall be semi-hermetic air-cooled condensing units with rigid structural bases, dual receivers. OSHA metal fan guards/shrouds with venture openings waterproof electrical system, exhaustible fusible plugs, internal inherent motor protection, liquid line shut off valves, oil pressure safety switches, crank-case heaters, pressure oil separators on low temperature units.

- A. Cooler evaporating coils shall be low profile U.L./N.S.F as manufactured by Bohn or approved substitute, with in-line fans, cross-fin staggered copper tubing/aluminum fin coils, aluminum case, permanently lubricated motors with thermal overload protection, water-proof electrical system pre-wired to single connection and slotted channel hangers. Coils are to be designed to operate not above 34 degrees.
- B. Freezer evaporating coils shall be low profile U.L./N.S.F. as manufactured by Bohn or equal with in-line fans, cross-fin staggered copper tubing/aluminum fin coils, aluminum case, heavy duty motors with thermal overload protection, electric defrosting system, pre-wired water-proof electric system and slotted channel hangers. Coils are to be designed to operate from 30 to minus 20 degrees temperature.
- C. Refrigerant shall be type 404A in low temperature and type R-22 in high and medium temperature systems.
- D. Mounting racks shall be galvanized steel angle frames with galvanized steel floor plates. Secure in place with Phillips red head anchors or equal. Rack to be wall mounted above cooler on exterior building wall with a security cover over compressors and an approved locking device.
- E. Control panel housing shall be Nema-4 enclosures.
- F. Freezer control panel shall be pre-wired assembly with magnetic starters, relays, condensing unit circuit breakers, dual pressure controls, liquid line pressure gauges, suction line pressure gauges and timer.
- G. Cooler control panels shall be pre-wired assembly with magnetic starters, condensing suction line pressure gauges, liquid line pressure gauges and timer.
- H. Freezer timers shall be time activated, pressure terminated type with 36 to 110 pounds adjustable range, 40 amp rated switches, heavy duty self starting motors, and 1 to 6 cycle per day defrost frequency range.
- I. Cooler timers shall be time activated, time terminated type with adjustable 4 to 100 minutes defrost duration, 40 amp switches and heavy duty synchronous industrial type

Project Specifications

- motors.
- J. Refrigerant circuits shall have liquid line site glasses, suction line site glasses, liquid line vibration eliminators, suction line vibration eliminators, filter dryers, automatic expansion valves, room thermostats interlocked with liquid line solenoid valves and heat exchangers.
 - K. Refrigerant lines shall be type ACR copper tubing with wrought copper firings assembled by silver soldering joints. Silver soldering or silver brazing shall be done in presence of nitrogen (oil) pumped) in tubing to prevent oxidation and scale formation. Refrigerant systems shall be evacuated three (3) times to a pressure of 500 microns maximum and flushed between each evacuation and refrigerant.
 - L. Refrigerant line supports shall be hanger rods (size variable), hinged pope hangers or support channels. Grade lines to compressors and install suction line trap adjacent to coil. Adjacent lines shall be parallel and straight with plumb vertical runs.
 - M. Coil drains shall be ¾" I.P.S. copper. Route and pitch ½" per foot to external drain and secure to wall with ¾" I.P.S. cast brass or wrought copper hangers. Provide electric heaters on freezer drains.
 - N. Refrigeration line insulation shall be 1-1/2" thick Armstrong Armaflex pipe insulation sealed with adhesive foam insulation.
 - O. The entire system shall be cleaned and dehydrated by maintaining a vacuum of 500 microns, or lower, for a minimum period of (5) hours. The vacuum pump used shall itself be capable of developing a vacuum of 50 microns with its refrigerant and oil shall be added and each system shall be tested for performance.

6.3.7 UNDERCOUNTER REFRIGERATORS/FREEZERS

- A. Refrigerators/freezers shall be all metal construction with no wood. Outer shell to be constructed with 18 gauge stainless steel and be fully welded to form a vapor proof seal. Inner shell to be no less than 20 gauge stainless steel with coved corners pitched to a 1" stainless steel drain fitting welded to the shell. Drain should be located as close as possible to the blower coil.
- B. Entire compartment shall be insulated with 2" thick approved urethane insulation on all sides, top and bottom. Provide a non-toxic. High impact plastic breaker strip around the entire cabinet opening perimeter. Provide the same heaters in freezer doors. A vinyl magnetic gasket shall be installed around the full perimeter around cabinet opening for a positive seal. Flush mount a 2-1/2" diameter dial thermometer in face of cabinet.
- C. Interior shelving to be stainless steel wire shelves mounted on adjustable chips providing four point support. Shelves shall be removable for cleaning. Provide one (1) bottom shelf and one (1) intermediate shelf, unless otherwise specified.
- D. Doors shall be fabricated 1-1/2" thick with approved foam urethane insulation. Outer shell shall be 18 gauge stainless steel pan type construction with flat sides for edge mounted hardware secured to internal tapping strips in door body. Provide each door with self-closing cam lift hinges. Door(s) to actuate an incandescent shatter-proof light. Light to be mounted so as not to interfere with storage space.
- E. Drawers, if specified, shall be mounted on stainless steel self-closing roller bearing tracks with positive stops. A vinyl magnetic gasket is to be provided around entire perimeter of drawer front for positive seal. Drawer fronts to be 28 gauge stainless steel construction with urethane insulation. Provide condensate proof heating wires in cabinet mullion and the entire perimeter of drawer opening.
- F. Refrigeration system shall be properly sized to maintain refrigerated food products at 38 degrees to 40 degrees Fahrenheit and frozen food at 0 degrees Fahrenheit.
- G. Where undercounter refrigerators are specified, top is to have opening to receive stainless steel pans, the openings shall be die stamped and fitted with gasket and stainless steel lift handle.

Project Specifications

6.3.8 UNDERCOUNTER REFRIGERATION SYSTEMS

- A. Evaporator coils for fabricated undercounter refrigerator/freezers shall be blower type coils and be installed for accessibility and replacement.
- B. All temperature controls, expansion valves, sight glass and solenoid valves are to be installed at the time of manufacturing and mounted for easy adjustment and service.
- C. Refrigeration circuits shall have automatic expansion valves, dual high-low pressure switches, high pressure sight glass and line vibration eliminators.
- D. Evaporator coils shall have the condensate drain line routed to and furnished with condensate evaporator.
- E. Each condensing unit shall have a separate control switch with pilot light and an engraved phenolic plastic identification sign.
- F. Refrigeration lines are to be type ACR copper with cast fittings assembled by silver soldering joints. Silver soldering or silver brazing shall be done in presence of nitrogen (oil pumped) in tubing to prevent oxidation and scale formation. Refrigeration system shall be evacuated three (3) times to a pressure of 500 microns maximum and flushed between each evacuation with refrigerant. Refrigeration lines shall be insulated with Armstrong Armaflex insulation.
- G. Refrigeration systems shall operate on Freon R-22 in high and medium temperature and type 404A in low temperature applications.
- H. On remote refrigeration systems, all refrigeration piping is to be pre-piped at the time of manufacturing and routed to one (1) central location ready for a one (1) point hook-up by the Refrigeration Contractor.

6.3.9 DISHTABLES

- A. Tops, trough, sinks, back and end splashes shall be 14 gauge stainless steel, integral all welded construction.
- B. Bases shall be open type construction, 1-5/8" O.D. stainless steel tubular legs, fitted with stainless steel bullet type, adjustable feet and enclosed conical gussets. Crossbracing shall be 1-5/8" O.D. stainless steel tubular members welded to legs as required.

6.3.10 DISPLAY SHELVES

This section not used.

6.3.11 DOORS

- A. Metal doors shall have 18 gauge stainless steel exteriors and interiors. Form ¾" X 90 degree edges on all sides and weld corners. Rear panels must slip inside front panels and form double pan assembly with tight joints.
- B. Insulation between panels shall be ¾" rigid fiberglass. Secure to both panels where hardware or other screw fastenings are required.
- C. Metal doors shall have 12 gauge steel tap-in plates welded to inside of panels where hardware or other screw fastenings are required.
- D. Sliding door tracks shall be No. 1357 Series Keil, Grant or Knape. Secure with ¼-20 stainless steel bolts.
- E. Sliding door rolling assemblies shall be No. 1358-1212-1000 Keil, Grant or Knape and Vogt.
- F. Sliding and hinged door pulls to be integral and shall be formed type as shown on plans.
- G. Hinged doors shall be mounted on No. 2948 Series Keil 16 gauge stainless steel continuous hinges with 3/16" diameter stainless steel pins or No. 2874 Series Keil stainless steel shutter type hinges. Hinged door magnetic latches shall be No. 2930-1010-3000 Keil, Ives

Project Specifications

- or Knappe and Vogt.
- H. Doors shall have stainless steel guide pins No. 1356-1010-3251 standard Keil.

6.3.12 DRAINBOARDS

- A. Bodies shall be 14 gauge stainless steel with all horizontal and vertical corners coved on a $\frac{3}{4}$ " radius with junction forming a one quarter hemispherical cove.
- B. Bottom of drainboard shall slope $\frac{1}{4}$ " per foot to sink tubs.
- C. Rims of freestanding drainboards shall match sink rims and form straight horizontal edges.
- D. Front edges of rims of freestanding drainboards shall be 3" deep at highest point.
- E. Exposed corner edges of rims shall be rounded on a 3" radius.
- F. Rear and endsplash of freestanding drainboards adjacent to walls or closed fixture shall be 44" above floor at rear and sloped to front at 45 degrees as shown in details.
- G. Drainboards over 30" long shall have open bases. Bases shall be an integral part of free standing sink bases.

6.3.13 SINKS

- A. Construct sinks of 14 gauge stainless steel forming corners with a $\frac{3}{4}$ " radius, both horizontal and vertical. Sink sizes established on the drawings by SSA shall be inside measurements.
- B. Provide double wall partitions between sink compartments with $\frac{3}{4}$ " radius corners, $\frac{3}{4}$ " radius top edge, integrally welded in place, ground smooth and polished. Fronts, bottoms and backs of multiple sinks shall be one piece with no overlapping joints and/or open crevices. The bottom of each sink shall be creased to the center and fitted with a lever operated rotary waste drain with strainer plate, brass tail piece and over flow pipe. The rotary waste drains shall be set into a $\frac{1}{2}$ " deep recess assuring complete draining. Over flows shall be fitted in the back of the sink to maintain a constant water level 1" below the sinks top edge.
- C. Where sinks occur in tables, sinks are to be integrally welded and polished as above.
- D. Provide all required holes for faucets, vacuum breakers, chemical supply lines, etc.

6.3.14 DRAWERS

- A. Drawer liners shall be Kylite ABS thermosplastic as manufactured by standard Keil. Size to be 20" x 20" x 5" deep and be set in a channel frame so as to be easily removed for cleaning without tools.
- B. Supporting drawer frame shall be 16 gauge stainless steel welded channel. Drawer face to be 18 gauge stainless steel double wall construction with insulation between. Face to be welded to drawer supporting frame. Drawer frame shall be integrally formed per details.
- C. All drawers shall be provided with replaceable rubber stops.
- D. Drawers are to be enclosed in an 18 gauge stainless steel housing under open base tables to make them vermin proof.
- E. Drawer slides shall be standard Keil No. 1452-3022-1251 and mounted to the supporting channel frame and shall be fitted with stainless steel ball bearing wheels. Slides to be of a self-closing type sufficient length to allow drawer liner to be removed without removing slides.

6.3.15 DRIP PANS

- A. Drip pans shall be located below each glass filler, urn faucet, beverage dispenser, ice dispenser or draft beer spigot.

Project Specifications

- B. Drip pans shall be a recessed integral part of top with cove corner bodies that slope to 1" plug drains. Drip pan recess fitted with strainers.
- C. Drip pan strainers shall be No. 1580 series Keil heavy duty stainless steel drip plates with three (3) ¾" wide louvers x 90% total strainer length, two (2) No. 1586-1010-1318 Keil finishing rings in each section, 1" x 90 degree angle edges, and welded corners.
- D. Drip pan strainer shall be constructed in equal length, removable sections.

6.3.16 ELECTRICAL

- A. Electrical conductors shall be run in rigid conduit to a junction box on exterior of fixture and have minimum 12" pigtail.
- B. Flexible conduit shall not be used except for motor connections.
- C. Motors shall have a flexible conduit vibration section, at least 12" long and not over 24" long, with a ground wire running through the conduit.
- D. Wiring in prefabricated and/or manufactured equipment shall be U.L. approved construction by the equipment manufacturer.
- E. Wiring in custom built equipment, areas, locations or compartments where temperature may exceed 150 degrees F. shall be type A1 moisture proof range and appliance lead wire with nickel conductors, with an approved insulation and braided cover.
- F. Wiring in custom built equipment, areas, locations or compartments that will be exposed to moisture or high humidity shall be type THW-75C machine wool wire with copper conductors and thermoplastic insulation. All internal wiring in custom-built equipment shall be terminated in (1) junction box that is accessible for connection and service. All wiring shall be permanently marked by color coding. A permanent wiring diagram shall be attached to each piece of equipment. Conductors connected to terminals shall have T & B Sta-Kon rings.
- G. Conductors connected together shall have Buchanan Crimp connectors including splash caps and insulators.
- H. Conductors of multi-wire branch circuits shall have (2) wire circuits with one (1) black and one (1) white: three(3) wire circuits with (1) black, one (1) white and one (1) blue.
- I. Neutral conductors shall be white.
- J. Grounding conductors shall be green.
- K. Electrically operated portable equipment shall have a cord and plug
- L. Service cords shall be type SJO with grounding conductor securely fastened to body or of equipment.
- M. Plugs shall be grounding type with service cord grounding conductor connected to grounding blade.
- N. Receptacle grounding contacts must be clearly labeled with instructions for electrician to connect this terminal or contact to branch circuit grounding conductor.
- O. Electric motors shall have control switches for starters.
- P. Electric motors and electric heated equipment directly connected to the building electric system shall have a positive disconnect that will open all conductors and meet Nema standard KS-1-1957 for type H.D. switches.
- Q. Combination starters and disconnects installed in a single Nema enclosure shall have the same type components as individual starters, switch, fused switches and breakers.
- R. Starters, transformers and disconnects shall have Nema enclosures in dry areas and watertight Nema 4 or 5 cast enclosures in wet areas.
- S. Each light fixture or group of light fixtures in the same system shall have No. 1251-1 Hubbell or equivalent Arrow-Hart or Pass and Seymour double pole press switch.
- T. All equipment specified or detailed where fluorescent light fixtures are specified shall have ballasts included. All lighting fixtures furnished as part of the food service equipment contract shall include fluorescent tubes with safety coating to prevent shattering. Bulbs

Project Specifications

and tubes are to be provided and installed by the F.E.C.

6.3.17 HANGER ASSEMBLIES

- A. Framing members for hoods, hoist or other equipment with live load of 500 pounds or weighing over 500 pounds shall be 2" x 2" x ¼" steel angles spaced at 36" O.C. maximum.
- B. Hangers for piping, refrigerant lines and beverage dispenser conduit shall be Power-Strut metal framing with series PS-300 channels, series PS-10 spring clamping nuts, ½' diameter hanger rods, brackets, beam clamps, conduit clamps for each pipe or line and fasteners.
- C. Horizontal runs of two or more pipes or lines shall have Power-Strut trapeze hanger and/or surface mounting assemblies spaced at 60" O.C. for lines smaller than ¾" O.D., 72" O.C. for lines ¾" to 1-1/2" O.D. for lines 1-5/8" or larger.
- D. Horizontal and vertical runs adjacent to building walls shall have surface mounted assemblies with same spacing and trapeze assembly.

6.3.18 OPEN BASES

- A. Legs shall be constructed of 1-5/8" O.D. x 16 gauge stainless steel tubing.
- B. Maximum spacing shall be 72" below worktables and 60" below dishtables, sinks and drainboards.
- C. Rails shall be constructed of 1-5/8" O.D. x 16 gauge stainless steel and shall be welded to legs.
- D. Install rails between legs 12" above floor.
- E. Legs on stationary equipment shall have No. BF158 United Show Case (Keil or Haralson) stainless steel adjustable bullet feet.

PART 7 PROCEDURES

7.1 WORKMANSHIP

- A. Entire procedure, including materials, workmanship, details, fabrication and fastening methods shall comply with applicable standards.
- B. Workmanship and finishes shall be in accordance with best practices of the trade. Only skilled workers shall be employed in the fabrication and erection of the work of this section.
- C. Work shall be provided complete in every detail and the finished work shall be strong, rigid, neat in appearance and free from defects as may be determined by the Owner / Project Architect and/or SSA.

7.2 WELDING

- A. Joints in stainless steel shall be electrically welded using stainless steel electrodes. All welds shall be free of pits and flaws. Acetylene welding or silver soldering will not be acceptable.
- B. Joints in galvanized material shall be electrically welded using electrodes designed to weld galvanized metal. All welds shall be free of pits and flaws.
- C. Acetylene welding will not be acceptable. Materials spot welded together shall have welds equally spaced in straight parallel or perpendicular lines. Spot welding procedure or technique is to be in strict accordance with recommendations of material and/or welding machine manufacturer.

7.3 FINISHING

- A. Joints in stainless steel that have been welded shall be ground smooth polished to a No. 4

Project Specifications

- finish. The grain shall be blended into the grain of surrounding surfaces.
- B. Joints in galvanized material that have been welded shall be thoroughly cleaned and finished with one coat of zinc-rich paint (70% minimum). Galvanized steel shall be washed with mineral spirits, primed with Pratt and Lambert Effecto Primer or approved substitute, then spray painted with two (2) coats of Pratt and Lambert Effecto Enamel or approved substitute of color by SSA / Project Architect. Allow eight hours minimum drying time between coat of paint and primer.
 - C. Powder coated items shall have a fifteen year warranty against chipping, cracking, fading, scratching and/or damage due to temperature. Colors to be selected by Project Architect. Finish and materials to approved for foodservice use by all governing agencies.

PART 8 MATERIALS

8.1 HARDWARE

- A. Hardware used in construction of custom-built equipment shall be standard products of an approved hardware manufacturer and/or as approved by SSA / Project Architect. All hardware used in construction of food service equipment to be tamper proof where it comes in contact with inmates. All control to have locking covers.

8.2 STAINLESS STEEL COMPONENTS

- A. Flat sheets shall be type 304 with No. 3 finish, in accordance with ASTM-A-167-70 standard. Materials shall be new, of prime quality, full gauge thickness. Stainless steel shall be type 304, 18-8 series, with a content of from 17% to 19% chrome, 7% to 10% nickel and a maximum carbon content of 0.09. Exposed surface shall be interpreted to include all inside surfaces exposed to view item is open.
- B. Structural shapes shall be type 304 with No. 3 finish on all exposed surfaces.
- C. Hardware and fittings shall be the standard product of the manufacturer named as a standard.
- D. Tubes shall be type 304, ornamental grade with No. 4 finish, 16 gauge minimum, seamless drawn.

8.3 GALVANIZED STEEL COMPONENTS

- A. Flat sheets shall be type 1, class D, in accordance with FF-QQ-S-775D standard.
- B. Structural shapes shall be galvanized by the hot dip process in accordance with ASTM-A-123-69 standards.
- C. Tubes shall be welded steel, structural grade, with hot dipped galvanized finish applied after fabrication.
- D. Pipes shall be type S, grade B, schedule 40, in accordance with ASTM-A-53-69 standard.

8.4 BRASS COMPONENTS

- A. Flat sheets shall be 70% copper and 30% zinc alloy in accordance with ASTM B19, B36, alloy 260 half-hard surface.
- B. Brass tops are to be B & S gauge as specified.
- C. Structural sheets are to be B & S 18 gauge and seamless.
- D. Brass flat surfaces and structural shapes are to have a mirror finish.
- E. Welds are to be restored to a mirror finish and shall blend into the surface of the surrounding surface.

Project Specifications

8.5 COPPER COMPONENTS

- A. Flat sheets shall be hard copper ASTM B152, type ETP. 48 ounces per square foot.

8.6 BRASS COMPONENTS

- A. Flat sheets shall be 70% copper and 30% zinc alloy in accordance with ASTM B19, B36, alloy 260 half-hard surface.
- B. Brass tops are to be B & S gauge as specified.
- C. Structural sheets are to be B & S 18 gauge and seamless.

8.7 CASTERS

- A. Casters on prefabricated equipment shall be the equipment manufacturer's standard product as specified under the itemized equipment list.
- B. Casters on custom-built equipment shall be Jarvis N.S.F. non-marking polyurethane or approved substitute or as specified under itemized specifications.
- C. Casters shall have wheel sizes indicated.
- D. Standard duty (S.D.) casters shall be No.5-25-111 swivel plate casters or No. 5-30-113.
- E. Heavy duty (H.D.) casters shall be No. 5-30-113 plate casters.
- F. Secure plate casters with (4) ¼-20 stainless steel bolts, stainless steel lock washers, and stainless steel nuts.
- G. Where breaks are specified, they shall be adjustable, cam acting, side lever with positive brake shoe on the wheel tread.

8.8 INSULATION

- A. Fiberglass bats shall be Johns-Manville, Owens-Corning or W.R. Grace Zonolite blanket insulation.
- B. Plastic foam board insulation shall be Dupont urethane or approved substitute.
- C. Insulation thickness indicated shall be foamed in place or constructed from multiple layers of board insulation of battes with staggered joints and perpendicular seams.

8.9 WOOD

- A. Lumber shall be free from knots, pitchy seams or other imperfections, thoroughly air-seasoned and Kiln dried. Cover all unexposed surfaces with two coats of odorless waterproof coating.
- B. Plywood shall be marine grade or exterior APA grade with closed grain and of thickness specified.
- C. Exposed wood surfaces to be birch, interiors to be Cypress, Spruce or Northern White Pine. Frame casings and jambs to be clear Douglas Fir.

8.10 FIBERGLASS (FRP)

- A. Fiberglass Reinforced Polyester (FRP) shall be molded with permanent color, minimum thickness, 1/8", glass content 33% minimum, Barcol hardness at least 55, flexural strength of 30,000 PSI minimum, tensile strength 25,000 PSI. All FRP parts shall be by manufacturer and color as specified by the Project Architect and/or Owner.
- B. Where finished FRP parts are used in conjunction with casters or other metallic parts which impart concentrated stress at specific points, these points shall be reinforced with stainless steel battens, bars or other required shapes.

Project Specifications

-
- C. Fire ratings shall be specified by the Project Architect.

8.11 PLASTIC LAMINATING

- A. Plastic laminated panels shall be constructed of $\frac{3}{4}$ " thick marine grade plywood veneered on all exposed surfaces with plastic laminate of pattern and color as selected by Architect / Interior Designer, seal all unexposed sides with $\frac{1}{8}$ " masonite.
- B. Plastic and masonite shall be pressure laminated to plywood with mastic recommended by plastic manufacturer.
- C. No joints shall be permitted when standard sheet size will permit panels to be constructed without joints.
- D. Grain on upright surfaces shall run vertical. All inside corners to be sealed with approved sealer as per above.

PART 9 INSULATION**9.1 PLACEMENT**

- A. Do all fitting and fastening necessary to install fixed items or sub-items in permanent position as shown on all plans.

9.2 ERECTION

- A. Work shall be erected plumb, square and unwrapped by experienced personnel.
- B. Protect all metal surfaces in contact with masonry, concrete and/or dissimilar metals with an acceptable nonabsorbent tape and/or gasket material.
- C. Work shall be erected in correct horizontal and vertical alignment at the locations shown on the drawings.
- D. Frames shall be anchored in place with sufficient anchorage to withstand live load with no apparent movement or tendency to fail.
- E. Installation screws and fasteners shall be installed carefully to avoid scratching and/or damaging adjacent surfaces and/or fastener heads and shall be stainless steel.
- F. At completion of erection work, finished surfaces shall be free of hammer and tool marks, scratches, blemishes, rust and stains.
- G. Equipment shall be suitably protected, by F.E.C. during installation to prevent damage by other trades.
- H. Provide general and/or seismic restraining devices in areas requiring such, as per local codes.

9.3 CLEARANCE

- A. Edges of splashes on open base fixtures that are adjacent to walls shall have a 3" cleaning clearance or be sealed, seal bead not to exceed $\frac{3}{8}$ " against wall.
- B. Edges of splashes enclosed base fixtures that are adjacent to wall or other solid fixtures higher than the splash shall form tight hairline joints. Seal joints with transparent Geoprene, General Electric or Dow silicone sealant. All excess sealant to be cleaned out to a smooth radius fillet.

9.4 FIELD JOINTS

- A. Field joints in stainless steel and/or brass tops shall be welded or fused and finished as specified herein.

Project Specifications

9.5 UTILITY SERVICE CONNECTIONS

- A. Plumbing, electrical and mechanical furnished by the F.E.C. shall be limited to that which is built-in or is an integral part of the equipment itself.
- B. Final utility installation and connections shall be by related trades and is to be included in the G.C. and/or C.M. contracts.
- C. Provide restraining devices with mobile cooking equipment as required.

9.6 CONTRACTOR COOPERATION

- A. Cooperate with and render all necessary assistance to other Contractors concerned with roughing-in and final connection of utility services for this contract.
- B. After final utility connections are made, thoroughly clean, sanitize, polish and inspect the proper function of all items.
- C. Report malfunctioning, incomplete or missing items, Owner furnished equipment or components to SSA / Project Architect.

9.7 ACCEPTANCE

- A. SSA will inspect the completed work connected with this section for compliance to the Contract Documents, upon notification by the Owner, Project Architect or F.E.C. which ever occurs first.
- B. Prior to acceptance of the work of this section, F.E.C. shall clean, sanitize, polish and treat all stainless steel, cast iron, enamel porcelain and other type surfaces in accordance with manufacturer's recommendations and/or procedures.
- C. Prior to acceptance of this section, F.E.C. shall clean and retouch all painted surfaces, powder-coated surfaces that have been damaged must be re-finished by an established powder-coating firm.

9.8 TESTING, DEMONSTRATING AND INSTRUCTING

NOTE: In addition to the stipulated retainage of payment as required, the Owner shall retain an additional (10%) ten percent of the line item applicable to "Food Service Equipment" as listed in the Contractor's Schedule of Values. This additional retainage will be released only after the requirements of this section of these specifications are met in their entirety and to the complete satisfaction of the Owner's Project Manager.

- A. F.E.C. shall at the completion of this work remove all debris, crating, packaging materials and implements associated with this work leaving the area broom clean.
- B. F.E.C. shall provide and maintain protective covering for finished surfaces and other parts of equipment and/or cooler/freezer assemblies subject to damage during and after installation.
- C. Clean, test, adjust, calibrate by a factory authorized service agency all foodservice equipment and fixtures to make ready for operation when the facility is turned over to the Owner.
- D. After the above is complete, all items furnished under this Contract shall be operated and thoroughly tested to insure proper safe operation. The Owner, the Food Service Consultant, the G.C. and/or C.M shall be notified of this testing and is to be provided with a copy of the service agencies' report.
- E. When the foodservice equipment has been cleaned and tested and is operating properly, the F.E.C. shall arrange to have equipment furnished under this section of the contract

Project Specifications

demonstrated, pursuant to the availability of the Owner and it's representatives, by authorized representatives who are to instruct the Owner's designated personnel in the use, care and maintenance of the equipment. NOTE: Attendance at the demonstration meeting is required of all manufacturers' designated representatives providing equipment under this Contract and is to occur at one meeting.

- F. The F.E.C. shall be responsible for scheduling the demonstration meeting. Each manufacturer's representative shall be present at this meeting:
1. Demonstrate to and instruct the Owner's designated personnel as to the operation, use, care, cleaning and maintenance of all items of equipment and respond to all questions and concerns by written response.
 2. Provide the Owner's designated representative with the name, address and telephone number of a designee of each manufacturer and state which designee shall be responsible to quickly respond to warranty work 24 hours a day, 365 days a year. This is to be direct contact. The Owner may contact such warrant representatives designee directly, and such designee may respond without voiding any responsibility or warranties of the manufacturer, the F.E.C., the G.C. and/or the C.M.. Service charges for this warranty representative, no matter what the resolution of the problem may be, shall be the responsibility of the manufacturer, the F.E.C., the G.C. and/or the C.M.. In any event, the F.E.C. shall be responsible to immediately pay upon invoice, charges by the warranty representative in order to keep the warranty representative responsive. Weather the plumbing, electrical, food service equipment or other sub-contractors (or even the Owner) should be back charged will be resolved later.
 3. Provide the Owner's representative with three (3) sets of operation maintenance manuals for each item of equipment furnished under this contract. This set shall be neatly bound in a three-ring binder, by F.E.C. with the delivery of this booklet received at the time of delivery.
 4. Attendance at the one demonstration meeting is required of all manufacturers' representatives providing equipment under this contract, if for any reason an additional meeting must be scheduled the F.E.C. will be responsible for all additional fees and costs incurred.

PART 10 CORRECTION OF DEFECTS, SERVICES AND GUARANTEE

10.1 GENERAL

- A. F.E.C. shall replace at the Owner's, SSA's and/or the Project Architect's discretion, or make satisfactory repairs to any item of equipment that fails to conform to the requirements of the Contract at the time and shall remedy any defects due to faulty materials or workmanship which appear within a period of one (1) year from start-up and demonstration of equipment.
- B. Items shall be tested and adjusted by skilled mechanics and this Contractor shall guarantee the material and workmanship of the equipment furnished by him under these specifications, for a period of one (1) year after acceptance by Owner.
- C. All equipment, refrigeration systems and ice makers shall have start-up and a two (2) year extended service warranty for parts and labor and five (5) year extended warranty on compressors which will start on the date of Owner's acceptance. The cost of all warranties shall be included in the bid proposal and contract sum and shall serve as a prepaid service contract.
- D. Contractors who do not normally maintain local refrigeration service personnel shall be required to provide the Owner with a refrigeration service policy in writing from a local



Project Specifications

- refrigeration service company that maintains a twenty-four (24) hour call service and that is acceptable to the Owner for a period of (1) year at no additional expense to the Owner.
- E. Provide to Owner a listing of factory authorized service agencies and copies of written service and warranty agreements on all items of equipment provided under this Contract, excluding Owner furnished and/or existing items.
 - F. Service contracts on refrigeration systems must be contracted for by the F.E.C. with authorized local service organizations capable of providing prompt and efficient service. Submit six (6) copies of all service contracts, as specified herein, upon completion of the installation of the equipment to the Owner.

PART 11 MISCELLANEOUS REQUIREMENTS

11.1 UNIFORM QUALITY

- A. Custom built items must be constructed by the same fabricator to insure uniform quality and appearance.
- B. Similar type items of manufacture and/or prefabricated equipment must be the product of the same manufacturer.

11.2 IDENTIFICATION PLATES

- A. Each piece of equipment must have a suitable nameplate supplied by the manufacturer that is to include the name of the manufacturer, the electrical and/or utility demands.
- B. Each switch and/or control device shall have an approved nameplate indicating its function or purpose such as display shelf lights, frost plate compressor and plate warmer.
- C. Indicator dials and other standard components of prefabricated equipment will be considered acceptable identification of their physical location clearly indicating the warmers and/or other equipment items that they control.
- D. All nameplates must be non-corrosive metal with engraved letters and have acid etched, phenolic and/or painted letters.

PART III EQUIPMENT LIST

01/30/2014	DEW-PCJ Kitchen
ITEM # 101	WALK IN COMBINATION COOLER/FREEZER, BOX ONLY
BASIS OF DESIGN	
Quantity:	One (1)
Manufact	
urer:	ThermoKool
Model:	CUSTOM
Utilities:	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Multi section walk in cooler. Overall dimensions per plan (to be field verified), exterior height to be 10'-0" AFF. All sections to be provided with floor and a 4" topping slab in an 8" depression. Cooler section to maintain 34 degrees F, freezer section to maintain -10 degrees F. trash cooler to maintain 34 -55 degrees F.

PANEL CONSTRUCTION:

- Walls and ceiling to be 4" polyurethane. Interior finish to be white stucco embossed



Project Specifications

aluminum. Exterior finish to be unpainted stucco embossed aluminum, 20 gauge type 304 #3 finish stainless steel where exposed. View windows (double insulated glass) in wall panels facing kitchen to be security glass and be mounted from 36" AFF to 6'6" AFF. See plan for location and width. Mullions to be placed by manufacturer as needed.

DOOR/ACCESSORIES:

•(13) 36 X 78 flush mounted entrance doors, with hardware, pilot light & switch assembly, vapor proof light and 4-1/2" dial thermometer. NSF listed. with hardware, pilot light & switch assembly, vapor proof light and 4-1/2" dial thermometer. NSF listed. (13) 14" x 14" cooler view ports with heated frame and glass, (3) hinges per door, (3) heated pressure relief vent, Aluminum treadplate exterior/interior kick plates and jamb guards 36" high on both sides. Stainless steel doors/frames interior/exterior, Thermostatically controlled door frame heater wires, L-shaped, spliced ceiling and floor.

- Provide (9) Modularm 75 audio/visual alarms flush mounted.
- Provide (27) Kason 1810L surface mounted LED light fixtures.
- Provide stainless steel closure panels and/or trim strips as needed.
- Provide (10) Vinyl strip curtains

ITEM # 101.1 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.
One (1) Model CUSTOM Bulk Produce Refrigerated Section



Project Specifications

ITEM # 101.2 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Dairy Refrigerated Section

ITEM # 101.3 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Bulk Meat Refrigerated Section

ITEM # 101.4 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Finished Produce Refrigerated Section



Project Specifications

ITEM # 101.5 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED

BASIS OF DESIGN

Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Finished Produce Refrigerated Section

ITEM # 101.6 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED

BASIS OF DESIGN

Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Finished Bulk Refrigerated Section

ITEM # 101.7 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED

BASIS OF DESIGN

Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Thaw/Pull Refrigerated Section



Project Specifications

ITEM # 101.8 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM -10 Freezer

Section

ITEM # 101.9 WALK IN COMBINATION COOLER FREEZER, SELF-CONTAINED
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: ThermoKool
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM -20 Freezer

Section

ITEM # 102 REFRIGERATION RACK, REMOTE
SINGLE SOURCE
Quantity: One (1)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	480	60	3	Direct	60"		28.6				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Multi compressor, indoor, remote water cooled refrigeration system. The refrigeration package shall be a pre-engineered and factory-assembled unit, trade name "Eco-Cool", as manufactured by Refrigeration Design Technologies

All low voltage connections between refrigeration rack, walk in units and appliances to be made by electrical contractor. Low voltage to include wiring for off cycle defrost sensor. Provide with all standard features.



Project Specifications

ITEM # 102.1 DIGITAL SCROLL DEMAND SYSTEM
SINGLE SOURCE
Quantity: One (1)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	480	60	3				86.5				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Digital scroll demand system

ITEM # 102.2 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				2.7				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model CUSTOM Evaporator
for 101.1



Project Specifications

ITEM # 102.3 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				1.8				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model CUSTOM Evaporator
for 101.2

ITEM # 102.4 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				1.8				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model CUSTOM Evaporator
for 101.3



Project Specifications

ITEM # 102.5 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				2.7				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model CUSTOM Evaporator
for 101.4

ITEM # 102.6 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				1.8				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model CUSTOM Evaporator
for 101.5



Project Specifications

ITEM # 102.7 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				2.7				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.
Two (2) Model CUSTOM Evaporator
for 101.6

ITEM # 102.8 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				1.8				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.
Two (2) Model CUSTOM Evaporator for 101.7



Project Specifications

ITEM # 102.9 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208	60	3				9				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model CUSTOM Evaporator
for 101.8

ITEM # 102.10 EVAPORATOR
SINGLE SOURCE
Quantity: Two (2)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208	60	3				9				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model CUSTOM Evaporator
for 101.9



Project Specifications

ITEM # 102.11 EVAPORATOR
SINGLE SOURCE
Quantity: One (1)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				.9				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.
One (1) Model CUSTOM Trash holding low velocity coil (60 degrees)

ITEM # 102.12 E2 SYSTEM CONTROLLER
SINGLE SOURCE
Quantity: One (1)
Manufacturer: RDT
Model: E2

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				15CKT				

Furnish and set in place per manufacturer's standard specifications.
One (1) Model E2 System controller



Project Specifications

ITEM # 102.13 EVAPORATOR
SINGLE SOURCE
Quantity: One (1)
Manufacturer: RDT
Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				1.8				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Evaporator for 109

ITEM # 103 SHELVING UNIT
BASIS OF DESIGN
Quantity: Twenty-Six (26)
Manufacturer: SPG
Model: 4H0490MOD

Utilities:

Furnish and set in place per manufacturer's standard specifications.

Twenty-Six (26) Model 4H0490MOD Kelmax Shelving All Welded, channel, 4 shelf unit, 72"H, 48"W x 20"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 103.1 SHELVING
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Kelmax
Model: 4H6976MOD

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 4H6976MOD Kelmax Shelving All Welded, channel, 4 shelf unit, 72"H, 54"W x 20"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 103.2 SHELVING
BASIS OF DESIGN
Quantity: Thirty-Three (33)
Manufacturer: Kelmax
Model: 4H0525MOD

Furnish and set in place per manufacturer's standard specifications.

Thirty-Three (33) Model 4H0525MOD Kelmax Shelving All Welded, channel, 4 shelf unit, 72"H, 60"W x 20"D, aluminum construction, all shelves heavy duty, NSF-Modified Version



Project Specifications

ITEM # 104 PALLET BASES
BASIS OF DESIGN
Quantity: Sixteen (16)
Manufacturer: Custom
Model: H-1022
Utilities:

Furnish and set in place per manufacturer's standard specifications.
Sixteen (16) Model H-1022 Plastic pallet bases

ITEM # 105 SHELIVING
BASIS OF DESIGN
Quantity: Four (4)
Manufacturer: Kelmax
Model: 4H2414MOD

Furnish and set in place per manufacturer's standard specifications.
Four (4) Model 4H2414MOD Kelmax Shelving All Welded, channel, 4 shelf unit, 72"H, 36"W x 20"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 105.1 SHELIVING UNIT
BASIS OF DESIGN
Quantity: Six (6)
Manufacturer: SPG
Model: 4H0490MOD

Furnish and set in place per manufacturer's standard specifications.
Six (6) Model 4H0490MOD Kelmax Shelving All Welded, channel, 4 shelf unit, 72"H, 48"W x 20"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 105.2 SHELIVING
BASIS OF DESIGN
Quantity: Ninety-Nine (99)
Manufacturer: Kelmax
Model: 4H0525MOD

Furnish and set in place per manufacturer's standard specifications.
Ninety-Nine (99) Model 4H0525MOD Kelmax Shelving All Welded, channel, 4 shelf unit, 72"H, 60"W x 20"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 106 SHELIVING UNIT
BASIS OF DESIGN
Quantity: Six (6)
Manufacturer: SPG
Model: 4H0490MOD

Furnish and set in place per manufacturer's standard specifications.
Six (6) Model 4H0490MOD Kelmax Shelving All Welded, channel, 4 shelf unit, 72"H, 48"W x 20"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 106.1 SHELIVING
BASIS OF DESIGN

Project Specifications

Quantity: Four (4)

Manufacturer: Kelmax

Model: 4H0525MOD

Furnish and set in place per manufacturer's standard specifications.

Four (4) Model 4H0525MOD Kelmax Shelving All Welded, channel, 4 shelf unit, 72"H, 60"W x 20"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 106.2 SHELIVING

BASIS OF DESIGN

Quantity: Two (2)

Manufacturer: Kelmax

Model: 4H6978MOD

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model 4H6978MOD Kelmax Shelving All Welded, Solid, 4 shelf unit, 72"H, 42"W x 24"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 106.3 SHELIVING

BASIS OF DESIGN

Quantity: Seven (7)

Manufacturer: kelmax

Model: 4H6541MOD

Furnish and set in place per manufacturer's standard specifications.

Seven (7) Model 4H6541MOD Kelmax Shelving All Welded, Solid, 4 shelf unit, 72"H, 60"W x 24"D, aluminum construction, all shelves heavy duty, NSF-Modified Version

ITEM # 107 laundry transfer cart

BASIS OF DESIGN

Quantity: Two (2)

Manufacturer: Custom

Model: 394

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model 394 Laundry transfer cart

ITEM # 108 GARBAGE CAN

Dimensions: 33(h) x 26.5(w) x 26.5(d)

BASIS OF DESIGN

Quantity: Twelve (12)

Manufacturer: Rubbermaid

Model: 1779732



Furnish and set in place per manufacturer's standard specifications.

Twelve (12) Model 1779732 BRUTE® Container, without lid, 55 gallon, 26-1/2"D x 33"H, round, reinforced rims, built in handles, double rimmed base, high-impact plastic construction, blue, NSF (case of 6)

ITEM # 109 WALK IN COMBINATION COOLER/FREEZER, BOX ONLY

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: ThermoKool

Model: CUSTOM

Utilities:

Project Specifications

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Receiving cooler/freezer. Overall dimensions per plan (to be field verified), exterior height to be 7'-4" AFF. Freezer section to be provided with floor and internal ramp. Cooler section to maintain 34 degrees F, freezer section to maintain -10 degrees F.

PANEL CONSTRUCTION:

- Walls and ceiling to be 4" polyurethane. Interior finish to be white stucco embossed aluminum. Exterior finish to be unpainted stucco embossed aluminum, 20 gauge type 304 #3 finish stainless steel where exposed. DOOR/ACCESSORIES:

- (3) 36 X 78 flush mounted entrance doors, with hardware, pilot light & switch assembly, vapor proof light and 4-1/2" dial thermometer. NSF listed. with hardware, pilot light & switch assembly, vapor proof light and 4-1/2" dial thermometer. NSF listed. (3) 14" x 14" cooler view ports with heated frame and glass, (3) hinges per door, (3) heated pressure relief vent, Aluminum treadplate exterior/interior kick plates and jamb guards 36" high on both sides. Stainless steel doors/frames interior/exterior, Thermostatically controlled door frame heater wires, L-shaped, spliced ceiling and floor.

- Provide (3) Modularm 75 audio/visual alarms flush mounted.
- Provide (9) Kason 1810L surface mounted LED light fixtures.
- Provide stainless steel closure panels and/or trim strips as needed.
- Provide (3) Vinyl strip curtains

ITEM # 201

SINK, HAND

BASIS OF DESIGN

Quantity: Three (3)

Manufacturer: Metcraft

Model: 5681

Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1	1-1/2"	

Furnish and set in place per manufacturer's standard specifications.

Three (3) Model 5681 Provide with security package.

ITEM # 202

HOSE REEL

BASIS OF DESIGN

Quantity: Three (3)

Manufacturer: Fisher

Model: 29629



Project Specifications

Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				1/2"						1		

Furnish and set in place per manufacturer's standard specifications.

Three (3) Model 29629 Hose Reel Assembly, stainless steel covered reel rinse with spray gun, 50 feet of 5/8" ID, 3 ply, pressure of 150 PSI, 1/2" NPT female inlet or 3/4" F garden hose inlet

ITEM # 203

FLOOR TROUGH

Dimensions: 4(h) x 42(w) x 12(d)

Quantity: Two (2)

Manufacturer: Advance Tabco

Model: FFTG-1242

Utilities:

BASIS OF DESIGN



WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1		4"

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model FFTG-1242 Floor Trough, 12"W, 42"L, 4"D, with fiberglass grating, stainless steel removable strainer basket, 4" O.D. waste pipe 3"L, pitched towards waste

ITEM # 204

FLOOR TROUGH

Dimensions: 4(h) x 60(w) x 12(d)

Quantity: One (1)

Manufacturer: Advance Tabco

Model: FFTG-1260

BASIS OF DESIGN



Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1		4"

Furnish and set in place per manufacturer's standard specifications.

One (1) Model FFTG-1260 Floor Trough, 12"W, 60"L, 4"D, with fiberglass grating, stainless steel removable strainer basket, 4" O.D. waste pipe 3"L, pitched towards waste

ITEM # 205

DISHTABLE SORTING TABLE

Dimensions: 37(h) x 96(w) x 30(d)

Quantity: One (1)

Manufacturer: Advance Tabco





Project Specifications

Model: SR-96
Utilities:
BASIS OF DESIGN

Furnish and set in place per manufacturer's standard specifications.

One (1) Model SR-96 Sorting Table, with 3" raised edge, 30" wide top, without splash, 96" long, with crossrails, stainless steel construction, 16 gauge 304 series stainless steel top



Project Specifications

ITEM # 206 WORK CENTER

Dimensions:

Quantity: One (1)

Manufacturer: Emjac

Model: CUSTOM

Utilities:

BASIS OF DESIGN

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Pre rinse table, all stainless steel construction sized and shaped as per plan. Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.

ITEM # 206.1 SINK, (2)TWO COMPARTMENT

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Emjac

Model: CUSTOM

Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM 20" x 25" x 12" integrally welded stainless steel sink. Provide with Fisher #22306 waste valve with flat strainer with overflow.

ITEM # 206.2 PRE-RINSE

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Fisher

Model: 80896

Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 80896 Pre-Rinse Unit, 8" backsplash with elbows, supply lines & angle stops control valve, with spring action flexible gooseneck, 21" riser, 36" hose, wall bracket, ultra spray valve & brush

ITEM # 206.3 FAUCET

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Fisher

Project Specifications

Model: 81094
Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 81094 Workboard Faucet, 8" c/c backsplash mount, with 10" swing spout, supply lines, elbows, angle stops

ITEM # 207 OVERSHELF

Dimensions: 11.5(h) x 72(w) x 12(d)

Quantity: One (1)

Manufacturer: Advance Tabco

Model: WS-12-72

Utilities:

BASIS OF DESIGN



Furnish and set in place per manufacturer's standard specifications.

One (1) Model WS-12-72 Shelf, wall-mounted, 12" wide, 72" long, 18 gauge type 430 stainless steel

ITEM # 208 SOILED DISHTABLE

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Emjac

Model: CUSTOM

Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				3/4"						1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Soiled ware table w/ trough. Provide water gusher at end and mid way of trough.

ITEM # 208.1

DISPOSAL SYSTEM

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Salvajor

Model: 300-TVL

Utilities:



ELECTRICAL

Project Specifications

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1									3		

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				1/2"						1		2"

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model 300-TVL TroughVeyor, food waste conveying & disposing system with water recirculation, left-hand operation, 3 HP disposer, with trough diffuser, salvage basin & silverware trap, stainless steel construction, with start/stop push button auto reversing control & safety line disconnect One (1) Model 988001 Gusher head assembly for TVL, TVR & S419

One (1) Model LSP5 Stainless steel bolt-down flanges for SM, PSM, TVL, TVR

One (1) Model 980600 TroughVeyor prison package, includes security screws with tool for service covers & control panel

One (1) Model 997101 Control padlock hasp

ITEM # 208.2 ROLLER CONVEYOR
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	230	60	3				11.66				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Roller conveyor.

ITEM # 208.3 OVERHEAD RACK SHELF
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Overhead rack shelf

ITEM # 209 DISHWASHER, FLIGHT TYPE
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Hobart



Project Specifications

Model: FT900S

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	480	60	3				13.6				

ELECTRICAL 1 REMARKS

Refer to Hobart engineered drawings

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1"			1"						1	2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model FT900S Space Saver Flight Type Continuous Racking Automatic Conveyor Dishwasher (Contact factory for details & pricing)

ITEM # 210 EXHAUST DUCT COLLAR

SINGLE SOURCE

Quantity: One (1)

Manufacturer: Halton

Model: CUSTOM

Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Condensate exhaust duct.

ITEM # 211 QUEEN MARY

Dimensions: 69.25(h) x 30.88(w) x 51.88(d)

Quantity: Eleven (11)

Manufacturer: Lakeside

Model: B592



Utilities:

BASIS OF DESIGN

Furnish and set in place per manufacturer's standard specifications.

Eleven (11) Model B592 Soiled Dish Breakdown Cart, 51-7/8"L x 30-7/8"W x 69-1/4"H, (4) 14 gauge stainless steel shelves ((2) flat, (2) angled), includes drain pan holder, clear plastic drain tube, built in plastic food scraper, hanging waste bin, tubular push handles, (4) 8" casters, (2) fixed & (2) swivel, NSF

ITEM # 212 CART, UTILITY

Dimensions: 37.38(h) x 48(w) x 25.75(d)

Quantity: Twelve (12)

Manufacturer: Lakeside

Model: 954



Utilities:



Project Specifications

BASIS OF DESIGN

Furnish and set in place per manufacturer's standard specifications and the following:

Twelve (12) Model 954 Tough Transport Utility Cart, open, (3) shelf, shelf size 24" x 42", stainless steel angle frame with push handle, 1000 lb. capacity, (2) 5" swivel & (2) 8" fixed casters, NSF
Twelve (12) Casters, Hi-temp 5" 2 each swivel, 2 each fixed
Twelve (12) Wall-Saver perimeter bumpers
Twelve (12) Ground and polished joint welds

ITEM # 213 SCULLERY
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Scullery sink, all stainless steel construction sized and shaped as per plan. Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.

ITEM # 213.1 SINK, (3) THREE COMPARTMENT
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM 24"x22"x12" integrally welded stainless steel sink. Provide with Fisher #22306 waste valve with flat strainer with overflow.

ITEM # 213.2 PRE-RINSE
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Fisher
Model: 80896
Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 80896 Pre-Rinse Unit, 8" backsplash with elbows, supply lines & angle stops control valve,

Project Specifications

with spring action flexible gooseneck, 21" riser, 36" hose, wall bracket, ultra spray valve & brush

ITEM # 213.3 FAUCET
Dimensions:
Quantity: One (1)
Manufacturer: Fisher
Model: 81094
Utilities:
BASIS OF DESIGN

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 81094 Workboard Faucet, 8" c/c backsplash mount, with 10" swing spout, supply lines, elbows, angle stops

ITEM # 214 OVERSHELF
Dimensions: 11.5(h) x 72(w) x 12(d)
Quantity: One (1)
Manufacturer: Advance Tabco
Model: WS-12-72
Utilities:
BASIS OF DESIGN



Furnish and set in place per manufacturer's standard specifications.

One (1) Model WS-12-72 Shelf, wall-mounted, 12" wide, 72" long, 18 gauge type 430 stainless steel

ITEM # 215 BEVERAGE DISPENSER
Dimensions: 25.75(h) x 16.25(w) x 20.5(d)
Quantity: Eight (8)
Manufacturer: Cambro
Model: UC1000110
BASIS OF DESIGN



Utilities:

Furnish and set in place per manufacturer's standard specifications and the following:

Eight (8) Model UC1000110 Ultra Camtainer® Beverage Carrier, insulated plastic, 10-1/2 gallon capacity, black, NSF approved

Eight (8) Model UC1000CVR110 Camtainer® Cover, for UC1000 series, water resistant, polyester, black

ITEM # 216.1 ICE CUBER
Dimensions: 29.5(h) x 48(w) x 24.5(d)
Quantity: Three (3)
Manufacturer: Manitowoc
Model: IY-1804A



Project Specifications

Utilities:

BASIS OF DESIGN

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208-230	60	1				23.5				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				3/8" FC						1	1/2"	

Furnish and set in place per manufacturer's standard specifications and the following:

Three (3) Model IY-1804A Indigo™ Series Ice Maker, cube-style, air-cooled, self-contained condenser, up to 1860-lb approximately/24 hours, DuraTech™ exterior (stainless finish with innovative clear-coat resists fingerprints & dirt), half dice size cubes

Three (3) 5 year parts & labor Commercial warranty on evaporator Three (3) 5- year parts & 3- year labor

Commercial warranty on compressor Three (3) (-261)

208-230v/60/1ph, 23.8 amps, std.

Three (3) (-261X) LuminIce Inhibitor model add suffix "X" to model when ordered with

ice maker Three (3) Correctional model add suffix "P" to model no., (NOT stackable)

Three (3) Program discount does not apply with selected Correctional option

Three (3) Model K-00434 LuminIce Growth Inhibitor Kit, for all Indigo IB Series, QuietQube I-1470C, I-1870C, I-2170C and

48" I-1400 and I-1800 models (field installed if not ordered with the ice maker)

ITEM # 216.2 ICE BIN FOR ICE MACHINES

Dimensions: 75(h) x 60(w) x 40(d)

Quantity: Three (3)

Manufacturer: Follett Corp

Model: ITS1350SG-60

Utilities:

BASIS OF DESIGN



WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	1-1/4"	

Furnish and set in place per manufacturer's standard specifications and the following:

Three (3) Model ITS1350SG-60 ITS Ice Storage & Transport System, elevated bin, 1350 lb. bin storage, for cube or flake ice, incl: (2) polyethylene carts with lid & casters, cart cap. 240 lb., ice paddle, poly liner, SmartGATE™, poly lift door with

PowerHinge, stainless steel exterior, custom cut top

Three (3) Model ROTOCART SmartCART™ 240, mobile, insulated, polyethylene, removable lid, 240-lb capacity Three (3) Model ABICETOTP Totes Ice Carrier, 25 lb maximum capacity, for ITS series, set of

6

ITEM # 216.3

WATER FILTER ASSEMBLY





Project Specifications

Dimensions: 18.06(h) x 16.88(w) x 5.38(d)
Quantity: Three (3)
Manufacturer: 3M Purification
Model: ICE265-S
Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				3/8"						1		

Furnish and set in place per manufacturer's standard specifications.

Three (3) Model ICE265-S 3M™ Water Filter System/Shut-Off Valve, 18-1/16"H x 16-7/8"W x 5-3/8"D, high turbidity water, dual cartridge manifold, built in pressure gauge, inlet water shut-off valve, outlet check valve, 3/4" MNPT, max pressure of 125 psi at 100°F, for sediment, chlorine taste & odor, scale, 3 micron rating, 6.68 gpm flow rate, 70,000 gallon capacity, for ice machines (cubers up to 3000lbs, flakers up to 4800lbs), integral mounting bracket and single o-ring seal cartridge filter included, NSF

ITEM # 217 BREAKROOM TABLE
Dimensions:
Quantity: Four (4)
Manufacturer: Emjac
Model: CUSTOM
Utilities:
BASIS OF DESIGN

Furnish and set in place per manufacturer's standard specifications.

Four (4) Model CUSTOM Breakroom table, all stainless steel construction sized and shaped as per plan. Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.

ITEM # 301 SINK, HAND
Dimensions:
Quantity: Six (6)
Manufacturer: Metcraft
Model: 5681
Utilities:
BASIS OF DESIGN

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		1-1/2"

Furnish and set in place per manufacturer's standard specifications.

Six (6) Model 5681

Project Specifications

ITEM # 302 VERTICAL CUTTER MIXER VCM
Dimensions: 48.06(h) x 23.63(w) x 27.38(d)
Quantity: One (1)
Manufacturer: Robot Coupe
Model: R30T
Utilities:
BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	220	60	3			L15-30P	40		7		

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model R30T Cutter/Mixer, vertical, 31 qt. capacity, stainless steel tilt removable cutter bowl with handle and see
-thru lid, (3) smooth edge "S" blade assembly, control panel equipped with digital 0-15 minute timer, stainless steel
construction, two speed 1800 & 3600 RPM, 208-240v/60/3-ph, 40 amps, 7 HP, NEMA L15-30P, ETL electrical and sanitation, cETL
One (1) 1 year parts & labor warranty
One (1) Model 57075 3 Blade Assembly,
serrated One (1) Model 57077 3 Blade
Assembly, serrated, fine One (1) Model
57074 3 Blade Assembly, straight

ITEM # 303 PREP TABLE
Dimensions:
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:
BASIS OF DESIGN

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Prep table, all stainless steel construction sized and shaped as per plan. Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.



Project Specifications

ITEM # 303.1 SINK, (1) ONE COMPARTMENT

Dimensions:

Quantity: One (1)

Manufacturer: Emjac

Model: CUSTOM

Utilities:

BASIS OF DESIGN

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM 20" x 14" x 12" integrally welded stainless steel sink. Provide with Fisher #22306 waste valve with flat strainer with overflow.

ITEM # 303.2 SINK, (2) TWO COMPARTMENT

Dimensions:

Quantity: One (1)

Manufacturer: Emjac

Model: CUSTOM

Utilities:

BASIS OF DESIGN

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM 20" x 14" x 12" integrally welded stainless steel sink. Provide with Fisher #22306 waste valve with flat strainer with overflow.

ITEM # 303.3 FAUCET

Dimensions:

Quantity: Two (2)

Manufacturer: Fisher

Model: 81094

Utilities:

BASIS OF DESIGN

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications.

Project Specifications

Two (2) Model 81094 Workboard Faucet, 8" c/c backsplash mount, with 10" swing spout, supply lines, elbows, angle stops

ITEM # 304 SHELF
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Stainless steel ceiling mounted over shelf, sized, shaped and located as per plan.
Shelf to be 16 gauge type 304 stainless steel and is to be mounted using stainless steel fasteners.

ITEM # 305 VEGETABLE DRYER
Dimensions: 32.5(h) x 27(w) x 27(d)
Quantity: One (1)
Manufacturer: Delfield
Model: SALD-1
BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1			5-15P	2.7				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	1-1/2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model SALD-1 Shelleymatic® Salad Drier, capacity (20) gallons, stainless steel exterior & lid, polyurethane interior, unit completely enclosed, watertight motor, 1-1/2" drain, adjustable on/off timer with cycles up to 5 minutes, cord & plug included, 4" locking stem casters, 115v/60/1-ph, 2.7 amp, NEMA 5-15P, cUL, UL, NSF

Project Specifications

ITEM # 306 MIXER,
PLANETARY
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Hobart
Model: N50-60
Utilities:



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	100-120	60	1	Cord & Plug			2.9		1/6		

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model N50-60 Mixer, Planetary, Bench, 5-qt., 3 fixed speeds, gear-driven transmission, #10 taper attachment hub, manual bowl lift, Hobart Gray enamel housing, s/s bowl, alum "B" beater, s/s "D" wire whip, alum dough hook, 100

-120/60/1, 1/6 hp, cord w/plug

One (1) Standard warranty - 1-Year parts, labor & travel time during normal working hours within the USA

One (1) Model TABLEHW-HL2012 Mixer Table w/Casters 27"x32" w/hardware

ITEM # 307 FOOD PROCESSOR
Dimensions: 19(h) x 8.69(w) x 11(d)
Quantity: One (1)
Manufacturer: Robot Coupe
Model: R2N
Utilities:
BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				7		1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model R2N Commercial Food Processor, 3 qt. gray ABS bowl w/handle, kidney-shaped opening, vegetable prep attachment with external ejection, "S" blade, 27577 5/64" (2mm) grating disc and 27566 5/32" (4mm) slicing disc, continuous feed, bowl attachment designed for vertical cutting and mixing, on/off & pulse switch, single speed, 1725 RPM, 120v/60/1-hp, 7 amps, 1 HP, ETL electrical and sanitation, Cetl

Project Specifications

ITEM # 308 VEGETABLE/POTATO
PEELER
Dimensions:
Quantity: One (1)
Manufacturer: Hobart
Model: 6430-4
Utilities:
BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	220-240	50	1	Direct					3/4		

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				1/2"						1	2"	

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model 6430-4 Vegetable Peeler, 30-33 lb. potatoes in 1-3 minute cap., synchronous timer adj. from 1/2 min. increment up to 4 min., double V-belt drive, removable abrasive silicon carbide disc & lexan liner, welded s/s construction, 220-240/50/1, 3/4 hp

One (1) Model 6430-CBTSST Cabinet base & trap - S/S strainer

ITEM # 309 MOBILE REFRIGERATOR CABINET
Dimensions: 73.5(h) x 28.63(w) x 35.13(d)
Quantity: Four (4)
Manufacturer: Carter-Hoffmann
Model: PHB450
BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Cord & Plug		5-15P	8.5	1.02			

Furnish and set in place per manufacturer's standard specifications and the following:

Four (4) Model PHB450 Refrigerated Cabinet, mobile, insulated, (30) 18"x 26" sheet pans capacity, slide spacing fixed on

1-1/2" centers, (1) door, on/off switch, thermometer, push handles, flush mounted sliding door latch, bottom-mounted

refrigeration, stainless steel construction, 6" swivel casters (2 with brakes), 120v/60/1-ph, 8.5 amps, NEMA 5-15P, 10'

cord, cUL, NSF (RapidShip)

Four (4) 1 Year parts and labor

Four (4) Correctional package, transport latch(es) with padlock hasp, tamper resistant fasteners,

Project Specifications

rack security hold
downs, Lexan thermometer cover, welded on stainless steel tubular handles
Four (4) Transport latch w/padlock hasp,
each Four (4) Menu card holder (8.5" x
11")

ITEM # 310 WORK TABLE
BASIS OF DESIGN
Quantity: Seven (7)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.
Seven (7) Model CUSTOM Work table, all stainless steel construction sized and shaped as per plan. Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.

ITEM # 311 REACH-IN REFRIGERATOR, 2 SECTIONS
Dimensions: 84.25(h) x 52.13(w) x 35(d)
Quantity: Two (2)
Manufacturer: Victory
Model: RS-2D-S1
BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug					1/3		
2	115	60	1	Cord & Plug		5-15P	10.7				

Furnish and set in place per manufacturer's standard specifications and the following:
Two (2) Model RS-2D-S1 UltraSpec Series 1 Refrigerator, Reach-in, two-section, self-contained refrigeration, 46.5 cu. ft. capacity, (2) hinged doors, (6) shelves, stainless steel exterior & interior, standard depth cabinet, full-height doors, 1/3 HP, V-TEMP electronic temperature control/indicator
Two (2) WARRANTY UPDATED: Full 3-year parts/labor service warranty within the USA and Canada valued at \$135.00 net included in equipment price, standard
Two (2) Self-Contained refrigeration
Two (2) 115v/60/1-ph, 10.7 amps w/cord & plug, standard
Two (2) 5-yr compressor warranty within the USA and Canada valued at \$80.00 net included in equipment price
Two (2) Door hinging: left door hinged on left, right door hinged on right standard
Two (2) Shelf, heavy duty stainless steel with clips
Two (2) Incandescent light
Two (2) Stainless steel door jamb - per door opening



Project Specifications

Two (2) Legs, set of 4, 6" high adjustable stainless steel, standard
Two (2) Extra heavy duty hinges w/"one way" screws
Two (2) Stainless steel slotted panel top cover
Two (2) Stainless steel security cover louvered grille and stainless
steel back Two (2) Stainless steel door jambs
Two (2) Heavy gauge chrome plated steel padlock hasp &
cylinder locks

ITEM # 312 PREP TABLE
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Prep table, all stainless steel construction sized and shaped as per plan. Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.

ITEM # 312.1 SINK,(1)ONECOMPARTMENT
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM 20" x 14" x 12" integrally welded stainless steel sink. Provide with Fisher #22306 waste valve with flat strainer with overflow.



Project Specifications

ITEM # 312.2 SINK, (2) TWO COMPARTMENT

BASIS OF DESIGN

Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM 20" x 14" x 12" integrally welded stainless steel sink. Provide with Fisher #22306 waste valve with flat strainer with overflow.

ITEM # 312.3 FAUCET

BASIS OF DESIGN

Quantity: Two (2)
Manufacturer: Fisher
Model: 81094
Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model 81094 Workboard Faucet, 8" c/c backsplash mount, with 10" swing spout, supply lines, elbows, angle stops

ITEM # 313 SHELF

Dimensions:

Quantity: One (1)
Manufacturer: Fabricated
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Stainless steel ceiling mounted over shelf, sized, shaped and located as per plan.

Shelf to be 16 gauge type 304 stainless steel and is to be mounted using stainless steel fasteners.

ITEM # 314 SHELF

BASIS OF DESIGN

Quantity: One (1)
Manufacturer: Fabricated
Model: CUSTOM
Utilities:

Project Specifications

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Stainless steel ceiling mounted over shelf, sized, shaped and located as per plan.
Shelf to be 16 gauge type 304 stainless steel and is to be mounted using stainless steel fasteners.

ITEM # 316 ROLL-IN OVEN

Dimensions: 99.5(h) x 72(w) x 62(d)

Quantity: Two (2)

Manufacturer: Baxter

Model: OV500G2-EE

BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208-240	60	1				8.6				
2	208-240	60	1								
3	208-240	60	3	Direct							

ELECTRICAL 1 REMARKS

controls

ELECTRICAL 2 REMARKS

controls

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG (min)	PSIG (max)
1	1-1/4"	300.0		1					

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				1/2"						1	3/8"	

Furnish and set in place per manufacturer's standard specifications and the following:

Two (2) Model OV500G2-EE Rotating Rack Oven, Gas, curved front, holds (2) single or (1) double oven racks, programmable digital controls, auto rack lift, Advanced Controls with 4-stage bake & 99 programmable menus, self-contained steam system stainless steel construction, fully fire sealed hood, flush floor, single vent, 275,000 BTU, Energy Efficient, cUL

Two (2) One year parts and labor warranty, standard Two (2) Model HTSNAT Natural gas burner

Two (2) 208-240v/60/3ph, requires 120v/60/1ph control circuit (USA)

Two (2) Model LFT00B "B" style lift, standard

Two (2) Model PRNYES2 Prison Safety Package, for double rack oven, includes tamper resistant hardware, lockable control cover with clear acrylic window, separate hasp for service panel access

Two (2) Model SHPSPD Oven body shipped split, double rack units

ITEM # 317

EXHAUST HOOD COLLAR

Project Specifications

SINGLE SOURCE

Quantity: Two (2)
Manufacturer: Halton
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.
Two (2) Model CUSTOM Oven exhaust collar

ITEM # 318 COMBI OVEN
Dimensions: 76.63(h) x 49.81(w) x 45.19(d)
Quantity: Two (2)
Manufacturer: Alto-Shaam
Model: 20-20ESG/S
BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208-240	60	1	Direct			1.4	1.4			
2	208-240	60	1	Direct			1.4	1.4			

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG (min)	PSIG (max)
1	3/4"	190.0		1					
2		190.0		2					

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				1/8"		3/4"				1	1-1/2"	

Furnish and set in place per manufacturer's standard specifications and the following:

Two (2) Model 20-20ESG/S CombiTherm® Oven/Steamer Combination, gas, boiler-free, simple manual control, low temperature steam, floor model with roll-in cart, capacity (40) full-size pans or (20) full-size sheet pans, stainless steel construction with temperature glass window, door hinged right, electric ignition, adjustable legs, 160,000 BTU, EcoSmart®, cULus, ANSI/NSF 4
Two (2) Natural gas (160,000 Btu/hr)
Two (2) 120v/60/1-ph, 22.0 amp, 2.60kW, NEMA L6-30P, AWG 10, (30 MCA), standard (smoker option not available) Two (2) Door hinging: right-hand swing, standard
Two (2) Model SH-22634 Chicken Rack, (10) chicken capacity, stainless steel, oven holds (12) racks, for 20-20es Two (2) Model 5010642 Roll-In Pan Cart Trolley, security option, includes tamper-proof screws and welded handle, (2) rigid & (2) swivel casters with brakes, for 20-20 Combitherm, CombiMate Holding Cabinet, and QC2-100 QuickChiller

Project Specifications

Two (2) Model CR-33543 Quick Disconnect Kit, for all gas ovens (one required for each oven)
Two (2) Correctional security device, base package
Two (2) Model 5011081 Anti-entrapment device
Two (2) Model 5012224 Control panel security cover
Two (2) Model 5011079 Hasp door lock

ITEM # 319 PASTA COOKER
Dimensions: 54.88(h) x 36(w) x 37(d)
Quantity: One (1)
Manufacturer: Frymaster
Model: GPCRB
Utilities:
BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1		120	60	1				8			

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG (min)	PSIG (max)
1	3/4"	80.0		1					

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/4"			1/4"						1	1-1/4"	

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model GPCRB Pasta Magic Cooker, Gas, timer controller, automatic timed basket lifts, rinse tank, auto-fill/skim, 15 gallon capacity, swing away hot/cold rinse faucet, stainless steel cookpot, door and cabinet, bulk pasta basket, portion cup rack and 24 portion cups or 3 round baskets in lieu of portion cups & rack, casters, 80,000 BTU
One (1) Gas type to be specified
One (1) 120v/60/1, 5 amps, standard
One (1) Model 823-7384 Pasta Bulk Basket, 13-1/2" x 16-1/2" x 9-3/4" (17C, 17BC, 17SMS, GPC, GPCB, GPCR, GPCRB)

ITEM # 320 HOT TOP RANGE
Dimensions: 10(h) x 34(w) x 38(d)
Quantity: Two (2)
Manufacturer: Garland USR
Model: M43-3T
Utilities:
BASIS OF DESIGN



GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG (min)	PSIG (max)
1				1					
2				2					



Project Specifications

1	1-1/4"	66.0	
2	1-1/4"		

Furnish and set in place per manufacturer's standard specifications and the following:

Two (2) Model M43-3T Master Series Heavy Duty Range, 34" W, gas, (3) 12" Even Heat Hot Top, modular, 1-1/4" front manifold, stainless steel front and sides, 66,000 BTU (Garland)

Two (2) Two year limited parts and labor warranty, covers products purchased and installed in the USA only, standard Two (2) Natural gas, specify elevation if over 2,000 ft

Two (2) 1-1/4" Front gas connection is standard

Two (2) Model 2670400 Natural Gas Regulator, 1-1/4" N.P.T. (Consult spec sheet and specify)

Two (2) Model 2591997 Gas Flex Hose with quick disconnect includes restraining device, 1-1/4" N.P.T. x 60" (verify gas connection)

Two (2) Stainless steel main back

Two (2) Maximum security: Stainless steel perforated full back and motor cover Two (2) Maximum security: Oven door with padlock hasp

(padlock by others) Two (2) Maximum security: Stainless steel

lockable control panel cover (padlock by others) Two (2) Maximum security:

Tamper proof external hardware

ITEM # 321 EXHAUST HOOD

SINGLE SOURCE

Quantity: One (1)

Manufacturer: Halton

Model: CUSTOM

Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Demand control ventilation system

ITEM # 321.1 EXHAUST HOOD

SINGLE SOURCE

Quantity: One (1)

Manufacturer: Halton

Model: CUSTOM

Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Exhaust

hood #1

ITEM # 321.2 EXHAUST HOOD

SINGLE SOURCE

Quantity: One (1)

Manufacturer: Halton

Model: CUSTOM

Utilities:



Project Specifications

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Exhaust
hood #2

ITEM # 321.3 EXHAUST HOOD
SINGLE SOURCE
Quantity: One (1)
Manufacturer: Halton
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				10				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	3/4"									1	2"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Fire suppression system

ITEM # 321.4 EXHAUST HOOD
SINGLE SOURCE
Quantity: One (1)
Manufacturer: Halton
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120-240	60	3				62.75				

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG (min)	PSIG (max)
1	2"	2350		1					

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
--	-------------	------------	------------	--------------	-------------	------------------	-----------------	-------------------------	--------------------------	--	------------------	----------------

Project Specifications

1	3/4"		3/4"						1		
---	------	--	------	--	--	--	--	--	---	--	--

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Utility distribution system

ITEM # 321.5 EXHAUST HOOD
SINGLE SOURCE
Quantity: One (1)
Manufacturer: Halton
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Marvel control panel

ITEM # 321.6 EXHAUST HOOD
SINGLE SOURCE
Quantity: One (1)
Manufacturer: Halton
Model: CUSTOM
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				10				

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Exhaust
hood #3

ITEM # 321.7 EXHAUST HOOD
SINGE SOURCE
Quantity: One (1)
Manufacturer: Halton
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Fire suppression system

ITEM # 322 TILTING SKILLET, GAS
BASIS OF DESIGN

Dimensions: 39(h) x 49.88(w) x 41(d)
Quantity: One (1)



Project Specifications

Manufacturer: Cleveland Range
Model: SGL40T1
Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				1.4				
2	120	60	1				1.4				

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG(min)	PSIG(max)
1	3/4"	200.0		1					

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model SGL40T1 PowerPan™ Tilting Skillet, Gas, 40-gallon capacity, bead blasted cooking surface, 10° tilt cooking feature, with easy manual hand tilt, spring-assisted cover with vent, gallon & liter markings, food strainer, stainless steel construction with open leg frame, CE, NSF

One (1) 1-year limited warranty,
standard One (1) Natural Gas

One (1) 120v/60/1-ph, 1.4 amp, standard

One (1) Model TD2SK 2" tangent draw-off valve, front mounted left side, includes FSSK strainer

One (1) Model CP-SCB Tamper proof exterior side & rear panels with spanner drilled head screws

One (1) Model CP-PCB-TR Protective Control Cover (lock provided by others)

One (1) Model CP-TDM 2" or 3" Tamper resistant tangent draw-off valve. Valve handle fastened to stem with tamper proof spanner drilled head screws

ITEM # 323 TILTING KETTLE

BASIS OF DESIGN

Quantity: Five (5)

Manufacturer: Cleveland

Range

Model:KDL-40-T

Utilities:



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				5				

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG(min)	PSIG(max)
1				1	3/4"	1/2"			



Project Specifications

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications and the following:

Five (5) Model KDL-40-T Kettle, Direct Steam, Tilting, 40-gallon capacity, 2/3 steam jacket design, mounted on open tri- leg base, stainless steel exterior finish, flanged feet, steam control valve, 50 psi rating

Five (5) 1-year limited warranty, standard

Five (5) Model SCK2 Steam Control Kit - Direct Steam Tilting Kettle, includes Steam Trap, Condensate Strainer, Check Valve

Five (5) Model CP-RB Heavy duty reinforced rim bar 1/2" x 1" stainless steel bar continuously welded to top & bottom Five(5) Model CP-TDPB Tangent draw-off valve protection, stainless steel BAR WELDED TO KETTLE

Five (5) Model CP-FBKT Reinforced faucet bracket bolted to console

Five (5) Model CP-PCB Protective box for controls, completely covers controls, gas and electric models only (locks provided by others)

ITEM # 324

FLOOR TROUGH

BASIS OF DESIGN

Quantity:

Six (6)

Manufacturer:

Fabricated

Model:

CUSTOM

Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3"	

Furnish and set in place per manufacturer's standard specifications.

Six (6) Model CUSTOM Stainless steel floor trough. 1-1/2" Depth, type 304 stainless steel construction.

All welded construction, Size and shape as per plans. Provide with drain connection and removable stainless steel scrap basket.

Grate to be high impact fibergrate.

ITEM # 325

WORKTABLE

BASIS OF DESIGN

Quantity:

One (1)

Manufacturer:

Emjac

Model:

CUSTOM

Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Work table, all stainless steel construction sized and shaped as per plan. Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.

Project Specifications

ITEM # 325.1 SINK,(1)ONECOMPARTMENT

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Emjac

Model: CUSTOM

Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	2"	

Furnish and set in place per manufacturer's standard specifications.

One(1) Model CUSTOM 20" x 14" x 12" integrally welded stainless steel sink. Provide with Fisher #22306 waste valve with flat strainer with overflow.

ITEM # 325.2 FAUCET

BASIS OF DESIGN

Quantity: One (1)

Manufacturer: Fisher

Model: 81043

Utilities:

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1	1/2"			1/2"						1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model 81043 Workboard Faucet, 8" c/c deck mount, with 10" swing spout, supply lines, angle stops

ITEM # 326 MOBILE HEATED CABINET

Dimensions: 60(h) x 30.5(w) x 33.25(d)

Quantity: (10)

Manufacturer: FWE

Model: TS-1826-15



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Cord & Plug		5-15P	11.3	1.35			

Furnish and set in place per manufacturer's standard specifications and the following:

(10) Model TS-1826-15 Heated Cabinet, mobile, insulated, humi-temp heat system w/eye level controls, 10 pr universal tray slides 4.5" OC, for 18"x26", 14"x18", 12"x20" and Gastronorm 1-1,

Project Specifications

removable slides & uprights, 20-gauge stainless steel exterior with 22-gauge stainless steel interior construction, heavy duty push bars, full bumper
(10) 5" Caster standard: EZ Roll Heavy Duty Poly, 2-rigid, 2-swivel with brakes (set)

ITEM # 327 HOT FOOD COUNTER
Dimensions: 35(h) x 50(w) x 30.5(d)
Quantity: Two (2)
Manufacturer: Atlas Metal
Model: CAH-3
Utilities:



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208	60	1			L6-20P	12.3	2.55			

ELECTRICAL1 REMARKS
6 ft cord

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model CAH-3 Hot Food Serving Counter, 50"L, electric, (3) pan size bain-marie type with single thermostat, open rear, stainless steel top, aluminum square tubing frame, laminated front panel, 5" swivel casters, (2) with brakes

ITEM # 328 TRAY MAKE-UP TABLE
Dimensions:
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:
BASIS OF DESIGN

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Tray make up table, all stainless steel construction sized and shaped as per plan. Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.

ITEM # 328.1 CONVEYOR raceway
Dimensions:
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM

Project Specifications

Utilities:
BASIS OF DESIGN

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120-208	60	1				VERIFY				

Furnish and set in place per manufacturer's standard specifications.
One (1) Model CUSTOM Power raceway

ITEM # 328.2 CONVEYOR ROLLER
Dimensions:
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:
BASIS OF DESIGN

Furnish and set in place per manufacturer's standard specifications.
One (1) Model CUSTOM Roller conveyor

ITEM # 329 TRAY DELIVERY CART
Dimensions: 49(h) x 69(w) x 29.25(d)
Quantity: Thirteen (13)
Manufacturer: FWE
Model: PTS-40-8HA



Utilities:
BASIS OF DESIGN

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				11.3				

Furnish and set in place per manufacturer's standard specifications and the following:
Thirteen (13) Model PTS-40-8HA Prisoner Tray Delivery Cart, hot-cold, (2) hot compartment w/Humi-Temp heat system, (40)15-1/2"x11-1/2" trays, slides 3"OC (2) trays each, (1) ambient compartment (12)10"x14" slides 4"OC, tamper proof, s/s const, push bars, full bumper
Thirteen (13) The Correctional Environment/Facilities is warranted for one year parts and 6 months labor

ITEM # 330 TRAY DELIVERY CART
Dimensions: 61(h) x 28(w) x 29.25(d)
Quantity: Eighteen (18)
Manufacturer: FWE
Model: PTS-3030
Utilities:



Project Specifications

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Cord & Plug		5-15P	11.3	1.35			

Furnish and set in place per manufacturer's standard specifications and the following:

Eighteen (18) Model PTS-3030 Prisoner Tray Delivery Cart, heated, insulated, humi-temp heat system w/eye level controls, welded s/s tray racks, 3" OC, (30)10x14 or (30)15.5x11.5 trays, tamper proof access., s/s construction, heavy duty push bars, full bumper

Eighteen (18) The Correctional Enviroment/Facilities is warranted for one year parts and 6 months labor

Eighteen (18) 120v/50/60/1-ph, 11.3 amps, 1350w, NEMA 5-15P

Eighteen (18) 6" Caster upgrade: Multi-Terrain Quite Ride, 2-rigid, 2-swivel with brakes (set)

ITEM # 402 REACH-IN REFRIGERATOR, 1 SECTION
Dimensions: 77.75(h) x 27.5(w) x 33.75(d)
Quantity: One (1)
Manufacturer: True
Model: STR1R-1S



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-15P	4.8		1/3		

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model STR1R-1S SPEC SERIES® Refrigerator, Reach-in, one-section, stainless steel front & sides, (1) stainless steel door with lock, cam-lift hinges, digital temperature control, stainless steel interior, (1) interior kit, LED interior lights, 5" castors, 1/3 HP, 115v/60/1, 4.8 amps, 9' cord, NEMA 5-15P, ENERGY STAR®, cUL, NSF, MADE IN USA

One (1) Warranty - 3 year parts and labor, please visit www.True-mfg.com for specifics

One (1) Warranty - 5 year compressor (self-contained only), please visit

www.True-mfg.com for specifics One (1) Door hinged right standard

One (1) Model SPECKIT4 Spec Kit #4 - (3) chrome shelves & shelf supports

One (1) Correctional Package, for one-section reach-in refrigerators & freezers, includes stainless breaker covers, light cover, locking hasp(s), non-removable doors, control cover, top screen/guards, security screws (includes required top screen), welded tray slides, seismic/flanged legs

ITEM # 403 RANGE, GAS, HEAVY DUTY, 36"
Dimensions: 36.38(h) x 34(w) x 38(d)
Quantity: One (1)
Manufacturer: Garland USR
Model: M54R
BASIS OF DESIGN



Utilities:



Project Specifications

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				3.4				

GAS

STEAM

	SIZE	MBTU	KW
1	1-1/4"	155.0	

	INLET SIZE	RETURN SIZE	LB/HR	PSIG (min)	PSIG (max)
1					

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model M54R Master Series Heavy Duty Range, 34" W, gas, (2) 35,000 BTU open burners, (1) Front Fired Hot Top (left), standard oven with Piezo ignition, 1-1/4" front manifold, stainless steel front and sides, 6" legs, 155,000 BTU

(Garland)

One (1) Two year limited parts and labor warranty, covers products purchased and installed in the USA only, standard One (1) Natural gas, specify elevation if over 2,000 ft

One (1) 1-1/4" Front gas connection is standard

One (1) Model 2591997 Gas Flex Hose with quick disconnect includes restraining device, 1-1/4" N.P.T. x 60" (verify gas connection)

One (1) NOTE: Oven base ranges require either Highshelf or backguard

One (1) Maximum security: Stainless steel perforated full back and motor cover One (1) Maximum security: Oven door with padlock hasp

(padlock by others) One (1) Maximum security: Stainless steel

lockable control panel cover (padlock by others) One (1) Maximum security:

Tamper proof external hardware

Project Specifications

ITEM # 404 GRIDDLE RANGE
Dimensions: 36.38(h) x 34(w) x 38(d)
Quantity: One (1)
Manufacturer: Garland USR
Model: M47S
BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				3.4				

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG (min)	PSIG (max)
1		132.0		1					
2	1-1/4"			2					

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model M47S Master Series Heavy Duty Griddle Range, 34" W, gas, fry top with Hi-Lo valve control for each burner, storage base, 1-1/4" front manifold, stainless steel front and sides, 6" legs, 99,000 BTU (Garland), CSA, NSF

One (1) Two year limited parts and labor warranty, covers products purchased and installed in the USA only, standard One (1) Natural gas, specify elevation if over 2,000 ft

One (1) 1-1/4" Rear gas connection, including "Tee" in manifold, end cap & cover (Consult spec sheet and specify) One (1) Model 2670100 Gas Shut-off Valve, 1-1/4" N.P.T. (Consult spec sheet and specify)

One (1) Maximum security: Stainless steel perforated full back and motor cover

One (1) Maximum security: Oven door with padlock hasp (padlock by others)

One (1) Maximum security: Stainless steel lockable control panel cover (padlock by others) One (1) Maximum security: Tamper proof external hardware

ITEM # 405 CHARBROILER
Dimensions: 24(w) x 35(d)
Quantity: One (1)
Manufacturer: Garland USR
Model: M24B
Utilities:
BASIS OF DESIGN



GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG (min)	PSIG (max)
1	1-1/4"	60.0		1					
2	3/4"			2					

Furnish and set in place per manufacturer's standard specifications and the following:

Project Specifications

One (1) Model M24B Master Series Charbroiler, gas, 24" W x 23" D grill area, briquettes, flat/tilt steel grates, spark ignition, 1-1/4" front manifold, storage base, stainless steel front and sides, 6" legs, 60,000 BTU (Garland) One (1) Two year limited parts and labor warranty, covers products purchased and installed in the USA only, standard One (1) Gas type to be specified One (1) Rear gas connection, including "Tee" in manifold, end cap & cover (Consult spec sheet and specify) One (1) Model 2670200 Natural Gas Regulator, 3/4" N.P.T. (Consult spec sheet and specify)

ITEM # 406 SPREADERPLATE
Dimensions: 36(h) x 12(w) x 37.88(d)
Quantity: One (1)
Manufacturer: Garland USR
Model: M12ES



Utilities:
BASIS OF DESIGN

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG(min)	PSIG(max)
1	1-1/4"			1					

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model M12ES Master Series Spreader Plate, 12" wide top, cabinet base with one door, stainless steel front, sides, front rail and work top, 6" legs (Garland)

One (1) One year limited parts and labor warranty, covers products purchased and installed in the USA only, standard One (1) Manifold "Tee" connection in spreader only (no rear pipe supplied - will accept 2" line) (Consult spec sheet and specify)

ITEM # 407 GASFRYER
Dimensions: 45.63(h) x 15.63(w) x 31.63(d)
Quantity: One (1)
Manufacturer: Frymaster
Model: H55E

Utilities:
BASIS OF DESIGN

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1				8				

ELECTRICAL REMARKS
controls

GAS

STEAM

	SIZE	MBTU	KW		INLET SIZE	RETURN SIZE	LB/HR	PSIG(min)	PSIG(max)
1	1"	160.0		1					

Project Specifications

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model H55E High Efficiency Open Full Pot Gas Fryer, 50 lb capacity, with electronic timer controller, rack-type basket support, basket hanger, twin baskets, automatic melt cycle, boil-out temp control, electronic ignition, center mounted RTD, 1° compensating temperature probe, stainless steel frypot and door, enamel cabinet, legs, 80,000 BTU, part of the Manitowoc EnerLogic™ program, ENERGY STAR®, NSF One (1) Natural gas (specify elevation if over 4,999 ft.) One (1) 120v/60/1, 1 amp, standard (controls)
One (1) Built-in filtration for (2) fryers
One (1) Casters are standard with Footprint filters
One (1) Electrical specs must be specified
One (1) (-SD) finish (stainless steel frypot and doors, enamel cabinet), standard
One (1) Model 806-5518 Cover, full pot, 15" W x 21-1/2" D, stainless steel (H55, MJ45, MJ35, GF40, GF14, J2X)
One (1) Model 803-0271 Fry Basket, twin, 11814 & HD50, ea 5-7/8" x 12-5/8" x 6-5/8"

ITEM # 409 REACH-IN FREEZER, 1 SECTION
Dimensions: 77.75(h) x 27.5(w) x 33.75(d)
Quantity: One (1)
Manufacturer: True
Model: STR1F-1S
BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-15P	6.8		1/3		

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model STR1F-1S SPEC SERIES® Freezer, Reach-in, -10°F, one-section, stainless steel front & sides, (1) stainless steel door with lock, cam-lift hinges, digital temperature control, stainless steel interior, (1) interior kit, LED interior lights, 5" castors, 1/3 HP, 115v/60/1, 6.8 amps, 9' cord, NEMA 5-15P, MADE IN USA
One (1) Warranty - 3 year parts and labor, please visit www.TrueMfg.com for specifics
One (1) Warranty - 5 year compressor (self-contained only), please visit www.TrueMfg.com for specifics
One (1) Door hinged right standard
One (1) Stainless steel back (upcharge & lead times may apply)
One (1) Model SPECKIT4 Spec Kit #4 - (3) chrome shelves & shelf supports
One (1) Correctional Package, for one-section reach-in refrigerators & freezers, includes stainless breaker covers, light cover, locking hasp(s), non-removable doors, control cover, top screen/guards, security screws (includes required top screen), welded tray slides, seismic/flanged legs

Project Specifications

ITEM # 410 SERVICE COUNTER
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Service counter, all stainless steel construction sized and shaped as per plan.

Top is to be 14 ga. type 304 stainless steel with 8" back splash with 2" return on 45 degree angle with mounting clips per plan, stainless steel cross bracing, stainless steel legs and stainless steel adjustable bullet feet.

ITEM # 410.1 SNEEZE GUARD COMPONENTS
BASIS OF DESIGN
Quantity: One (1)
Manufacturer: Emjac
Model: CUSTOM
Utilities:

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM Sneeze guard

ITEM # 411 CONVEYOR TOASTER
Dimensions: 16.63(h) x 14.5(w) x 22.75(d)
Quantity: One (1)
Manufacturer: Hatco
Model: TQ-800H
Utilities:
BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208	60	1	Cord & Plug		6-20P	16	3.3		20	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model TQ-800H Toast-Qwik® Conveyor Toaster, horizontal conveyor, countertop design, all bread types toaster, approximately 13 slice capacity/min, 3" opening height, electronic controls, colorguard sensing system, UL, CE

Project Specifications

ITEM # 412 DROP-IN HOT WELL

Dimensions: 8.75(h) x 12.25(w)

Quantity: Two (2)

Manufacturer: Hatco

Model: HWBHRN-11QTD

BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Direct			6.7	.8		15	

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

Two (2) Model HWBHRN-11QTD Built-In Heated Well, with drain, round, non-insulated, top mounted, 11 qt., Infinite switch control, pilot light & leads, stainless steel construction (high watt)

ITEM # 413 HEATED HOLDING BIN

Dimensions: 33.88(h) x 60.25(w) x

26.75(d)

Quantity: One (1)

Manufacturer: Hatco

Model: GR2SDS-54D

Utilities:

BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Cord & Plug		L14-20P	15.8	3.78			

Furnish and set in place per manufacturer's standard specifications.

One (1) Model GR2SDS-54D Designer Slant Display Warmer, free-standing, double shelf with 20 rods, adjustable thermostat, incandescent light, hardcoat aluminum base, tempered glass end panels, designer panels & corner caps, 4" legs, 3780 watts

Project Specifications

ITEM # 414 DROP-IN HOT WELL

Dimensions:12.75(h) x 57.25(w) x 24(d)

Quantity:One (1)

Manufacturer:Atlas Metal

Model:WH-4

Utilities:

BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208	60	1	Cord & Plug		L6-30P	16.4	3.4			

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model WH-4 Hot Food Drop-In Well Unit, electric, bain-marie or individual pan, wet or dry type, four-pan size for 12" x 20" pans, control panel with single thermostatic control, stainless steel top & inner liner, galvanized outer liner, with fiberglass insulation

ITEM # 415 DROP-IN COLD FOOD PAN

Dimensions:24.75(h) x 75.25(w) x

24(d)

Quantity:One (1)

Manufacturer:Atlas Metal

Model:WCMD-4

Utilities:

BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Cord & Plug		5-15P	6.8		1/4		

ELECTRICAL 1 REMARKS

6 ft cord

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model WCMD-4 Cold Food Drop-In Unit, refrigerated, deep design, 4-pan size, self-contained refrigeration system, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, with

Project Specifications

on/off thermostat switch and
pilot light
One (1) A 3/4" diameter drain & valve, separator channels
are provided

ITEM # 416 DROP-IN COLD FOOD PAN
Dimensions:24.75(h) x 29.75(w) x 24(d)
Quantity:One (1)
Manufacturer:Atlas Metal
Model:WCMD-2
Utilities:



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Cord & Plug		5-15P	3.9		1/5		

ELECTRICAL 1 REMARKS
6 ft cord

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model WCMD-2 Cold Food Drop-In Unit, refrigerated, deep design, 2-pan size, self-contained refrigeration system, insulated pan, stainless steel inner liner & top, galvanized steel outer liner, with on/off thermostat switch and pilot light
One (1) A 3/4" diameter drain & valve, separator channels are provided

ITEM # 417 COFFEE URN
Dimensions:32.4(h) x 34.5(w) x 21(d)
Quantity:One (1)
Manufacturer:Bunn
Model:U3-0000



Utilities:
BASIS OF DESIGN

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120/208	60	1				28	5.825			

WATER

WASTE

Project Specifications

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1						3/8				1		

Furnish and set in place per manufacturer's standard specifications.

One (1) Model U3-000020500.0000 U3 Coffee Urn, twin 3 gallon reservoirs, automatic, electric, single service, brews full or half batches & 16.3 gallons per hour, hot water faucet, stainless decor, 120/208/60/1-ph, 28 amp, 5825 watts, UL, NSF

ITEM # 418 DRIPTRAYTROUGH, BEVERAGE

Dimensions:

Quantity: One (1)

Manufacturer: Emjac

Model: CUSTOM

Utilities:

BASIS OF DESIGN

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1										1	3/4"	

Furnish and set in place per manufacturer's standard specifications.

One (1) Model CUSTOM

ITEM # 419 TEA BREWER

Dimensions: 34(h) x 11.6(w) x 22(d)

Quantity: One (1)

Manufacturer: Bunn

Model: ITB-0000

BASIS OF DESIGN



Utilities:

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1			5-15P	14	1.7			

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				3/8"		1/4				1		

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model ITB-0000 41400.0000 Infusion Series® Iced Tea Brewer, 3 or 5 gallon capacity single brewer (brews 16.3 to 26.7 gallon/hr), 29" trunk, 3 recipe buttons, digital temperature control, brew counter, pulse interface, energy-saver mode, English & Spanish alphanumeric & advertising display, includes single button graphic overlay & Quickbrew & SplashGard® funnel, brews into BUNN tea dispensers (except TDS-5), 120v/60/1-ph, 1700w, 14amps,

Project Specifications

NEMA 5-15P, cord attached, UL, NSF

One (1) Model TDO-5-0001 34100.0001 TDO-5 Iced Tea/Coffee Dispenser, cylinder style, 5 gallon capacity (18.9 litres), sump dispense valve, oval shape solid plastic lid, faucet handles are labeled sweetened & unsweetened, side handles, NSF

ITEM # 420 ICE MACHINE & DISPENSER, NUGGET STYLE
Dimensions: 32(h) x 16.13(w) x 23.5(d)
Quantity: One (1)
Manufacturer: Follett Corp
Model: 12CI400A-L
Utilities:
BASIS OF DESIGN



ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-20P	13				
2	115	60	1	Cord & Plug		5-20P	13				

WATER

WASTE

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE		INDIRECT SIZE	DIRECT SIZE
1				3/8"						1	3/4"	

Furnish and set in place per manufacturer's standard specifications and the following:

One (1) Model 12CI400A-L Symphony™ Ice & Water Dispenser, countertop, lever dispense, integral ice machine, nugget style, air-cooled condenser, 400 lb. production/24 hours, 12 lb. storage capacity, stainless steel exterior, NSF, UL One (1) 115v/60/1-ph, 13.0 amps, NEMA 5-20P, std.

One (1) Model 00130229 Water Filter System (one per ice machine) for Maestro™ 400 Series ice machines and Symphony™ ice and water dispensers, filtration capacity 3,000 gallons (11,356 liters)

END OF SECTION 11 40 00



Specifications

12 24 13 - ROLLER WINDOW SHADES

PART 1 GENERAL

1.1 GENERAL REQUIREMENTS

Provide roller window shades, complete with necessary brackets, fittings, and hardware as located in the drawings. Mount and operate equipment in accordance with manufacturer's instructions. Windows to receive a shade shall be completely covered.

- a. Submit drawings showing plans, elevations, sections, product details, installation details, operational clearances, wiring diagrams and relationship to adjacent work. Include the use of same room designations as indicated on the drawings.
- b. Provide manufacturer's data composed of catalog cuts, brochures, product information, and operating and maintenance instructions on each product to be used. Include styles, profiles and features.
- c. Furnish samples of each type and color of roller shade fabric and roller shade channel. Shade material shall be minimum 6 by 6 inch in size. Mark face of material to indicate interior faces.
- d. Mock up: Install shade in area designated by Owner. Do not proceed with remaining work until the Owner approves workmanship and operation. Re-work mock-up as required to produce acceptable work. The approved shade can be used in installation.
- e. Submit fire resistance data, flame spread and smoke contribution data.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM G21	(2009) Determining Resistance of Synthetic Polymeric Materials to Fungi
----------	---

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701	(2010) Standard Methods of Fire Tests for Flame Propagation of Textiles and Films
----------	---

U.S. GREEN BUILDING COUNCIL (USGBC)

LEED NC	(2009) Leadership in Energy and Environmental Design(tm) New Construction Rating System
---------	---

1.3 SUSTAINABILITY REQUIREMENTS

Materials in this technical specification may contribute towards contract compliance with sustainability requirements. See Section 01 33 29 LEED DOCUMENTATION for project LEED NC requirements.

1.4 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES

Specifications

SD-02 Shop Drawings Installation

SD-03 Product Data Window Shades

SD-04 Samples

Window Shades

SD-06 Test Reports

Window Shades

SD-08 Manufacturer's Instructions

Window Shades

SD-10 Operation and Maintenance Data

Window Shades

SD-11 Closeout Submittals

LEED Documentation

1.5 QUALITY ASSURANCE

1.5.1 Qualifications

1.5.1.1 Installer's Qualifications

Installer trained and certified by the manufacturer with a minimum of ten years experience in installing products comparable to those specified in this section.

1.5.2 Flammability Requirements

Passes in accordance with NFPA 701 small and large-scale vertical burn. Materials tested shall be identical to products proposed for use.

1.5.3 Anti-Microbial Requirements

'No Growth' per ASTM G21 results for fungi ATCC9642, ATCC 9644, ATCC9645.

1.6 DELIVERY, STORAGE, AND HANDLING

Deliver components to the jobsite in the manufacturer's original packaging with the brand or company name, item identification, and project reference clearly marked. Store components in a dry location that is adequately ventilated and free from dust, water, or other contaminants and has easy access for inspection and handling. Store materials flat in a clean dry area with temperature maintained above 50 degrees F. Do not open containers until needed for installation unless verification inspection is required.

1.7 WARRANTY

Provide 10 year minimum limited warranty.

Specifications

PART 2 PRODUCTS**2.1 WINDOW SHADES**

Roller tube shall operate smoothly and be of sufficient diameter and thickness to prevent excessive deflection. Provide brackets that are appropriate for required mount. The shade cloth shall meet the performance described in NFPA 701, small scale test. Treat steel features for corrosion resistance.

2.1.1 Room Darkening Shades

Provide room darkening (black-out) window shades designed to eliminate all visible light gaps when shades are fully closed, and conform with the following:

- a. Roller tube shall be aluminum, controlled by webbing tape. Provide shop fabricated light traps, consisting of a head box to house the shade roller, and U-shaped channels to serve as guides for the shade along the sides and to receive the bottom edge of the shade along the sill.
- b. Provide light trap made of sheet steel having a minimum thickness of 22 gauge or anodized, extruded, aluminum. The legs of the channels shall be not less than 1-3/4 inches long and separated by the minimum distance that will permit free operation of the shade. Edges of light trap coming into contact with the shade cloth shall be smooth pile light seal. The exposed face of the head box shall be hinged or removable for access to the shade roller. The interior or unexposed surfaces of the light trap shall have a finish coat of flat black enamel. The exposed portions of the light trap shall have a factory-applied priming coat of gray paint.
- c. Cloth shall be of type for blackout purposes. Make the shade from a single piece of canvas duck cloth laminated to vinyl. When not finished with a selvage, the vertical edges of the shade shall be bound or hemmed using a high-grade thread. Make needle holes lightproof by applying a suitable filler.
- d. Fit the bottom edge of the shade with a steel operating bar. Shades will engage positively with bottom rail through operating bar or chain pull. Paint bars with flat black enamel. Make pull cords of No. 4 braided nylon or beaded chain having not less than 175 pounds breaking strength.

2.2 COLOR

Provide color, pattern and texture for metal and shade fabric as selected by Architect.

PART 3 EXECUTION**3.1 FIELD MEASUREMENTS**

After becoming familiar with details of the work, verify all dimensions in the field, and advise the Contracting Officer of any discrepancy before performing the work.

3.2 INSTALLATION

Perform installation in accordance with the approved detail drawings and manufacturer's installation instructions. Install units level, plumb, secure, and at proper height and location relative to window units. Provide and install supplementary or miscellaneous items in total, including clips, brackets, or anchorages incidental to or necessary for a sound, secure, and complete installation. Do not start installation until completion of room painting and finishing operations.

Specifications

3.3 CLEAN-UP

Upon completion of the installation, clean window treatments and adjust them for form and appearance and proper operating condition. Repair or replace damaged units as directed by the Architect. Isolate metal parts from direct contact with concrete, mortar, or dissimilar metals. Ensure shades installed in recessed pockets can be removed without disturbing the pocket. The entire shade, when retracted, shall be contained inside the pocket. For shades installed outside the jambs and mullions, overlap each jamb and mullion 0.75 inch or more when the jamb and mullion sizes permit. Include all hardware, brackets, anchors, fasteners, and accessories necessary for a complete, finished installation.

-- End of Section --

14 21 13 - ELECTRIC TRACTION FREIGHT ELEVATORS**PART 1 GENERAL****1.1 REFERENCES**

The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

AMERICAN WELDING SOCIETY (AWS)

AWS B2.1/B2.1M	(2009) Specification for Welding Procedure and Performance Qualification
AWS D1.1/D1.1M	(2012; Errata 2011) Structural Welding Code - Steel

ASME INTERNATIONAL (ASME)

ASME A17.1/CSA B44	(2010) Safety Code for Elevators and Escalators
ASME A17.2	(2012) Guide for Inspection of Elevators, Escalators, and Moving Walks Includes Inspection Procedures for Electric Traction and Winding Drum Elevators, Hydraulic Elevators, and Escalators and Moving Walks
ASME A17.3	(2011) Safety Code for Existing Elevators and Escalators
ASME QEI-1	(2010) Standard for the Qualification of Elevator Inspectors

INTERNATIONAL CODE COUNCIL (ICC)

ICC IBC	(2012) International Building Code
ICC PCBF	(2012) INTERNATIONAL CODE COUNCIL PERFORMANCE CODE® For buildings and facilities

NATIONAL ELECTRICAL MANUFACTURERS ASSOCIATION (NEMA)

NEMA MG 1	(2011; Errata 2012) Motors and Generators
NEMA PREMIUM	(2007) General Specification for Consultants, Industrial and Municipal: NEMA Premium Efficiency Electric Motors(600 Volts or Less)

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 101	(2012; Amendment 1 2012) Life Safety Code
NFPA 252	(2012) Standard Methods of Fire Tests of Door Assemblies
NFPA 70	(2011; Errata 2 2012) National Electrical Code
NFPA 72	(2013) National Fire Alarm and Signaling Code

Specifications

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

29 CFR 1910.27

Fixed Ladders

36 CFR 1191

Americans with Disabilities Act (ADA) Accessibility Guidelines
for Buildings and Facilities; Architectural Barriers Act (ABA)
Accessibility Guidelines**1.2 SYSTEM DESCRIPTION**

Provide a pre-engineered elevator system, by manufacturer regularly engaged in the production of elevator systems, that complies with ASME A17.1/CSA B44 and ASME A17.2 in their entirety, and additional requirements specified herein.

1.2.1 Fire Protection System

Provide a fire protection system complying with the applicable provisions of NFPA 72, NFPA 101, and ASME A17.1/CSA B44.

1.2.2 Miscellaneous Requirements

Submit one set of wiring diagrams, in plastic or glass cover, framed and mounted in elevator machine room for revised building electrical system, if needed, to make supplied elevator system function as specified. Deliver other sets to Owner. Coded diagrams are not acceptable unless adequately identified. Submit calculations, certified by a Registered Professional Engineer, for the Reaction Loads that comply with ASME A17.1/CSA B44, imposed on building by elevator system. And calculations, certified by a Registered Professional Engineer, of total anticipated heat loads generated by all the elevator machine room equipment. Do not fabricate materials nor perform construction until approved by the Contracting Officer.

1.3 SUBMITTALS

Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-02 Shop Drawings**Detail Drawings****SD-03 Product Data**

Freight Elevators
Accessories
Data sheets
Maintenance and diagnostic tools
Wiring Diagrams
Sequence of Operation
Field Quality Control
Logic Control

SD-05 Design Data

Reaction loads Heat loads

SD-06 Test Reports Field Tests

SD-07 Certificates Quality

Assurance

SD-10 Operation and Maintenance Data

Operation and Maintenance Manuals
Maintenance and Diagnostic Tools
Maintenance and Repair Action Plan
Operation and Maintenance Training

1.4 QUALITY ASSURANCE**1.4.1 Elevator Specialist**

Perform work specified in this section in compliance with ASME A17.3 under the direct guidance of the Elevator Specialist who is regularly engaged in the installation and maintenance of the type and complexity of elevator system specified in the contract documents, and who served in a similar capacity for at least three systems that have performed in the manner intended for a period of not less than 24 months. Elevator system manufacturer shall provide a letter of endorsement certifying that the Elevator Specialist is acceptable to manufacturer. The Elevator Specialist shall oversee the acceptance inspections and tests, and sign and certify the successful results. The Elevator Specialist, after completion of the acceptance inspections and tests, shall certify in writing that the installation is in accordance with the contract requirements. Bring any discrepancies to the attention of the Architect in writing, no later than three working days after the discrepancy is discovered. Submit a letter of endorsement from the elevator manufacturer certifying that the Elevator Specialist is acceptable to manufacturer no later than 14 days after the Notice to Proceed, providing the name and Statement of Qualifications of the individual who will perform the duties specified herein for the Elevator Specialist.

1.4.2 Elevator Inspector**1.4.2.1 Inspector Provided by Contractor**

The Elevator Inspector shall be certified in accordance with the requirements of ASME A17.1/CSA B44 and ASME QEI-1 and licensed by the State of Florida in elevator inspection. The Certified Elevator Inspector shall inspect the installation of the elevator(s) to ensure that the installation conforms with all contract requirements. The Elevator Inspector shall be directly employed by the Prime Contractor and be independent of the Elevator System Manufacturer and the Elevator Specialist, shall witness the acceptance inspections and tests, approve all results and shall sign and certify the successful results. The Elevator Inspector, after completion of the acceptance inspections and tests, shall certify in writing that the installation is in accordance with the contract requirements. Bring any discrepancy, including any safety related deficiencies, to the attention of the Architect in writing, no later than three working days after the discrepancy is discovered. Submit a letter, no later than 14 days after the Notice to Proceed, providing the name and Statement of Qualifications, including ASME A17.1/CSA B44 and ASME QEI-1 Certificate and all required state and local licenses of the individual who will perform the duties specified herein for the Elevator Inspector.

1.4.3 Welders' Qualifications

Comply with AWS D1.1/D1.1M, Section 4, and AWS B2.1/B2.1M. Submit certified copies of welders' qualifications, demonstrating compliance with AWS D1.1/D1.1M, Section 4; and a list of welders' names with corresponding code marks to identify each welder's work.

Specifications

1.4.4 Detail Drawings

a. Submit Detail Drawings, including dimensioned layouts in plan and elevation, showing the arrangement of elevator equipment, accessories, and data sheets showing all:

- 1). Supporting systems,
- 2). Anchorage of equipment,
- 3). Clearances for maintenance and operation;
- 4). Details on hoistway,
- 5). Doors and frames,
- 6). Operation and signal stations,
- 7). Machinery and Controllers,
- 8). Motors,
- 9). Guide rails and brackets,
- 10). Points of interface with normal power,
- 11). Fire alarm system,
- 12). HVAC or exhaust systems,
- 13). Interface with emergency power systems.

b. Include in the drawings complete wiring diagrams showing electrical connections and other details required to demonstrate Sequence of Operation and functions of system devices, and the appropriate sizing of electrical protective devices which are frequently different from National Electrical Code standard sizes.

1.5 WARRANTY

Provide routine warranty service in accordance with manufacturer's warranty requirements, for a period of 12 months after the date of acceptance by Owner. Perform work during regular working hours. During the warranty service period, include 24-hour emergency service, with 4 hour response time, without additional cost to the Owner. Include adjustments, greasing, oiling, and cleaning. Provide routine inspection and tests of elevators in accordance with ASME A17.1/CSA B44 Section 8.11.3 and ASME A17.2. Provide supplies and parts to keep elevator system in operation. Perform service only by factory trained personnel. Maintain a maintenance log of all service orders performed during the warranty period and submit it to the Owner 21 days prior to the end of the warranty period.

1.6 MAINTENANCE AND REPAIR ACTION PLAN

Provide plan of action prepared by the Elevator Specialist for emergency and routine maintenance in accordance with paragraph titled WARRANTY. Provide a list of phone numbers, personnel contacts, and all maintenance and diagnostic tools provided by paragraph "Maintenance and Diagnostic Tools", to the Owner.

1.6.1 Maintenance and Diagnostic Tools

Provide all special tools and software necessary to service and maintain each elevator delivered at time of final acceptance. Provide one of each tool per group of elevators. Include solid state or microprocessor diagnostic tools unavailable on the open market. Provide necessary diagnostic software in cases where the solid state or microprocessor diagnostic tools are available on the open market. Submit information on motor, hall station, and buffer on elevators and accessories. For elevator supporting systems, include information on car control and emergency power systems. Include information for maintenance and diagnostic tools for all components. On data sheets, provide document identification number or bulletin number, published or copyrighted prior to the date of contract bid opening.

Specifications

1.6.2 Keys for Elevator Key Switches

Provide a minimum of twelve keys per unique cylinder used on all key switches for single elevator. If there is more than one elevator, additional keys are not required unless there are additional unique cylinders. Provide keys with brass or fiberglass tags marked on one side with function of key or approved code number on other side.

PART 2 PRODUCTS**2.1 FREIGHT ELEVATORS****2.1.1 Basic Requirements**

- a. Type: Geared
- b. Rated Load: 5,000 lbs.
- c. Rated Speed: 100 fpm.
- d. Travel Length: see drawings.
- e. Number of Stops: see drawings.
- f. Number of Hoist Way Openings: see drawings.
- g. Car Inside Dimensions: 8-0 ft.-in. wide, 9-8 ft.-in. deep and 8-0 ft.-in. high.
- h. Hoistway Door Type & Size: Power Operated Vertical Bi-Parting ft.-in. wide and 8-0 ft.-in. high.
- i. Car Gate Type: Power Operated
- j. Loading Type: Class C1

2.1.2 Cab Enclosures and Door Frame Finishes: Provide finishes as listed below. Coordinate selection with County.

- a. Floor; aluminum diamond plate.
- b. Walls; prefinished steel panels and wall trim; prefinished steel.
- c. Interior face of doors; prefinished steel.
- d. Ceiling; prefinished steel panels.

2.2 SPECIAL OPERATION AND CONTROL

Provide all special operations and control systems in accordance with ASME A17.1/CSA B44. Provide special operation key switches with 7 pin cylinder locks with removable cores and a key control lock for each operation system.

Security Features: Provide the following security features, where indicated. Security features shall not affect emergency firefighters' service.

- a. Coordinate and integrate security control override for car control buttons to allow elevator control

Specifications

- take-over from a security control room and the card-reader system.
- b. Card-Reader Operation: System uses card readers to authorize calls. Security system determines which landings and at what times calls require authorization by card reader. Allow space for card reader in car.
 - c. Power for Security Camera: Provide 120V AC outlet on cab top for security camera power supply.
 - d. Provide required conductors in traveling cable and panel in machine room for interconnecting card readers, camera, other security access system equipment, and elevator controllers.

2.2.2 Firefighters' Service

Provide equipment and signaling devices. The designated level for Firefighters' key operated switch is the ground floor.

2.2.3 Smoke Detectors

Provide connections directly to elevator controls that will, when smoke is detected by any smoke detector, actuate Firefighters' Service and send each elevator to the correct floor as required by ASME A17.1/CSA B44. Provide dual-contact smoke detectors located in the elevator lobbies and the elevator machine room. If a sprinkler is provided at the top of the hoistway, provide dual-contact smoke detector at top of hoistway. Include only these smoke detectors in the circuit for elevator controller actuation of Firefighters' Service. In lieu of dual-contact smoke detectors, an addressable fire alarm system with listed smoke detectors can be used in the above stated locations. Ensure that all smoke detectors are mounted on finished ceiling.

2.2.4 Fire Sprinklers

For each elevator, provide control wiring connecting the flow switch to the shunt trip equipped circuit breaker within the electrical panel serving the main line disconnect. Upon flow of water, flow switch shall instantaneously send a signal to cause opening of shunt-trip equipped mainline circuit breaker, in compliance with ASME A17.1/CSA B44, Section 2.8.2, and send a signal to fire alarm control panel to indicate water flow condition. Machine room sprinkler flow switch actuation shall shunt trip all elevator(s) served by the machine room. Machine room heat detector spacing shall comply with NFPA 72. Hoistway sprinkler flow switch actuation shall shunt trip all elevator(s) in the hoistway.

2.2.5 Top-of-Car Operating Device

Provide, in accordance with ASME A17.1/CSA B44, operating device mounted on or from car crosshead, to permit operation of car at 150 fpm maximum for adjustment, maintenance, testing, and repair. Include integral or remote safety device, continuous pressure "UP" and "DOWN" switches or buttons, emergency stop switch, and inspection switch.

2.2.6 Hoistway Access Switches

Provide key-operated hoistway access switch to permit limited movement of car at terminal floors for car positioning, operative only when "INSPECTION" switch in car operating panel is in the "INSPECTION" position. Locate switch 6 feet above floor level, within 12 inches of hoistway entrance frame or with only ferrule exposed when located in entrance frame.

2.2.7 Independent Service

Provide exposed key-operated switch in car operating panel to enable independent service and simultaneously disable in-car signals and landing-call responses. Provide indicator lights that automatically illuminate during independent service.

Specifications

2.2.8 Elevator Operation**2.2.7.1 Single, Two-Stop, Automatic Operation**

Provide Single Two-Stop Automatic Operation. Provide illuminating push buttons.

2.2.7.2 Selective Collective Automatic Operation

Provide Selective Collective Automatic Operation. Provide illuminating push buttons.

2.2.8 Parking Switch

Provide two-position parking switch in car station service cabinet. One position causes car to remain parked at floor landing where last used; other position causes car to park at main floor.

2.3 ELEVATOR MACHINE

Provide elevator machines which are geared traction, direct-drive machines. Paint or finish ferrous surfaces with minimum one coat of rust-inhibiting paint conforming to manufacturer's standard practice.

Direct current drive motor shall conform to NEMA MG 1, Part 18, and NEMA PREMIUM hoisting motor with separately excited direct current (dc) generator. Provide drive motor with Class F insulation, and rated for continuous duty.

2.4 CONTROL EQUIPMENT**2.4.1 Motor Control Equipment**

ASME A17.1/CSA B44, Section 2.26. Provide variable-voltage with motor-generator set, or variable-frequency alternating current (ac) drive control. Enclose control equipment in factory-primed and baked-enamel coated sheet-metal cabinets with removable or hinged doors with ventilation louvers.

2.4.1.1 Motor Generator Set

NEMA MG 1, Part 18. Provide motor-generator set with Class F insulation, and rated at 120 starts per hour for elevator service. Maximum acceptable generator voltage is 600 volts. Indicate direction of rotation by an arrow embossed, engraved, stamped, or cast on the frame. Enclose electric connections at motor generator set in conduit boxes. Provide adjustable timing device that will automatically shut the set off at 3-minute predetermined time after the elevator has answered the last registered call.

2.4.2 Logic Control

Provide commercially available microprocessor controller to enable programmable control of call allocation, logic functions, door control, speed sensing and car position. Provide a comprehensive and unrestricted method of accessing the microprocessor memory for elevator diagnostic purposes and a method of reprogramming adjustable parameters of computerized controls. Store all programming in non-volatile memory. The microprocessor control system is acceptable only if all hardware, software, and software documentation required to maintain and utilize the microprocessor is provided, and training is provided to Owner Personnel by the equipment manufacturer and supplier.

2.4.2.1 External Port

For each individual elevator microprocessor controller, and elevator group microprocessor controller,

Specifications

provide a USB port or an RS 232 port that allows connection to an on-site or a remote portable laptop computer. Provide the same level of unrestricted access as the on-board diagnostic panel. Provide three (3) copies of the complete manufacturer's software program, with complete software documentation, that enables the same level of unrestricted access to all controllers of the same make and model, regardless of the installation date or location. Provide signed certification, from the manufacturer's corporate headquarters, that guarantees that the microprocessor software and access system will not terminate the unlimited and unrestricted access at any future date.

2.4.2.2 Repair Requirements

For repair of the microprocessor control system(s), provide maintenance tools, supporting computer software, and software documentation required for complete maintenance of elevator system including diagnostics and adjustments. On-board diagnostic panels shall not require recharging to maintain their memory or authorization for use. Software requiring periodic reprogramming, or reauthorization is not permitted. Store programs in non-volatile memory. Provide electromagnetic switch, relay logic controller, complete with three (3) copies of the ladder diagram, fully cross-referenced and annotated, with the complete sequence of operations.

2.5 OPERATING PANELS, SIGNAL FIXTURES, AND COMMUNICATIONS CABINETS**2.5.1 Capacity and Data Plates**

Attach faceplates with spanner security screws. On car panel, provide stainless steel capacity and data plates, with name of elevator manufacturer.

2.5.2 Car and Hall Buttons

Provide tamper-proof push buttons identical in size and design to hall call buttons, but not illuminating.

2.6 FREIGHT CAR-OPERATING PANEL

Provide 1/8 inch thick stainless steel face plate with edges relieved; a car operating panel (COP) for each car at each car entrance; exposed, flush mounted buttons for the controls that must be passenger accessible; and service cabinet or keyed switches for those controls that should not be passenger accessible. Allow maximum 48 inches between car floor and center line of top operating button. Allow 35 inches between car floor and center line of bottom button. Use engraving and backfilling or photo etching for button and switch designations. Do not use attached signs.

2.6.1 Freight Elevator Controls Provide the following:

- a. Illuminating operating call buttons identified to correspond to landings served by elevator car. For two openings at a floor, provide two buttons marked "FRONT" and "REAR" above buttons.
- b. Manual "STOP" switch.
- c. "ALARM" button in compliance with UFAS, ADA, and ASME A17.1/CSA B44, Section 2.27.1. Alarm button shall be red with engraved legend "ALARM" which illuminates when pushed. Locate "ALARM" button at panel bottom.
- d. "FIRE DEPARTMENT" key switch, with "OFF-HOLD-ON" positions, in that order with key removable in all positions and fire sign or jewel and audible signal device. Both visual and audible signals are activated when Phase I key switch in hall is activated or when smoke detector activates return of elevator(s) to main fire response floor. Visual and audible signal shall remain activated until car has reached designated or alternate fire response floor. Upon arrival at fire response floor, visual signal remains illuminated and audible signal becomes silent.

Specifications

- e. Emergency two-way communication. Provide momentary pressure, single illuminating pushbutton operated communication device that complies with ASME A17.1/CSA B44, UFAS, and the Americans with Disabilities Act.

2.6.2 Service Controls

- a. Inspection switch that transfers car control to top-of-car inspection operating controls and prevents car operation from in-car control panel.
- b. Independent service switch.
- c. Two car light switches, one for light in car and one for lights on top and bottom of car frame.
- d. Fan switch, two-speed.
- e. 120-volt ac 60 Hz single-phase duplex electrical outlet of ground-fault-circuit-interrupt (GFCI) design.
- f. Communication device between car and elevator machine room.
- g. Parking switch.
- h. "DOOR OPEN" and "DOOR CLOSE" buttons.

2.6.3 Certificate Window

Provide a minimum 4 inches high by 6 inches wide certificate window in car operating panel for elevator inspection certificate.

2.6.4 Full-Selective Door Operation

For elevator with one or more rear openings at same level as front opening, provide full-selective operation with car and door operating buttons clearly marked for front and rear openings, front and rear car button for each such floor, and front and rear "DOOR OPEN" and "DOOR CLOSE" buttons. Only door for which the button was operated opens or closes.

2.6.5 Switches and Devices

Provide elevator manufacturer's standard grade for switches and devices on car operating panel. Legibly and indelibly identify each device and its operating positions. Locate car dispatching buttons in identical positions in car operating panels for corresponding floors.

2.6.6 In-Car Position and Direction Indicator and Signal

Include in-car direction indicator in the in-car position indicator fixture.

2.6.6.1 In-Car Position Indicator and Signal

Provide horizontal electrical or electronic digital position indicator located minimum of 84 inches above car floor. Arrange indicator to show floor position of car in hoistway and its traveling direction. Indicate position by illumination of numeral or letter corresponding to landing at which car is passing or stopping. Provide audible signal to alert passenger that elevator is passing or stopping at a floor. Provide audible signals exceeding ambient noise level by at least 20 decibels with frequency not higher than 1500 Hz.

Specifications

2.6.6.2 In-Car Direction Indicator and Signal

Provide visual and audible car direction indicators in car, indicating car traveling direction. For visual directional signal, provide arrow of minimum 2 1/2 inches in size. Use equilateral triangles for arrows, green for upward direction and red for downward direction. Provide audible signal that sounds once for upward direction and twice for downward direction.

2.6.7 Landing Position and Direction Indicator and Signal

Provide a single fixture containing the landing position and direction indicator.

2.6.7.1 Landing Position Indicator and Signal

Provide an electrical or electronic digital position indicator similar to the car position indicator. Arrange position indicator in wall horizontally above the door frame or vertically at the side of the door frame. Provide indicators to show floor position of car in hoistway; indicate position by illumination of numeral or letter corresponding to landing at which car is passing or stopping.

2.6.7.2 Landing Direction Indicator and Signal

Provide landing direction indicator with visual and audible signal devices; single direction indicator at terminal floors; "UP" and "DOWN" direction indicator at intermediate floors; equilateral triangles not less than 2 1/2 inches in size, green for upward direction and red for downward direction; electronic audible device that sounds once for upward direction and twice for downward direction; and audible signals exceeding ambient noise level by at least 20 decibels with frequency not higher than 1500 Hz.

2.6.8 Infra-red Curtain Unit

Provide Infra-red Curtain Unit (ICU) with multiple infra-red beams that protect to the full height of the door opening. Minimum coverage shall extend from 2 inches off the floor to 70 inches above floor level. Door operation shall meet the requirements of ASME A17.1/CSA B44.

2.7 HOISTWAY AND CAR EQUIPMENT**2.7.1 Car and Counterweight Guide Rails and Fastenings**

Paint rail shanks with one coat of black enamel. Only T-section type guide rail is acceptable.

2.7.2 Car and Counterweight Buffers Provide data plate on each buffer.**2.7.3 Pit Equipment**

Provide pit channel for anchorage of main guide rail brackets and also for anchorage of counterweight guide rail brackets. Each channel shall span distance between guides. Pit channel for main guide rails shall also serve as mounting surface for car buffer(s). Pit channel for counterweight guide rails shall serve as mounting surface for counterweight buffer(s). Prevent pit waterproofing puncturing by method of installation of channels, brackets and buffer mounts. Fully grout both pit channels on completion of guide rail and buffer installation.

Specifications

2.7.3.1 Pit "STOP" Switch

Provide push/pull type pit "STOP" switch for stopping elevator motor, independent of regular operating device. Locate switch on same side of hoistway as ladder.

2.7.3.2 Ladder

Provide galvanized steel ladder conforming to 29 CFR 1910.27 with minimum 7 inch distance between rung and wall. Locate ladder on hoistway side wall closest to hoistway door opening. Extend pit ladders 48 inches above the door sill. Pits which are more than 83 inches below the underside of the car when it is at the lowest landing, require a maintenance personnel platform.

2.7.3.3 Lighting of Pits

Locate pit light not less than 6 feet above pit floor. Locate switch on same side of hoistway as ladder. Provide GFCI duplex receptacle in each pit.

2.7.3.4 Elevator Pit Sump Pump

Provide submersible sump pump for each elevator pit. Refer to Section 22 14 29.00 40 SUMP PUMPS.

2.7.4 Wiring and Traveling Cables

Refer to NFPA 70, Article 620 and Section 26 20 00 INTERIOR DISTRIBUTION SYSTEM. Suspend traveling cables by means of self-tightening webbed devices.

2.7.5 Emergency Signaling Devices

Provide audible signaling device, operable from Car Operating Panel button marked "ALARM". Mount audible signaling device in hoistway. Operation of the EMERGENCY STOP button shall sound audible signaling device.

2.8 FREIGHT ELEVATOR GUIDES, PLATFORM, AND ENCLOSURE

2.8.1 Roller Guides

Provide roller guide assemblies in adjustable mountings on each side of car and counterweight frames in accurate alignment to top and bottom of frames.

2.8.2 Car Enclosure

Complete with two-section gate, power gate operator, emergency exit, emergency light, and lighting fixtures. Paint interior and exposed surfaces with manufacturer's standard finish. Provide certificate frame and recessed car station.

2.9 FREIGHT ELEVATOR HOISTWAY DOORS AND ENTRANCES

Provide hoistway entrance with complete door assembly including door panels with truckable sill, frames, guide rails, and accessories. Provide hoistway entrance assemblies that have a minimum 1.5 hour fire rating complying with NFPA 252.

2.9.1 Door Panel

Fire rated door panel, with minimum 4 inch wide by 9 inch high vision panel at upper door section.

Specifications

2.9.2 Door Operation

Provide full-selective door operation.

2.10 HANDICAPPED AND MEDICAL SERVICES ACCESS

2.10.1 Provision for Handicapped

Refer to 36 CFR 1191, Sections 4.10 for Elevators, 4.30 for Signage, and 4.31 for Telephones.

2.10.2 Emergency Medical Services

ICC PCBF and ICC IBC, Chapter 30 for elevators and signage.

2.11 EMERGENCY POWER OPERATION

Upon outage of normal power and initiation of emergency power, provide circuitry and wiring to operate elevator telephone and intercom to accomplish operation sequences. For single elevator system, elevator travels automatically to main floor, opens doors, and automatically places itself in regular service. During emergency power operation, provide a sign reading "EMERGENCY POWER" flashing in each car station. At the same time, provide operable Firefighters' Service.

2.12 ALTERNATIVE INSTALLATION

Upon approval of the customer on an individual basis, a machine-room-less elevator system alternative may be utilized in-lieu-of elevators which require a machine room. Machine-room-less elevators can be specified where optimizing building and energy efficiency is desired. Machine-room-less type elevators can be selected for speeds from 150 up to 350 feet/minute. Hoisting machinery is located in the hoistway at the top of the shaft with controls located either in a control room or a control space at the top landing adjacent to the hoistway. Units shall comply with all applicable requirements of this specification in addition to the manufacturers specifications.

PART 3 EXECUTION

3.1 INSTALLATION

Install in accordance with manufacturer's instructions, ASME A17.1/CSA B44, 36 CFR 1191, and NFPA 70.

3.1.1 Traveling Cables

Do not allow abrupt bending of traveling cables.

3.1.2 Structural Members

Do not cut or alter. Restore any damaged or defaced work to original condition.

3.1.3 Safety Guards

Completely enclose selector cables or tapes exposed to possibility of accidental contact in machine room with 16 gage thick sheet metal or expanded metal guards, both horizontally and vertically. Guard exposed gears, sprockets, and selector drums from accidental contact in accordance with ASME A17.1/CSA B44.

Specifications

3.1.4 Other Requirements

Include recesses, cutouts, slots, holes, patching, grouting, and refinishing to accommodate elevator installation. Use core drilling to drill all new holes in concrete. Finish work to be straight, level, and plumb. During installation, protect machinery and equipment from dirt, water, or mechanical damage. At completion, clean all work, and spot paint. Firefighters' service shall be complete, including installation and wiring of all smoke detectors in accordance with ASME A17.1/CSA B44, Section 2.27.3.2. Coordinate smoke detector installation for firefighters' service.

3.2 FIELD QUALITY CONTROL

- a. After completing elevators system installation, notify Architect that elevator system is ready for final inspection and acceptance test.
- b. Submit a plan detailing the testing procedures 60 days prior to performing the elevator tests. Perform all required tests and demonstrate proper operation of each elevator system and prove that each system complies with contract requirements and ASME A17.1/CSA B44, including Section 8.10.3, "Acceptance Inspection and Tests of Passenger and Freight Hydraulic Elevators", and the applicable requirements of Section 8.3, "Engineering and Type Tests". Inspection procedures in ASME A17.2 form a part of this inspection and acceptance testing. Conduct all testing and inspections in the presence of both the Elevator Specialist and the Elevator Inspector. Demonstrate the proper operation of all equipment at various date settings, selected by the Elevator Inspector, ranging from the date of contract award through 1 January 2099.
- c. The Elevator Inspector shall complete, sign and post the results of all tests and inspection results after successful completion of inspection and testing. The Contractor is responsible for all costs involved with reinspection and retesting required to correct discrepancies discovered during testing and the subsequent retesting required.

3.2.1 Testing Materials and Instruments

Provide testing materials and instruments required for final inspection. Include calibrated test weights, tachometer, 600-volt megohm meter, volt meter and ammeter, three Celsius calibrated thermometers, door pressure gage, spirit level, stop watch, hydraulic pressure test gauge, and a 100 foot tape measure.

3.2.2 Field Tests

Submit test reports, in booklet form, showing all field tests performed to adjust each component and all field tests performed to prove compliance with the specified performance criteria, upon completion and testing of installed system. Submit field test reports no later than 14 days after the successful completion of testing.

3.2.2.1 Endurance Tests

Test each elevator for a period of one hour continuous run, with specified rated load in the car. Restart the one hour test period from beginning, following any shutdown or failure. During the test run, stop car at each floor in both directions of travel for standing period of 10 seconds per floor. The requirements for Rated Speed, Leveling, Temperature Rise, and Motor Amperes testing specified herein shall be met throughout the duration of the Endurance test.

3.2.2.2 Speed Tests

Determine actual speed of each elevator in both directions of travel with rated load and with no load in elevator car. Make Speed tests before and immediately after Endurance test. Determine speed by tachometer reading, excluding accelerating and slow-down zones in accordance with ASME A17.2.

Specifications

Minimum acceptable elevator speed is the Rated speed specified. Maximum acceptable elevator speed is 110 percent of Rated speed.

3.2.2.3 Leveling Tests

Test elevator car leveling devices for landing accuracy of plus or minus 1/4 inch at each floor with no load in car, symmetrical load in car, and with rated load in car in both directions of travel. Determine accuracy of floor landing both before and immediately after endurance tests.

3.2.2.4 Insulation Resistance Tests

Perform tests to ensure wiring systems free from short circuits and grounds. Minimum acceptable insulation resistance for electrical conductors is one megohm between each conductor and ground and between each conductor and other conductors. Prior to megohm meter test, make provision to prevent damage to the electronic devices.

3.2.2.5 Brake Test

Conduct brake test with 125 percent of rated load in elevator. Verify that brakes stop and hold elevator with 125 percent of rated load.

3.2.2.6 Temperature Rise Tests

Determine temperature rise of elevator hoisting motor, motor-generator, exciter, and booster during full-load test run for one hour minimum. Under these conditions, maximum acceptable temperature rise shall not exceed acceptable temperature rise indicated on manufacturer's data plate. Start test only when equipment is within 9 degrees F of ambient temperature.

3.2.2.7 Balance Tests

Perform electrical and mechanical balance tests of car and counterweight.

3.2.2.8 Motor Ampere Tests

Measure and record motor amperage when motor is running and elevator is lifting at rated load and speed. Measure and record motor amperage at beginning and end of Endurance test.

3.3 OPERATION AND MAINTENANCE TRAINING

The Elevator Specialist shall instruct Owner personnel in care, adjustment, and maintenance of elevator equipment for a period of not less than 1 working day immediately following acceptance of system. Submit Operation and Maintenance Manuals, 28 days prior to the Operation and Maintenance Training. Include a list of phone numbers, personnel contacts, and all tools required for operation and maintenance, as required. Submit proposed Onsite Training schedule, concurrently with the Operation and Maintenance Manuals.

-- End of Section --