CJMW ARCHITECTURE

PROJECT MANUAL

Carolina Museum of the Marine

Jacksonville
North Carolina

Architectural Specification Sections
Construction Documents

Commission No. 22-0410

Volume 1

CAROLINA MUSEUM OF THE MARINE

October 24, 2023

SECTION 00 0101

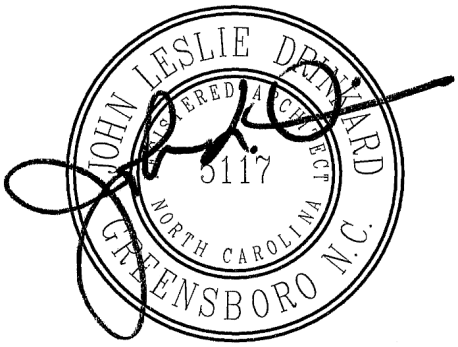
PROJECT TITLE PAGE

PROJECT MANUAL
FOR
MUSEUM OF THE MARINE
ARCHITECTS PROJECT NUMBER: 22-0410
MUSEUM OF THE MARINE
MONTFORD POINT DRIVE
JACKSONVILLE, NC 28540

DATE: 10-24-23
PREPARED BY: CJMW ARCHITECTURE

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PROFESSIONAL RESPONSIBILITY

A. Unless noted otherwise, technical specifications listed below were prepared under the direction of J&A Engineering LLC, Jorge Gomez PE:

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   4. 270800 – COMMISSIONING
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   11. 281300 - SECURITY & ACCESS CONTROL
   12. 282000 - VIDEO SURVEILLANCE SYSTEMS





10-23-23

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PART 1 GENERAL

1.01 PRELIMINARY DATA

A. Certain preliminary investigations and studies are available directly from the Owner and are available to proposers upon request to the Owner:
   1. Report of Subsurface Exploration and Geotechnical Engineering Analysis
      Marine Corps Museum Of The Carolinas
      Jacksonville North Carolina
      Prepared by: ECS Carolinas, LLP
      ECS Carolinas, LLP Project No: 22.13112
      September 13, 2007.

PART 2 PRODUCTS (NOT USED)

PART 3 EXECUTION (NOT USED)

3.01 OBTAINMENT OF PERMITS

END OF SECTION

SECTION 01 1000
SUMMARY

PART 1 GENERAL

1.01 PROJECT

A. Project Name: Museum Of The Marine

B. Owner's Name: Museum of the Marine.

C. Architect's Name: CJMW Architecture, Winston Salem, 1525 Vine Street, Suite 350. North Carolina 27101.

D. The Project consists of the construction of exhibit space, office and support areas as indicated in the Contract Documents. The poject is designed to comply with Certification Level according to the US Green Building Council's Leadership in Energy & Environmental Design (LEED) Rating System..

1.02 CONTRACT DESCRIPTION

A. Contract Type: A single prime contract based on a Stipulated Price as described in Document 00 5000 - Contracting Forms and Supplements.

1.03 FUTURE WORK

A. Project is designed for future museum expansion and site development..

1.04 OWNER OCCUPANCY

A. Owner intends to occupy the Project upon Substantial Completion.

B. Cooperate with Owner to minimize conflict and to facilitate Owner's operations.

C. Schedule the Work to accommodate Owner occupancy.

1.05 CONTRACTOR USE OF SITE AND PREMISES

A. Construction Operations: Limited to areas noted on Drawings.

B. Provide access to and from site as required by law and by Owner:
   1. Emergency Building Exits During Construction: Keep all exits required by code open during construction period; provide temporary exit signs if exit routes are temporarily altered.
   2. Do not obstruct roadways, sidewalks, or other public ways without permit.

C. Utility Outages and Shutdown:
   1. Prevent accidental disruption of utility services to other facilities.

1.06 WORK SEQUENCE

A. Coordinate construction schedule and operations with Owner.

1.07 SPECIFICATION SECTIONS APPLICABLE TO EVERY CONTRACT

A. Unless otherwise noted, provisions of the sections listed below apply to every contract. Specific items of work listed under individual contract descriptions constitute exceptions.

B. Section 01 2000 - Price and Payment Procedures.

C. Section 01 2200 - Unit Prices.

D. Section 01 2500 - Substitution Procedures.

E. Section 01 3000 - Administrative Requirements.

F. Section 01 3216 - Construction Progress Schedule.

G. Section 01 4000 - Quality Requirements.

H. Section 01 5000 - Temporary Facilities and Controls.

I. Section 01 5100 - Temporary Utilities.

J. Section 01 6000 - Product Requirements.

K. Section 01 7000 - Execution and Closeout Requirements.

L. Section 01 7800 - Closeout Submittals.

END OF SECTION

SECTION 01 2000
PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedures for preparation and submittal of applications for progress payments.

1.02 RELATED REQUIREMENTS

A. Section 00 5000 - Contracting Forms and Supplements: Forms to be used.

1.03 SCHEDULE OF VALUES

A. Use Schedule of Values Form: AIA G703, edition stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit draft to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Revise schedule to list approved Change Orders, with each Application For Payment.

1.04 APPLICATIONS FOR PROGRESS PAYMENTS

A. Payment Period: Submit at intervals stipulated in the Agreement.

B. Electronic media printout including equivalent information will be considered in lieu of standard form specified; submit sample to Architect for approval.

C. Forms filled out by hand will not be accepted.

D. Execute certification by signature of authorized officer.

E. Submit one electronic and agreed upon quantity of hard-copies of each Application for Payment.

1.05 MODIFICATION PROCEDURES

A. For minor changes not involving an adjustment to the Contract Sum or Contract Time, Architect will issue instructions directly to Contractor.

B. For other required changes, Architect will issue a document signed by Owner instructing Contractor to proceed with the change, for subsequent inclusion in a Change Order.
   1. The document will describe the required changes and will designate method of determining any change in Contract Sum or Contract Time.
   2. Promptly execute the change.

C. For changes for which advance pricing is desired, Architect will issue a document that includes a detailed description of a proposed change with supplementary or revised drawings and specifications, a change in Contract Time for executing the change with a stipulation of any overtime work required and the period of time during which the requested price will be considered valid. Contractor shall prepare and submit a fixed price quotation within ____ days.

D. Computation of Change in Contract Amount: As specified in the Agreement and Conditions of the Contract.
   1. For change requested by Architect for work falling under a fixed price contract, the amount will be based on Contractor's price quotation.
   2. For change requested by Contractor, the amount will be based on the Contractor's request for a Change Order as approved by Architect.
   3. For pre-determined unit prices and quantities, the amount will based on the fixed unit prices.
   4. For change ordered by Architect without a quotation from Contractor, the amount will be determined by Architect based on the Contractor's substantiation of costs as specified for Time and Material work.

E. Substantiation of Costs: Provide full information required for evaluation.
   1. On request, provide the following data:
      a. Quantities of products, labor, and equipment.
      b. Taxes, insurance, and bonds.

c. Overhead and profit.
d. Justification for any change in Contract Time.
e. Credit for deletions from Contract, similarly documented.

2. Support each claim for additional costs with additional information:
   a. Origin and date of claim.
   b. Dates and times work was performed, and by whom.
   c. Time records and wage rates paid.
   d. Invoices and receipts for products, equipment, and subcontracts, similarly documented.
3. For Time and Material work, submit itemized account and supporting data after completion of change, within time limits indicated in the Conditions of the Contract.

F. After execution of Change Order, promptly revise Schedule of Values and Application for Payment forms to record each authorized Change Order as a separate line item and adjust the Contract Sum.

G. Promptly revise progress schedules to reflect any change in Contract Time, revise sub-schedules to adjust times for other items of work affected by the change, and resubmit.

H. Promptly enter changes in Project Record Documents.

1.06 APPLICATION FOR FINAL PAYMENT

A. Prepare Application for Final Payment as specified for progress payments, identifying total adjusted Contract Sum, previous payments, and sum remaining due.

B. Application for Final Payment will not be considered until the following have been accomplished:

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2200
UNIT PRICES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. List of unit prices, for use in preparing Bids.

B. Measurement and payment criteria applicable to Work performed under a unit price payment method.

C. Defect assessment and non-payment for rejected work.

1.02 COSTS INCLUDED

A. Unit Prices included on the Bid Form shall include full compensation for all required labor, products, tools, equipment, plant, transportation, services and incidentals; erection, application or installation of an item of the Work; overhead and profit.

1.03 UNIT QUANTITIES SPECIFIED

A. Quantities indicated in the Bid Form are for bidding and contract purposes only. Quantities and measurements of actual Work will determine the payment amount.

1.04 MEASUREMENT OF QUANTITIES

A. Measurement methods delineated in the individual specification sections complement the criteria of this section.

B. Take all measurements and compute quantities. Measurements and quantities will be verified by Owner.

C. Assist by providing necessary equipment, workers, and survey personnel as required.

D. Measurement Devices:

E. Measurement by Weight: Concrete reinforcing steel, rolled or formed steel or other metal shapes will be measured by handbook weights. Welded assemblies will be measured by handbook or scale weight.

F. Measurement by Volume: Measured by cubic dimension using mean length, width and height or thickness.

G. Measurement by Area: Measured by square dimension using mean length and width or radius.

H. Linear Measurement: Measured by linear dimension, at the item centerline or mean chord.

1.05 PAYMENT

A. Payment for Work governed by unit prices will be made on the basis of the actual measurements and quantities of Work that is incorporated in or made necessary by the Work and accepted by the Architect, multiplied by the unit price.

B. Payment will not be made for any of the following:
   1. Products wasted or disposed of in a manner that is not acceptable.
   2. Products determined as unacceptable before or after placement.
   3. Products not completely unloaded from the transporting vehicle.
   4. Products placed beyond the lines and levels of the required Work.
   5. Products remaining on hand after completion of the Work.
   6. Loading, hauling, and disposing of rejected Products.

1.06 DEFECT ASSESSMENT

A. Replace Work, or portions of the Work, not complying with specified requirements.

B. If, in the opinion of Architect, it is not practical to remove and replace the Work, Architect will direct one of the following remedies:
   1. The defective Work may remain, but the unit price will be adjusted to a new unit price at the discretion of Architect.

2. The defective Work will be partially repaired to the instructions of the Architect, and the unit price will be adjusted to a new unit price at the discretion of Architect.

1.07 SCHEDULE OF UNIT PRICES

A. Unit Price No.1 - Unsatisfoactory Soil Onsite:
   1. Description: Removal of soil material determined, by the testing engineer, to be unsatisfactory and disposed in an approved onsite location and prepared to specified standards.
   2. Unit of Measurement: Cubic Yard.

B. Unit Price No. 2 - Unsatisfactory Soil Offsite:
   1. Description: Removal of soil material determined, by the testing engineer, to be unsatisfactory and disposed offsite.
   2. Unit of Measurement: Cubic Yard.

C. Unit Price No. 3 Satisfactory Soil Onsite:
   1. Description: Placement of soil material, determined by using a testing engineer, to be satisfactory which was excavated on site as part of contract work.
   2. Unit of Measurement: Cubic Yard.

D. Unit Price No. 4 - Satisfactory Soil Offsite:
   1. Description: Placement of soil material, determined by using a testing engineer, to be satisfactory which is from an offsite source.
   2. Unit of Measurement: Cubic Yard.

E. Unit Price No. 5 - Mass Rock:
   1. Description: Removal of material, determined by using a testing engineer, to be mass rock and disposed offsite.
   2. Unit of Measurement: Cubic Yard.

F. Unit Price No. 6 - Trench Rock:
   1. Description: Removal of material, determined by using a testing engineer, to be trench rock and disposed offsite.
   2. Unit of Measurement: Cubic Yard.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 01 2500
SUBSTITUTION PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Procedural requirements for proposed substitutions.

1.02 RELATED REQUIREMENTS

A. Section 00 4325 - Substitution Request Form - During Procurement: Required form for substitution requests made prior to award of contract (During procurement).

B. Section 00 6325 - Substitution Request Form - During Construction: Required form for substitution requests made after award of contract (During construction).

C. Section 01 3000 - Administrative Requirements: Submittal procedures, coordination.

1.03 DEFINITIONS

A. Substitutions: Changes from Contract Documents requirements proposed by Contractor to materials, products, assemblies, and equipment.
   1. Substitutions for Cause: Proposed due to changed Project circumstances beyond Contractor's control.
      a. Unavailability.
      b. Regulatory changes.
   2. Substitutions for Convenience: Proposed due to possibility of offering substantial advantage to the Project.
      a. Substitution requests offering advantages solely to the Contractor will not be considered.

1.04 REFERENCE STANDARDS

A. CSI/CSC Form 1.5C - Substitution Request (During the Bidding/Negotiating Stage); Current Edition.

B. CSI/CSC Form 13.1A - Substitution Request (After the Bidding/Negotiating Phase); Current Edition.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 GENERAL REQUIREMENTS

A. A Substitution Request for products, assemblies, materials, and equipment constitutes a representation that the submitter:
   1. Has investigated proposed product and determined that it meets or exceeds the quality level of the specified product, equipment, assembly, or system.
   2. Agrees to provide the same warranty for the substitution as for the specified product.
   3. Agrees to provide same or equivalent maintenance service and source of replacement parts, as applicable.
   4. Agrees to coordinate installation and make changes to other work that may be required for the work to be complete, with no additional cost to Owner.
   5. Waives claims for additional costs or time extension that may subsequently become apparent.
   6. Agrees to reimburse Owner and Architect for review or redesign services associated with re-approval by authorities.

B. A Substitution Request for specified installer constitutes a representation that the submitter:
   1. Has acted in good faith to obtain services of specified installer, but was unable to come to commercial, or other terms.

C. Document each request with complete data substantiating compliance of proposed substitution with Contract Documents. Burden of proof is on proposer.
   1. Note explicitly any non-compliant characteristics.

D. Content: Include information necessary for tracking the status of each Substitution Request, and information necessary to provide an actionable response.
   1. Forms indicated in the Project Manual are adequate for this purpose, and must be used.
   2. No specific form is required. Contractor's Substitution Request documentation must include the following:
      a. Project Information:
         1) Official project name and number, and any additional required identifiers established in Contract Documents.
         2) Owner's, Architect's, and Contractor's names.
      b. Substitution Request Information:
         1) Discrete and consecutive Substitution Request number, and descriptive subject/title.
         2) Indication of whether the substitution is for cause or convenience.
         3) Issue date.
         4) Reference to particular Contract Document(s) specification section number, title, and article/paragraph(s).
         5) Description of Substitution.
         6) Reason why the specified item cannot be provided.
         7) Differences between proposed substitution and specified item.
         8) Description of how proposed substitution affects other parts of work.
      c. Attached Comparative Data: Provide point-by-point, side-by-side comparison addressing essential attributes specified, as appropriate and relevant for the item:
         1) Physical characteristics.
         2) In-service performance.
         3) Visual effect.
         4) Warranties.
         5) Other salient features and requirements.
         6) Include, as appropriate or requested, the following types of documentation:
            (a) Product Data:
            (b) Certificates, test, reports or similar qualification data.
            (c) Drawings, when required to show impact on adjacent construction elements.
      d. Impact of Substitution:
         1) Savings to Owner for accepting substitution.
         2) Change to Contract Time due to accepting substitution.

E. Limit each request to a single proposed substitution item.

3.02 SUBSTITUTION PROCEDURES DURING PROCUREMENT

A. Submittal Time Restrictions:
   1. Owner will consider requests for substitutions only if submitted at least 10 days prior to the date for receipt of bids.

B. Submittal Form (before award of contract):
   1. Submit substitution requests by completing CSI/CSC Form 1.5C - Substitution Request. See this form for additional information and instructions. Use only this form; other forms of submission are unacceptable.

3.03 SUBSTITUTION PROCEDURES DURING CONSTRUCTION

A. Architect will consider requests for substitutions only within 15 days after date of Agreement.

B. Submit request for Substitution for Cause within 14 days of discovery of need for substitution, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

C. Submit request for Substitution for Convenience within 14 days of discovery of its potential advantage to the project, but not later than 14 days prior to time required for review and approval by Architect, in order to stay on approved project schedule.

1. In addition to meeting general documentation requirements, document how the requested substitution benefits the Owner through cost savings, time savings, greater energy conservation, or in other specific ways.
2. Document means of coordinating of substitution item with other portions of the work, including work by affected subcontractors.
3. Bear the costs engendered by proposed substitution of:
    a. Owner's compensation to the Architect for any required redesign, time spent processing and evaluating the request.

D. Substitutions will not be considered under one or more of the following circumstances:
1. When they are indicated or implied on shop drawing or product data submittals, without having received prior approval.
2. Without a separate written request.
3. When acceptance will require revisions to Contract Documents.

3.04 RESOLUTION

A. Architect may request additional information and documentation prior to rendering a decision. Provide this data in an expeditious manner.

B. Architect will notify Contractor in writing of decision to accept or reject request.

3.05 ACCEPTANCE

A. Accepted substitutions change the work of the Project. They will be documented and incorporated into work of the project by Change Order, Construction Change Directive, Architectural Supplementary Instructions, or similar instruments provided for in the Conditions of the Contract.

3.06 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

B. Include completed Substitution Request Forms as part of the Project record.

END OF SECTION

SECTION 01 3000
ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General administrative requirements.
B. Electronic document submittal service.
C. Preconstruction meeting.
D. Progress meetings.
E. Construction progress schedule.
F. Coordination drawings.
G. Submittals for review, information, and project closeout.
H. Number of copies of submittals.
I. Requests for Interpretation (RFI) procedures.
J. Submittal procedures.

1.02 RELATED REQUIREMENTS

A. Section 01 6000 - Product Requirements: General product requirements.

1.03 REFERENCE STANDARDS

A. AIA G716 - Request for Information; 2004.

1.04 GENERAL ADMINISTRATIVE REQUIREMENTS

A. Comply with requirements of Section 01 7000 - Execution and Closeout Requirements for coordination of execution of administrative tasks with timing of construction activities.
B. Make the following types of submittals to Architect:
    1. Requests for Interpretation (RFI).
    2. Requests for substitution.
    3. Shop drawings, product data, and samples.
    4. Test and inspection reports.
    5. Design data.
    6. Manufacturer's instructions and field reports.
    7. Applications for payment and change order requests.
    8. Progress schedules.
    9. Coordination drawings.
    10. Correction Punch List and Final Correction Punch List for Substantial Completion.
    11. Closeout submittals.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 ELECTRONIC DOCUMENT SUBMITTAL SERVICE

A. All documents transmitted for purposes of administration of the contract are to be in electronic (PDF, MS Word, or MS Excel) format, as appropriate to the document, and transmitted via an Internet-based submittal service that receives, logs and stores documents, provides electronic stamping and signatures, and notifies addressees via email.
    1. Besides submittals for review, information, and closeout, this procedure applies to Requests for Interpretation (RFIs), progress documentation, contract modification documents (e.g. supplementary instructions, change proposals, change orders), applications for payment, field reports and meeting minutes, Contractor's correction punchlist, and any other document any participant wishes to make part of the project record.
    2. Contractor and Architect are required to use this service.

3. It is Contractor's responsibility to submit documents in allowable format.
4. Subcontractors, suppliers, and Architect's consultants are to be permitted to use the service at no extra charge.
5. Users of the service need an email address, internet access, and PDF review software that includes ability to mark up and apply electronic stamps (such as Adobe Acrobat, www.adobe.com, or Bluebeam PDF Revu, www.bluebeam.com), unless such software capability is provided by the service provider.
6. Paper document transmittals will not be reviewed; emailed electronic documents will not be reviewed.
7. All other specified submittal and document transmission procedures apply, except that electronic document requirements do not apply to samples or color selection charts.

B. Cost: The cost of the service is to be paid by Contractor; include the cost of the service in the Contract Sum.

C. Submittal Service: Use one of the following:
1. Submittal Exchange (tel: 1-800-714-0024): www.submittalexchange.com/#sle.
2. Procore.

D. Training: One, one-hour, web-based training session will be arranged for all participants, with representatives of Architect and Contractor participating; further training is the responsibility of the user of the service.
1. Representatives of Owner are scheduled and included in this training.

E. Project Closeout: Architect will determine when to terminate the service for the project and is responsible for obtaining archive copies of files for Owner.

3.02 PRECONSTRUCTION MEETING

A. Schedule meeting after Notice of Award.

B. Attendance Required:
1. Owner.
2. Architect.
3. Contractor.
4. Mager subcontractors, as mutually agreed..

C. Agenda:
1. Execution of Owner-Contractor Agreement.
2. Submission of executed bonds and insurance certificates.
3. Distribution of Contract Documents.
4. Submission of list of subcontractors, list of products, schedule of values, and progress schedule.
5. Designation of personnel representing the parties to Contract, _____ and Architect.
6. Procedures and processing of field decisions, submittals, substitutions, applications for payments, proposal request, Change Orders, and Contract closeout procedures.
7. Scheduling.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.03 PROGRESS MEETINGS

A. Schedule and administer meetings throughout progress of the work at maximum bi-monthly intervals.

B. Make arrangements for meetings, prepare agenda with copies for participants, preside at meetings.

C. Attendance Required:
1. Contractor.
2. Owner.
3. Architect.
4. Contractor's superintendent.

5. Major subcontractors.

D. Agenda:
   1. Review minutes of previous meetings.
   2. Review of work progress.
   3. Field observations, problems, and decisions.
   4. Identification of problems that impede, or will impede, planned progress.
   5. Review of submittals schedule and status of submittals.
   6. Maintenance of progress schedule.
   7. Corrective measures to regain projected schedules.
   8. Planned progress during succeeding work period.
   9. Maintenance of quality and work standards.
   10. Effect of proposed changes on progress schedule and coordination.
   11. Other business relating to work.

E. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 CONSTRUCTION PROGRESS SCHEDULE

A. Within 10 days after date of the Agreement, submit preliminary schedule defining planned operations for the first 60 days of work, with a general outline for remainder of work.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

3.05 COORDINATION DRAWINGS

A. Review drawings prior to submission to Architect.

3.06 REQUESTS FOR INTERPRETATION (RFI)

A. Definition: A request seeking one of the following:
   1. An interpretation, amplification, or clarification of some requirement of Contract Documents arising from inability to determine from them the exact material, process, or system to be installed; or when the elements of construction are required to occupy the same space (interference); or when an item of work is described differently at more than one place in Contract Documents.
   2. A resolution to an issue which has arisen due to field conditions and affects design intent.

B. Preparation: Prepare an RFI immediately upon discovery of a need for interpretation of Contract Documents. Failure to submit a RFI in a timely manner is not a legitimate cause for claiming additional costs or delays in execution of the work.
   1. Prepare a separate RFI for each specific item.
      a. Review, coordinate, and comment on requests originating with subcontractors and/or materials suppliers.
      b. Do not forward requests which solely require internal coordination between subcontractors.
   2. Prepare in a format and with content acceptable to Owner.
      a. Use AIA G716 - Request for Information .
   3. Prepare using software provided by the Electronic Document Submittal Service.

C. Reason for the RFI: Prior to initiation of an RFI, carefully study all Contract Documents to confirm that information sufficient for their interpretation is definitely not included.
   1. Include in each request Contractor's signature attesting to good faith effort to determine from Contract Documents information requiring interpretation.

2. Unacceptable Uses for RFIs: Do not use RFIs to request the following::
   a. Approval of submittals (use procedures specified elsewhere in this section).
   b. Approval of substitutions (see Section - 01 6000 - Product Requirements)
   c. Changes that entail change in Contract Time and Contract Sum (comply with provisions of the Conditions of the Contract).
3. Improper RFIs: Requests not prepared in compliance with requirements of this section, and/or missing key information required to render an actionable response. They will be returned without a response, with an explanatory notation.
4. Frivolous RFIs: Requests regarding information that is clearly indicated on, or reasonably inferable from, Contract Documents, with no additional input required to clarify the question. They will be returned without a response, with an explanatory notation.
   a. The Owner reserves the right to assess the Contractor for the costs (on time-and-materials basis) incurred by the Architect, and any of its consultants, due to processing of such RFIs.

D. Content: Include identifiers necessary for tracking the status of each RFI, and information necessary to provide an actionable response.
1. Official Project name and number, and any additional required identifiers established in Contract Documents.
2. Owner's, Architect's, and Contractor's names.
3. Discrete and consecutive RFI number, and descriptive subject/title.
4. Issue date, and requested reply date.
5. Reference to particular Contract Document(s) requiring additional information/interpretation. Identify pertinent drawing and detail number and/or specification section number, title, and paragraph(s).
6. Annotations: Field dimensions and/or description of conditions which have engendered the request.
7. Contractor's suggested resolution: A written and/or a graphic solution, to scale, is required in cases where clarification of coordination issues is involved, for example; routing, clearances, and/or specific locations of work shown diagrammatically in Contract Documents. If applicable, state the likely impact of the suggested resolution on Contract Time or the Contract Sum.

E. Attachments: Include sketches, coordination drawings, descriptions, photos, submittals, and other information necessary to substantiate the reason for the request.

F. RFI Log: Prepare and maintain a tabular log of RFIs for the duration of the project.
1. Indicate current status of every RFI. Update log promptly and on a regular basis.
2. Note dates of when each request is made, and when a response is received.
3. Highlight items requiring priority or expedited response.
4. Highlight items for which a timely response has not been received to date.

G. Review Time: Architect will respond and return RFIs to Contractor within ten calendar days of receipt. For the purpose of establishing the start of the mandated response period, RFIs received after 12:00 noon will be considered as having been received on the following regular working day.
1. Response period may be shortened or lengthened for specific items, subject to mutual agreement, and recorded in a timely manner in progress meeting minutes.

H. Responses: Content of answered RFIs will not constitute in any manner a directive or authorization to perform extra work or delay the project. If in Contractor's belief it is likely to lead to a change to Contract Sum or Contract Time, promptly issue a notice to this effect, and follow up with an appropriate Change Order request to Owner.
1. Response may include a request for additional information, in which case the original RFI will be deemed as having been answered, and an amended one is to be issued forthwith. Identify the amended RFI with an R suffix to the original number.
2. Do not extend applicability of a response to specific item to encompass other similar conditions, unless specifically so noted in the response.

3. Upon receipt of a response, promptly review and distribute it to all affected parties, and update the RFI Log.
4. Notify Architect within seven calendar days if an additional or corrected response is required by submitting an amended version of the original RFI, identified as specified above.

3.07 SUBMITTAL SCHEDULE

A. Submit to Architect for review a schedule for submittals in tabular format.
   1. Submit at the same time as the preliminary schedule specified in Section - 01 3216 - Construction Progress Schedule.
   2. Coordinate with Contractor's construction schedule and schedule of values.
   3. Format schedule to allow tracking of status of submittals throughout duration of construction.
   4. Arrange information to include scheduled date for initial submittal, specification number and title, submittal category (for review or for information), description of item of work covered, and role and name of subcontractor.

3.08 SUBMITTALS FOR REVIEW

A. When the following are specified in individual sections, submit them for review:
   1. Product data.
   2. Shop drawings.
   3. Samples for selection.
   4. Samples for verification.

B. Submit to Architect for review for the limited purpose of checking for compliance with information given and the design concept expressed in Contract Documents.

C. Samples will be reviewed for aesthetic, color, or finish selection.

D. After review, provide copies and distribute in accordance with SUBMITTAL PROCEDURES article below and for record documents purposes described in Section 01 7800 - Closeout Submittals.

3.09 SUBMITTALS FOR INFORMATION

A. When the following are specified in individual sections, submit them for information:
   1. Design data.
   2. Certificates.
   3. Test reports.
   4. Inspection reports.
   5. Manufacturer's instructions.
   6. Manufacturer's field reports.
   7. Other types indicated.

B. Submit for Architect's knowledge as contract administrator or for Owner.

3.10 SUBMITTALS FOR PROJECT CLOSEOUT

A. Submit Correction Punch List for Substantial Completion.

B. Submit Final Correction Punch List for Substantial Completion.

C. When the following are specified in individual sections, submit them at project closeout in compliance with requirements of Section 01 7800 - Closeout Submittals:
   1. Project record documents.
   2. Operation and maintenance data.
   3. Warranties.
   4. Bonds.
   5. Other types as indicated.

D. Submit for Owner's benefit during and after project completion.

3.11 NUMBER OF COPIES OF SUBMITTALS

A. Electronic Documents: Submit one electronic copy in PDF format; an electronically-marked up file will be returned. Create PDFs at native size and right-side up; illegible files will be rejected.

B. Samples: Submit the number specified in individual specification sections; one of which will be retained by Architect.
   1. After review, produce duplicates.
   2. Retained samples will not be returned to Contractor unless specifically so stated.

3.12 SUBMITTAL PROCEDURES

A. General Requirements:
   1. Use a single transmittal for related items.
   2. Submit separate packages of submittals for review and submittals for information, when included in the same specification section.
   3. Transmit using approved form.
   4. Sequentially identify each item. For revised submittals use original number and a sequential numerical suffix.
   5. Identify: Project; Contractor; subcontractor or supplier; pertinent drawing and detail number; and specification section number and article/paragraph, as appropriate on each copy.
   6. Apply Contractor's stamp, signed or initialed certifying that review, approval, verification of products required, field dimensions, adjacent construction work, and coordination of information is in accordance with the requirements of the work and Contract Documents.
      a. Submittals from sources other than the Contractor, or without Contractor's stamp will not be acknowledged, reviewed, or returned.
   7. Deliver each submittal on date noted in submittal schedule, unless an earlier date has been agreed to by all affected parties, and is of the benefit to the project.
      a. Send submittals in electronic format via email to Architect.
   8. Schedule submittals to expedite the Project, and coordinate submission of related items.
      a. For each submittal for review, allow 15 days excluding delivery time to and from the Contractor.
      b. For sequential reviews involving Architect's consultants, Owner, or another affected party, allow an additional 7 days.
      c. For sequential reviews involving approval from authorities having jurisdiction (AHJ), in addition to Architect's approval, allow an additional 30 days.
   9. Identify variations from Contract Documents and product or system limitations that may be detrimental to successful performance of the completed work.
   10. Provide space for Contractor and Architect review stamps.
   11. When revised for resubmission, identify all changes made since previous submission.
   12. Distribute reviewed submittals. Instruct parties to promptly report inability to comply with requirements.
   13. Incomplete submittals will not be reviewed, unless they are partial submittals for distinct portion(s) of the work, and have received prior approval for their use.
   14. Submittals not requested will not be recognized or processed.

B. Product Data Procedures:
   1. Submit only information required by individual specification sections.
   2. Collect required information into a single submittal.
   3. Submit concurrently with related shop drawing submittal.
   4. Do not submit (Material) Safety Data Sheets for materials or products.

C. Shop Drawing Procedures:
   1. Prepare accurate, drawn-to-scale, original shop drawing documentation by interpreting Contract Documents and coordinating related work.
   2. Use of reproductions of Contract Documents in digital data form to create shop drawings is only permitted as defined _____.

3. Generic, non-project-specific information submitted as shop drawings do not meet the requirements for shop drawings.

D. Samples Procedures:
   1. Transmit related items together as single package.
   2. Identify each item to allow review for applicability in relation to shop drawings showing installation locations.
   3. High-resolution image files of samples may be acceptable for preliminary review by Architect to facilitate electronic review and preliminary approval. Provide separate submittal page for each item image.
      a. Provide actual samples in size and format requested by Architect, for final selection.

3.13 SUBMITTAL REVIEW

A. Submittals for Review: Architect will review each submittal, and approve, or take other appropriate action.

B. Submittals for Information: Architect will acknowledge receipt and review. See below for actions to be taken.

C. Architect's actions will be reflected by marking each returned submittal using virtual stamp on electronic submittals.
   1. Notations may be made directly on submitted items and/or listed on appended Submittal Review cover sheet.

D. Architect's and consultants' actions on items submitted for review:
   1. Authorizing purchasing, fabrication, delivery, and installation:
      a. "Approved", or language with same legal meaning.
      b. "Approved as Noted, Resubmission not required", or language with same legal meaning.
         1) At Contractor's option, submit corrected item, with review notations acknowledged and incorporated.
      c. "Approved as Noted, Resubmit for Record", or language with same legal meaning.
         1) Resubmit corrected item, with review notations acknowledged and incorporated. Resubmit separately, or as part of project record documents.
         2) Non-responsive resubmittals may be rejected.
   2. Not Authorizing fabrication, delivery, and installation:
      a. "Revise and Resubmit".
         1) Resubmit revised item, with review notations acknowledged and incorporated.
         2) Non-responsive resubmittals may be rejected.
      b. "Rejected".
         1) Submit item complying with requirements of Contract Documents.

E. Architect's and consultants' actions on items submitted for information:
   1. Items for which no action was taken:
      a. "Received" - to notify the Contractor that the submittal has been received for record only.
   2. Items for which action was taken:
      a. "Reviewed" - no further action is required from Contractor.

END OF SECTION

SECTION 01 3216
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preliminary schedule.

B. Construction progress schedule, bar chart type.

1.02 RELATED SECTIONS

A. Section 01 1000 - Summary: Work sequence.

1.03 REFERENCE STANDARDS

A. AGC (CPSM) - Construction Planning and Scheduling Manual; 2004.

B. M-H (CPM) - CPM in Construction Management - Project Management with CPM; 2015.

1.04 SUBMITTALS

A. Within 10 days after date of Agreement, submit preliminary schedule.

B. If preliminary schedule requires revision after review, submit revised schedule within 10 days.

C. Within 20 days after review of preliminary schedule, submit draft of proposed complete schedule for review.
   1. Include written certification that major contractors have reviewed and accepted proposed schedule.

D. Within 10 days after joint review, submit complete schedule.

E. Submit updated schedule with each Application for Payment.

F. Submit in PDF format.

1.05 QUALITY ASSURANCE

A. Scheduler: Contractor's personnel or specialist Consultant specializing in CPM scheduling with one years minimum experience in scheduling construction work of a complexity comparable to this Project, and having use of computer facilities capable of delivering a detailed graphic printout within 48 hours of request.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 PRELIMINARY SCHEDULE

A. Prepare preliminary schedule in the form of a horizontal bar chart.

3.02 CONTENT

A. Show complete sequence of construction by activity, with dates for beginning and completion of each element of construction.

B. Identify each item by specification section number.

C. Identify work of separate stages and other logically grouped activities.

D. Show accumulated percentage of completion of each item, and total percentage of Work completed, as of the first day of each month.

E. Provide separate schedule of submittal dates for shop drawings, product data, and samples, owner-furnished products, products identified under Allowances, and dates reviewed submittals will be required from Architect. Indicate decision dates for selection of finishes.

F. Indicate delivery dates for owner-furnished products.

G. Coordinate content with schedule of values specified in Section 01 2000 - Price and Payment Procedures.

H. Provide legend for symbols and abbreviations used.

3.03 BAR CHARTS

A. Include a separate bar for each major portion of Work or operation.

B. Identify the first work day of each week.

3.04 REVIEW AND EVALUATION OF SCHEDULE

A. Participate in joint review and evaluation of schedule with Architect at each submittal.

B. Evaluate project status to determine work behind schedule and work ahead of schedule.

C. After review, revise as necessary as result of review, and resubmit within 10 days.

3.05 UPDATING SCHEDULE

A. Maintain schedules to record actual start and finish dates of completed activities.

B. Indicate progress of each activity to date of revision, with projected completion date of each activity.

C. Annotate diagrams to graphically depict current status of Work.

D. Identify activities modified since previous submittal, major changes in Work, and other identifiable changes.

E. Indicate changes required to maintain Date of Substantial Completion.

F. Submit reports required to support recommended changes.

G. Provide narrative report to define problem areas, anticipated delays, and impact on the schedule. Report corrective action taken or proposed and its effect.

3.06 DISTRIBUTION OF SCHEDULE

A. Distribute copies of updated schedules to Contractor's project site file, to subcontractors, suppliers, Architect, Owner, and other concerned parties.

B. Instruct recipients to promptly report, in writing, problems anticipated by projections indicated in schedules.

END OF SECTION

SECTION 01 4000
QUALITY REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Submittals.

B. Quality assurance.

C. References and standards.

D. Testing and inspection agencies and services.

E. Contractor's construction-related professional design services.

F. Contractor's design-related professional design services.

G. Control of installation.

H. Mock-ups.

I. Tolerances.

J. Manufacturers' field services.

K. Defect Assessment.

1.02 RELATED REQUIREMENTS

A. Document 00 7200 - General Conditions: Inspections and approvals required by public authorities.

B. Section 01 6000 - Product Requirements: Requirements for material and product quality.

1.03 REFERENCE STANDARDS

A. ASTM C1021 - Standard Practice for Laboratories Engaged in Testing of Building Sealants; 2008 (Reapproved 2019).

B. ASTM C1077 - Standard Practice for Agencies Testing Concrete and Concrete Aggregates for Use in Construction and Criteria for Testing Agency Evaluation; 2017.

C. ASTM C1093 - Standard Practice for Accreditation of Testing Agencies for Masonry; 2022a.

D. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2019.

E. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2021.

F. ASTM E543 - Standard Specification for Agencies Performing Nondestructive Testing; 2021.

G. ASTM E699 - Standard Specification for Agencies Involved in Testing, Quality Assurance, and Evaluating of Manufactured Building Components; 2016.

H. IAS AC89 - Accreditation Criteria for Testing Laboratories; 2021.

1.04 DEFINITIONS

A. Contractor's Professional Design Services: Design of some aspect or portion of the project by party other than the design professional of record. Provide these services as part of the Contract for Construction.

1. Design Services Types Required:
    a. Design-Related: Design services explicitly required to be performed by another design professional due to highly-technical and/or specialized nature of a portion of the project. Services primarily involve engineering analysis, calculations, and design, and are not intended to alter the aesthetic aspects of the design.

B. Design Data: Design-related, signed and sealed drawings, calculations, specifications, certifications, shop drawings and other submittals provided by Contractor, and prepared directly by, or under direct supervision of, appropriately licensed design professional.

1.05 CONTRACTOR'S CONSTRUCTION-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

1.06 CONTRACTOR'S DESIGN-RELATED PROFESSIONAL DESIGN SERVICES

A. Coordination: Contractor's professional design services are subject to requirements of project's Conditions for Construction Contract.

B. Base design on performance and/or design criteria indicated in individual specification sections.

C. Scope of Contractor's Professional Design Services: Provide for the following items of work:
   1. Concrete Mix Design: As described in Section 03 3000 - Cast-in-Place Concrete. No specific designer qualifications are required.
   2. Structural Calculations and Design: As described in Section 03 4100 - Precast Structural Concrete.
   3. Concrete Mix and Structural Design: As described in Section 03 4500 - Precast Architectural Concrete.
   4. Structural Design of Steel Connections: As described in Section 05 1200 - Structural Steel Framing.
   5. Structural Design of Steel Connections: As described in Section 05 2100 - Steel Joist Framing.
   6. Structural Design of Steel Decking: As described in Section 05 3100 - Steel Decking.
   7. Structural Design of Metal Framing: As described in Section 05 4000 - Cold-Formed Metal Framing.
   8. Fire Protection Design: As described in Section 07 8700 - Smoke Containment Barriers.
   9. Structural Design: Include physical characteristics, engineering calculations, and resulting dimensional limitations as described in Section 08 4435 - Protective Framed Glazing Assemblies.
   10. Structural Design: Include physical characteristics, engineering calculations, and resulting dimensional limitations as described in Section 08 4313 - Aluminum-Framed Storefronts.
   11. Structural design: Include calculations for resisting wind loads, anchor locations, and loads at points of attachment as described in Section 08 4327 - Channel Glass Storefronts.
   12. Structural Design: Include calculations for resisting wind loads, anchor locations, loads at points of attachment to building structure, physical characteristics, resulting dimensional limitations as described in Section 08 4413 - Glazed Aluminum Curtain Walls.
   13. Structural Design of Canopy: As described in Section 10 7316.13 - Metal Canopies.
   14. Structural Design of Foundation: As described in Section 10 7500 - Flagpoles.
   15. Structural Design and Calculations: As described in Section 10 8213 - Exterior Grilles and Screens.

1.07 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Test Reports: After each test/inspection, promptly submit two copies of report to Architect and to Contractor.
   1. Include:
      a. Date issued.
      b. Project title and number.
      c. Name of inspector.
      d. Date and time of sampling or inspection.
      e. Identification of product and specifications section.
      f. Location in the Project.
      g. Type of test/inspection.
      h. Date of test/inspection.
      i. Results of test/inspection.
      j. Compliance with Contract Documents.

k. When requested by Architect, provide interpretation of results.

1.08 QUALITY ASSURANCE

A. Testing Agency Qualifications:

B. Designer Qualifications: Where professional engineering design services and design data submittals are specifically required of Contractor by Contract Documents, provide services of a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.09 REFERENCES AND STANDARDS

A. For products and workmanship specified by reference to a document or documents not included in the Project Manual, also referred to as reference standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Comply with reference standard of date of issue current on date of Contract Documents, except where a specific date is established by applicable code.

C. Obtain copies of standards where required by product specification sections.

D. Maintain copy at project site during submittals, planning, and progress of the specific work, until Substantial Completion.

E. Should specified reference standards conflict with Contract Documents, request clarification from Architect before proceeding.

F. Neither the contractual relationships, duties, or responsibilities of the parties in Contract nor those of Architect shall be altered from Contract Documents by mention or inference otherwise in any reference document.

1.10 TESTING AND INSPECTION AGENCIES AND SERVICES

PART 3 EXECUTION

2.01 CONTROL OF INSTALLATION

A. Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce work of specified quality.

B. Comply with manufacturers' instructions, including each step in sequence.

C. Should manufacturers' instructions conflict with Contract Documents, request clarification from Architect before proceeding.

D. Comply with specified standards as minimum quality for the work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.

E. Have work performed by persons qualified to produce required and specified quality.

F. Verify that field measurements are as indicated on shop drawings or as instructed by the manufacturer.

G. Secure products in place with positive anchorage devices designed and sized to withstand stresses, vibration, physical distortion, and disfigurement.

2.02 MOCK-UPS

A. Before installing portions of the Work where mock-ups are required, construct mock-ups in location and size indicated for each form of construction and finish required to comply with the following requirements, using materials indicated for the completed Work. The purpose of mock-up is to demonstrate the proposed range of aesthetic effects and workmanship.

B. Accepted mock-ups establish the standard of quality the Architect will use to judge the Work.

C. Integrated Exterior Mock-ups: Construct integrated exterior mock-up as indicated on drawings. Coordinate installation of exterior envelope materials and products as required in individual Specification Sections. Provide adequate supporting structure for mock-up materials as necessary.

D. Room Mock-ups: Construct room mock-ups as indicated on drawings. Coordinate installation of materials, products, and assemblies as required in specification sections; finish according to requirements. Provide required lighting and any supplemental lighting where required to enable Architect to evaluate quality of the mock-up.

E. Notify Architect and _____ Consultant fifteen (15) working days in advance of dates and times when mock-ups will be constructed.

F. Provide supervisory personnel who will oversee mock-up construction. Provide workers that will be employed during the construction at Project.

G. Tests shall be performed under provisions identified in this section and identified in the respective product specification sections.

H. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

I. Obtain Architect's approval of mock-ups before starting work, fabrication, or construction.

J. Architect will use accepted mock-ups as a comparison standard for the remaining Work.

K. Where mock-up has been accepted by Architect and is specified in product specification sections to be removed, protect mock-up throughout construction, remove mock-up and clear area when directed to do so by Architect.

2.03 TOLERANCES

A. Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Architect before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

2.04 TESTING AND INSPECTION

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of Work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests/inspections specified.

B. Limits on Testing/Inspection Agency Authority:
   1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
   2. Agency may not approve or accept any portion of the Work.
   3. Agency may not assume any duties of Contractor.
   4. Agency has no authority to stop the Work.

C. Contractor Responsibilities:
   1. Deliver to agency at designated location, adequate samples of materials proposed to be used that require testing, along with proposed mix designs.
   2. Cooperate with laboratory personnel, and provide access to the Work and to manufacturers' facilities.
   3. Provide incidental labor and facilities:
      a. To provide access to Work to be tested/inspected.
      b. To obtain and handle samples at the site or at source of Products to be tested/inspected.
      c. To facilitate tests/inspections.
      d. To provide storage and curing of test samples.

4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing/inspection services.
5. Employ services of an independent qualified testing laboratory and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.
6. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

D. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

E. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

2.05 MANUFACTURERS' FIELD SERVICES

A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, test, adjust, and balance equipment, and _____ as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

2.06 DEFECT ASSESSMENT

A. Replace Work or portions of the Work not complying with specified requirements.

B. If, in the opinion of Owner, it is not practical to remove and replace the work, Owner will direct an appropriate remedy or adjust payment.

END OF SECTION

SECTION 01 4533
CODE-REQUIRED SPECIAL INSPECTIONS AND PROCEDURES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Code-required special inspections.

B. Testing services incidental to special inspections.

C. Submittals.

D. Manufacturers' field services.

E. Fabricators' field services.

1.02 RELATED REQUIREMENTS

A. Section 01 4000 - Quality Requirements.

1.03 ABBREVIATIONS AND ACRONYMS

A. AHJ: Authority having jurisdiction.

B. UFC: Unified Facilities Criteria.

C. NIST: National Institute of Standards and Technology.

1.04 DEFINITIONS

A. Authority Having Jurisdiction (AHJ): Agency or individual officially empowered to enforce the building, fire and life safety code requirements of the permitting jurisdiction in which the Project is located.

B. Special Inspection:
   1. Special inspections are inspections and testing of materials, installation, fabrication, erection or placement of components and connections mandated by the AHJ that also require special expertise to ensure compliance with the approved Contract Documents and the referenced standards.
   2. Special inspections are separate from and independent of tests and inspections conducted by Owner or Contractor for the purposes of quality assurance and contract administration.

1.05 REFERENCE STANDARDS

A. AISC 360 - Specification for Structural Steel Buildings; 2022.

B. ASTM D3740 - Standard Practice for Minimum Requirements for Agencies Engaged in Testing and/or Inspection of Soil and Rock as Used in Engineering Design and Construction; 2019.

C. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection, Testing, or Special Inspection; 2021.

D. ASTM E605/E605M - Standard Test Methods for Thickness and Density of Sprayed Fire-Resistive Material (SFRM) Applied to Structural Members; 2019 (Reapproved 2023).

E. ASTM E736/E736M - Standard Test Method for Cohesion/Adhesion of Sprayed Fire-Resistive Materials Applied to Structural Members; 2019 (Reapproved 2023).

F. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2020a.

G. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2020a.

H. ASTM E2570/E2570M - Standard Test Methods for Evaluating Water-Resistive Barrier (WRB) Coatings Used Under Exterior Insulation and Finish Systems (EIFS) or EIFS with Drainage; 2007 (Reapproved 2019).

I. ICC (IBC)-2018 - International Building Code; 2018.

J. Unified Facilities Criteria (UFC).

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Special Inspection Agency Qualifications: Prior to the start of work, the Special Inspection Agency is required to:
   1. Submit agency name, address, and telephone number, names of full time registered Engineer and responsible officer.
   2. Submit copy of report of laboratory facilities inspection made by NIST Construction Materials Reference Laboratory during most recent inspection, with memorandum of remedies of any deficiencies reported by the inspection.
   3. Submit certification that Special Inspection Agency is acceptable to AHJ.

C. Smoke Control Testing Agency Qualifications: Prior to the start of work, the Testing Agency is required to:
   1. Submit agency name, address, and telephone number, and names of full time registered Engineer and responsible officer.
   2. Submit documentary evidence that agency has appropriate credentials and documented experience in fire protection engineering, mechanical engineering and HVAC air balancing.
   3. Submit certification that Testing Agency is acceptable to AHJ.

1.07 SPECIAL INSPECTION AGENCY

A. Owner or Architect will employ services of a Special Inspection Agency to perform inspections and associated testing and sampling in accordance with ASTM E329 and required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.08 TESTING AND INSPECTION AGENCIES

A. Owner or Architect may employ services of an independent testing agency to perform additional testing and sampling associated with special inspections but not required by the building code.

B. Employment of agency in no way relieves Contractor of obligation to perform work in accordance with requirements of Contract Documents.

1.09 QUALITY ASSURANCE

A. Special Inspection Agency Qualifications:
   1. Independent firm specializing in performing testing and inspections of the type specified in this section.

B. Testing Agency Qualifications:
   1. Independent firm specializing in performing testing and inspections of the type specified in this section.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 SPECIAL INSPECTIONS FOR STEEL CONSTRUCTION

A. Structural Steel: Comply with quality assurance inspection requirements of ICC (IBC)-2018.

3.02 SPECIAL INSPECTIONS FOR CONCRETE CONSTRUCTION

3.03 SPECIAL INSPECTIONS FOR MASONRY CONSTRUCTION

3.04 SPECIAL INSPECTIONS FOR SOILS

A. Materials and Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
   1. Design bearing capacity of material below shallow foundations; periodic.
   2. Design depth of excavations and suitability of material at bottom of excavations; periodic.
   3. Materials, densities, lift thicknesses; placement and compaction of backfill: continuous.

4. Subgrade, prior to placement of compacted fill verify proper preparation; periodic.

B. Testing: Classify and test excavated material; periodic.

3.05 SPECIAL INSPECTIONS FOR CAST-IN-PLACE DEEP FOUNDATIONS

A. Materials, Equipment and Final Placement: Verify each item below complies with approved construction documents and approved geotechnical report.
1. Element length; continuous.
2. Element diameters and bell diameters; continuous.
3. Embedment into bedrock; continuous.
4. End bearing strata capacity; continuous.
5. Placement locations and plumbness; continuous.
6. Type and size of hammer; continuous.

B. Drilling Operations: Observe and maintain complete and accurate records for each element; continuous.

C. Material Volume: Record concrete and grout volumes.

D. Concrete Elements Associated with Cast-in-Place Deep Foundations: Perform additional inspections as required by the Special Inspections for Concrete Construction article of this section.

3.06 SPECIAL INSPECTIONS FOR SPRAYED FIRE RESISTANT MATERIALS

A. Sprayed Fire Resistant Materials, General:
1. Verify compliance of sprayed-fire resistant materials with specific fire-rated assemblies indicated in approved Contract Documents, and with applicable requirements of the building code.
2. Perform special inspections after rough installation of electrical, mechanical, plumbing, automatic fire sprinkler and suspension systems for ceilings.

B. Physical and visual tests: Verify compliance with fire resistance rating.
1. Condition of substrates; periodic.
2. Thickness of sprayed fire resistant material; periodic.
3. Density of sprayed fire resistant material in pounds per cubic foot; periodic.
4. Bond strength (adhesion and cohesion); periodic.
5. Condition of finished application; periodic.

C. Structural member surface conditions:
1. Inspect structural member surfaces before application of sprayed fire resistant materials; periodic.
2. Verify preparation of structural member surfaces complies with approved Contract Documents and manufacturer's written instructions; periodic.

D. Application:
1. Ensure minimum ambient temperature before and after application complies with the manufacturer's written instructions; periodic.
2. Verify area where sprayed fire resistant material is applied is ventilated as required by the manufacturer's written instructions during and after application; periodic.

E. Thickness: Verify that no more than 10 percent of thickness measurements taken from sprayed fire resistant material are less than thickness required by fire resistance design in approved Contract Documents. In no case shall the thickness of the sprayed fire resistant material be less than the minimum below.
1. Minimum Allowable Thickness: Tested according to ASTM E605/E605M, periodic.

F. Density: Verify density of sprayed fire resistant material is no less than density required by the fire resistance design in the approved Contract Documents.

G. Bond Strength: Verify adhesive and cohesive bond strength of sprayed fire resistant materials is no less than 150 pounds per square foot when in-place samples of the cured material are tested according to ASTM E736/E736M and as described below.

3.07 SPECIAL INSPECTIONS FOR EXTERIOR INSULATION AND FINISH SYSTEMS (EIFS)

A. Verify water resistive barrier coating applied over sheathing complies with ASTM E2570/E2570M.

3.08 SPECIAL INSPECTIONS FOR FIRE RESISTANT PENETRATIONS AND JOINTS

A. Verify penetration firestops in accordance with ASTM E2174.

B. Verify fire resistant joints in accordance with ASTM E2393.

3.09 SPECIAL INSPECTIONS FOR SMOKE CONTROL

A. Test smoke control systems as follows:
   1. Record device locations and test system for leakage after erection of ductwork but before starting construction that conceals or blocks access to system.
   2. Test and record pressure difference, flow measurements, detection function and controls after system is complete and before structure is occupied.

3.10 SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE

A. Designated Seismic System Verification: Verify label, anchorage or mounting complies with certificate of compliance provided by manufacturer or fabricator.

B. Structural Observations for Seismic Resistance: Visually observe structural system for general compliance with the approved Contract Documents; periodic.

3.11 SPECIAL INSPECTIONS FOR WIND RESISTANCE

3.12 OTHER SPECIAL INSPECTIONS

A. Provide for special inspection of work that, in the opinion of the AHJ, is unusual in nature.

B. Building Envelope Vapor Retarders:
   1. Compliance with requirements of Article 2.4, 1404.3.3 - 1403.3.5 of UFC 3-101-01 Architecture, with Change 3 (2023).

C. Air Barrier Design and Testing:
   1. Compliance with requirements of Article 3-6 of UFC 3-101-01 Architecture, with Change 3 (2023).

3.13 SPECIAL INSPECTION AGENCY DUTIES AND RESPONSIBILITIES

A. Special Inspection Agency shall:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified reference standards.
   3. Ascertain compliance of materials and products with requirements of Contract Documents.
   4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
   5. Perform additional tests and inspections required by Architect.
   6. Submit reports of all tests or inspections specified.

B. Re-testing required because of non-compliance with specified requirements shall be performed by the same agency on instructions by Architect.

C. Re-testing required because of non-compliance with specified requirements shall be paid for by Contractor.

3.14 TESTING AGENCY DUTIES AND RESPONSIBILITIES

A. Testing Agency Duties:
   1. Provide qualified personnel at site. Cooperate with Architect and Contractor in performance of services.
   2. Perform specified sampling and testing of products in accordance with specified standards.
   3. Ascertain compliance of materials and mixes with requirements of Contract Documents.

4. Promptly notify Architect and Contractor of observed irregularities or non-compliance of work or products.
5. Perform additional tests and inspections required by Architect.
6. Submit reports of all tests or inspections specified.

B. Limits on Testing or Inspection Agency Authority:
1. Agency may not release, revoke, alter, or enlarge on requirements of Contract Documents.
2. Agency may not approve or accept any portion of the work.
3. Agency may not assume any duties of Contractor.
4. Agency has no authority to stop the work.

C. On instructions by Architect, perform re-testing required because of non-compliance with specified requirements, using the same agency.

D. Contractor will pay for re-testing required because of non-compliance with specified requirements.

3.15 CONTRACTOR DUTIES AND RESPONSIBILITIES

A. Contractor Responsibilities, General:
1. Deliver to agency at designated location, adequate samples of materials for special inspections that require material verification.
2. Cooperate with agency and laboratory personnel; provide access to approved documents at project site, to the work, to manufacturers' facilities, and to fabricators' facilities.
3. Provide incidental labor and facilities:
a. To provide access to work to be tested or inspected.
b. To obtain and handle samples at the site or at source of Products to be tested or inspected.
c. To facilitate tests or inspections.
d. To provide storage and curing of test samples.
4. Notify Architect and laboratory 24 hours prior to expected time for operations requiring testing or inspection services.
5. Arrange with Owner's agency and pay for additional samples, tests, and inspections required by Contractor beyond specified requirements.

B. Contractor Responsibilities, Wind Force-Resisting System and Wind Force-Resisting Component: Submit written statement of responsibility for each item listed in the Statement of Special Inspections to AHJ and Owner prior to starting work. Statement of responsibility shall acknowledge awareness of special construction requirements and other requirements listed.

3.16 MANUFACTURERS' AND FABRICATORS' FIELD SERVICES

A. When specified in individual specification sections, require material suppliers, assembly fabricators, or product manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, to test, adjust, and balance equipment and _____ as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

3.17 SCHEDULE

A. Schedule of special inspections, as follows herein:

SCHEDULE OF SPECIAL INSPECTIONS

Reference UFGS 01 45 35 for all requirements not noted as part of this schedule.

INSPECTION DEFINITIONS:

PERFORM: Perform these tasks for each weld, fastener or bolted connection, and noted verification.

OBSERVE: Observe these items randomly during the course of each work day to insure that applicable requirements are being met. Operations need not be delayed pending these inspections at contractor's risk.

DOCUMENT: Document, with a report, that the work has been performed in accordance with the contract documents. This is in addition to any other reports required in the Special Inspections guide specification.

CONTINUOUS: Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

The Seismic Design Category for this project is: ☐ A, ☒ B, ☐ C, ☐ D, ☐ E, ☐ F (check appropriate box)

STRUCTURAL - STEEL – WELDING SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

STEEL INSPECTION PRIOR TO WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.2.1, AISC 360-16: Table C-N5.4-1		
TASK	INSPECTION TYPE[1]	DESCRIPTION
1. Verify that the welding procedures specification (WPS) is available	**PERFORM**	
2. Verify manufacturer certifications for welding consumables are available	**PERFORM**	
3. Verify material identification	**PERFORM**	Type and grade.
4. Welder Identification System	**PERFORM**	The fabricator or erector, as applicable, shall maintain a system by which a welder who has welded a joint or member can be identified. Stamps, if used, shall be the low-stress type.
5. Fit-up of groove welds (including joint geometry)	OBSERVE	✓ Joint preparation ✓ Dimensions (alignment, root opening, root face, bevel) ✓ Cleanliness (condition of steel surfaces) ✓ Tacking (tack weld quality and location) ✓ Backing type and fit (if applicable)
6. Configuration and finish of access holes	OBSERVE	
7. Fit-up of fillet welds	OBSERVE	✓ Dimensions (alignment, gaps at root) ✓ Cleanliness (condition of steel surfaces) ✓ Tacking (tack weld quality and location)
STEEL INSPECTION DURING WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.2.1, AISC 360-16: Table C-N5.4-2		
TASK	INSPECTION TYPE	DESCRIPTION
8. Use of qualified welders	**PERFORM**	Welding by welders, welding operators, and tack welders who are qualified in conformance with requirements.
9. Control and handling of welding consumables	OBSERVE	✓ Packaging ✓ Electrode atmospheric exposure control
10. No welding over cracked tack welds	OBSERVE	
11. Environmental conditions	OBSERVE	✓ Wind speed within limits ✓ Precipitation and temperature
12. Welding Procedures Specification followed	OBSERVE	✓ Settings on welding equipment ✓ Travel speed ✓ Selected welding materials ✓ Shielding gas type/flow rate ✓ Preheat applied ✓ Interpass temperature maintained (min./max.) ✓ Proper position (F, V, H, OH) ✓ Intermix of filler metals avoided
13. Welding techniques	OBSERVE	✓ Interpass and final cleaning ✓ Each pass within profile limitations ✓ Each pass meets quality requirements

[1] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

STRUCTURAL - STEEL – WELDING SECTION (CONTINUED)

STEEL INSPECTION AFTER WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.2.1, AISC 360-16: Table C-N5.4-3		
TASK	INSPECTION TYPE [1]	DESCRIPTION
14. Welds cleaned	OBSERVE	
15. Size, length, and location of all welds	**PERFORM**	Size, length, and location of all welds conform to the requirements of the detail drawings.
16. Welds meet visual acceptance criteria	**PERFORM AND DOCUMENT**	✓ Crack prohibition ✓ Weld/base-metal fusion ✓ Crater cross section ✓ Weld profiles ✓ Weld size ✓ Undercut ✓ Porosity
17. Arc strikes	**PERFORM**	
18. k-area	**PERFORM**	When welding of doubler plates, continuity plates or stiffeners has been performed in the k-area, visually inspect the web k-area for cracks.
19. Backing removed, weld tabs removed and finished, and fillet welds added where required	**PERFORM**	
20. Repair activities	**PERFORM AND DOCUMENT**	
21. Document acceptance or rejection of welded joint or member	**PERFORM**	

END SECTION

STRUCTURAL - STEEL – BOLTING SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

STEEL INSPECTION TASKS PRIOR TO BOLTING – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.2.1, AISC 360-16: Table C-N5.6-1		
TASK	INSPECTION TYPE [2]	DESCRIPTION
1. Manufacture's certifications available for fastener materials	**PERFORM**	
2. Fasteners marked in accordance with ASTM requirements	OBSERVE	
3. Proper fasteners selected for joint detail (grade, type, bolt length if threads are to be excluded from shear plane)	OBSERVE	
4. Proper bolting procedure selected for joint detail	OBSERVE	
5. Connecting elements, including appropriate faying surface condition and	OBSERVE	

[1] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
DOCUMENT: Document in a report that the work has been performed as required. This is in addition to all other required reports.

[2] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.
DOCUMENT: Document in a report that the work has been performed as required. This is in addition to all other required reports.

hole preparation, if specified, meet applicable requirements		
6. Proper storage provided for bolts, nuts, washers, and other fastener components	OBSERVE	
STEEL INSPECTION TASKS DURING BOLTING – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.2.1, AISC 360-16: Table C-N5.6-2		
TASK	INSPECTION TYPE [1]	DESCRIPTION
7. Fastener assemblies of suitable condition, placed in all holes and washers (if required) are positioned as required	OBSERVE	
8. Joint brought to the snug-tight condition prior to pretensioning operation	OBSERVE	
9. Fastener component not turned by the wrench prevented from rotating	OBSERVE	
10. Bolts are pretensioned in accordance with RCSC Specification, progressing systematically from the most rigid point toward the free edges	OBSERVE	
STEEL INSPECTION TASKS AFTER BOLTING – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.1, AISC 360-10: Table C-N5.6-3		
TASK	INSPECTION TYPE [1]	DESCRIPTION
11. Document acceptance or rejection of all bolted connections	**DOCUMENT**	

END SECTION

STRUCTURAL - STEEL - NON DESTRUCTIVE TESTING SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

NONDESTRUCTIVE TESTING OF WELDED JOINTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.2.1, AISC 360-16: Section N5.5		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Use of qualified nondestructive testing personnel	**PERFORM**	Visual weld inspection and nondestructive testing (NDT) shall be conducted by personnel qualified in accordance with AWS D1.8 clause 7.2
2. CJP groove welds	OBSERVE	**[NOTE: DOR must delete this row if section D (SEISMIC PROVISIONS SECTION) is checked]** Dye penetrant testing (DT) and ultrasonic testing (UT) shall be performed on 20% of CJP groove welds for materials greater than 5/16" (8mm) thick. Testing rate must be increased to 100% if greater than 5% of welds tested have unacceptable defects.
3. Welded joints subject to fatigue	OBSERVE	Dye penetrant testing (DT) and Ultrasonic testing (UT) shall be performed on 100% of welded joints identified on contract drawings as being subject to fatigue.
4. Weld tab removal sites	OBSERVE	At the end of welds where weld tabs have been removed, magnetic particle testing shall be performed on the same beam-to-column joints receiving UT

END SECTION

[1] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

STRUCTURAL - STEEL - COMPOSITE CONSTRUCTION [1]

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

COMPOSITE CONSTRUCTION PRIOR TO PLACING CONCRETE – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.2.1, AISC 360-16: Table N6.1, AISC 341-16: Table J9.1		
TASK	INSPECTION TYPE [2]	DESCRIPTION
1. Placement and installation of steel headed stud anchors	**PERFORM**	
2. Material identification of reinforcing steel (Type/Grade)	OBSERVE	
3. Determination of carbon equivalent for reinforcing steel other than ASTM A706	OBSERVE	
4. Proper reinforcing steel size, spacing, clearances, support, and orientation	OBSERVE	
5. Reinforcing steel has not been re-bent in the field	OBSERVE	
6. Reinforcing clearances have been provided	OBSERVE	
7. Reinforcing steel has been tied and supported as required	OBSERVE	
8. Composite member has required size	OBSERVE	

END SECTION

STRUCTURAL - STEEL - OTHER INSPECTIONS

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

OTHER STEEL INSPECTIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.2.1, AISC 341-16: Tables J8.1 & J10.1		
TASK	INSPECTION TYPE [2]	DESCRIPTION
1. Anchor rods and other embedments supporting structural steel	**PERFORM**	Verify the diameter, grade, type, and length of the anchor rod or embedded item, and the extent or depth of embedment prior to placement of concrete.
2. Fabricated steel or erected steel frame	OBSERVE	Verify compliance with the details shown on the construction documents, such as braces, stiffeners, member locations and proper application of joint details at each connection.
3. Reduced beam sections (RBS) where/if occurs	**DOCUMENT**	✓ Contour and finish ✓ Dimensional tolerances
4. Protected zones	**DOCUMENT**	No holes or unapproved attachments made by fabricator or erector
5. H-piles where/if occurs	**DOCUMENT**	No holes or unapproved attachments made by the responsible contractor

END SECTION

[1] See Concrete Construction Section for all concrete related inspection of composite steel construction.

[2] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.
DOCUMENT: Document in a report that the work has been performed as required. This is in addition to all other required reports.

STRUCTURAL - COLD-FORMED METAL DECK - PLACEMENT SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

METAL DECK INSPECTION PRIOR TO DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.1		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Verify compliance of materials (deck and all deck accessories) with construction documents, including profiles, material properties, and base metal thickness	**PERFORM**	
2. Document acceptance or rejection of deck and deck accessories	**DOCUMENT**	
METAL DECK INSPECTION DURING DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.2		
TASK	INSPECTION TYPE [1]	DESCRIPTION
3. Verify compliance of deck and all deck accessories installation with construction documents	**PERFORM**	
4. Verify deck materials are represented by the mill certifications that comply with the construction documents	**PERFORM**	
5. Document acceptance or rejection of installation of deck and deck accessories	**DOCUMENT**	
METAL DECK INSPECTION AFTER DECK PLACEMENT – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.3		
TASK	INSPECTION TYPE [1]	DESCRIPTION
6. Welding procedure specification (WPS) available	**PERFORM**	
7. Manufactures certifications for welding consumables available	OBSERVE	
8. Material identification (type/grade)	OBSERVE	
9. Check welding equipment	OBSERVE	

END SECTION

[1] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.
DOCUMENT: Document in a report that the work has been performed as required. This is in addition to all other required reports.

STRUCTURAL - COLD-FORMED METAL DECK – WELDING SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

METAL DECK INSPECTION DURING WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.4		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Use of qualified welders	OBSERVE	
2. Control and handling of welding consumables	OBSERVE	
3. Environmental conditions (wind speed, moisture, temperature)	OBSERVE	
4. WPS followed	OBSERVE	
METAL DECK INSPECTION AFTER WELDING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.5		
TASK	INSPECTION TYPE [1]	DESCRIPTION
5. Verify size and location of welds, including support, sidelap, and perimeter welds.	**PERFORM**	
6. Welds meet visual acceptance criteria	**PERFORM**	
7. Verify repair activities	**PERFORM**	
8. Document acceptance or rejection of welds	**DOCUMENT**	

END SECTION

STRUCTURAL - COLD-FORMED METAL DECK – FASTENING SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

METAL DECK INSPECTION BEFORE MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.6		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Manufacturer installation instructions available for mechanical fasteners	OBSERVE	
2. Proper tools available for fastener installation	OBSERVE	
METAL DECK INSPECTION DURING MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.7		
TASK	INSPECTION TYPE [1]	DESCRIPTION
3. Fasteners are positioned as required	OBSERVE	
4. Fasteners are installed in accordance with manufacturer's instructions	OBSERVE	
METAL DECK INSPECTION AFTER MECHANICAL FASTENING – VERIFY THE FOLLOWING ARE IN COMPLIANCE SDI QA/QC-2011, Appendix 1, Table 1.8		

[1] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.
DOCUMENT: Document in a report that the work has been performed as required. This is in addition to all other required reports.

TASK	INSPECTION TYPE [1]	DESCRIPTION
5. Check spacing, type, and installation of support fasteners	**PERFORM**	
6. Check spacing, type, and installation of sidelap fasteners	**PERFORM**	
7. Check spacing, type, and installation of perimeter fasteners	**PERFORM**	
8. Verify repair activities	**PERFORM**	
9. Document acceptance or rejection of mechanical fasteners	**DOCUMENT**	

END SECTION

STRUCTURAL - LIGHT GAUGE STEEL FRAMING AND/OR LIGHT GAUGE TRUSSES SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

LIGHT GAUGE STEEL CONSTRUCTION AND CONNECTIONS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.2.2, 1705.11.2, 1705.11.3, UFC 4 023 03		
TASK	INSPECTION TYPE[2]	DESCRIPTION
1. Trusses spanning 60-feet or greater where/if applies	**PERFORM**	Verify that temporary and permanent truss restraint/bracing is installed in accordance with approved truss submittal package.
2. Welded connections (seismic and/or wind resisting system)	OBSERVE	Visually inspect all welds composing part of the main wind or seismic force resisting system, including shearwalls, braces, collectors (drag struts), and hold-downs.
3. Connections (seismic and/or wind resisting system)	OBSERVE	Visually inspect all screw attachment, bolting, anchoring and other fastening of components within the main wind or seismic force resisting system, including roof deck, roof framing, exterior wall covering, wall to roof/floor connections, braces, collectors (drag struts) and hold-downs.
4. Cold-formed steel (progressive collapse resisting system where/if applies)	OBSERVE	Verify proper welding operations, screw attachment, bolting, anchoring and other fastening of components within the progressive collapse resisting system, including horizontal tie force elements, vertical tie force elements and bridging elements (UFC 4 023 03).

END SECTION

[1] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.
DOCUMENT: Document in a report that the work has been performed as required. This is in addition to all other required reports.

[2] **PERFORM**: Perform these tasks for each weld, fastener or bolted connection, and required verification.
OBSERVE: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

STRUCTURAL - OPEN-WEB STEEL JOISTS SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

OPEN-WEB STEEL JOISTS AND JOIST GIRDERS – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC TABLE 1705.2.3		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Installation of open-web steel joists and joist girders	OBSERVE	✓ End connections – welded or bolted ✓ Bridging – horizontal and diagonal

END SECTION

STRUCTURAL - CONCRETE CONSTRUCTION SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

CONCRETE CONSTRUCTION, INCLUDING COMPOSITE DECK – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC TABLE 1705.3 (ACI 318 REFERENCES NOTED IN IBC TABLE)		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Inspect reinforcement, including prestressing tendons, and verify placement.	OBSERVE	Verify prior to placing concrete that reinforcing is of specified type, grade and size; that it is free of oil, dirt and unacceptable rust; that it is located and spaced properly; that hooks, bends, ties, stirrups and supplemental reinforcement are placed correctly; that lap lengths, stagger and offsets are provided; and that all mechanical connections are installed per the manufacturer's instructions and/or evaluation report.
2. Reinforcing bar welding	OBSERVE	✓ Verify weldability of reinforcing bars other than ASTM A 706 ✓ Inspect single-pass fillet welds, maximum 5/16" in accordance with AWS D1.4
3. All other welding	**CONTINUOUS**	Visually inspect all welds in accordance with AWS D1.4
4. Cast in place anchors and post installed drilled anchors (downward inclined)	OBSERVE	Verify prior to placing concrete that cast in place anchors and post installed drilled anchors have proper embedment, spacing and edge distance.
5. Post-installed adhesive anchors in horizontal or upward inclined orientations	**CONTINUOUS AND DOCUMENT**	✓ Inspect as required per approved ICC-ES report ✓ Verify that installer is certified for installation of horizontal and overhead installation applications ✓ Inspect proof loading as required by the contract documents
6. Verify use of required mix design	OBSERVE	Verify that all mixes used comply with the approved construction documents
7. Prior to concrete placement, fabricate specimens for strength tests, perform slump and air content tests, and determine the temperature of the concrete	**CONTINUOUS**	At the time fresh concrete is sampled to fabricate specimens for strength test verify these tests are performed by qualified technicians.
8. Inspect concrete and/or shotcrete placement for proper application techniques	**CONTINUOUS**	Verify proper application techniques are used during concrete conveyance and depositing avoids

[1] **OBSERVE**: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.
DOCUMENT: Document in a report that the work has been performed as required. This is in addition to all other required reports.
CONTINUOUS: Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

		segregation or contamination. Verify that concrete is properly consolidated.
9. Verify maintenance of specified curing temperature and technique	OBSERVE	Inspect curing, cold weather protection, and hot weather protection procedures.
10. Pre-stressed concrete	**CONTINUOUS**	Verify application of prestressing forces and grouting of bonded prestressing tendons.
11. Inspect erection of precast concrete members	**OBSERVE**	
12. Verify in-situ concrete strength, prior to stressing of tendons in post-tensioned concrete and prior to removal of shores and forms from beams and structural slabs.	**OBSERVE**	
13. Inspect formwork for shape, location and dimensions of the concrete member being formed.	**OBSERVE**	

END SECTION

STRUCTURAL - MASONRY CONSTRUCTION SECTION (ALL RISK CATEGORIES)

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE AT START OF CONSTRUCTION IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Compliance with approved submittals prior to start	OBSERVE	
2. Proportions of site-mixed mortar.	OBSERVE	
3. Grade and type of reinforcement, anchor bolts, and prestressing tendons and anchorages	OBSERVE	
4. Prestressing technique	OBSERVE	
5. Properties of thin bed mortar for AAC masonry	OBSERVE	
MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE PRIOR TO GROUTING IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE [1]	DESCRIPTION
6. Grout space	OBSERVE	
7. Proportions of site-prepared grout and prestressing grout for bonded tendons	OBSERVE	
8. Proportions of site-mixed grout and prestressing grout for bonded tendons	OBSERVE	
9. Placement of masonry units and mortar joints	OBSERVE	
10. Welding of reinforcement	**CONTINUOUS**	
MASONRY CONSTRUCTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE DURING CONSTRUCTION IBC 1705.4 (ACI 530-13 TABLE 3.1.2 & 3.1.3)		
TASK	INSPECTION TYPE [1]	DESCRIPTION
11. Size and location of structural elements is in compliance	OBSERVE	

[1] **OBSERVE**: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.
CONTINUOUS: Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

12. Preparation, construction, and protection of masonry during cold weather (temperature below 40°F (4.4°c) or hot weather (temp above 90°F (32.2°C))	OBSERVE	
13. Application and measurement of prestressing force	**CONTINUOUS**	
14. Placement of grout and prestressing grout for bonded tendons	**CONTINUOUS**	
15. Placement of AAC masonry units and construction of thin bed mortar joints	**CONTINUOUS**	Continuous for first 5000 square feet only (465 square meters).
16. Observe preparation of grout specimens, mortar specimens, and/or prisms	OBSERVE	
17. Type, size and placement of reinforcement, connectors, anchor bolts and prestressing tendons and anchorages, including details of anchorage of masonry to structural members, frames, or other construction	OBSERVE	

END SECTION

GEOTECHNICAL - SOILS INSPECTION SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

SOILS INSPECTION – VERIFY THE FOLLOWING ARE IN COMPLIANCE IBC 1705.6		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Materials below shallow foundations are adequate to achieve the design bearing capacity.	OBSERVE	
2. Excavations are extended to proper depth and have reached proper material	OBSERVE	
3. Perform classification and testing of compacted fill materials	**OBSERVE**	
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill	**CONTINUOUS**	
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	OBSERVE	During fill placement, the special inspector shall verify that proper materials and procedures are used in accordance with the provisions of the approved geotechnical report

END SECTION

[1] **OBSERVE**: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.
CONTINUOUS: Constant monitoring of identified tasks by a special inspector over the duration of performance of said tasks.

FIRE PROTECTION - SPRAYED FIRE-RESISTANT MATERIALS SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

SPRAYED FIRE RESISTANT MATERIALS (SFRM) – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.14		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Substrate condition	OBSERVE	Prior to application, confirm that surfaces have been prepared according to the approved fire-resistance design and manufacturer's instructions.
2. Material thickness	OBSERVE	Verify SFRM thickness according to 2018 IBC 1705.14.4
3. Material density	OBSERVE	Verify SFRM density according to 2018 IBC 1705.14.5
4. Bond strength	OBSERVE	Verify bond strength of cured SFRM according to IBC 1705.14.6

END SECTION

FIRE PROTECTION – FIRE RESISTANT PENETRATIONS AND JOINTS SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

FIRE RESISTANT PENETRATIONS AND JOINTS – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.17		
TASK	INSPECTION TYPE [1]	DESCRIPTION
1. Inspections of penetration firestop systems conducted in accordance with ASTM E 2174.	OBSERVE	
2. Inspections of fire-resistant joint systems conducted in accordance with ASTM E 2393	OBSERVE	

END SECTION

FIRE PROTECTION – SMOKE CONTROL SECTION

ALL OR PORTIONS OF THIS SECTION ARE APPLICABLE IF BOX IS CHECKED: ☒

SMOKE CONTROL – VERIFY THE FOLLOWING ARE IN COMPLIANCE 2018 IBC 1705.18		
TASK	INSPECTION TYPE [2]	DESCRIPTION
1. Verify device locations and perform leakage testing	OBSERVE	Perform during erection of ductwork and prior to concealment
2. Pressure difference testing, flow measurements and detection and control verification	OBSERVE	Perform prior to occupancy and after sufficient completion

END SECTION

[1] **OBSERVE**: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

[2] **OBSERVE**: Observe these items on a random sampling basis daily to insure that applicable requirements are met. Operations need not be delayed pending these inspections at contractor's risk.

END OF SECTION

SECTION 01 5000
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Dewatering
B. Temporary utilities.
C. Temporary telecommunications services.
D. Temporary sanitary facilities.
E. Temporary Controls: Barriers, enclosures, and fencing.
F. Vehicular access and parking.
G. Waste removal facilities and services.
H. Field offices.

1.02 RELATED REQUIREMENTS

1.03 DEWATERING

A. Provide temporary means and methods for dewatering all temporary facilities and controls.

1.04 TEMPORARY UTILITIES - SEE SECTION 01 5100

1.05 TELECOMMUNICATIONS SERVICES

A. Provide, maintain, and pay for telecommunications services to field office at time of project mobilization.
B. Telecommunications services shall include:
   1. Windows-based personal computer dedicated to project telecommunications, with necessary software and laser printer.
   2. Internet Connections: Minimum of one; DSL modem or faster.
   3. Project web site.

1.06 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Provide at time of project mobilization.
B. Maintain daily in clean and sanitary condition.

1.07 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas, to prevent access to areas that could be hazardous to workers or the public, to allow for owner's use of site and to protect existing facilities and adjacent properties from damage from construction operations and demolition.
B. Provide barricades and covered walkways required by governing authorities for public rights-of-way.
C. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

1.08 FENCING

A. Construction: Commercial grade chain link fence.
B. Provide 6 foot (1.8 m) high fence around construction site; equip with vehicular and pedestrian gates with locks.

1.09 EXTERIOR ENCLOSURES

A. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for Products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

1.10 SECURITY - SEE SECTION 01 3553

A. Provide security and facilities to protect Work, existing facilities, and Owner's operations from unauthorized entry, vandalism, or theft.

1.11 VEHICULAR ACCESS AND PARKING - SEE SECTION 01 5500

A. Coordinate access and haul routes with governing authorities and Owner.

B. Provide and maintain access to fire hydrants, free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering streets.

D. Provide temporary parking areas to accommodate construction personnel. When site space is not adequate, provide additional off-site parking.

1.12 WASTE REMOVAL

A. Provide waste removal facilities and services as required to maintain the site in clean and orderly condition.

B. Provide containers with lids. Remove trash from site periodically.

C. If materials to be recycled or re-used on the project must be stored on-site, provide suitable non-combustible containers; locate containers holding flammable material outside the structure unless otherwise approved by the authorities having jurisdiction.

D. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

1.13 FIELD OFFICES - SEE SECTION 01 5213

A. Office: Weathertight, with lighting, electrical outlets, heating, cooling equipment, and equipped with sturdy furniture, drawing rack, and drawing display table.

B. Provide space for Project meetings, with table and chairs to accommodate 6 persons.

C. Locate offices a minimum distance of 30 feet (10 m) from existing and new structures.

1.14 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, materials, prior to Date of Substantial Completion inspection.

B. Remove underground installations to a minimum depth of 2 feet (600 mm). Grade site as indicated.

C. Clean and repair damage caused by installation or use of temporary work.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION - NOT USED

END OF SECTION

SECTION 015639
TEMPORARY TREE AND PLANT PROTECTION

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. Section includes general protection and pruning of existing trees and plants that are affected by execution of the Work, whether temporary or permanent construction.

B. Related Sections:

1. Division 01 Section "Temporary Facilities and Controls" for temporary site fencing.
2. Division 31 Section "Site Clearing" for removing existing trees and shrubs.
3. Division 31 Section “Earth Moving” for building and utility trench excavation, backfilling, compacting and grading requirements, and soil materials.

1.3 DEFINITIONS

A. Caliper: Diameter of a trunk measured by a diameter tape at 6 inches above the ground for trees up to, and including, 4-inch size; and 12 inches above the ground for trees larger than 4-inch size.

B. Plant-Protection Zone: Area surrounding individual trees, groups of trees, shrubs, or other vegetation to be protected during construction, and indicated on Drawings.

C. Tree-Protection Zone: Area surrounding individual trees or groups of trees to be protected during construction, and indicated on Drawings.

D. Vegetation: Trees, shrubs, groundcovers, grass, and other plants.

1.4 SUBMITTALS

A. Qualification Data: For qualified arborist and tree service firm.

B. Maintenance Recommendations: From arborist, for care and protection of trees affected by construction during and after completing the Work.

1.5 QUALITY ASSURANCE

A. Tree Service Firm Qualifications: An experienced tree service firm that has successfully completed temporary tree and plant protection work similar to that required for this Project

and that will assign an experienced, qualified arborist to Project site during execution of the Work.

1.6 PROJECT CONDITIONS

A. The following practices are prohibited within protection zones:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Foot traffic.
4. Erection of sheds or structures.
5. Impoundment of water.
6. Excavation or other digging unless otherwise indicated.
7. Attachment of signs to or wrapping materials around trees or plants unless otherwise indicated.

B. Do not direct vehicle or equipment exhaust toward protection zones.

C. Prohibit heat sources, flames, ignition sources, and smoking within or near protection zones and organic mulch.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Topsoil: Natural or cultivated top layer of the soil profile or manufactured topsoil; containing organic matter and sand, silt, and clay particles; friable, pervious, and black or a darker shade of brown, gray, or red than underlying subsoil; reasonably free of subsoil, clay lumps, gravel, and other objects more than 1 inch in diameter; and free of weeds, roots, and toxic and other nonsoil materials.

1. Obtain topsoil only from well-drained sites where topsoil is 4 inches deep or more; do not obtain from bogs or marshes.

B. Organic Mulch: Free from deleterious materials and suitable as a top dressing for trees and shrubs, consisting of one of the following:

1. Type: Shredded hardwood, ground or shredded bark, orwood and bark chips.
2. Size Range: 3 inches maximum, 1/2 inch minimum .
3. Color: Natural.

C. Protection-Zone Fencing: Fencing fixed in position and meeting the following requirements.

1. Plastic Protection-Zone Fencing: Plastic construction fencing constructed of high-density extruded and stretched polyethylene fabric with 2-inch maximum opening in pattern and weighing a minimum of 0.4 lb/ft. ; remaining flexible from minus 60 to plus 200 deg F ; inert to most chemicals and acids; minimum tensile yield strength of 2000 psi and ultimate tensile strength of 2680 psi ; secured with plastic bands or galvanized-steel or stainless-steel wire ties; and supported by tubular or T-shape galvanized-steel posts spaced not more than 8 feet apart.

a. Height: 4 feet .
b. Color: High-visibility orange, nonfading.

2. Gates: Double swing access gates matching material and appearance of fencing, to allow for maintenance activities within protection zones; leaf width 36 inches .

D. Protection-Zone Signage: Shop-fabricated, rigid plastic or metal sheet with attachment holes prepunched and reinforced; legibly printed with nonfading lettering and as follows:

1. Lettering: 3-inch- high minimum, white characters on red background.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Erosion and Sedimentation Control: Examine the site to verify that temporary erosion- and sedimentation-control measures are in place. Verify that flows of water redirected from construction areas or generated by construction activity do not enter or cross protection zones.

3.2 PREPARATION

A. Locate and clearly identify trees, shrubs, and other vegetation to remain. Tie a 1-inch blue-vinyl tape around each tree trunk at 54 inches above the ground.

B. Protect tree root systems from damage caused by runoff or spillage of noxious materials while mixing, placing, or storing construction materials. Protect root systems from ponding, eroding, or excessive wetting caused by dewatering operations.

C. Tree-Protection Zones: Mulch areas inside tree-protection zones and other areas indicated.

1. Apply 4-inch average thickness of organic mulch. Do not place mulch within 6 inches of tree trunks.

3.3 TREE- AND PLANT-PROTECTION ZONES

A. Protection-Zone Fencing: Install protection-zone fencing along edges of protection zones before materials or equipment are brought on the site and construction operations begin in a manner that will prevent people from easily entering protected area except by entrance gates. Construct fencing so as not to obstruct safe passage or visibility at vehicle intersections where fencing is located adjacent to pedestrian walkways or in close proximity to street intersections, drives, or other vehicular circulation.
1. Posts: Set or drive posts into ground one-third the total height of the fence without concrete footings. Where a post is located on existing paving or concrete to remain, provide appropriate means of post support acceptable to Architect.
2. Access Gates: Install ; adjust to operate smoothly, easily, and quietly, free of binding, warp, excessive deflection, distortion, nonalignment, misplacement, disruption, or malfunction, throughout entire operational range. Confirm that latches and locks engage accurately and securely without forcing or binding.

B. Protection-Zone Signage: Install protection-zone signage in visibly prominent locations in a manner approved by Architect. Install one sign spaced approximately every 50 feet on protection-zone fencing, but no fewer than four signs with each facing a different direction.

C. Maintain protection zones free of weeds and trash.

D. Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

E. Maintain protection-zone fencing and signage in good condition as acceptable to Architect and remove when construction operations are complete and equipment has been removed from the site.

1. Do not remove protection-zone fencing, even temporarily, to allow deliveries or equipment access through the protection zone.
2. Temporary access is permitted subject to preapproval in writing by arborist if a root buffer effective against soil compaction is constructed as directed by arborist. Maintain root buffer so long as access is permitted.

3.4 EXCAVATION

A. General: Excavate at edge of protection zones and for trenches indicated within protection zones according to requirements in Division 31 Section "Earth Moving."

B. Trenching near Trees: Where utility trenches are required within protection zones, hand excavate under or around tree roots or tunnel under the roots by drilling, auger boring, or pipe jacking. Do not cut main lateral tree roots or taproots; cut only smaller roots that interfere with installation of utilities. Cut roots as required for root pruning.

C. Redirect roots in backfill areas where possible. If encountering large, main lateral roots, expose roots beyond excavation limits as required to bend and redirect them without breaking. If encountered immediately adjacent to location of new construction and redirection is not practical, cut roots approximately 3 inches back from new construction and as required for root pruning.

D. Do not allow exposed roots to dry out before placing permanent backfill. Provide temporary earth cover or pack with peat moss and wrap with burlap. Water and maintain in a moist condition. Temporarily support and protect roots from damage until they are permanently relocated and covered with soil.

3.5 ROOT PRUNING

A. Prune roots that are affected by temporary and permanent construction. Prune roots as follows:

1. Cut roots manually by digging a trench and cutting exposed roots with sharp pruning instruments; do not break, tear, chop, or slant the cuts. Do not use a backhoe or other equipment that rips, tears, or pulls roots.
2. Cut Ends: Do not paint cut root ends .
3. Temporarily support and protect roots from damage until they are permanently redirected and covered with soil.
4. Cover exposed roots with burlap and water regularly.
5. Backfill as soon as possible according to requirements in Division 31 Section "Earth Moving."

B. Root Pruning at Edge of Protection Zone: Prune roots 12 inches outside of the protection zone, by cleanly cutting all roots to the depth of the required excavation.

C. Root Pruning within Protection Zone: Clear and excavate by hand to the depth of the required excavation to minimize damage to root systems. Use narrow-tine spading forks, comb soil to expose roots, and cleanly cut roots as close to excavation as possible.

3.6 REGRADING

A. Lowering Grade: Where new finish grade is indicated below existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

B. Lowering Grade within Protection Zone: Where new finish grade is indicated below existing grade around trees, slope grade away from trees as recommended by arborist unless otherwise indicated.

1. Root Pruning: Prune tree roots exposed by lowering the grade. Do not cut main lateral roots or taproots; cut only smaller roots. Cut roots as required for root pruning.

C. Raising Grade: Where new finish grade is indicated above existing grade around trees, slope grade beyond the protection zone. Maintain existing grades within the protection zone.

D. Minor Fill within Protection Zone: Where existing grade is 2 inches or less below elevation of finish grade, fill with topsoil. Place topsoil in a single uncompacted layer and hand grade to required finish elevations.

3.7 REPAIR AND REPLACEMENT

A. General: Repair or replace trees, shrubs, and other vegetation indicated to remain or be relocated that are damaged by construction operations, in a manner approved by Architect.

1. Submit details of proposed root cutting and tree and shrub repairs.
2. Have arborist perform the root cutting, branch pruning, and damage repair of trees and shrubs.
3. Treat damaged trunks, limbs, and roots according to arborist's written instructions.
4. Perform repairs within 24 hours.
5. Replace vegetation that cannot be repaired and restored to full-growth status, as determined by Architect.

B. Trees: Remove and replace trees indicated to remain that are more than 66 percent dead or in an unhealthy condition before the end of the corrections period or are damaged during construction operations that Architect determines are incapable of restoring to normal growth pattern.

1. Plant and maintain new trees as specified in Division 32 Section "Plants."

C. Soil Aeration: Where directed by Architect, aerate surface soil compacted during construction. Aerate 10 feet beyond drip line and no closer than 36 inches to tree trunk. Drill 2-inch- diameter holes a minimum of 12 inches deep at 24 inches o.c. Backfill holes with an equal mix of augered soil and sand.

3.8 DISPOSAL OF SURPLUS AND WASTE MATERIALS

A. Disposal: Remove excess excavated material, displaced trees, trash and debris, and legally dispose of them off Owner's property.

END OF SECTION 015639

SECTION 01 6000
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. General product requirements.

B. Re-use of existing products.

C. Transportation, handling, storage and protection.

D. Product option requirements.

E. Substitution limitations.

F. Maintenance materials, including extra materials, spare parts, tools, and software.

1.02 RELATED REQUIREMENTS

A. Section 01 2500 - Substitution Procedures: Substitutions made during procurement and/or construction phases.

B. Section 01 4000 - Quality Requirements: Product quality monitoring.

C. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions: Requirements for VOC-restricted product categories.

D. Section 01 7419 - Construction Waste Management and Disposal: Waste disposal requirements potentially affecting product selection, packaging and substitutions.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. Product Data Submittals: Submit manufacturer's standard published data. Mark each copy to identify applicable products, models, options, and other data. Supplement manufacturers' standard data to provide information specific to this Project.

B. Shop Drawing Submittals: Prepared specifically for this Project; indicate utility and electrical characteristics, utility connection requirements, and location of utility outlets for service for functional equipment and appliances.

C. Sample Submittals: Illustrate functional and aesthetic characteristics of the product, with integral parts and attachment devices. Coordinate sample submittals for interfacing work.
   1. For selection from standard finishes, submit samples of the full range of the manufacturer's standard colors, textures, and patterns.

1.05 QUALITY ASSURANCE

PART 2 PRODUCTS

2.01 EXISTING PRODUCTS

2.02 NEW PRODUCTS

A. Provide new products unless specifically required or permitted by Contract Documents.

B. See Section 01 4000 - Quality Requirements, for additional source quality control requirements.

C. Use of products having any of the following characteristics is not permitted:

D. Where other criteria are met, Contractor shall give preference to products that:
   1. If used on interior, have lower emissions, as defined in Section 01 6116.
   2. If wet-applied, have lower VOC content, as defined in Section 01 6116.

2.03 PRODUCT OPTIONS

A. Products Specified by Reference Standards or by Description Only: Use any product meeting those standards or description.

B. Products Specified by Naming One or More Manufacturers: Use a product of one of the manufacturers named and meeting specifications, no options or substitutions allowed.

C. Products Specified by Naming One or More Manufacturers with a Provision for Substitutions: Submit a request for substitution for any manufacturer not named.

2.04 MAINTENANCE MATERIALS

A. Furnish extra materials, spare parts, tools, and software of types and in quantities specified in individual specification sections.

B. Deliver to Project site; obtain receipt prior to final payment.

PART 3 EXECUTION

3.01 SUBSTITUTION LIMITATIONS

A. See Section 01 2500 - Substitution Procedures.

3.02 TRANSPORTATION AND HANDLING

A. Package products for shipment in manner to prevent damage; for equipment, package to avoid loss of factory calibration.

B. If special precautions are required, attach instructions prominently and legibly on outside of packaging.

C. Coordinate schedule of product delivery to designated prepared areas in order to minimize site storage time and potential damage to stored materials.

D. Transport and handle products in accordance with manufacturer's instructions.

E. Transport materials in covered trucks to prevent contamination of product and littering of surrounding areas.

F. Promptly inspect shipments to ensure that products comply with requirements, quantities are correct, and products are undamaged.

G. Provide equipment and personnel to handle products by methods to prevent soiling, disfigurement, or damage, and to minimize handling.

H. Arrange for the return of packing materials, such as wood pallets, where economically feasible.

3.03 STORAGE AND PROTECTION

A. Provide protection of stored materials and products against theft, casualty, or deterioration.

B. Designate receiving/storage areas for incoming products so that they are delivered according to installation schedule and placed convenient to work area in order to minimize waste due to excessive materials handling and misapplication. See Section 01 7419.

1. Structural Loading Limitations: Handle and store products and materials so as not to exceed static and dynamic load-bearing capacities of project floor and roof areas.

C. Store and protect products in accordance with manufacturers' instructions.

D. Store with seals and labels intact and legible.

E. Store sensitive products in weathertight, climate-controlled enclosures in an environment favorable to product.

F. For exterior storage of fabricated products, place on sloped supports above ground.

G. Protect products from damage or deterioration due to construction operations, weather, precipitation, humidity, temperature, sunlight and ultraviolet light, dirt, dust, and other contaminants.

H. Comply with manufacturer's warranty conditions, if any.

I. Cover products subject to deterioration with impervious sheet covering. Provide ventilation to prevent condensation and degradation of products.

J. Prevent contact with material that may cause corrosion, discoloration, or staining.

K. Provide equipment and personnel to store products by methods to prevent soiling, disfigurement, or damage.

L. Arrange storage of products to permit access for inspection. Periodically inspect to verify products are undamaged and are maintained in acceptable condition.

END OF SECTION

SECTION 01 7000
EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Examination, preparation, and general installation procedures.

B. Requirements for alterations work.

C. Pre-installation meetings.

D. Cutting and patching.

E. Surveying for laying out the work.

F. Cleaning and protection.

G. Starting of systems and equipment.

H. Demonstration and instruction of Owner personnel.

I. Closeout procedures, including Contractor's Correction Punch List, except payment procedures.

J. General requirements for maintenance service.

1.02 RELATED REQUIREMENTS

A. Section 01 3000 - Administrative Requirements: Submittals procedures, Electronic document submittal service.

B. Section 01 4000 - Quality Requirements: Testing and inspection procedures.

C. Section 01 7900 - Demonstration and Training: Demonstration of products and systems to be commissioned and where indicated in specific specification sections

D. Section 07 8400 - Firestopping.

1.03 REFERENCE STANDARDS

A. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2022, with Errata (2021).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Survey work: Submit name, address, and telephone number of Surveyor before starting survey work.
   1. On request, submit documentation verifying accuracy of survey work.
   2. Submit a copy of site drawing signed by the Land Surveyor, that the elevations and locations of the work are in compliance with Contract Documents.
   3. Submit surveys and survey logs for the project record.

C. Cutting and Patching: Submit written request in advance of cutting or alteration that affects:
   1. Structural integrity of any element of Project.
   2. Integrity of weather exposed or moisture resistant element.
   3. Efficiency, maintenance, or safety of any operational element.
   4. Visual qualities of sight exposed elements.
   5. Work of Owner or separate Contractor.
   6. Include in request:
      a. Identification of Project.
      b. Location and description of affected work.
      c. Necessity for cutting or alteration.
      d. Description of proposed work and products to be used.
      e. Alternatives to cutting and patching.
      f. Effect on work of Owner or separate Contractor.
      g. Written permission of affected separate Contractor.
      h. Date and time work will be executed.

D. Project Record Documents: Accurately record actual locations of capped and active utilities.

1.05 QUALIFICATIONS

A. For surveying work, employ a land surveyor registered in the State in which the Project is located and acceptable to Architect. Submit evidence of surveyor's Errors and Omissions insurance coverage in the form of an Insurance Certificate. Employ only individual(s) trained and experienced in collecting and recording accurate data relevant to ongoing construction activities,

B. For field engineering, employ a professional engineer of the discipline required for specific service on Project, licensed in the State in which the Project is located. Employ only individual(s) trained and experienced in establishing and maintaining horizontal and vertical control points necessary for laying out construction work on project of similar size, scope and/or complexity.

C. For design of temporary shoring and bracing, employ a Professional Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

1.06 PROJECT CONDITIONS

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

C. Ventilate enclosed areas to assist cure of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.

D. Dust Control: Execute work by methods to minimize raising dust from construction operations. Provide positive means to prevent air-borne dust from dispersing into atmosphere and over adjacent property.
   1. Provide dust-proof enclosures to prevent entry of dust generated outdoors.

E. Erosion and Sediment Control: Plan and execute work by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

F. Noise Control: Provide methods, means, and facilities to minimize noise produced by construction operations.

G. Pest and Rodent Control: Provide methods, means, and facilities to prevent pests and insects from damaging the work.

H. Pollution Control: Provide methods, means, and facilities to prevent contamination of soil, water, and atmosphere from discharge of noxious, toxic substances, and pollutants produced by construction operations. Comply with federal, state, and local regulations.

1.07 COORDINATION

A. Coordinate scheduling, submittals, and work of the various sections of the Project Manual to ensure efficient and orderly sequence of installation of interdependent construction elements, with provisions for accommodating items installed later.

B. Notify affected utility companies and comply with their requirements.

C. Verify that utility requirements and characteristics of new operating equipment are compatible with building utilities. Coordinate work of various sections having interdependent responsibilities for installing, connecting to, and placing in service, such equipment.

D. Coordinate space requirements, supports, and installation of mechanical and electrical work that are indicated diagrammatically on drawings. Follow routing indicated for pipes, ducts, and conduit, as closely as practicable; place runs parallel with lines of building. Utilize spaces efficiently to maximize accessibility for other installations, for maintenance, and for repairs.

E. In finished areas except as otherwise indicated, conceal pipes, ducts, and wiring within the construction. Coordinate locations of fixtures and outlets with finish elements.

F. Coordinate completion and clean-up of work of separate sections.

G. After Owner occupancy of premises, coordinate access to site for correction of defective work and work not in accordance with Contract Documents, to minimize disruption of Owner's activities.

PART 2 PRODUCTS

2.01 PATCHING MATERIALS

A. New Materials: As specified in product sections; match existing products and work for patching and extending work.

B. Type and Quality of Existing Products: Determine by inspecting and testing products where necessary, referring to existing work as a standard.

C. Product Substitution: For any proposed change in materials, submit request for substitution described in Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that existing site conditions and substrate surfaces are acceptable for subsequent work. Start of work means acceptance of existing conditions.

B. Verify that existing substrate is capable of structural support or attachment of new work being applied or attached.

C. Examine and verify specific conditions described in individual specification sections.

D. Take field measurements before confirming product orders or beginning fabrication, to minimize waste due to over-ordering or misfabrication.

E. Verify that utility services are available, of the correct characteristics, and in the correct locations.

F. Prior to Cutting: Examine existing conditions prior to commencing work, including elements subject to damage or movement during cutting and patching. After uncovering existing work, assess conditions affecting performance of work. Beginning of cutting or patching means acceptance of existing conditions.

3.02 PREPARATION

A. Clean substrate surfaces prior to applying next material or substance.

B. Seal cracks or openings of substrate prior to applying next material or substance.

C. Apply manufacturer required or recommended substrate primer, sealer, or conditioner prior to applying any new material or substance in contact or bond.

3.03 PREINSTALLATION MEETINGS

A. Require attendance of parties directly affecting, or affected by, work of the specific section.

B. Notify Architect four days in advance of meeting date.

C. Prepare agenda and preside at meeting:
   1. Review conditions of examination, preparation and installation procedures.
   2. Review coordination with related work.

D. Record minutes and distribute copies within two days after meeting to participants, with two copies to Architect, Owner, participants, and those affected by decisions made.

3.04 LAYING OUT THE WORK

A. Verify locations of survey control points prior to starting work.

B. Promptly notify Architect of any discrepancies discovered.

C. Protect survey control points prior to starting site work; preserve permanent reference points during construction.

D. Promptly report to Architect the loss or destruction of any reference point or relocation required because of changes in grades or other reasons.

E. Replace dislocated survey control points based on original survey control. Make no changes without prior written notice to Architect.

F. Utilize recognized engineering survey practices.

G. Establish elevations, lines and levels. Locate and lay out by instrumentation and similar appropriate means:
   1. Site improvements including pavements; stakes for grading, fill and topsoil placement; utility locations, slopes, and invert elevations; and _____.
   2. Grid or axis for structures.
   3. Building foundation, column locations, ground floor elevations, and _____.

H. Periodically verify layouts by same means.

I. Maintain a complete and accurate log of control and survey work as it progresses.

J. On completion of foundation walls and major site improvements, prepare a certified survey illustrating dimensions, locations, angles, and elevations of construction and site work.

3.05 GENERAL INSTALLATION REQUIREMENTS

A. Install products as specified in individual sections, in accordance with manufacturer's instructions and recommendations, and so as to avoid waste due to necessity for replacement.

B. Make vertical elements plumb and horizontal elements level, unless otherwise indicated.

C. Install equipment and fittings plumb and level, neatly aligned with adjacent vertical and horizontal lines, unless otherwise indicated.

D. Make consistent texture on surfaces, with seamless transitions, unless otherwise indicated.

E. Make neat transitions between different surfaces, maintaining texture and appearance.

3.06 ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
   1. Verify that construction and utility arrangements are as indicated.
   2. Report discrepancies to Architect before disturbing existing installation.
   3. Beginning of alterations work constitutes acceptance of existing conditions.

B. Remove existing work as indicated and as required to accomplish new work.
   1. Protect existing work to be reinstalled.
   2. Remove items indicated on drawings.
   3. Relocate items indicated on drawings.
   4. Where new surface finishes are to be applied to existing work, perform removals, patch, and prepare existing surfaces as required to receive new finish; remove existing finish if necessary for successful application of new finish.
   5. Where new surface finishes are not specified or indicated, patch holes and damaged surfaces to match adjacent finished surfaces as closely as possible.

C. Services (Including but not limited to HVAC, Plumbing, Fire Protection, Electrical, Telecommunications, and _____): Remove, relocate, and extend existing systems to accommodate new construction.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components; if necessary, modify installation to allow access or provide access panel.
   2. Where existing systems or equipment are not active and Contract Documents require reactivation, put back into operational condition; repair supply, distribution, and equipment as required.
   3. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
      a. Disable existing systems only to make switchovers and connections; minimize duration of outages.

b. Provide temporary connections as required to maintain existing systems in service.

4. Verify that abandoned services serve only abandoned facilities.
5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification; patch holes left by removal using materials specified for new construction.

D. Protect existing work to remain.
   1. Prevent movement of structure; provide shoring and bracing if necessary.
   2. Perform cutting to accomplish removals neatly and as specified for cutting new work.
   3. Repair adjacent construction and finishes damaged during removal work.

E. Adapt existing work to fit new work: Make as neat and smooth transition as possible.

F. Patching: Where the existing surface is not indicated to be refinished, patch to match the surface finish that existed prior to cutting. Where the surface is indicated to be refinished, patch so that the substrate is ready for the new finish.

G. Refinish existing surfaces as indicated:
   1. Where rooms or spaces are indicated to be refinished, refinish all visible existing surfaces to remain to the specified condition for each material, with a neat transition to adjacent finishes.
   2. If mechanical or electrical work is exposed accidentally during the work, re-cover and refinish to match.

H. Clean existing systems and equipment.

I. Remove demolition debris and abandoned items from alterations areas and dispose of off-site; do not burn or bury.

J. Do not begin new construction in alterations areas before demolition is complete.

K. Comply with all other applicable requirements of this section.

3.07 CUTTING AND PATCHING

A. Whenever possible, execute the work by methods that avoid cutting or patching.

B. See Alterations article above for additional requirements.

C. Perform whatever cutting and patching is necessary to:
   1. Complete the work.
   2. Fit products together to integrate with other work.
   3. Provide openings for penetration of mechanical, electrical, and other services.
   4. Match work that has been cut to adjacent work.
   5. Repair areas adjacent to cuts to required condition.
   6. Repair new work damaged by subsequent work.
   7. Remove samples of installed work for testing when requested.
   8. Remove and replace defective and non-complying work.

D. Execute work by methods that avoid damage to other work and that will provide appropriate surfaces to receive patching and finishing. In existing work, minimize damage and restore to original condition.

E. Employ original installer to perform cutting for weather exposed and moisture resistant elements, and sight exposed surfaces.

F. Cut rigid materials using masonry saw or core drill. Pneumatic tools not allowed without prior approval.

G. Restore work with new products in accordance with requirements of Contract Documents.

H. Fit work air tight to pipes, sleeves, ducts, conduit, and other penetrations through surfaces.

I. At penetrations of fire rated walls, partitions, ceiling, or floor construction, completely seal voids with fire rated material in accordance with Section 07 8400, to full thickness of the penetrated element.

J. Patching:
   1. Finish patched surfaces to match finish that existed prior to patching. On continuous surfaces, refinish to nearest intersection or natural break. For an assembly, refinish entire unit.
   2. Match color, texture, and appearance.
   3. Repair patched surfaces that are damaged, lifted, discolored, or showing other imperfections due to patching work. If defects are due to condition of substrate, repair substrate prior to repairing finish.

3.08 PROGRESS CLEANING

A. Maintain areas free of waste materials, debris, and rubbish. Maintain site in a clean and orderly condition.

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing the space.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and trash/rubbish from site periodically and dispose off-site; do not burn or bury.

3.09 PROTECTION OF INSTALLED WORK

A. Protect installed work from damage by construction operations.

B. Provide special protection where specified in individual specification sections.

C. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

D. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

E. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

F. Prohibit traffic or storage upon waterproofed or roofed surfaces. If traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

G. Remove protective coverings when no longer needed; reuse or recycle coverings if possible.

3.10 SYSTEM STARTUP

A. Coordinate schedule for start-up of various equipment and systems.

B. Verify that each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions that may cause damage.

C. Verify tests, meter readings, and specified electrical characteristics agree with those required by the equipment or system manufacturer.

D. Verify that wiring and support components for equipment are complete and tested.

E. Execute start-up under supervision of applicable Contractor personnel and manufacturer's representative in accordance with manufacturers' instructions.

F. Submit a written report that equipment or system has been properly installed and is functioning correctly.

3.11 DEMONSTRATION AND INSTRUCTION

A. See Section 01 7900 - Demonstration and Training.

3.12 ADJUSTING

A. Adjust operating products and equipment to ensure smooth and unhindered operation.

3.13 FINAL CLEANING

A. Use cleaning materials that are nonhazardous.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances, polish transparent and glossy surfaces, vacuum carpeted and soft surfaces.

C. Remove all labels that are not permanent. Do not paint or otherwise cover fire test labels or nameplates on mechanical and electrical equipment.

D. Clean equipment and fixtures to a sanitary condition with cleaning materials appropriate to the surface and material being cleaned.

E. Clean filters of operating equipment.

F. Clean debris from roofs, gutters, downspouts, scuppers, overflow drains, area drains, drainage systems, and _____.

G. Clean site; sweep paved areas, rake clean landscaped surfaces.

H. Remove waste, surplus materials, trash/rubbish, and construction facilities from the site; dispose of in legal manner; do not burn or bury.

3.14 CLOSEOUT PROCEDURES

A. Make submittals that are required by governing or other authorities.

B. Accompany Project Coordinator on preliminary inspection to determine items to be listed for completion or correction in the Contractor's Correction Punch List for Contractor's Notice of Substantial Completion.

C. Notify Architect when work is considered ready for Architect's Substantial Completion inspection.

D. Submit written certification containing Contractor's Correction Punch List, that Contract Documents have been reviewed, work has been inspected, and that work is complete in accordance with Contract Documents and ready for Architect's Substantial Completion inspection.

E. Conduct Substantial Completion inspection and create Final Correction Punch List containing Architect's and Contractor's comprehensive list of items identified to be completed or corrected and submit to Architect.

F. Correct items of work listed in Final Correction Punch List and comply with requirements for access to Owner-occupied areas.

G. Notify Architect when work is considered finally complete and ready for Architect's Substantial Completion final inspection.

H. Complete items of work determined by Architect listed in executed Certificate of Substantial Completion.

3.15 MAINTENANCE

A. Provide service and maintenance of components indicated in specification sections.

B. Maintenance Period: As indicated in specification sections or, if not indicated, not less than one year from the Date of Substantial Completion or the length of the specified warranty, whichever is longer.

C. Examine system components at a frequency consistent with reliable operation. Clean, adjust, and lubricate as required.

D. Include systematic examination, adjustment, and lubrication of components. Repair or replace parts whenever required. Use parts produced by the manufacturer of the original component.

E. Maintenance service shall not be assigned or transferred to any agent or subcontractor without prior written consent of the Owner.

END OF SECTION

SECTION 01 7419
CONSTRUCTION WASTE MANAGEMENT AND DISPOSAL

PART 1 GENERAL

1.01 WASTE MANAGEMENT REQUIREMENTS

A. Owner requires that this project generate the least amount of trash and waste possible.

B. Employ processes that ensure the generation of as little waste as possible due to error, poor planning, breakage, mishandling, contamination, or other factors.

C. Minimize trash/waste disposal in landfills; reuse, salvage, or recycle as much waste as economically feasible.

D. Contractor Reporting Responsibilities: Submit periodic Waste Disposal Reports; report landfill disposal, incineration, recycling, salvage, and reuse regardless of to whom the cost or savings accrues; use the same units of measure on required reports.

E. Methods of trash/waste disposal that are not acceptable are:
   1. Burning on the project site.
   2. Burying on the project site.
   3. Dumping or burying on other property, public or private.
   4. Other illegal dumping or burying.

F. Regulatory Requirements: Contractor is responsible for knowing and complying with regulatory requirements, including but not limited to Federal, state and local requirements, pertaining to legal disposal of all construction and demolition waste materials.

1.02 DEFINITIONS

A. Clean: Untreated and unpainted; not contaminated with oils, solvents, caulk, or the like.

B. Construction and Demolition Waste: Solid wastes typically including building materials, packaging, trash, debris, and rubble resulting from construction, remodeling, repair and demolition operations.

C. Hazardous: Exhibiting the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity or reactivity.

D. Nonhazardous: Exhibiting none of the characteristics of hazardous substances, i.e., ignitibility, corrosivity, toxicity, or reactivity.

E. Nontoxic: Neither immediately poisonous to humans nor poisonous after a long period of exposure.

F. Recyclable: The ability of a product or material to be recovered at the end of its life cycle and remanufactured into a new product for reuse by others.

G. Recycle: To remove a waste material from the project site to another site for remanufacture into a new product for reuse by others.

H. Recycling: The process of sorting, cleansing, treating and reconstituting solid waste and other discarded materials for the purpose of using the altered form. Recycling does not include burning, incinerating, or thermally destroying waste.

I. Return: To give back reusable items or unused products to vendors for credit.

J. Reuse: To reuse a construction waste material in some manner on the project site.

K. Salvage: To remove a waste material from the project site to another site for resale or reuse by others.

L. Sediment: Soil and other debris that has been eroded and transported by storm or well production run-off water.

M. Source Separation: The act of keeping different types of waste materials separate beginning from the first time they become waste.

N. Toxic: Poisonous to humans either immediately or after a long period of exposure.

O. Trash: Any product or material unable to be reused, returned, recycled, or salvaged.

P. Waste: Extra material or material that has reached the end of its useful life in its intended use. Waste includes salvageable, returnable, recyclable, and reusable material.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Waste Disposal Reports: Submit at specified intervals, with details of quantities of trash and waste, means of disposal or reuse, and costs; show both totals to date and since last report.
   1. Submit updated Report with each Application for Progress Payment; failure to submit Report will delay payment.
   2. Submit Report on a form acceptable to Owner.
   3. Landfill Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project disposed of in landfills.
      c. State the identity of landfills, total amount of tipping fees paid to landfill, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   4. Incinerator Disposal: Include the following information:
      a. Identification of material.
      b. Amount, in tons or cubic yards (cubic meters), of trash/waste material from the project delivered to incinerators.
      c. State the identity of incinerators, total amount of fees paid to incinerator, and total disposal cost.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
   5. Recycled and Salvaged Materials: Include the following information for each:
      a. Identification of material, including those retrieved by installer for use on other projects.
      b. Amount, in tons or cubic yards (cubic meters), date removed from the project site, and receiving party.
      c. Transportation cost, amount paid or received for the material, and the net total cost or savings of salvage or recycling each material.
      d. Include manifests, weight tickets, receipts, and invoices as evidence of quantity and cost.
      e. Certification by receiving party that materials will not be disposed of in landfills or by incineration.
   6. Material Reused on Project: Include the following information for each:
      a. Identification of material and how it was used in the project.
      b. Amount, in tons or cubic yards (cubic meters).
      c. Include weight tickets as evidence of quantity.
   7. Other Disposal Methods: Include information similar to that described above, as appropriate to disposal method.

PART 3 EXECUTION

2.01 WASTE MANAGEMENT PROCEDURES

A. See Section 01 3000 for additional requirements for project meetings, reports, submittal procedures, and project documentation.

B. See Section 01 5000 for additional requirements related to trash/waste collection and removal facilities and services.

C. See Section 01 6000 for waste prevention requirements related to delivery, storage, and handling.

D. See Section 01 7000 for trash/waste prevention procedures related to demolition, cutting and patching, installation, protection, and cleaning.

2.02 WASTE MANAGEMENT PLAN IMPLEMENTATION

A. Manager: Designate an on-site person or persons responsible for instructing workers and overseeing and documenting results of the Waste Management Plan.

B. Communication: Distribute copies of the Waste Management Plan to job site foreman, each subcontractor, Owner, and Architect.

C. Instruction: Provide on-site instruction of appropriate separation, handling, and recycling, salvage, reuse, and return methods to be used by all parties at the appropriate stages of the project.

D. Meetings: Discuss trash/waste management goals and issues at project meetings.
   1. Prebid meeting.
   2. Preconstruction meeting.
   3. Regular job-site meetings.

E. Facilities: Provide specific facilities for separation and storage of materials for recycling, salvage, reuse, return, and trash disposal, for use by all contractors and installers.
   1. Provide containers as required.
   2. Provide adequate space for pick-up and delivery and convenience to subcontractors.
   3. Keep recycling and trash/waste bin areas neat and clean and clearly marked in order to avoid contamination of materials.

F. Hazardous Wastes: Separate, store, and dispose of hazardous wastes according to applicable regulations.

G. Recycling: Separate, store, protect, and handle at the site identified recyclable waste products in order to prevent contamination of materials and to maximize recyclability of identified materials. Arrange for timely pickups from the site or deliveries to recycling facility in order to prevent contamination of recyclable materials.

H. Reuse of Materials On-Site: Set aside, sort, and protect separated products in preparation for reuse.

I. Salvage: Set aside, sort, and protect products to be salvaged for reuse off-site.

END OF SECTION

SECTION 01 7900
DEMONSTRATION AND TRAINING

PART 1 GENERAL

1.01 SUMMARY

1.02 RELATED REQUIREMENTS

A. Section 01 7800 - Closeout Submittals: Operation and maintenance manuals.

B. Section 01 9113 - General Commissioning Requirements: Additional requirements applicable to demonstration and training.

C. Other Specification Sections: Additional requirements for demonstration and training.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures; except:
   1. Make all submittals specified in this section, and elsewhere where indicated for commissioning purposes, directly to the Commissioning Authority.
   2. Submit one copy to the Commissioning Authority, not to be returned.
   3. Make commissioning submittals on time schedule specified by Commissioning Authority.
   4. Submittals indicated as "Draft" are intended for the use of the Commissioning Authority in preparation of overall Training Plan; submit in editable electronic format, Microsoft Word 2003 preferred.

B. Training Manuals: Provide training manual for each attendee; allow for minimum of two attendees per training session.
   1. Include applicable portion of O&M manuals.
   2. Include copies of all hand-outs, slides, overheads, video presentations, etc., that are not included in O&M manuals.
   3. Provide one extra copy of each training manual to be included with operation and maintenance data.

C. Video Recordings: Submit digital video recording of each demonstration and training session for Owner's subsequent use.
   1. Format: DVD Disc.

1.04 QUALITY ASSURANCE

A. Instructor Qualifications: Familiar with design, operation, maintenance and troubleshooting of the relevant products and systems.
   1. Provide as instructors the most qualified trainer of those contractors and/or installers who actually supplied and installed the systems and equipment.
   2. Where a single person is not familiar with all aspects, provide specialists with necessary qualifications.

PART 2 PRODUCTS - NOT USED

PART 3 EXECUTION

3.01 TRAINING - GENERAL

A. Commissioning Authority will prepare the Training Plan based on draft plans submitted.

B. Conduct training on-site unless otherwise indicated.

C. Owner will provide classroom and seating at no cost to Contractor.

D. Do not start training until Functional Testing is complete, unless otherwise specified or approved by the Commissioning Authority.

E. Provide training in minimum two hour segments.

F. The Commissioning Authority is responsible for determining that the training was satisfactorily completed and will provide approval forms.

G. Training schedule will be subject to availability of Owner's personnel to be trained; re-schedule training sessions as required by Owner; once schedule has been approved by Owner failure to conduct sessions according to schedule will be cause for Owner to charge Contractor for personnel "show-up" time.

H. Review of Facility Policy on Operation and Maintenance Data: During training discuss:
   1. The location of the O&M manuals and procedures for use and preservation; backup copies.
   2. Typical contents and organization of all manuals, including explanatory information, system narratives, and product specific information.
   3. Typical uses of the O&M manuals.

I. Product- and System-Specific Training:
   1. Review the applicable O&M manuals.
   2. For systems, provide an overview of system operation, design parameters and constraints, and operational strategies.
   3. Review instructions for proper operation in all modes, including start-up, shut-down, seasonal changeover and emergency procedures, and for maintenance, including preventative maintenance.
   4. Provide hands-on training on all operational modes possible and preventive maintenance.
   5. Emphasize safe and proper operating requirements; discuss relevant health and safety issues and emergency procedures.
   6. Discuss common troubleshooting problems and solutions.
   7. Discuss any peculiarities of equipment installation or operation.
   8. Discuss warranties and guarantees, including procedures necessary to avoid voiding coverage.
   9. Review recommended tools and spare parts inventory suggestions of manufacturers.
   10. Review spare parts and tools required to be furnished by Contractor.
   11. Review spare parts suppliers and sources and procurement procedures.

J. Be prepared to answer questions raised by training attendees; if unable to answer during training session, provide written response within three days.

END OF SECTION

SECTION 01 9113
GENERAL COMMISSIONING REQUIREMENTS

PART 1 GENERAL

1.01 SUMMARY

A. Commissioning is intended to achieve the following specific objectives; this section specifies the Contractor's responsibilities for commissioning:
   1. Verify that the work is installed in accordance with Contract Documents and the manufacturer92s recommendations and instructions, and that it receives adequate operational checkout prior to startup: Startup reports and Prefunctional Checklists executed by Contractor are utilized to achieve this.
   2. Verify and document that functional performance is in accordance with Contract Documents: Functional Tests executed by Contractor and witnessed by the Commissioning Authority are utilized to achieve this.
   3. Verify that operation and maintenance manuals submitted to Owner are complete: Detailed operation and maintenance (O&M) data submittals by Contractor are utilized to achieve this.
   4. Verify that the Owner’s operating personnel are adequately trained: Formal training conducted by Contractor is utilized to achieve this.

B. The Commissioning Authority directs and coordinates all commissioning activities; this section describes some but not all of the Commissioning Authority's responsibilities.

PART 2 PRODUCTS

2.01 TEST EQUIPMENT

A. Provide all standard testing equipment required to perform startup and initial checkout and required Functional Testing; unless otherwise noted such testing equipment will NOT become the property of Owner.

B. Calibration Tolerances: Provide testing equipment of sufficient quality and accuracy to test and/or measure system performance with the tolerances specified. If not otherwise noted, the following minimum requirements apply:
   1. Temperature Sensors and Digital Thermometers: Certified calibration within past year to accuracy of 0.5 degree F (0.3 degree C) and resolution of plus/minus 0.1 degree F (0.05 degree C).
   2. Pressure Sensors: Accuracy of plus/minus 2.0 percent of the value range being measured (not full range of meter), calibrated within the last year.
   3. Calibration: According to the manufacturer’s recommended intervals and when dropped or damaged; affix calibration tags or keep certificates readily available for inspection.

C. Equipment-Specific Tools: Where special testing equipment, tools and instruments are specific to a piece of equipment, are only available from the vendor, and are required in order to accomplish startup or Functional Testing, provide such equipment, tools, and instruments as part of the work at no extra cost to Owner; such equipment, tools, and instruments are to become the property of Owner.

D. Dataloggers: Independent equipment and software for monitoring flows, currents, status, pressures, etc. of equipment.
   1. Dataloggers required to for Functional Tests will be provided by the Commissioning Authority and will not become the property of Owner.

PART 3 EXECUTION

3.01 COMMISSIONING PLAN

A. Commissioning Authority has prepared the Commissioning Plan.
   1. Attend meetings called by the Commissioning Authority for purposes of completing the commissioning plan.
   2. Require attendance and participation of relevant subcontractors, installers, suppliers, and manufacturer representatives.

B. Contractor is responsible for compliance with the Commissioning Plan.

C. Commissioning Plan: The commissioning schedule, procedures, and coordination requirements for all parties in the commissioning process.

D. Commissioning Schedule:
   1. Submit anticipated dates of startup of each item of equipment and system to Commissioning Authority within 60 days after award of Contract.
   2. Re-submit anticipated startup dates monthly, but not less than 4 weeks prior to startup.
   3. Prefunctional Checklists and Functional Tests are to be performed in sequence from components, to subsystems, to systems.
   4. Provide sufficient notice to Commissioning Authority for delivery of relevant Checklists and Functional Test procedures, to avoid delay.

3.02 STARTUP PLANS AND REPORTS

A. Startup Plans: For each item of equipment and system for which the manufacturer provides a startup plan, submit the plan not less than 8 weeks prior to startup.

B. Startup Reports: For each item of equipment and system for which the manufacturer provides a startup checklist (or startup plan or field checkout sheet), document compliance by submitting the completed startup checklist prior to startup, signed and dated by responsible entity.

C. Submit directly to the Commissioning Authority.

3.03 PREFUNCTIONAL CHECKLISTS

A. A Prefunctional Checklist is required to be filled out for each item of equipment or other assembly specified to be commissioned.
   1. No sampling of identical or near-identical items is allowed.
   2. These checklists do not replace manufacturers' recommended startup checklists, regardless of apparent redundancy.
   3. Prefunctional Checklist forms will not be complete until after award of the contract; the following types of information will be gathered via the completed Checklist forms:
      a. Certification by installing contractor that the unit is properly installed, started up, and operating and ready for Functional Testing.
      b. Confirmation of receipt of each shop drawing and commissioning submittal specified, itemized by unit.
      c. Manufacturer, model number, and relevant capacity information; list information "as specified," "as submitted," and "as installed."
      d. Serial number of installed unit.
      e. List of inspections to be conducted to document proper installation prior to startup and Functional Testing; these will be primarily static inspections and procedures; for equipment and systems may include normal manufacturer’s start-up checklist items and minor testing.
      f. Sensor and actuator calibration information.

B. Contractor is responsible for filling out Prefunctional Checklists, after completion of installation and before startup; witnessing by the Commissioning Authority is not required unless otherwise specified.
   1. Each line item without deficiency is to be witnessed, initialed, and dated by the actual witness; checklists are not complete until all line items are initialed and dated complete without deficiencies.
   2. Checklists with incomplete items may be submitted for approval provided the Contractor attests that incomplete items do not preclude the performance of safe and reliable Functional Testing; re-submission of the Checklist is required upon completion of remaining items.
   3. Individual Checklists may contain line items that are the responsibility of more than one installer; Contractor shall assign responsibility to appropriate installers or subcontractors, with identification recorded on the form.
   4. If any Checklist line item is not relevant, record reasons on the form.

5. Contractor may independently perform startup inspections and/or tests, at Contractor's option.
6. Regardless of these reporting requirements, Contractor is responsible for correct startup and operation.
7. Submit completed Checklists to Commissioning Authority within two days of completion.

C. Commissioning Authority is responsible for furnishing the Prefunctional Checklists to Contractor.
1. Initial Drafts: Contractor is responsible for initial draft of Prefunctional Checklist where so indicated in Contract Documents.
2. Provide all additional information requested by Commissioning Authority to aid in preparation of checklists, such as shop drawing submittals, manufacturers' startup checklists, and O&M data.
3. Commissioning Authority may add any relevant items deemed necessary regardless of whether they are explicitly mentioned in Contract Documents or not.
4. When asked to review the proposed Checklists, do so in a timely manner.

D. Commissioning Authority Witnessing: Required for:
1. Each piece of primary equipment, unless sampling of multiple similar units is allowed by the commissioning plan.
2. A sampling of non-primary equipment, as allowed by the commissioning plan.

E. Deficiencies: Correct deficiencies and re-inspect or re-test, as applicable, at no extra cost to Owner.
1. If difficulty in correction would delay progress, report deficiency to the Commissioning Authority immediately.

3.04 FUNCTIONAL TESTS

A. A Functional Test is required for each item of equipment, system, or other assembly specified to be commissioned, unless sampling of multiple identical or near-identical units is allowed by the final test procedures.

B. Contractor is responsible for execution of required Functional Tests, after completion of Prefunctional Checklist and before closeout.

C. Commissioning Authority is responsible for witnessing and reporting results of Functional Tests, including preparation and completion of forms for that purpose.

D. Contractor is responsible for correction of deficiencies and re-testing at no extra cost to Owner; if a deficiency is not corrected and re-tested immediately, the Commissioning Authority will document the deficiency and the Contractor's stated intentions regarding correction.
1. Deficiencies are any condition in the installation or function of a component, piece of equipment or system that is not in compliance with Contract Documents or does not perform properly.
2. When the deficiency has been corrected, the Contractor completes the form certifying that the item is ready to be re-tested and returns the form to the Commissioning Authority; the Commissioning Authority will reschedule the test and the Contractor shall re-test.
3. Identical or Near-Identical Items: If 10 percent, or three, whichever is greater, of identical or near-identical items fail to perform due to material or manufacturing defect, all items will be considered defective; provide a proposal for correction within 2 weeks after notification of defect, including provision for testing sample installations prior to replacement of all items.
4. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing.
5. Contractor shall bear the cost of Owner and Commissioning Authority personnel time witnessing re-testing if the test failed due to failure to execute the relevant Prefunctional Checklist correctly; if the test failed for reasons that would not have been identified in the Prefunctional Checklist process, Contractor shall bear the cost of the second and subsequent re-tests.

E. Functional Test Procedures:

1. Some test procedures are included in Contract Documents; where Functional Test procedures are not included in Contract Documents, test procedures will be determined by the Commissioning Authority with input by and coordination with Contractor.
2. Examples of Functional Testing:
    a. Test the dynamic function and operation of equipment and systems (rather than just components) using manual (direct observation) or monitoring methods under full operation (e.g., the chiller pump is tested interactively with the chiller functions to see if the pump ramps up and down to maintain the differential pressure setpoint).
    b. Systems are tested under various modes, such as during low cooling or heating loads, high loads, component failures, unoccupied, varying outside air temperatures, fire alarm, power failure, etc.
    c. Systems are run through all the HVAC control system's sequences of operation and components are verified to be responding as the sequence's state.
    d. Traditional air or water test and balancing (TAB) is not Functional Testing; spot checking of TAB by demonstration to the Commissioning Authority is Functional Testing.

F. Deferred Functional Tests: Some tests may need to be performed later, after substantial completion, due to partial occupancy, equipment, seasonal requirements, design or other site conditions; performance of these tests remains the Contractor's responsibility regardless of timing.

3.05 SENSOR AND ACTUATOR CALIBRATION

A. Calibrate all field-installed temperature, relative humidity, carbon monoxide, carbon dioxide, and pressure sensors and gauges, and all actuators (dampers and valves) on this piece of equipment shall be calibrated. Sensors installed in the unit at the factory with calibration certification provided need not be field calibrated.

B. Calibrate using the methods described below; alternate methods may be used, if approved by Commissioning Authority and Owner beforehand. See PART 2 for test instrument requirements. Record methods used on the relevant Prefunctional Checklist or other suitable forms, documenting initial, intermediate and final results.

C. All Sensors:
1. Verify that sensor location is appropriate and away from potential causes of erratic operation.
2. Verify that sensors with shielded cable are grounded only at one end.
3. For sensor pairs that are used to determine a temperature or pressure difference, for temperature make sure they are reading within 0.2 degree F (0.1 degree C) of each other, and for pressure, within tolerance equal to 2 percent of the reading, of each other.
4. Tolerances for critical applications may be tighter.

D. Sensors Without Transmitters - Standard Application:
1. Make a reading with a calibrated test instrument within 6 inches (150 mm) of the site sensor.
2. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
3. If not, install offset, calibrate or replace sensor.

E. Sensors With Transmitters - Standard Application.
1. Disconnect sensor.
2. Connect a signal generator in place of sensor.
3. Connect ammeter in series between transmitter and building automation system control panel.
4. Using manufacturer's resistance-temperature data, simulate minimum desired temperature.
5. Adjust transmitter potentiometer zero until 4 mA is read by the ammeter.
6. Repeat for the maximum temperature matching 20 mA to the potentiometer span or maximum and verify at the building automation system.

7. Record all values and recalibrate controller as necessary to comply with specified control ramps, reset schedules, proportional relationship, reset relationship and P/I reaction.
8. Reconnect sensor.
9. Make a reading with a calibrated test instrument within 6 inches (150 mm) of the site sensor.
10. Verify that the sensor reading, via the permanent thermostat, gauge or building automation system, is within the tolerances in the table below of the instrument-measured value.
11. If not, replace sensor and repeat.
12. For pressure sensors, perform a similar process with a suitable signal generator.

F. Sensor Tolerances for Standard Applications: Plus/minus the following maximums:
1. Watthour, Voltage, Amperage: 1 percent of design.
2. Pressure, Air, Water, Gas: 3 percent of design.
3. Air Temperatures (Outside Air, Space Air, Duct Air): 0.4 degrees F (0.2 degree C).
4. Relative Humidity: 4 percent of design.
5. Barometric Pressure: 0.1 inch of Hg (340 Pa).
6. Flow Rate, Air: 10 percent of design.
7. Flow Rate, Water: 4 percent of design.
8. AHU Wet Bulb and Dew Point: 2.0 degrees F (1.1 degrees C).

G. Critical Applications: For some applications more rigorous calibration techniques may be required for selected sensors. Describe any such methods used on an attached sheet.

H. Valve/Damper Stroke Setup and Check:
1. For all valve/damper actuator positions checked, verify the actual position against the control system readout.
2. Set pump/fan to normal operating mode.
3. Command valve/damper closed; visually verify that valve/damper is closed and adjust output zero signal as required.
4. Command valve/damper to open; verify position is full open and adjust output signal as required.
5. Command valve/damper to a few intermediate positions.
6. If actual valve/damper position does not reasonably correspond, replace actuator or add pilot positioner (for pneumatics).

I. Isolation Valve or System Valve Leak Check: For valves not associated with coils.
1. With full pressure in the system, command valve closed.
2. Use an ultra-sonic flow meter to detect flow or leakage.

3.06 TEST PROCEDURES - GENERAL

A. Provide skilled technicians to execute starting of equipment and to execute the Functional Tests. Ensure that they are available and present during the agreed upon schedules and for sufficient duration to complete the necessary tests, adjustments and problem-solving.

B. Provide all necessary materials and system modifications required to produce the flows, pressures, temperatures, and conditions necessary to execute the test according to the specified conditions. At completion of the test, return all affected equipment and systems to their pre-test condition.

C. Sampling: Where Functional Testing of fewer than the total number of multiple identical or near-identical items is explicitly permitted, perform sampling as follows:
1. Identical Units: Defined as units with same application and sequence of operation; only minor size or capacity difference.
2. Sampling is not allowed for:
   a. Major equipment.
   b. Life-safety-critical equipment.
   c. Prefunctional Checklist execution.
3. XX = the percent of the group of identical equipment to be included in each sample; defined for specific type of equipment.

4. YY = the percent of the sample that if failed will require another sample to be tested; defined for specific type of equipment.
5. Randomly test at least XX percent of each group of identical equipment, but not less than three units. This constitutes the "first sample."
6. If YY percent of the units in the first sample fail, test another XX percent of the remaining identical units.
7. If YY percent of the units in the second sample fail, test all remaining identical units.
8. If frequent failures occur, resulting in more troubleshooting than testing, the Commissioning Authority may stop the testing and require Contractor to perform and document a checkout of the remaining units prior to continuing testing.

D. Manual Testing: Use hand-held instruments, immediate control system readouts, or direct observation to verify performance (contrasted to analyzing monitored data taken over time to make the “observation”).

E. Simulating Conditions: Artificially create the necessary condition for the purpose of testing the response of a system; for example apply hot air to a space sensor using a hair dryer to see the response in a VAV box.

F. Simulating Signals: Disconnect the sensor and use a signal generator to send an amperage, resistance or pressure to the transducer and control system to simulate the sensor value.

G. Over-Writing Values: Change the sensor value known to the control system in the control system to see the response of the system; for example, change the outside air temperature value from 50 degrees F to 75 degrees F to verify economizer operation.

H. Indirect Indicators: Remote indicators of a response or condition, such as a reading from a control system screen reporting a damper to be 100 percent closed, are considered indirect indicators.

I. Monitoring: Record parameters (flow, current, status, pressure, etc.) of equipment operation using dataloggers or the trending capabilities of the relevant control systems; where monitoring of specific points is called for in Functional Test Procedures:
   1. All points that are monitored by the relevant control system shall be trended by Contractor; at the Commissioning Authority’s request, Contractor shall trend up to 20 percent more points than specified at no extra charge.
   2. Other points will be monitored by the Commissioning Authority using dataloggers.
   3. At the option of the Commissioning Authority, some control system monitoring may be replaced with datalogger monitoring.
   4. Provide hard copies of monitored data in columnar format with time down left column and at least 5 columns of point values on same page.
   5. Graphical output is desirable and is required for all output if the system can produce it.
   6. Monitoring may be used to augment manual testing.

3.07 OPERATION AND MAINTENANCE MANUALS

A. See Section 01 7800 - Closeout Submittals for additional requirements.

B. Add design intent documentation furnished by Architect to manuals prior to submission to Owner.

C. Submit manuals related to items that were commissioned to Commissioning Authority for review; make changes recommended by Commissioning Authority.

D. Commissioning Authority will add commissioning records to manuals after submission to Owner.

END OF SECTION

SECTION 02 41 00
DEMOLITION
08/22

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 SAFETY PROFESSIONALS (ASSP)

ASSP A10.6	(2006) Safety & Health Program Requirements for Demolition Operations - American National Standard for Construction and Demolition Operations

U.S. ARMY CORPS OF ENGINEERS (USACE)

EM 385-1-1	(2014) Safety and Health Requirements Manual

U.S. DEFENSE LOGISTICS AGENCY (DLA)

DLA 4145.25	(Jun 2000; Reaffirmed Oct 2010) Storage and Handling of Liquefied and Gaseous Compressed Gases and Their Full and Empty Cylinders; https://www.dla.mil/Portals/104/Documents/DispositionServices /ddsr/docs/cylinderjointpub.pdf

U.S. DEPARTMENT OF DEFENSE (DOD)

DOD 4000.25-1-M	(2006) MILSTRIP - Military Standard Requisitioning and Issue Procedures
MIL-STD-129	(2014; Rev R; Change 1 2018; Change 2 2019) Military Marking for Shipment and Storage

U.S. NATIONAL ARCHIVES AND RECORDS ADMINISTRATION (NARA)

40 CFR 61	National Emission Standards for Hazardous Air Pollutants
49 CFR 173.301	Shipment of Compressed Gases in Cylinders and Spherical Pressure Vessels

1.2 PROJECT DESCRIPTION

1.2.1 GENERAL REQUIREMENTS

A. Do not begin demolition or deconstruction until authorization is received from the Contracting Officer. The work of this section is to be performed in a manner that maximizes the value derived from the salvage and recycling of materials. Remove rubbish and debris from the project site; do not allow accumulations inside or outside the work areas. Remove rubbish and debris from Government property daily, unless otherwise directed. Store materials that cannot be removed daily in areas specified by the Contracting Officer. In the interest of occupational safety and health, perform the work in accordance with EM 385-1-1, Section 23, Demolition, and other applicable Sections.

1.3. ITEMS TO REMAIN IN PLACE

A. Comply with FAR 52.236-9 to protect existing vegetation, structures, equipment, utilities, and improvements. Coordinate the work of this section with all other work indicated. Construct and maintain shoring, bracing, and supports as required. Ensure that structural elements are not overloaded. Increase structural supports or add new supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract. Do not overload, damage or disturb structural elements or pavements to remain. Provide new supports and reinforcement for existing construction weakened by demolition or removal work. Repairs, reinforcement, or structural replacement require approval by the Contracting Officer prior to performing such work.

1.3.1 EXISTING CONSTRUCTION LIMITS AND PROTECTION

A. Do not disturb existing construction beyond the extent indicated or necessary for installation of new construction. Provide temporary shoring and bracing for support of building components to prevent settlement or other movement. Provide protective measures to control accumulation and migration of dust and dirt in all work areas. Remove dust, dirt, and debris from work areas daily.

1.3.2 UTILITY SERVICE

A. Maintain existing utilities indicated to stay in service and protect against damage during demolition and deconstruction operations. Prior to start of work, utilities serving each area of alteration or removal will be shut off by the Government and disconnected and sealed by the Contractor.

1.3.3 FACILITIES

A. Protect electrical and mechanical services and utilities. Where removal of existing utilities and pavement is specified or indicated, provide approved barricades, temporary covering of exposed areas, and temporary services or connections for electrical and mechanical utilities. Floors, roofs, walls, columns, pilasters, and other structural components that are designed and constructed to stand without lateral support or shoring, and are determined to be in stable condition, must remain standing without additional bracing, shoring, or lateral support until demolished or deconstructed, unless directed otherwise by the Contracting Officer. Ensure that no elements determined to be unstable are left unsupported and place and secure bracing, shoring, or lateral supports as may be required as a result of any cutting, removal, deconstruction, or demolition work performed under this contract.

1.4 BURNING

A. The use of burning at the project site for the disposal of refuse and debris will not be permitted.

1.5 SUBMITTALS

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

SD-01 Preconstruction Submittals

Existing Conditions

SD-07 Certificates

Notification

1.6 QUALITY ASSURANCE

A. Submit timely notification of demolition projects to Federal, State, regional, and local authorities in accordance with 40 CFR 61, Subpart M. Notify the Contracting Officer in writing 10 working days prior to the commencement of work in accordance with 40 CFR 61, Subpart M. Comply with federal, state, and local hauling and disposal regulations. In addition to the requirements of the "Contract Clauses," conform to the safety requirements contained in ASSP A10.6. Comply with the Environmental Protection Agency requirements specified. Use of explosives will not be permitted.

1.6.1 DUST AND DEBRIS CONTROL

A. Prevent the spread of dust and debris and avoid the creation of a nuisance or hazard in the surrounding area. Do not use water if it results in hazardous or objectionable conditions such as, but not limited to, ice, flooding, or pollution. Vacuum and dust the work area daily.

1.7 PROTECTION

1.7.1 TRAFFIC CONTROL SIGNS

A. Where pedestrian and driver safety is endangered in the area of removal work, use traffic barricades with flashing lights. Notify the Contracting Officer prior to beginning such work.

1.7.2 PROTECTION OF PERSONNEL

A. Before, during and after the demolition work continuously evaluate the condition of the items being demolished and take immediate action to protect all personnel working in and around the project site. No area, section, or component of floors, roofs, walls, columns, pilasters, or other structural element will be allowed to be left standing without sufficient bracing, shoring, or lateral support to prevent collapse or failure while workmen remove debris or perform other work in the immediate area.

1.8 RELOCATIONS

A. Perform the removal and reinstallation of relocated items as indicated with workmen skilled in the trades involved. Repair or replace items to be relocated which are damaged by the Contractor with new undamaged items as approved by the Contracting Officer.

1.9 EXISTING CONDITIONS

A. Before beginning any demolition or deconstruction work, survey the site and examine the drawings and specifications to determine the extent of the work. Record existing conditions in the presence of the Contracting Officer showing the condition of structures and other facilities adjacent to areas of alteration or removal. Photographs or electronic images with a minimum resolution of 3072 x 2304 pixels, capable of a print resolution of 300 dpi, will be acceptable as a record of existing conditions. Include in the record the elevation of the top of foundation walls, finish floor elevations, possible conflicting electrical conduits, plumbing lines, alarms systems, the location and extent of existing cracks and other damage and description of surface conditions that exist prior to starting work. It is the Contractor's responsibility to verify and document all required outages which will be required during the course of work, and to note these outages on the record document. Submit survey results to the Contracting Officer.

PART 2 PRODUCTS

2.1 FILL MATERIAL

A. Comply with 31 23 00.00 20 EXCAVATION AND FILL.

PART 3 EXECUTION

3.1 EXISTING FACILITIES TO BE REMOVED

A. Inspect and evaluate existing structures onsite for reuse. Disassemble existing construction scheduled to be removed for reuse. Dismantled and removed materials are to be separated, set aside, and prepared as specified, and stored or delivered to a collection point for reuse, remanufacture, recycling, or other disposal, as specified. Designate materials for reuse onsite whenever possible.

3.1.1 UTILITIES AND RELATED EQUIPMENT

3.1.1.1 GENERAL REQUIREMENTS

A. Do not interrupt existing utilities serving occupied or used facilities, except when authorized in writing by the Contracting Officer. Do not interrupt existing utilities serving facilities occupied and used by the Government except when approved in writing and then only after temporary utility services have been approved and provided. Do not begin demolition or deconstruction work until all utility disconnections have been made. Shut off and cap utilities for future use, as indicated.

3.1.1.2 DISCONNECTING EXISTING UTILITIES

A. Remove existing utilities as indicated and terminate in a manner conforming to the nationally recognized code covering the specific utility and approved by the Contracting Officer. When utility lines are encountered but are not indicated on the drawings, notify the Contracting Officer prior to further work in that area. Remove meters and related equipment and deliver to a location in accordance with instructions of the Contracting Officer.

3.1.2 CHAIN LINK FENCING

A. Remove chain link fencing, gates and other related salvaged items scheduled for removal and transport to designated areas. Remove gates as whole units. Cut chain link fabric to 25 foot lengths and store in rolls off the ground.

3.1.3 PAVING AND SLABS

A. Remove sawcut concrete and asphaltic concrete paving and slabs including aggregate base as indicated to a depth of 6 inches below existing adjacent grade. Provide neat sawcuts at limits of pavement removal as indicated. Move, grind and store pavement and slabs designated to be recycled and utilized in this project as directed by the Contracting Officer. Remove pavement and slabs not to be used in this project from the installation at Contractor's expense.

3.1.4 CONCRETE

A. Saw concrete along straight lines to a depth of a minimum 2 inch. Make each cut in walls perpendicular to the face and in alignment with the cut in the opposite face. Break out the remainder of the concrete provided that the broken area is concealed in the finished work, and the remaining concrete is sound. At locations where the broken face cannot be concealed, grind smooth or saw cut entirely through the concrete. Sawcuts in existing concrete sidewalks, roads, concrete pads, or parking areas must be at the nearest existing expansion joint or weakened plane joint and at full depth.

3.1.5 PATCHING

A. Where removals leave holes and damaged surfaces exposed in the finished work, patch and repair these holes and damaged surfaces to match adjacent finished surfaces, using on-site materials when available. Where new work is to be applied to existing surfaces, perform removals and patching in a manner to produce surfaces suitable for receiving new work. Make finished surfaces of patched area flush with the adjacent existing surface and match the existing adjacent surface as closely as possible to texture and finish. Provide patching as specified and indicated, and include the following:

B. Concrete and Masonry: Completely fill holes and depressions, caused by previous physical damage or left as a result of removals in existing masonry walls to remain, with an approved masonry patching material, applied in accordance with the manufacturer's printed instructions.

3.1.6 AIR CONDITIONING EQUIPMENT

A. Remove air conditioning, refrigeration, and other equipment containing refrigerants without releasing chlorofluorocarbon refrigerants to the atmosphere in accordance with the Clean Air Act Amendment of 1990. Recover all refrigerants prior to removing air conditioning, refrigeration, and other equipment containing refrigerants and dispose of in accordance with the paragraph entitled "Disposal of Ozone Depleting Substance (ODS)." Turn in salvaged Class I ODS refrigerants as specified in paragraph, "Salvaged Materials and Equipment."

3.1.7 PIPING

A. Disconnect piping at unions, flanges and valves, and fittings as required to reduce the pipe into straight lengths for practical storage. Store salvaged piping according to size and type. If the piping that remains can become pressurized due to upstream valve failure, attach end caps, blind flanges, or other types of plugs or fittings with a pressure gage and bleed valve to the open end of the pipe to ensure positive leak control. Carefully dismantle piping that previously contained gas, gasoline, oil, or other dangerous fluids, with precautions taken to prevent injury to persons and property. Store piping outdoors until all fumes and residues are removed. Box

prefabricated supports, hangers, plates, valves, and specialty items according to size and type. Wrap sprinkler heads individually in plastic bags before boxing. Classify piping not designated for salvage, or not reusable, as scrap metal.

3.1.7.1 DUCTS

A. Classify removed duct work as scrap metal.

3.1.8 ELECTRICAL EQUIPMENT AND FIXTURES3.1.8.1 ELECTRICAL DEVICES

A. Remove and salvage switches, switchgear, transformers, conductors including wire and nonmetallic sheathed and flexible armored cable, regulators, meters, instruments, plates, circuit breakers, panelboards, outlet boxes, and similar items. Box and tag these items for identification according to type and size.

3.1.8.2 CONDUIT AND MISCELLANEOUS ITEMS

A. Salvage conduit except where embedded in concrete or masonry. Consider corroded, bent, or damaged conduit as scrap metal. Sort straight and undamaged lengths of conduit according to size and type. Classify supports, knobs, tubes, cleats, and straps as debris to be removed and disposed.

3.1.9 ITEMS WITH UNIQUE/REGULATED DISPOSAL REQUIREMENTS

A. Remove and dispose of items with unique or regulated disposal requirements in the manner dictated by law or in the most environmentally responsible manner.

3.2 DISPOSITION OF MATERIAL

3.2.1 TITLE TO MATERIALS

A. Except for salvaged items specified in related Sections, and for materials or equipment scheduled for salvage, all materials and equipment removed and not reused or salvaged, become the property of the Contractor and must be removed from Government property. Materials approved for storage by the Contracting Officer must be removed before completion of the contract. Title to materials resulting from demolition and deconstruction, and materials and equipment to be removed, is vested in the Contractor upon approval by the Contracting Officer. The Government will not be responsible for the condition or loss of, or damage to, such property after contract award. Showing for sale or selling materials and equipment on site is prohibited.

3.2.2 REUSE OF MATERIALS AND EQUIPMENT

A. Remove and store materials and equipment indicated to be reused or relocated to prevent damage, and reinstall as the work progresses.

3.2.3 SALVAGED MATERIALS AND EQUIPMENT

A. Remove materials and equipment that are indicated to be removed by the Contractor and that are to remain the property of the Government, and deliver to a storage site.

B. Salvage items and material to the maximum extent possible.

C. Store all materials salvaged for the Contractor as approved by the Contracting Officer and remove from Government property before completion of the contract.

D. Remove salvaged items to remain the property of the Government in a manner to prevent damage, and packed or crated to protect the items from damage while in storage or during shipment. Items damaged during removal or storage must be repaired or replaced to match existing items. Properly identify the contents of containers. Deliver items reserved as property of the Government to the areas designated by the Contracting Officer.

E. Remove historical items in a manner to prevent damage. Deliver the following historical items to the Government for disposition: Corner stones, contents of corner stones, and document boxes wherever located on the site.3.2.4 Transportation Guidance

F. Ship all ODS containers in accordance with MIL-STD-129, DLA 4145.25 (also referenced one of the following: Army Regulation 700-68, Naval Supply Instruction 4440.128C, Marine Corps Order 10330.2C, and Air Force Regulation 67-12), 49 CFR 173.301, and DOD 4000.25-1-M.

3.2.5 UNSALVAGEABLE AND NON-RECYCLABLE MATERIAL

A. Dispose of unsalvageable and non-recyclable combustible material off the site.

3.3 CLEANUP

A. Remove debris and rubbish from project site and similar excavations. Remove and transport the debris in a manner that prevents spillage on streets or adjacent areas. Apply local regulations regarding hauling and disposal.

3.4 DISPOSAL OF REMOVED MATERIALS

3.4.1 REGULATION OF REMOVED MATERIALS

A. Dispose of debris, rubbish, scrap, and other nonsalvageable materials resulting from removal operations with all applicable federal, state and local regulations as contractually specified.

3.4.2 BURNING ON GOVERNMENT PROPERTY

A. Burning of materials removed from demolished and deconstructed structures will not be permitted on Government property.

3.4.3 REMOVAL TO SPOIL AREAS ON GOVERNMENT PROPERTY

A. Transport noncombustible materials removed from demolition and deconstruction structures to designated spoil areas on Government property.

3.4.4 REMOVAL FROM GOVERNMENT PROPERTY

A. Transport waste materials removed from demolished and deconstructed structures, except waste soil, from Government property for legal disposal. Dispose of waste soil as directed.

3.5 REUSE OF SALVAGED ITEMS

A. Recondition salvaged materials and equipment designated for reuse before installation. Replace items damaged during removal and salvage operations or restore them as necessary to usable condition.

END OF SECTION

SECTION 03 2000
CONCRETE REINFORCING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Reinforcing steel for cast-in-place concrete.

B. Supports and accessories for steel reinforcement.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete.

B. Section 03 4500 - Precast Architectural Concrete: Reinforcement for precast concrete panels.

C. Section 04 2000 - Unit Masonry: Reinforcement for masonry.

D. Section 04 2613 - Masonry Veneer: Spacing for veneer anchor reglets recessed in concrete.

E. Section 26 0526 - Grounding and Bonding for Electrical Systems: Grounding connection to concrete reinforcement.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. ACI MNL-66 - ACI Detailing Manual; 2020.

C. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

D. ASTM A184/A184M - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement; 2019.

E. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

F. ASTM A706/A706M - Standard Specification for Deformed and Plain Low-Alloy Steel Bars for Concrete Reinforcement; 2022a.

G. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

H. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.

I. AWS D1.4/D1.4M - Structural Welding Code - Steel Reinforcing Bars; 2018, with Amendment (2020).

J. CRSI (DA4) - Manual of Standard Practice; 2018, with Errata (2019).

K. CRSI (P1) - Placing Reinforcing Bars, 10th Edition; 2019.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Comply with requirements of ACI MNL-66. Include bar schedules, shapes of bent bars, spacing of bars, and location of splices.

C. Manufacturer's Certificate: Certify that reinforcing steel and accessories supplied for this project meet or exceed specified requirements.

D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301.
   1. Maintain one copy of each document on project site.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.4/D1.4M and no more than 12 months before start of scheduled welding work.

PART 2 PRODUCTS

2.01 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).

B. Reinforcing Steel: ASTM A706/A706M, deformed low-alloy steel bars.

C. Steel Welded Wire Reinforcement (WWR): Deformed type; ASTM A1064/A1064M.
   1. Form: Flat Sheets.

D. Reinforcement Accessories:
   1. Tie Wire: Annealed, minimum 16 gauge, 0.0508 inch (1.29 mm).
   2. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for adequate support of reinforcement during concrete placement.

2.02 FABRICATION

A. Fabricate concrete reinforcing in accordance with CRSI (DA4) - Manual of Standard Practice.

B. Welding of reinforcement is permitted where indicated or only with the specific approval of Architect. Perform welding in accordance with AWS D1.4/D1.4M.

PART 3 EXECUTION

3.01 PLACEMENT

A. Place, support and secure reinforcement against displacement. Do not deviate from required position.

B. Do not displace or damage vapor barrier.

C. Accommodate placement of formed openings.

D. Maintain concrete cover around reinforcing as indicated in drawings.

E. Comply with applicable code for concrete cover over reinforcement.

F. Bond and ground all reinforcement to requirements of Section 26 0526.

3.02 FIELD QUALITY CONTROL

A. An independent testing agency, as specified in Section 01 4000 - Quality Requirements, will inspect installed reinforcement for compliance with contract documents before concrete placement.

END OF SECTION

SECTION 03 3000
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete formwork.

B. Concrete for composite floor construction.

C. Floors and slabs on grade.

D. Concrete footings and foundation walls.

E. Joint devices associated with concrete work.

F. Miscellaneous concrete elements, including equipment pads, equipment pits, light pole bases, and flagpole bases.

G. Concrete curing.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing.

B. Section 07 9200 - Joint Sealants: Products and installation for sealants and joint fillers for saw cut joints and isolation joints in slabs.

C. Section 32 1313 - Concrete Paving: Sidewalks, curbs and gutters.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. ACI PRC-211.1 - Selecting Proportions for Normal-Density and High Density-Concrete - Guide; 2022.

C. ACI PRC-302.1 - Guide to Concrete Floor and Slab Construction; 2015.

D. ACI PRC-304 - Guide for Measuring, Mixing, Transporting, and Placing Concrete; 2000 (Reapproved 2009).

E. ACI PRC-305 - Guide to Hot Weather Concreting; 2020.

F. ACI PRC-306 - Guide to Cold Weather Concreting; 2016.

G. ACI PRC-308 - Guide to External Curing of Concrete; 2016.

H. ACI PRC-347 - Guide to Formwork for Concrete; 2014 (Reapproved 2021).

I. ACI SPEC-117 - Specification for Tolerances for Concrete Construction and Materials; 2010 (Reapproved 2015).

J. ACI SPEC-301 - Specifications for Concrete Construction; 2020.

K. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

L. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

M. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.

N. ASTM C39/C39M - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens; 2021.

O. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2022a.

P. ASTM C109/C109M - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (Using 2-in. or [50 mm] Cube Specimens); 2021.

Q. ASTM C143/C143M - Standard Test Method for Slump of Hydraulic-Cement Concrete; 2020.

R. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.

S. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete; 2020.

T. ASTM C173/C173M - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method; 2016.

U. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

V. ASTM C309 - Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete; 2019.

W. ASTM C476 - Standard Specification for Grout for Masonry; 2023.

X. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).

Y. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2023, with Editorial Revision.

Z. ASTM C685/C685M - Standard Specification for Concrete Made by Volumetric Batching and Continuous Mixing; 2017.

AA. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2016.

AB. ASTM C881/C881M - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete; 2020a.

AC. ASTM C1059/C1059M - Standard Specification for Latex Agents for Bonding Fresh to Hardened Concrete; 2021.

AD. ASTM C1107/C1107M - Standard Specification for Packaged Dry, Hydraulic-Cement Grout (Nonshrink); 2020.

AE. ASTM C1311 - Standard Specification for Solvent Release Sealants; 2022.

AF. ASTM C1315 - Standard Specification for Liquid Membrane-Forming Compounds Having Special Properties for Curing and Sealing Concrete; 2019.

AG. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2018.

AH. ASTM D1751 - Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types); 2018.

AI. ASTM D1752 - Standard Specification for Preformed Sponge Rubber, Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction; 2018.

AJ. ASTM D2103 - Standard Specification for Polyethylene Film and Sheeting; 2015.

AK. ASTM D8139 - Standard Specification for Semi-Rigid, Closed-Cell Polypropylene Foam, Preformed Expansion Joint Fillers for Concrete Paving and Structural Construction; 2017.

AL. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a, with Editorial Revision (2023).

AM. ASTM E1155 - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers; 2020.

AN. ASTM E1155M - Standard Test Method for Determining FF Floor Flatness and FL Floor Levelness Numbers (Metric); 2014.

AO. ASTM E1643 - Standard Practice for Selection, Design, Installation, and Inspection of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs; 2018a.

AP. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill under Concrete Slabs; 2017 (Reapproved 2023).

AQ. ICC-ES AC380 - Acceptance Criteria for Termite Physical Barrier Systems; 2014, with Editorial Revision (2017).

AR. ICRI 310.2R - Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, Polymer Overlays, and Concrete Repair; 2013.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturers' data on manufactured products showing compliance with specified requirements and installation instructions.
   1. For curing compounds, provide data on method of removal in the event of incompatibility with floor covering adhesives.
   2. For membrane-forming, moisture emission-reducing, curing and sealing compound, provide manufacturer's installation instructions,.

C. Mix Design: Submit proposed concrete mix design.
   1. Indicate proposed mix design complies with requirements of ACI SPEC-301, Section 4 - Concrete Mixtures.
   2. Indicate proposed mix design complies with requirements of ACI CODE-318, Chapter 5 - Concrete Quality, Mixing and Placing.
   3. Indicate proposed mix design complies with admixture manufacturer's written recommendations.

D. Samples: Submit samples of underslab vapor retarder to be used.

E. Test Reports: Submit report for each test or series of tests specified.

1.05 QUALITY ASSURANCE

A. Perform work of this section in accordance with ACI SPEC-301 and ACI CODE-318.
   1. Maintain one copy of each document on site.

B. Follow recommendations of ACI PRC-305 when concreting during hot weather.

C. Follow recommendations of ACI PRC-306 when concreting during cold weather.

D. For slabs required to include moisture vapor reducing admixture (MVRA), do not proceed with placement unless manufacturer's representative is present for first day of placement.

E. For slabs indicated to receive membrane-forming, moisture emission-reducing, curing and sealing compound, do not proceed with application unless manufacturer's representative is present for first day of placement.

PART 2 PRODUCTS

2.01 FORMWORK

A. Formwork Design and Construction: Comply with guidelines of ACI PRC-347 to provide formwork that will produce concrete complying with tolerances of ACI SPEC-117.

B. Form Materials: Contractor's choice of standard products with sufficient strength to withstand hydrostatic head without distortion in excess of permitted tolerances.
   1. Form Facing for Exposed Finish Concrete: Contractor's choice of materials that will provide smooth, stain-free final appearance.
   2. Form Coating: Release agent that will not adversely affect concrete or interfere with application of coatings.
   3. Form Ties: Cone snap type that will leave no metal within 1-1/2 inches (38 mm) of concrete surface.

2.02 REINFORCEMENT MATERIALS

A. Comply with requirements of Section 03 2000.

2.03 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal Portland type.
   1. Acquire cement for entire project from same source.

B. Fine and Coarse Aggregates: ASTM C33/C33M.
   1. Acquire aggregates for entire project from same source.

C. Fly Ash: ASTM C618, Class C or F.

D. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

2.04 ADMIXTURES

A. Do not use chemicals that will result in soluble chloride ions in excess of 0.1 percent by weight of cement.

B. Air Entrainment Admixture: ASTM C260/C260M.

C. High Range Water Reducing and Retarding Admixture: ASTM C494/C494M Type G.

D. High Range Water Reducing Admixture: ASTM C494/C494M Type F.

E. Water Reducing and Accelerating Admixture: ASTM C494/C494M Type E.

F. Water Reducing and Retarding Admixture: ASTM C494/C494M Type D.

G. Accelerating Admixture: ASTM C494/C494M Type C.

H. Retarding Admixture: ASTM C494/C494M Type B.

I. Water Reducing Admixture: ASTM C494/C494M Type A.

2.05 ACCESSORY MATERIALS

A. Underslab Vapor Retarder:
   1. Sheet Material: ASTM E1745, Class A; 10 mils minimum, stated by manufacturer as suitable for installation in contact with soil or granular fill under concrete slabs. Single-ply polyethylene is prohibited.
   2. Accessory Products: Vapor retarder manufacturer's recommended tape, adhesive, mastic, prefabricated boots, etc., for sealing seams and penetrations.
   3. Products:
      a. Henry Company; Moistop Ultra 10: www.henry.com/#sle.
      b. Inteplast Group; Barrier-Bac VB-250: www.barrierbac.com/#sle.
      c. ISI Building Products; Viper VaporCheck II 10-mil (Class A): www.isibp.com/#sle.
      d. Poly-America; Husky Yellow Guard Class A 10-mil Vapor Barrier: www.yellowguard.com/#sle.
      e. Stego Industries, LLC; ____: www.stegoindustries.com/#sle.
      f. Tex-Trude, LP; Xtreme Vapor Barrier (10-mil): www.tex-trude.com/#sle.
      g. W. R. Meadows, Inc; PERMINATOR Class A - 10 mils (0.25 mm): www.wrmeadows.com/#sle.
      h. Substitutions: See Section 01 6000 - Product Requirements.

B. Non-Shrink Cementitious Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Grout: Comply with ASTM C1107/C1107M.
   2. Height Change, Plastic State; when tested in accordance with ASTM C827/C827M:
      a. Maximum: Plus 4 percent.
      b. Minimum: Plus 1 percent.
   3. Minimum Compressive Strength at 28 Days, ASTM C109/C109M: 7,000 pounds per square inch (48 MPa).
   4. Products containing aluminum powder are not permitted.
   5. Flowable Products:
      a. Euclid Chemical Company; NS GROUT: www.euclidchemical.com/#sle.
      b. Five Star Products, Inc; Five Star Fluid Grout 100: www.fivestarproducts.com/#sle.
      c. Kaufman Products Inc; SureGrout: www.kaufmanproducts.net/#sle.
      d. W. R. Meadows, Inc; CG-86: www.wrmeadows.com/#sle.
      e. Substitutions: See Section 01 6000 - Product Requirements.
   6. Low-Slump, Dry Pack Products:
      a. Euclid Chemical Company; DRY PACK GROUT: www.euclidchemical.com/#sle.
      b. Five Star Products, Inc; Five Star Grout: www.fivestarproducts.com/#sle.
      c. SpecChem, LLC; SC Multipurpose Grout: www.specchemllc.com/#sle.

d. Substitutions: See Section 01 6000 - Product Requirements.

2.06 BONDING AND JOINTING PRODUCTS

A. Epoxy Bonding System:
   1. Complying with ASTM C881/C881M and of Type required for specific application.

B. Reglets: Formed steel sheet, galvanized, with temporary filler to prevent concrete intrusion during placement.
   1. Size: 1/2 inch (13 mm) throat, 1/2 inch (13 mm) deep unless otherwise indicated on drawings.

C. Slab Isolation Joint Filler: 1/2-inch (13 mm) thick, height equal to slab thickness, with removable top section forming 1/2-inch (13 mm) deep sealant pocket after removal.
   1. Material: ASTM D1751, cellulose fiber.
   2. Products:
      a. Nomaco, Inc; Nomaflex Expansion Joint Filler with Void Cap Option: www.nomaco.com/#sle.
      b. WE Cork, Inc; Expansion Joints: www.wecork.com/#sle.
      c. W. R. Meadows, Inc; Fiber Expansion Joint Filler with Snap-Cap: www.wrmeadows.com/#sle.
      d. Substitutions: See Section 01 6000 - Product Requirements.

D. Slab Construction Joint Devices: Combination keyed joint form and screed, galvanized steel, with rectangular or round knockout holes for conduit or rebar to pass through joint form at 6 inches (150 mm) on center; ribbed steel stakes for setting.

E. Plate Dowel System: Steel plate dowel and plastic dowel sleeve; with integral fasteners for attachment to formwork.
   1. Manufacturers: As indicated on drawings.
      a. Substitutions: See Section 01 6000 - Product Requirements.

2.07 CURING MATERIALS

A. Evaporation Reducer: Liquid thin-film-forming compound that reduces rapid moisture loss caused by high temperature, low humidity, and high winds; intended for application immediately after concrete placement.
   1. Products:
      a. Dayton Superior Corporation; _____: www.daytonsuperior.com/#sle.
      b. Euclid Chemical Company ; EUCOBAR: www.euclidchemical.com/#sle.
      c. Kaufman Products Inc; VaporAid: www.kaufmanproducts.net/#sle.
      d. Nox-Crete Inc; Monofilm: www.nox-crete.com/#sle.
      e. SpecChem, LLC; SpecFilm Concentrate or SpecFilm: www.specchemllc.com/#sle.
      f. W. R. Meadows, Inc ; Evapre or Evapre-RTU: www.wrmeadows.com/#sle.
      g. Substitutions: See Section 01 6000 - Product Requirements.

B. Curing Compound, Naturally Dissipating: Clear, water-based, liquid membrane-forming compound; complying with ASTM C309.
   1. Provide product containing fugitive red dye.

C. Curing and Sealing Compound, Moisture Emission-Reducing, Membrane-Forming: Clear, liquid sealer for application to newly-placed concrete; capable of providing adequate bond for flooring adhesives, initially and over the long term; with sufficient moisture vapor impermeability to prevent deterioration of flooring adhesives due to moisture emission.
   1. Use this product to cure and seal all slabs to receive adhesively applied flooring or roofing.
   2. Comply with ASTM C309 and ASTM C1315 Type I Class A.
   3. VOC Content: Less than 100 g/L.
   4. Solids Content: 25 percent, minimum.
   5. Products:
      a. Floor Seal Technology, Inc; VaporSeal 309 System: www.floorseal.com/#sle.
      b. Forta Corporation; _____: www.forta-ferro.com/#sle.
      c. _____.

d. Substitutions: See Section 01 6000 - Product Requirements.

D. Curing and Densifying Compound, Membrane-Forming: Lithium polysilicate-based, clear, liquid densifier for application to newly-placed concrete.
1. Comply with ASTM C309.
2. VOC Content: Less than 50 g/L.
3. Solids Content: 25 percent, minimum.
4. Products:
a. Adhesives Technology Corporation; Pentra-Cure (MH): www.atcepoxy.com/#sle.
b. Green Umbrella Architectural Concrete Systems; SoloCure: www.greenumbrellasystems.com/#sle.
c. Substitutions: See Section 01 6000 - Product Requirements.

E. Moisture-Retaining Sheet: ASTM C171.
1. Curing paper, regular.
2. Polyethylene film, white opaque, minimum nominal thickness of 4 mil, 0.004 inch (0.102 mm).
3. White-burlap-polyethylene sheet, weighing not less than 3.8 ounces per square yard (1.71 kg/sq m).

F. Polyethylene Film: ASTM D2103, 4 mil, 0.004 inch (0.102 mm) thick, clear.

G. Water: Potable, not detrimental to concrete.

2.08 CONCRETE MIX DESIGN

A. Proportioning Normal Weight Concrete: Comply with ACI PRC-211.1 recommendations.

B. Concrete Strength: Establish required average strength for each type of concrete on the basis of field experience or trial mixtures, as specified in ACI SPEC-301.
1. For trial mixtures method, employ independent testing agency acceptable to Architect for preparing and reporting proposed mix designs.

C. Admixtures: Add acceptable admixtures as recommended in ACI PRC-211.1 and at rates recommended or required by manufacturer.

D. Normal Weight Concrete:
1. Compressive Strength, when tested in accordance with ASTM C39/C39M at 28 days: As indicated on drawings.
2. Fly Ash Content: Maximum 25 percent of cementitious materials by weight.
3. Water-Cement Ratio: Maximum 50 percent by weight.
4. Total Air Content: 4 percent, determined in accordance with ASTM C173/C173M.
5. Maximum Slump: 5 inches (___ mm).
6. Maximum Aggregate Size: 3/4 inch (19 mm).

2.09 MIXING

A. On Project Site: Mix in drum type batch mixer, complying with ASTM C685/C685M. Mix each batch not less than 1-1/2 minutes and not more than 5 minutes.

B. Transit Mixers: Comply with ASTM C94/C94M.

C. Adding Water: If concrete arrives on-site with slump less than suitable for placement, do not add water that exceeds the maximum water-cement ratio or exceeds the maximum permissible slump.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify lines, levels, and dimensions before proceeding with work of this section.

3.02 PREPARATION

A. Formwork: Comply with requirements of ACI SPEC-301. Design and fabricate forms to support all applied loads until concrete is cured and for easy removal without damage to concrete.

B. Verify that forms are clean and free of rust before applying release agent.

C. Coordinate placement of embedded items with erection of concrete formwork and placement of form accessories.

D. Prepare existing concrete surfaces to be repaired according to ICRI 310.2R, _____.

E. Where new concrete is to be bonded to previously placed concrete, prepare existing surface by cleaning and applying bonding agent in according to bonding agent manufacturer's instructions.
   1. Use epoxy bonding system for bonding to damp surfaces, for structural load-bearing applications, and where curing under humid conditions is required.

F. In locations where new concrete is doweled to existing work, drill holes in existing concrete, insert steel dowels and pack solid with non-shrink grout.

G. Interior Slabs on Grade: Install vapor retarder under interior slabs on grade. Comply with ASTM E1643. Lap joints minimum 6 inches (150 mm). Seal joints, seams and penetrations watertight with manufacturer's recommended products and follow manufacturer's written instructions. Repair damaged vapor retarder before covering.
   1. Vapor Retarder Over Drainage Course: Install drainagecourse before placing vapor retarder as indicated on drawings.

3.03 PLACING CONCRETE

A. Place concrete in accordance with ACI PRC-304.

B. Place concrete for floor slabs in accordance with ACI PRC-302.1.

C. Notify Architect not less than 24 hours prior to commencement of placement operations.

D. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.

E. Ensure reinforcement, inserts, embedded parts, and formed construction joint devices will not be disturbed during concrete placement.

F. Finish floors level and flat, unless otherwise indicated, within the tolerances specified on the drawings.

3.04 SLAB JOINTING

A. Locate joints as indicated on drawings.

B. Anchor joint fillers and devices to prevent movement during concrete placement.

C. Isolation Joints: Use preformed joint filler with removable top section for joint sealant, total height equal to thickness of slab, set flush with top of slab.
   1. Install wherever necessary to separate slab from other building members, including columns, walls, equipment foundations, footings, stairs, manholes, sumps, and drains.

D. Load Transfer Construction and Contraction Joints: Install load transfer devices as indicated; saw cut joint at surface as indicated for contraction joints.

E. Saw Cut Contraction Joints: Saw cut joints before concrete begins to cool, within 4 to 12 hours after placing; use 1/8" to 3/16 inch (5 mm) thick blade and cut at least 1 inch (25 mm) deep but not less than one quarter (1/4) the depth of the slab.

F. Construction Joints: Where not otherwise indicated, use metal combination screed and key form, with removable top section for joint sealant.

3.05 FLOOR FLATNESS AND LEVELNESS TOLERANCES

A. An independent testing agency, as specified in Section 01 4000, will inspect finished slabs for compliance with specified tolerances.

B. Minimum F(F) Floor Flatness and F(L) Floor Levelness Values: As indicated on the drawings.

C. Measure F(F) Floor Flatness and F(L) Floor Levelness in accordance with ASTM E1155 (ASTM E1155M), within 48 hours after slab installation; report both composite overall values and local values for each measured section.

D. Correct the slab surface if composite overall value is less than specified and if local value is less than two-thirds of specified value or less than F(F) 13/F(L) 10.

E. Correct defects by grinding or by removal and replacement of the defective work. Areas requiring corrective work will be identified. Re-measure corrected areas by the same process.

3.06 CONCRETE FINISHING

A. Repair surface defects, including tie holes, immediately after removing formwork.

B. Unexposed Form Finish: Rub down or chip off fins or other raised areas 1/4 inch (6 mm) or more in height.

C. Exposed Form Finish: Rub down or chip off and smooth fins or other raised areas 1/4 inch (6 mm) or more in height. Provide finish as follows:
   1. Smooth Rubbed Finish: Wet concrete and rub with carborundum brick or other abrasive, not more than 24 hours after form removal.
   2. Grout Cleaned Finish: Wet areas to be cleaned and apply grout mixture by brush or spray; scrub immediately to remove excess grout. After drying, rub vigorously with clean burlap, and keep moist for 36 hours.

D. Concrete Slabs: Finish to requirements of ACI PRC-302.1 and as follows:
   1. Surfaces to Receive Thick Floor Coverings: "Wood float" as described in ACI PRC-302.1; thick floor coverings include quarry tile, ceramic tile, and Portland cement terrazzo with full bed setting system.
   2. Surfaces to Receive Thin Floor Coverings: "Steel trowel" as described in ACI PRC-302.1; thin floor coverings include carpeting, resilient flooring, seamless flooring, resinous matrix terrazzo, thin set quarry tile, and thin set ceramic tile.
   3. Other Surfaces to Be Left Exposed: Trowel as described in ACI PRC-302.1, minimizing burnish marks and other appearance defects.

3.07 CURING AND PROTECTION

A. Comply with requirements of ACI PRC-308. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.

B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
   1. Normal concrete: Not less than seven days.
   2. High early strength concrete: Not less than four days.

C. Formed Surfaces: Cure by moist curing with forms in place for full curing period.

D. Surfaces Not in Contact with Forms:
   1. Slabs and Floors To Receive Adhesive-Applied Flooring: Curing compounds and other surface coatings are usually considered unacceptable by flooring and adhesive manufacturers. If such materials must be used, either obtain the approval of the flooring and adhesive manufacturers prior to use or remove the surface coating after curing to flooring manufacturer's satisfaction.
   2. Initial Curing: Start as soon as free water has disappeared and before surface is dry. Keep continuously moist for not less than three days by water ponding, water-saturated sand, water-fog spray, or saturated burlap.
      a. Ponding: Maintain 100 percent coverage of water over floor slab areas, continuously for 4 days.
      b. Spraying: Spray water over floor slab areas and maintain wet.
      c. Saturated Burlap: Saturate burlap-polyethylene and place burlap-side down over floor slab areas, lapping ends and sides; maintain in place.
   3. Final Curing: Begin after initial curing but before surface is dry.
      a. Moisture-Retaining Sheet: Lap strips not less than 3 inches (75 mm) and seal with waterproof tape or adhesive; secure at edges.
      b. Curing Compound: Apply in two coats at right angles, using application rate recommended by manufacturer.

3.08 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. Provide free access to concrete operations at project site and cooperate with appointed firm.

C. Submit proposed mix design of each class of concrete to inspection and testing firm for review prior to commencement of concrete operations.

D. Tests of concrete and concrete materials may be performed at any time to ensure compliance with specified requirements.

E. Compressive Strength Tests: ASTM C39/C39M, for each test, mold and cure four concrete test cylinders. Obtain test samples for every 100 cubic yards (76 cu m) or less of each class of concrete placed on each day.

F. Take one additional test cylinder during cold weather concreting, cured on job site under same conditions as concrete it represents.

G. Perform one slump test for each set of test cylinders taken, following procedures of ASTM C143/C143M.

3.09 DEFECTIVE CONCRETE

A. Test Results: The testing agency shall report test results in writing to Architect and Contractor within 24 hours of test.

B. Defective Concrete: Concrete not complying with required lines, details, dimensions, tolerances or specified requirements.

C. Repair or replacement of defective concrete will be determined by the Architect. The cost of additional testing shall be borne by Contractor when defective concrete is identified.

D. Do not patch, fill, touch-up, repair, or replace exposed concrete except upon express direction of Architect for each individual area.

3.10 PROTECTION

A. Do not permit traffic over unprotected concrete floor surface until fully cured.

END OF SECTION

SECTION 03 4500
PRECAST ARCHITECTURAL CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Architectural precast concrete wall panels with integral insulation.

B. Architectural precast concrete accessories.

C. Grouting under panels.

1.02 RELATED REQUIREMENTS

A. Section 07 2100 - Thermal Insulation: Integral insulation.

B. Section 07 6200 - Sheet Metal Flashing and Trim: Reglets recessed in units.

C. Section 07 9200 - Joint Sealants: Sealing perimeter and intermediate joints.

D. Section 08 1113 - Hollow Metal Doors and Frames.

E. Section 08 9100 - Louvers.

F. Section 23 3000 - Ductwork And Air Outlets: Louvers and Vents.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. ASHRAE (FUND) - ASHRAE Handbook - Fundamentals; Most Recent Edition Cited by Referring Code or Reference Standard.

C. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

F. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

G. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2019.

H. ASTM A775/A775M - Standard Specification for Epoxy-Coated Steel Reinforcing Bars; 2022.

I. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

J. ASTM C1602/C1602M - Standard Specification for Mixing Water Used in the Production of Hydraulic Cement Concrete; 2018.

K. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.

L. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.

M. ASTM C260/C260M - Standard Specification for Air-Entraining Admixtures for Concrete; 2010a (Reapproved 2016).

N. ASTM C618 - Standard Specification for Coal Ash and Raw or Calcined Natural Pozzolan for Use in Concrete; 2023, with Editorial Revision.

O. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.

P. ASTM C989/C989M - Standard Specification for Slag Cement for Use in Concrete and Mortars; 2022.

Q. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures; 2020.

R. ASTM D3963/D3963M - Standard Specification for Fabrication and Jobsite Handling of Epoxy-Coated Steel Reinforcing Bars; 2021.

S. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.

T. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).

U. IAS AC157 - Accreditation Criteria for Fabricator Inspection Programs for Reinforced and Precast/Prestressed Concrete; 2017.

V. PCI MNL-117 - Manual for Quality Control for Plants and Production of Architectural Precast Concrete Products; 2013.

W. PCI MNL-120 - PCI Design Handbook; 2017, with Errata (2021).

X. PCI MNL-122 - Architectural Precast Concrete: Fully Revised Manual Including New Sections, Extensive Updates, and Detailed Specifications to Meet Today's Construction Needs; 2007.

Y. PCI MNL-123 - Connections Manual: Design and Typical Details of Connections for Precast and Prestressed Concrete; 1988.

Z. PCI MNL-135 - Tolerance Manual for Precast and Prestressed Concrete Construction; 2000.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week prior to commencing work of this section.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's information on accessory products, including pigments, admixtures, inserts, plates, etc.

C. Shop Drawings: Indicate layout, unit locations, configuration, unit identification marks, reinforcement, integral insulation, insulated panel system connectors, connection details, support items, location of lifting devices, dimensions, openings, and relationship to adjacent materials. Provide erection drawings.
   1. Include details of mix designs.
   2. Include structural design calculations.

D. Samples: Submit two for each type of finish indicated on expoosed surfaces of insulated concrete units., 12x12 inch (____by____ mm) in size, illustrating surface finish, color and texture.

E. Designer's Qualification Statement.

F. Integrally Insulated Panel System Manufacturer's Qualification Statement.

G. Integrally Insulated Panel System Manufacturer's Installation Instructions: Submit manufacturer's current installation instructions for system specified. Certify that copies are available at fabrication site prior to start of precast fabrication

H. Thin Prestressed Panel Manufacturer's Qualification Statement.

I. Fabricator's Qualification Statement: Provide documentation showing precast concrete fabricator is accredited under IAS AC157.

J. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

K. Integrally Insulated Panel System Design Data:
   1. Thermal Resistance: Submit calculations complying with ASHRAE Std 90.1 I-P, isothermal planes method, and demonstrating thermal resistance of integrally insulated panel system.
   2. Dew Point: Submit calculations complying with ASHRAE (FUND). Demonstrate condensation prevention, prevention of frost or ice formation on panels surfaces, and inner wall condensation potential of _____ ounce per day per square foot (_____ ml / day / sq m) or less.

3. Thermal Bowing and Crack Mitigation: Submit drawing details and written procedures for mitigation and repair of bowing and cracking in insulated concrete panels without full-thickness concrete sections or metallic connectors between wythes.

L. Sustainable Design Reporting: If any fly ash, ground granulated blast furnace slag, silica fume, rice hull ash, or other waste material is used in mix designs to replace Portland cement, submit the total volume of concrete, mix design(s) used showing the quantity of Portland cement replaced, reports showing successful cylinder testing, and temperature on day of pour if cold weather mix is used.

M. Maintenance Data: Indicate surface cleaning instructions.

1.06 QUALITY ASSURANCE

A. Design Engineer Qualifications: Design precast concrete units under direct supervision of a Professional Structural Engineer experienced in design of precast concrete and licensed in the State in which the Project is located.

B. Fabricator Qualifications:
1. Firm having at least 2 years of documented experience in production of precast concrete of the type required.
2. Plant certified under Precast/Prestressed Concrete Institute Plant Certification Program; product group and category A1 - Architectural Precast Concrete.
3. Plant certified under Architectural Precast Association Plant Certification Program for production of architectural precast concrete.
4. Fabricator Qualifications: Precast concrete fabricator accredited by IAS according to IAS AC157.

C. Insulated Panel System Installer Qualifications: Company specializing in fabrication of integrally insulated panel system specified in this section, with not less than three years of experience and approved by system manufacturer.

D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

E. Copies of Documents at Project Site: Maintain at the project site a copy of each referenced document that prescribes execution requirements.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handling: Lift and support precast units only from support points.

B. Blocking and Lateral Support During Transport and Storage: Use materials that are clean, non-staining, and non-harmful to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.

C. Protect units to prevent staining, chipping, or spalling of concrete.

D. Mark units with date of production in location that will be concealed after installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Integrally Insulated Panel System:
1. Basis-of-Design: AltusGroup, Inc; CarbonCast: www.altusprecast.com/#sle.

2.02 PRECAST UNITS, GENERAL

A. Precast Architectural Concrete Units: Comply with PCI MNL-120, PCI MNL-122, PCI MNL-123, PCI MNL-135, and ACI CODE-318.
1. Design Loads: Static loads, anticipated dynamic loading, including positive and negative wind loads, thermal movement loads, and erection forces as defined by applicable code.
2. Calculate structural properties of units in accordance with ACI CODE-318.
3. Accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

4. Provide connections that accommodate building movement and thermal movement and adjust to misalignment of structure without unit distortion or damage.

B. Finish
   1. Exposed Conditions: Medium Acid Etched on all exposed-to-view surfaces.
   2. Non-Exposed Exterior and Interior Conditions: Steel troweled finish. Finish shall not interfere with the applicaiton of other finishses including signage or paint.

C. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

2.03 REINFORCEMENT

A. Reinforcing Steel: ASTM A615/A615M, Grade 60 (60,000 psi) (420 MPa).
   1. Deformed billet-steel bars.
   2. Epoxy coated in accordance with ASTM A775/A775M.

B. Steel Welded Wire Reinforcement (WWR): Plain type, ASTM A1064/A1064M.
   1. Form: Flat Sheets.

2.04 CONCRETE MATERIALS

A. Cement: ASTM C150/C150M, Type I - Normal or Type II - Moderate. Portland type.

B. Other Cementitious Materials:
   1. Fly Ash or Natural Pozzolans: Comply with ASTM C618.
   2. Ground Granulated Blast Furnace Slag: ASTM C989/C989M.
   3. Silica Fume: Comply with ASTM C1240.

C. Normal-Weight Aggregates for face and back wythes: Except as modified by PCI MNL 116 or ASTM C 33.

D. Light-Weight Aggregates for back wythes (optional – use if needed to increase panel R-value or reduce superstructure or transportation cost): Except as modified by PCI MNL 116 or ASTM C 33 with absorption less than 11 percent.
   1. If using light-weight back wythe aggregates, similar water-cement and cement-aggregate ratios are recommended for both wythes to limit bowing or warping.

E. Fine and Coarse Structural Aggregates: ASTM C33/C33M.
   1. Fine Aggregate: Light Brown sand.
   2. Course Aggregate: Grey Granite.

F. Surface Finish Aggregate: Complying with sample in office of Architect.

G. Color Additives: Pure, concentrated mineral pigments specifically intended for mixing into concrete and complying with ASTM C979/C979M.
   1. Color(s): Charcoal.

H. Water: ASTM C1602/C1602M; clean, potable, and not detrimental to concrete.

I. Fiber Reinforcement: Synthetic fiber shown to be resistant to long-term deterioration when exposed to moisture and alkalis; 1/2 inch (12 mm) length.
   1. Product: CarbonCast manufactured by AltusGroupe, Inc..

J. Air Entrainment Admixture: ASTM C260/C260M.
   1. Water reducing, retarding, accelerating, high range water reducing admixtures: ASTM C494 or C1017.
   2. Viscosity-Modifying Admixture.
   3. Metakaolin Admixture: ASTM C 618, Class N.
   4. Calcium chloride or admixtures containing chlorides shall not be used.

K. Grout:
   1. Non-shrink, non-metallic, minimum 10,000 psi (70 MPa), 28 day strength.

2.05 SUPPORT DEVICES

A. Connecting and Support Devices; Anchors and Inserts: ASTM A36/A36M steel; hot-dip galvanized in accordance with ASTM A153/A153M.

1. Clean surfaces of rust, scale, grease, and foreign matter.

2.06 INSULATION

A. Integral Insulation: Rigid extruded polystyrene (XPS) board insulation.
   1. Design and construct panels to maintain overall u-value of 0.123, with less than one percent change due to penetrations and connections, when calculated in accordance with ASHRAE Std 90.1 I-P, isothermal planes method.

B. Non-Conduction Connectors for Integral Insulation: Corrosion- and alkali-resistant connectors designed and manufactured for use in insulated composite panels.

2.07 FABRICATION

A. Fabricate in compliance with PCI MNL-117 and PCI MNL-135.

B. Fabricate and handle epoxy-coated reinforcing bars in accordance with ASTM D3963/D3963M.

C. Place recessed flashing reglets continuous and straight.

2.08 ACCESSORIES

A. Bearing Pads: High density plastic; Shore A Durometer ____; 1/8 inch (3 mm) thick, smooth both sides.

B. Reglets: Specified in Section 07 6200.

C. Cast-In Structural Thermal Break for Continuously Insulated Panels: Rigid, closed-cell PVC foam connectors; provides thermal break at panel edges as well as door and window openings in panels.

2.09 SOURCE QUALITY CONTROL

A. Provide testing and analysis of concrete mix.

B. Take water absorption test in accordance with PCI MNL-117.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building structure, anchors, devices, and openings are ready to receive work of this section.

3.02 PREPARATION

A. Provide for erection procedures and induced loads during erection. Maintain temporary bracing in place until final support is provided.

3.03 ERECTION

A. Erect units without damage to shape or finish. Replace or repair damaged panels.

B. Erect units level and plumb within allowable tolerances.

3.04 TOLERANCES

A. Erect members level and plumb within allowable tolerances. Comply with PCI MNL-135.

3.05 CLEANING

A. Clean exposed surfaces..

B. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

3.06 PROTECTION

A. Protect installed precast architecural concrete from subsequent construction operations.

END OF SECTION

SECTION 04 2000
UNIT MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete block.
B. Concrete building brick.
C. Mortar and grout.
D. Reinforcement and anchorage.
E. Flashings.
F. Lintels.
G. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing: Reinforcing steel for grouted masonry.
B. Section 03 3000 - Cast-in-Place Concrete: Installation of dovetail slots for masonry anchors.
C. Section 04 4313 - Stone Masonry Veneer: Stone bonded to masonry back-up.
D. Section 04 7200 - Cast Stone Masonry. Cast stone cladding.
E. Section 07 6200 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.
F. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.
B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2022b.
C. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2022.
D. ASTM C91/C91M - Standard Specification for Masonry Cement; 2023.
E. ASTM C129 - Standard Specification for Nonloadbearing Concrete Masonry Units; 2022.
F. ASTM C140/C140M - Standard Test Methods for Sampling and Testing Concrete Masonry Units and Related Units; 2022c.
G. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2018.
H. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.
I. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2018.
J. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.
K. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2018.
L. ASTM C780 - Standard Test Method for Preconstruction and Construction Evaluation of Mortars for Plain and Reinforced Unit Masonry; 2020.
M. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.
N. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2019).
O. TMS 402/602 - Building Code Requirements and Specification for Masonry Structures; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by all relevant installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, mortar, and masonry accessories.

C. Shop Drawings: Indicate pertinent dimensions, materials, anchorage, size and type of fasteners, and accessories for brickwork support system.

D. Manufacturer's Certificate: Certify that water repellent admixture manufacturer has certified masonry unit manufacturer as an approved user of water repellent admixture in the manufacture of concrete block.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

A. Comply with provisions of TMS 402/602, except where exceeded by requirements of Contract Documents.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver, handle, and store masonry units by means that will prevent mechanical damage and contamination by other materials.

PART 2 PRODUCTS

2.01 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Size: Standard units with nominal face dimensions of 16 by 8 inches (400 by 200 mm) and nominal depths as indicated on drawings for specific locations.
   2. Special Shapes: Provide nonstandard blocks configured for corners, lintels, jambs, sashes, movement joints, headers, bonding, and other special conditions.
      a. Provide CMU bullnose corners at exterior corners on interior of building, at locations designated by Architect.
   3. Load-Bearing Units: ASTM C90, lightweight.
      a. Unit Compressive Strength: Provide units with minimum average net area compressive strength of 2000 psi.
      b. Exposed Faces: Special color and texture where indicated, as follows: Standard pattern, ground finish..
      c. Manufacturers:
         1) Basis-of-Design: Johnson Concrete Company.
         2) Oldcastle

2.02 MASONRY LINTELS

A. Masonry Lintels: Made from bond beam concrete masonry units with reinforcing bars placed as indicated and filled with coarse grout.

2.03 MORTAR AND GROUT MATERIALS

A. Masonry Cement: ASTM C91/C91M, Type S.
   1. Colored Mortar: Premixed cement as required to match Architect's color sample.

B. Portland Cement: ASTM C150/C150M, Type I; color as required to produce approved color sample.

C. Hydrated Lime: ASTM C207, Type S.

D. Mortar Aggregate: ASTM C144.

E. Grout Aggregate: ASTM C404.

F. Pigments for Colored Mortar: Pure, concentrated mineral pigments specifically intended for mixing into mortar and complying with ASTM C979/C979M.
   1. Color(s): As selected by Architect from manufacturer's full range.

G. Water: Clean and potable.

2.04 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: Type specified in Section 03 2000; size as indicated on drawings; uncoated finish.

B. Joint Reinforcement: Use ladder type joint reinforcement where vertical reinforcement is involved and truss type elsewhere, unless otherwise indicated.

C. Single Wythe Joint Reinforcement: ASTM A951/A951M.
   1. Type: Truss or ladder.
   2. Material: ASTM A1064/A1064M steel wire, mill galvanized to ASTM A641/A641M, Class 3.
   3. Size: 0.1875 inch (4.8 mm) side rods with 0.1483 inch (3.8 mm) cross rods; width as required to provide not less than 5/8 inch (16 mm) of mortar coverage on each exposure.

D. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
   3. Vertical adjustment: Not less than 3-1/2 inches (89 mm).

2.05 FLASHINGS

A. Metal Flashing Materials: Stainless Steel, as specified in Section 07 6200.

B. Combination Non-Asphaltic Flashing Materials - Stainless Steel:
   1. Stainless Steel Flashing - Self-adhering: ASTM A240/A240M; 2 mil (0.05 mm) type 304 stainless steel sheet with 8 mil (0.20 mm) of butyl adhesive and a removable release liner.
      a. Manufacturers:
         1) Substitutions: See Section 01 6000 - Product Requirements.
   2. Stainless Steel/Polymer Fabric Flashing: ASTM A240/A240M; 2 mil (0.05 mm) type 304 stainless steel sheet bonded on one side to one sheet of polymer fabric.
      a. Manufacturers:
         1) Hohmann & Barnard, Inc; Mighty-Flash Stainless Flashing: www.h-b.com/#sle.
         2) WIRE-BOND; _____: www.wirebond.com/#sle.
         3) York Manufacturing, Inc; Multi-Flash SS: www.yorkmfg.com/#sle.
         4) Substitutions: See Section 01 6000 - Product Requirements.
   3. Stainless Steel/Polymer Fabric Flashing - Self-adhering: ASTM A240/A240M; 2 mil (0.05 mm) type 304 stainless steel sheet bonded on inward facing side to a sheet of polymer fabric that has a clear adhesive with a removable release liner.
      a. Manufacturers:
         1) Hohmann & Barnard, Inc; _____: www.h-b.com/#sle.
         2) Substitutions: See Section 01 6000 - Product Requirements.
   4. Stainless Steel/Polymer Fabric Drainage Plane Flashing: ASTM A240/A240M; 2 mil (0.05 mm) type 304 stainless steel sheet bonded between one sheet of polymer fabric and one sheet of non-woven drainage material.
      a. Manufacturers:
         1) STS Coatings, Inc; _____: www.stscoatings.com/#sle.
         2) York Manufacturing, Inc; ____: www.yorkmfg.com/#sle.
         3) Substitutions: See Section 01 6000 - Product Requirements.

C. Membrane Asphaltic Flashing Materials:
   1. Rubberized Asphalt Flashing: Self-adhering polymer modified asphalt sheet; 40 mils (0.040 inch) (1.0 mm) minimum total thickness; 8 mil (0.20 mm) cross-laminated polyethylene bonded to adhesive rubberized asphalt, with a removable release liner.
      a. Manufacturers:

1) Advanced Building Products, Inc; Strip-N-Flash: www.advancedbuildingproducts.com/#sle.
2) Heckmann Building Products, Inc; ____: www.heckmannbuildingprods.com/#sle
3) WIRE-BOND; _____: www.wirebond.com/#sle.
4) York Manufacturing, Inc; York Seal: www.yorkmfg.com/#sle.
5) Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORIES

A. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.
   1. Mortar Diverter: Semi-rigid mesh designed for installation at flashing locations.

B. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 LINTELS

A. Prefabricated Steel Lintels:

2.08 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, using the Proportion Specification.
   1. Masonry below grade and in contact with earth: Type S.
   2. Exterior, loadbearing masonry: Type N.
   3. Exterior, non-loadbearing masonry: Type N.
   4. Interior, loadbearing masonry: Type N.
   5. Interior, non-loadbearing masonry: Type O.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive masonry.

B. Verify that related items provided under other sections are properly sized and located.

C. Verify that built-in items are in proper location, and ready for roughing into masonry work.

3.02 PREPARATION

A. Direct and coordinate placement of metal anchors supplied for installation under other sections.

B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

3.03 COLD AND HOT WEATHER REQUIREMENTS

A. Maintain materials and surrounding air temperature to minimum 40 degrees F (5 degrees C) prior to, during, and 48 hours after completion of masonry work.

B. Maintain materials and surrounding air temperature to maximum 90 degrees F (32 degrees C) prior to, during, and 48 hours after completion of masonry work.

3.04 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
   1. Coursing and Bond: As indicated for different locations.
   2. Mortar Joints: Concave.

3.05 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Remove excess mortar and mortar smears as work progresses.

D. Isolate top joint of masonry partitions from horizontal structural framing members and slabs or decks with compressible joint filler.

3.06 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.07 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

A. Masonry Back-Up: Embed anchors in masonry back-up to bond veneer at maximum 1.77 sq ft (0.16 sq m) of wall surface per anchor. Place additional anchors at perimeter of openings and ends of panels, so maximum spacing of anchors is 8 inches (200 mm) on center.

3.08 REINFORCEMENT AND ANCHORAGES - MULTIPLE WYTHE UNIT MASONRY

A. Use individual metal ties installed in horizontal joints to bond wythes together. Provide ties spaced as indicated on drawings.

B. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch (13 mm) of dimensioned position.

3.09 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

B. Extend metal flashings to within 1/2 inch (12 mm) of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.

C. Extend plastic, laminated, EPDM, and _____ flashings to within 1/2 inch (12 mm) of exterior face of masonry and adhere to top of stainless steel angled drip with hemmed edge.

3.10 LINTELS

A. Maintain minimum ____ inch (____ mm) bearing on each side of opening.

3.11 CLEANING

A. Clean soiled surfaces with cleaning solution.

3.12 PROTECTION

A. Without damaging completed work, provide protective boards at exposed external corners that are subject to damage by construction activities.

3.13 SCHEDULES

A. Exterior and Interior Curved Wall: Composite masonry,sizes and patterned as indicated on drawings and Finish Legend:
   1. MV-01: Groundface: Noimal 4"x12"x24". Corner,and special pieces as required at openings and ends of wall and as indicated.
   2. MV-02: Rockface: Noimal 4"x12"x24". Corner,and special pieces as required at openings and ends of wall and as indicated.
   3. MV-03: Chiselface: Nominal 12"x24", 4"x24", 8"x24". Corner,and special pieces as required by drawings.
   4. MV-04 Wall Cap: Finish to be selected by architect. Dimenions as indicated on drawings. Corner,and special pieces as required at openings and ends of wall and as indicated
   5. MV-05: refer to, related specification section 04 7200-Cast Stone Masonry. Veneer cladding.
   6. MV-06: refer to, related specification section 04 7200-Cast Stone Masonry.Wall Cap/Coping.

END OF SECTION

SECTION 04 2613
MASONRY VENEER

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Concrete block.

B. Concrete facing brick.

C. Mortar and grout.

D. Reinforcement and anchorage.

E. Flashings.

F. Accessories.

1.02 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim: Through-wall masonry flashings.

B. Section 07 9200 - Joint Sealants: Sealing control and expansion joints.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

B. ASTM A240/A240M - Standard Specification for Chromium and Chromium-Nickel Stainless Steel Plate, Sheet, and Strip for Pressure Vessels and for General Applications; 2022b.

C. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

D. ASTM C90 - Standard Specification for Loadbearing Concrete Masonry Units; 2022.

E. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.

F. ASTM C744 - Standard Specification for Prefaced Concrete and Calcium Silicate Masonry Units; 2021.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene one week before starting work of this section.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data for masonry units, fabricated wire reinforcement, and mortar.

C. Samples: Submit four samples of decorative block units to illustrate color, texture, and extremes of color range.

D. Manufacturer's Certificate: Certify that masonry units meet or exceed specified requirements.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.

1.06 QUALITY ASSURANCE

1.07 MOCK-UP

1.08 FIELD CONDITIONS

PART 2 PRODUCTS

2.01 UNIT MASONRY - GENERAL

2.02 CONCRETE MASONRY UNITS

A. Concrete Block: Comply with referenced standards and as follows:
   1. Load-Bearing Units: ASTM C90, see section 04 2000-Unit Masonry.
   2. Pre-Faced Units: ASTM C90, solid block, with smooth resinous facing complying with ASTM C744.

B. Manufacturer:
   1. Manufacturer.
      a. Oldcastle, Echelon.
      b. Colors and Styles: [Cordova Stone, Alabaster]. Surface finish as listed below:
         1) MV-01: Chisel Face:
            (a) Size: 4-inch x 12-inch x 24 -inch.
            (b) Corner,and special pieces as required at openings and ends of wall and as indicated.
         2) MV-02: Rockface:
            (a) Size: 4-inch x 12-inch x 24 -inch.
            (b) Corner,and special pieces as required at openings and ends of wall and as indicated.
         3) MV-03: Ground Face:
            (a) Size: 4-inch x 12-inch x 24 -inch.
            (b) Corner,and special pieces as required at openings and ends of wall and as indicated.
         4) MV-04: Coping / Wall Cap: Finiish as indicated on drawings.
            (a) Size: as indicated on drawings.
            (b) Corner,and special pieces as required at openings and ends of wall and as indicated.
      c. Locations indicated on drawings.
      d. Substitutions: Not permitted.

2.03 MORTAR AND GROUT MATERIALS

2.04 REINFORCEMENT AND ANCHORAGE

A. Reinforcing Steel: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa) yield strength, deformed billet bars; galvanized.

B. Masonry Veneer Anchors: 2-piece anchors that permit differential movement between masonry veneer and structural backup, hot dip galvanized to ASTM A 153/A 153M, Class B.
   1. Anchor plates: Not less than 0.075 inch (1.91 mm) thick, designed for fastening to structural backup through sheathing by two fasteners; provide design with legs that penetrate sheathing and insulation to provide positive anchorage.
   2. Wire ties: Manufacturer's standard shape, 0.1875 inch (4.75 mm) thick.
   3. Vertical adjustment: Not less than 3-1/2 inches (89 mm).

2.05 FLASHINGS

A. Metal Flashing Materials: Copper, as specified in Section 07 6200.

B. Combination Non-Asphaltic Flashing Materials - Copper:
   1. Copper/Polymer Film or Fabric Flashing: 3 oz/sq ft (0.915 kg/sq m) copper sheet laminated between two sheets of polymer or fiberglass fiber-reinforced film.
   2. Copper/Polymer Film or Fabric Flashing - Self-Adhering: 3 oz/sq ft (0.915 kg/sq m) copper sheet bonded on inward facing side to a sheet of polymer or fiberglass fabric that has a clear adhesive with a removable release liner.
   3. Copper/Polymer Fabric Drainage Plane Flashing System: 3 oz/sq ft (0.915 kg/sq m) copper sheet bonded with rubber-based adhesive between one sheet of polymer fabric and one sheet of non-woven drainage material.

C. Combination Non-Asphaltic Flashing Materials - Stainless Steel:
   1. Stainless Steel/Polymer Fabric Flashing: ASTM A240/A240M; 2 mil (.05 mm) type 304 stainless steel sheet bonded on one side to one sheet of polymer fabric.
      a. Manufacturers:
         1) Hohmann & Barnard, Inc: www.h-b.com.
         2) WIRE-BOND: www.wirebond.com.
         3) York Manufacturing, Inc: www.yorkmfg.com.
         4) Substitutions: See Section 01 6000 - Product Requirements.

2. Stainless Steel/Polymer Fabric Flashing - Self-Adhering: ASTM A240/A240M; 2 mil (.05 mm) type 304 stainless steel sheet bonded on inward facing side to a sheet of polymer fabric that has a clear adhesive with a removable release liner.
    a. Manufacturers:
        1) Hohmann & Barnard, Inc: www.h-b.com.
        2) Substitutions: See Section 01 6000 - Product Requirements.
3. Stainless Steel/Polymer Fabric Drainage Plane Flashing: ASTM A240/A240M; 2 mil (.05 mm) type 304stainless steel sheet bonded between one sheet of polymer fabric and one sheet of non-woven drainage material.
    a. Manufacturers:
        1) STS Coatings, Inc: www.stscoatings.com.
        2) York Manufacturing, Inc; Flash-Vent SS: www.yorkmfg.com.
        3) Substitutions: See Section 01 6000 - Product Requirements.
4. Stainless Steel/Polymer Fabric Drainage Plane Flashing - Self-Adhering: ASTM A240/A240M; 2 mil (.05 mm) type 304 stainless steel sheet with 8 mil (0.20 mm) of butyl adhesive and a removable release liner on one side and a sheet of non-woven drainage material bonded to the other side.
    a. Manufacturers:
        1) York Manufacturing, Inc: www.yorkmfg.com.
        2) Substitutions: See Section 01 6000 - Product Requirements.

D. Membrane Asphaltic Flashing Materials:
1. Rubberized Asphalt Flashing: Self-adhering polymer modified asphalt sheet; 40 mils (0.040 inch) (1.0 mm) minimum total thickness; 8 mil (0.20 mm) cross-laminated polyethylene bonded to adhesive rubberized asphalt, with a removable release liner.
    a. Manufacturers:
        1) Advanced Building Products, Inc: www.advancedbuildingproducts.com
        2) Heckmann Building Products, Inc: www.heckmannbuildingprods.com
        3) Substitutions: See Section 01 6000 - Product Requirements.

2.06 ACCESSORIES

A. Cavity Mortar Control: Semi-rigid polyethylene or polyester mesh panels, sized to thickness of wall cavity, and designed to prevent mortar droppings from clogging weeps and cavity vents and allow proper cavity drainage.

B. Cleaning Solution: Non-acidic, not harmful to masonry work or adjacent materials.

2.07 MORTAR AND GROUT MIXING

A. Mortar for Unit Masonry: ASTM C270, Proportion Specification.
1. Masonry below grade and in contact with earth; Type S.
2. Exterior, non-loadbearing masonry; Type N.
3. Interior, non-loadbearing masonry; Type O.

B. Colored Mortar: Proportion selected pigments and other ingredients to match Architect's sample, without exceeding manufacturer's recommended pigment-to-cement ratio.

PART 3 EXECUTION

3.01 EXAMINATION

3.02 COURSING

A. Establish lines, levels, and coursing indicated. Protect from displacement.

B. Maintain masonry courses to uniform dimension. Form vertical and horizontal joints of uniform thickness.

C. Concrete Masonry Units:
1. Coursing and bond as indicated on drawings.
2. Mortar Joints: Concave.

3.03 PLACING AND BONDING

A. Lay solid masonry units in full bed of mortar, with full head joints, uniformly jointed with other work.

B. Buttering corners of joints or excessive furrowing of mortar joints is not permitted.

C. Remove excess mortar as work progresses.

D. Perform job site cutting of masonry units with proper tools to provide straight, clean, unchipped edges. Prevent broken masonry unit corners or edges.

E. Isolate top joint of masonry veneer from horizontal structural framing members or support angles with compressible joint filler.

3.04 CAVITY MORTAR CONTROL

A. Do not permit mortar to drop or accumulate into cavity air space or to plug weep/cavity vents.

B. For cavity walls, build inner wythe ahead of outer wythe to accommodate accessories.

C. Install cavity mortar control panels continuously throughout full height of exterior masonry cavities during construction of exterior wythe, complying with manufacturer's installation instructions.

D. Install cavity mortar diverter at base of cavity and at other flashing locations as recommended by manufacturer to prevent mortar droppings from blocking weep/cavity vents.

3.05 REINFORCEMENT AND ANCHORAGE - MASONRY VENEER

3.06 MASONRY FLASHINGS

A. Whether or not specifically indicated, install masonry flashing to divert water to exterior at all locations where downward flow of water will be interrupted.

3.07 CONTROL AND EXPANSION JOINTS

A. Do not continue horizontal joint reinforcement through control or expansion joints.

3.08 TOLERANCES

A. Maximum Variation from Plumb: 1/4 inch (6 mm) per story non-cumulative; 1/2 inch (13 mm) in two stories or more.

3.09 CUTTING AND FITTING

A. Cut and fit for pipes and conduit. Coordinate with other sections of work to provide correct size, shape, and location.

B. Obtain approval prior to cutting or fitting masonry work not indicated or where appearance or strength of masonry work may be impaired.

3.10 CLEANING

A. Remove excess mortar and mortar smears as work progresses.

B. Clean soiled surfaces with cleaning solution.

C. Use non-metallic tools in cleaning operations.

3.11 PROTECTION

3.12 SCHEDULES

A. Exterior and Interior Curved Wall: Composite masonry sizes and locations as patterned and indicated on drawings and Finish Legend.
   1. MV-01: Chisel Face: Noimal 4"x12"x24". Corner,and special pieces as required at openings and ends of wall and as indicated.
   2. MV-02: Rock Face: Noimal 4"x12"x24". Corner,and special pieces as required at openings and ends of wall and as indicated.
   3. MV-03A: Ground Face: Nominal 12"x24", 4"x24", 8"x24". Corner,and special pieces as required by drawings.

4. MV-03B: Ground Face: Nominal 12"x24", 4"x24", 8"x24". Corner,and special pieces as required by drawings.
5. MV-03C: Ground Face: Nominal 12"x24", 4"x24", 8"x24". Corner,and special pieces as required by drawings.
6. MV-04 Wall Cap: Finish to be selected by architect. Dimenions as indicated on drawings. Corner,and special pieces as required at openings and ends of wall and as indicated.
7. MV-05: refer to, related specification section 04 7200-Cast Stone Masonry.
8. MV-06: refer to, related specification section 04 7200-Cast Stone Masonry.

END OF SECTION

SECTION 04 7200
CAST STONE MASONRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Architectural cast stone.

B. Units required are indicated on drawings as "cast stone".

C. Units required are:
   1. Exterior and interior wall cladding..

1.02 RELATED REQUIREMENTS

A. Section 04 0511 - Masonry Mortaring and Grouting: Mortar for setting cast stone.

B. Section 04 2000 - Unit Masonry: Installation of cast stone in conjunction with masonry.

C. Sectuib 05 4000 - Cold Formed Metal Framing: Framing for exterior and interall walls.

D. Section 07 9200 - Joint Sealants: Sealing joints indicated to be left open for sealant.

1.03 REFERENCE STANDARDS

A. ACI CODE-318 - Building Code Requirements for Structural Concrete and Commentary; 2019 (Reapproved 2022).

B. ASTM A615/A615M - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement; 2022.

C. ASTM A767/A767M - Standard Specification for Zinc-Coated (Galvanized) Steel Bars for Concrete Reinforcement; 2019.

D. ASTM A884/A884M - Standard Specification for Epoxy-Coated Steel Wire and Welded Wire Reinforcement; 2019, with Editorial Revision (2020).

E. ASTM A1064/A1064M - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plain and Deformed, for Concrete; 2022.

F. ASTM C33/C33M - Standard Specification for Concrete Aggregates; 2018.

G. ASTM C150/C150M - Standard Specification for Portland Cement; 2022.

H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2019a, with Editorial Revision.

I. ASTM C494/C494M - Standard Specification for Chemical Admixtures for Concrete; 2019, with Editorial Revision (2022).

J. ASTM C642 - Standard Test Method for Density, Absorption, and Voids in Hardened Concrete; 2021.

K. ASTM C979/C979M - Standard Specification for Pigments for Integrally Colored Concrete; 2016.

L. ASTM C1364 - Standard Specification for Architectural Cast Stone; 2023.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Test results of cast stone components made previously by the manufacturer.
   1. Include one copy of ASTM C1364 for Architect's use.

C. Shop Drawings: Include elevations, dimensions, layouts, profiles, cross sections, reinforcement, exposed faces, arrangement of joints, anchoring methods, anchors, and piece numbers.

D. Verification Samples: Pieces of actual cast stone components not less than 6 inches (152 mm) square, illustrating range of color and texture to be anticipated in components furnished for the project.

E. Source Quality Control Test Reports.

F. Manufacturer's Qualification Data: Documentation showing compliance with specified requirements.

1.05 QUALITY ASSURANCE

1.06 MOCK-UPS

A. Provide full size cast stone components for installation in mock-up of exterior wall.

B. See Section 01 4000 - Quality Requirements for additional requirements.

C. Approved mock-up will become standard for appearance and workmanship.

D. Mock-up may remain as part of the completed work.

E. Remove mock-up not incorporated into the work and dispose of debris.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver cast stone components secured to shipping pallets and protected from damage and discoloration. Protect corners from damage.

B. Number each piece individually to match shop drawings and schedule.

C. Store cast stone components and installation materials in accordance with manufacturer's instructions.

D. Store cast stone components on pallets with nonstaining, waterproof covers. Ventilate under covers to prevent condensation. Prevent contact with dirt.

E. Protect cast stone components during handling and installation to prevent chipping, cracking, or other damage.

F. Store mortar materials where contamination can be avoided.

G. Schedule and coordinate production and delivery of cast stone components with unit masonry work to optimize on-site inventory and to avoid delaying the work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Architectural Cast Stone:
   1. Any current producer member of the Cast Stone Institute.
   2. Basis-Of Design: RockCast Pewter GP-C, by Reading Rock, Inc..
   3. Dimensions as indicated on drawings.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ARCHITECTURAL CAST STONE

A. Cast Stone: Architectural concrete product manufactured to simulate appearance of natural granite, complying with ASTM C1364.
   1. Compressive Strength: As specified in ASTM C1364; calculate strength of pieces to be field cut at 80 percent of uncut piece.
   2. Freeze-Thaw Resistance: Demonstrated by laboratory testing in accordance with ASTM C1364.
   3. Surface Texture: Fine grained texture, with no bugholes, air voids, or other surface blemishes visible from distance of 20 feet (6 meters).
   4. Color: Selected by Architect from manufacturer's full range.
   5. Remove cement film from exposed surfaces before packaging for shipment.

B. Shapes: Provide shapes indicated on drawings.
   1. Variation from Any Dimension, Including Bow, Camber, and Twist: Maximum of plus/minus 1/8 inch (3 mm) or length divided by 360, whichever is greater, but not more than 1/4 inch (6 mm).
   2. Unless otherwise indicated on drawings, provide:
      a. Wash or slope of 1:12 on exterior horizontal surfaces.
      b. Drips on projecting components, wherever possible.
      c. Raised fillets at back of sills and at ends to be built in.

C. Reinforcement: Provide reinforcement as required to withstand handling and structural stresses; comply with ACI CODE-318.

2.03 MATERIALS

A. Portland Cement: ASTM C150/C150M.
   1. For Units: Type I or II, white.
   2. For Mortar: Type I or II, except Type III may be used in cold weather.

B. Coarse Aggregate: ASTM C33/C33M, except for gradation; granite, quartz, or limestone.

C. Fine Aggregate: ASTM C33/C33M, except for gradation; natural or manufactured sands.

D. Pigments: ASTM C979, inorganic iron oxides; do not use carbon black.

E. Admixtures: ASTM C494/C494M.

F. Water: Potable.

G. Reinforcing Bars: ASTM A615/A615M, Grade 40 (40,000 psi) (280 MPa), deformed bars, galvanized.
   1. Galvanized in accordance with ASTM A767/A767M, Class I.

H. Steel Welded Wire Reinforcement: ASTM A1064/A1064M, galvanized or ASTM A884/A884M, epoxy coated.

I. Embedded Anchors, Dowels, and Inserts: Type 304 stainless steel, of type and size as required for conditions.

J. Mortar: Portland cement-lime, as specified in Section 04 0511; do not use masonry cement.

K. Cleaner: General-purpose cleaner designed for removing mortar and grout stains, efflorescence, and other construction stains from new masonry surfaces without discoloring or damaging masonry surfaces; approved for intended use by cast stone manufacturer and by cleaner manufacturer for use on cast stone and adjacent masonry materials.

2.04 SOURCE QUALITY CONTROL

A. Test compressive strength and absorption of specimens selected at random from plant production.
   1. Test in accordance with ASTM C642.
   2. Select specimens at rate of 3 per 500 cubic feet (3 per 14 cubic m), with a minimum of 3 per production week.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine construction to receive cast stone components. Notify Architect if construction is not acceptable.

B. Do not begin installation until unacceptable conditions have been corrected.

3.02 INSTALLATION

A. Install cast stone components in conjunction with masonry, complying with requirements of Section 04 2000.

B. Mechanically anchor cast stone units indicated; set remainder in mortar.

C. Setting:
   1. Drench cast stone components with clear, running water immediately before installation.
   2. Set units in a full bed of mortar unless otherwise indicated.
   3. Fill vertical joints with mortar.
   4. Fill dowel holes and anchor slots completely with mortar or non-shrink grout.

3.03 TOLERANCES

A. Joints: Make all joints 3/8 inch (9.5 mm), except as otherwise detailed.
   1. Rake mortar joints 3/4 inch (19 mm) for pointing.
   2. Remove excess mortar from face of stone before pointing joints.

3. Point joints with mortar in layers 3/8 inch (9.5 mm) thick and tool to a slight concave profile.
4. Leave the following joints open for sealant:
    a. Head joints in top courses, including copings, parapets, cornices, sills, and steps.
    b. Joints in projecting units.
    c. Joints between rigidly anchored units, including soffits, panels, and column covers.
    d. Joints below lugged sills and stair treads.
    e. Joints below ledge and relieving angles.
    f. Joints labeled "expansion joint".

B. Installation Tolerances:
1. Variation from Plumb: Not more than 1/8 inch in 10 feet (3 mm in 3 m) or 1/4 inch in 20 feet (6 mm in 6 m) or more.
2. Variation from Level: Not more than 1/8 inch in 10 feet (3 mm in 3 m) or 1/4 inch in 20 feet (6 mm in 6 m), or 3/8 inch (9 mm) maximum.
3. Variation in Joint Width: Not more than 1/8 inch in 36 inches (3 mm in 900 mm) or 1/4 of nominal joint width, whichever is less.
4. Variation in Plane Between Adjacent Surfaces (Lipping): Not more than 1/16 inch (1.5 mm) difference between planes of adjacent units or adjacent surfaces indicated to be flush with units.

3.04 REPAIR

A. Repair chips and other surface damage noticeable when viewed in direct daylight at 20 feet (6 m).

B. Repair with matching touch-up material provided by the manufacturer and in accordance with manufacturer's instructions.

C. Repair methods and results subject to Architect 's approval.

3.05 CLEANING

A. Keep cast stone components clean as work progresses.

B. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

3.06 PROTECTION

A. Protect completed work from damage.

B. Clean, repair, or restore damaged or mortar-splashed work to condition of new work.

3.07 SCHEDULE

A. MV-05: RockCast: Nominal 4""x16"x24". Corner,and special pieces as required by drawings.

B. MV-06: RockCast: Wall Cap/Coping as indicated on drawings. Corner,and special pieces as required by drawings.

END OF SECTION

SECTION 05 1200
STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Structural steel framing members.

B. Structural steel support members and struts.

C. Base plates, shear stud connectors.

D. Grouting under base plates.

1.02 RELATED REQUIREMENTS

A. Section 05 1213 - Architecturally-Exposed Structural Steel Framing: Additional requirements for structural steel members designated as architecturally-exposed structural steel (AESS).

B. Section 05 2100 - Steel Joist Framing.

C. Section 05 3100 - Steel Decking: Support framing for small openings in deck.

D. Section 05 5000 - Metal Fabrications: Steel fabrications affecting structural steel work.

E. Section 07 8100 - Applied Fire Protection: Fireproof protection to framing systems.

1.03 REFERENCE STANDARDS

A. AISC (MAN) - Steel Construction Manual; 2017.

B. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

D. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

E. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.

F. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

G. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

H. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

I. ASTM A449 - Standard Specification for Hex Cap Screws, Bolts and Studs, Steel, Heat Treated, 120/105/90 ksi Minimum Tensile Strength, General Use; 2014 (Reapproved 2020).

J. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.

K. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.

L. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.

M. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.

N. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.

O. ASTM C827/C827M - Standard Test Method for Change in Height at Early Ages of Cylindrical Specimens of Cementitious Mixtures; 2016.

P. ASTM E94/E94M - Standard Guide for Radiographic Examination Using Industrial Radiographic Film; 2017.

Q. ASTM E164 - Standard Practice for Contact Ultrasonic Testing of Weldments; 2019.

R. ASTM E165/E165M - Standard Practice for Liquid Penetrant Testing for General Industry; 2018.

S. ASTM E709 - Standard Guide for Magnetic Particle Testing; 2021.

T. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.

U. ASTM F959/F959M - Standard Specification for Compressible-Washer-Type Direct Tension Indicators for Use with Structural Fasteners, Inch and Metric Series; 2017a.

V. ASTM F1554 - Standard Specification for Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength; 2020.

W. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.

X. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

Y. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.

Z. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).

AA. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.

AB. RCSC (HSBOLT) - Specification for Structural Joints Using High-Strength Bolts; Research Council on Structural Connections; 2020.

AC. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

AD. SSPC-SP 2 - Hand Tool Cleaning; 2018.

AE. SSPC-SP 3 - Power Tool Cleaning; 2018.

AF. SSPC-SP 7 - Brush-Off Blast Cleaning; 2007.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate profiles, sizes, spacing, locations of structural members, openings, attachments, and fasteners.
   2. Connections not detailed.
   3. Indicate cambers and loads.
   4. Indicate welded connections with AWS A2.4 welding symbols. Indicate net weld lengths.

C. Manufacturer's Mill Certificate: Certify that products meet or exceed specified requirements.

D. Fabricator Test Reports: Comply with ASTM A1011/A1011M.

E. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Fabricate structural steel members in accordance with AISC (MAN) "Steel Construction Manual."

B. Structural steel members designated as architecturally-exposed structural steel (AESS) to also comply with Section 05 1213.

C. Maintain one copy of each document on site.

D. Fabricator: Company specializing in performing the work of this section with minimum 5 years of documented experience.

E. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and no more than 12 months before start of scheduled welding work.

F. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

G. Erector: Company specializing in performing the work of this section with minimum _____ years of documented experience.

H. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Angles, Plates, and Channels: ASTM A36/A36M.

B. Steel W Shapes and Tees: ASTM A992/A992M.

C. Rolled Steel Structural Shapes: ASTM A992/A992M.

D. Cold-Formed Structural Tubing: ASTM A500/A500M, Grade B.

E. Pipe: ASTM A53/A53M, Grade B, Finish black.

F. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.

G. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.

H. Tension Control Bolts: Twist-off type; ASTM F3125/F3125M.

I. Headed Anchor Rods: ASTM F1554, Grade 36, plain.

J. Load Indicator Washers: Provide washers complying with ASTM F959/F959M at connections requiring high-strength bolts.

K. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

L. Grout: ASTM C1107/C1107M; Non-shrink; premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents.
   1. Minimum Compressive Strength at 48 Hours: 2,000 pounds per square inch (13.7 MPa).
   2. Minimum Compressive Strength at 28 Days: 7,000 pounds per square inch (48 MPa).
   3. Height Change, Plastic State; when tested according to ASTM C827/C827M:
      a. Maximum: Plus 4 percent.
      b. Minimum: Plus 1 percent.

M. Shop and Touch-Up Primer: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

N. Touch-Up Primer for Galvanized Surfaces: Fabricator's standard, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Shop fabricate to greatest extent possible.

B. Fabricate connections for bolt, nut, and washer connectors.

2.03 FINISH

A. Prepare structural component surfaces in accordance with SSPC-SP 3.

B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted.

2.04 SOURCE QUALITY CONTROL

A. Welded Connections: Visually inspect all shop-welded connections and test as indicated in the drawings.____

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that conditions are appropriate for erection of structural steel and that the work may properly proceed.

3.02 ERECTION

A. Erect structural steel in compliance with AISC 303.

B. Allow for erection loads and provide sufficient temporary bracing to maintain structure in safe condition, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Field weld components indicated on shop drawings.

D. Use carbon steel bolts only for temporary bracing during construction, unless otherwise specifically permitted on drawings. Install high-strength bolts in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts".

E. Do not field cut or alter structural members without approval of Architect.

F. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.

G. Grout solidly between column plates and bearing surfaces, complying with manufacturer's instructions for nonshrink grout. Trowel grouted surfaces smooth, splaying neatly to 45 degrees.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

B. High-Strength Bolts: Provide testing and verification of field-bolted connections as indicated in the drawings and in accordance with RCSC (HSBOLT) "Specification for Structural Joints Using High-Strength Bolts," ____

C. Welded Connections: Visually inspect all field-welded connections and test as indicated on the drawings. ____

END OF SECTION

SECTION 05 1213

ARCHITECTURALLY-EXPOSED STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Additional requirements for structural steel members designated as architecturally-exposed structural steel (AESS).

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: General requirements for structural steel members, including AESS framing specified in this section.

B. Section 05 2100 - Steel Joist Framing: Alignment and location of bridging where joists are visible.

C. Section 05 3100 - Steel Decking: Erection requirements relating to exposed steel decking and its connections.

D. Section 05 5000 - Metal Fabrications: Loose steel bearing plates and miscellaneous steel framing.

E. Section 07 8100 - Applied Fire Protection: Fireproof protection to framing and metal deck systems.

F. Section 09 9113 - Exterior Painting: Finish coat requirements and coordination with primer and surface preparation specified in this section.

G. Section 09 9123 - Interior Painting: Finish coat requirements and coordination with primer and surface preparation specified in this section.

H. Section 09 9600 - High-Performance Coatings: Finish coat requirements and coordination with primer and surface preparation specified in this section.

1.03 DEFINITIONS

A. Architecturally-Exposed Structural Steel: Structural steel complying with designated AESS category as defined in AISC 303.

1.04 REFERENCE STANDARDS

A. AISC 303 - Code of Standard Practice for Steel Buildings and Bridges; 2022.

B. AISC 325 - Steel Construction Manual; 2017.

C. AISC 360 - Specification for Structural Steel Buildings; 2022.

D. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

E. ASTM A572/A572M - Standard Specification for High-Strength Low-Alloy Columbium-Vanadium Structural Steel; 2021, with Editorial Revision.

F. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2022.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

H. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.

I. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

J. ASTM A1085/A1085M - Standard Specification for Cold-Formed Welded Carbon Steel Hollow Structural Sections (HSS); 2015.

K. ASTM A992/A992M - Standard Specification for Structural Steel Shapes; 2022.

L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum

Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.

M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

N. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.

O. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).

P. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

Q. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

1.05 ADMINISTRATIVE REQUIREMENTS

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product data for each type of product specified. Submit paint systems in accordance with Section 09 9113.

C. Shop Drawings: Detailing for fabrication of AESS components.
   1. Provide erection documents clearly indicating which members are AESS members and the AESS category of each part.
   2. Include details that clearly identify AESS requirements found in this specification. Provide connections for AESS consistent with concepts shown on drawings.
   3. Indicate welds by AWS A2.4 symbols, distinguishing between shop and field welds, and show size, length and type of each weld. Identify grinding, finish and profile of welds as defined by the designated AESS category.
   4. Indicate orientation of hollow structural section (HSS) seams and mill marks (where applicable).
   5. Indicate type, size, finish and length of bolts, distinguishing between shop and field bolts. Identify high-strength bolted slip-critical, direct-tensioned shear/bearing connections. Indicate orientation of bolt heads.
   6. Indicate which surfaces or edges are exposed and what class of surface preparation is being used.
   7. Indicate special tolerances and erection requirements as noted on drawings or defined by the designated AESS category.
   8. Indicate vent or drainage holes for HSS members.

D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

1.07 QUALITY ASSURANCE

A. Fabricator Qualifications: In addition to those qualifications listed in Section 05 1200, engage an AISC Certified Fabricator, experienced in fabricating AESS similar to that indicated for this project with a record of successful in-service performance, as well as sufficient production capacity to fabricate AESS without delaying the work.

B. Erector Qualifications: In addition to those qualifications listed in Section 05 1200, engage an AISC Certified Erector, experienced in erecting AESS work similar in material, design, and extent to that indicated for this project and with a record of successful in-service performance.

C. Welder Qualifications: Welding processes and welding operators qualified within previous 12 months in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work..

D. Comply with applicable provisions of AISC 303, Section 10 for the designated AESS category.

E. Owner to engage a quality assurance agency per requirements of AISC 360, Chapter N and AISC 303, Section 10.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Handle finished pieces in accordance with Section 10 of AISC 303, using nylon-type slings, or chains with softeners, or wire ropes with softeners such that they are not damaged.

B. Store materials to permit easy access for inspection and identification. Keep steel members off ground by using pallets, platforms, or other supports. Protect steel members and packaged materials from erosion and deterioration. Use special care in handling to prevent twisting or warping of AESS members.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Comply with Section 05 1200, except as amended in this section for aesthetic purposes.

B. Comply with AISC 303, Section 10 for specific AESS category designated on drawings.

2.02 FABRICATION

A. Fabricate and assemble AESS in shop to greatest extent possible. Locate field joints in AESS assemblies at concealed locations or as approved by Architect. Detail AESS assemblies to minimize field handling and expedite erection.

B. Permissible tolerances for member depth, width, out of square, and camber and sweep to be as specified in ASTM A6/A6M, ASTM A500/A500M, and ASTM A1085/A1085M.

C. For curved structural members, whether composed of a single standard structural shape or built-up, the as-fabricated variation from theoretical curvature to be equal to or less than standard camber and sweep tolerances permitted for straight members in applicable ASTM standard.

D. Use special care in handling and shipping of AESS both before and after shop painting to minimize damage to any shop finish. Use nylon-type slings or softeners when using chains or wire rope slings.

E. Bolted Connections:

F. Welded Connections:
   1. Comply with AWS D1.1/D1.1M and Section 05 1200.
   2. Assemble and weld built-up sections by methods that will maintain alignment of members without warp exceeding tolerances of this section.

G. Surface Preparation:
   1. Remove blemishes or unsightly surfaces resulting from temporary braces or fixtures.
   2. Remove backing and run out tabs.

H. Fabricate AESS in accordance with categories defined in AISC 303, as follows:
   1. AESS 1: Basic elements.
   2. AESS 2: Feature elements viewed at a distance greater than 20 feet (6 m) (feature elements not in close view).

2.03 PAINT SYSTEM

A. Compatibility: All components/procedures of AESS paint system to comply with coating system specified, submitted, and approved per Sections 09 9113, 09 9123, and 09 9600. As a minimum, identify required surface preparation, primer, intermediate coat (if applicable), and finish coat. Primer, intermediate coating, and finish coating to be from a single manufacturer combined in a system documented by manufacturer with adequate guidance for fabricator to procure and execute.

B. Primer: As specified in Sections 09 9113, 09 9123, and 09 9600. Primer to comply with all federal standards for VOC, lead and chromate levels.

C. Finish Coating: Field apply intermediate and top coats per Sections 09 9113, 09 9123, and 09 9600.

2.04 SHOP PRIMING

A. Surface Preparation:
   1. Provide surface preparations to meet SSPC-SP 6.
   2. Coordinate required surface profile with approved paint submittal prior to beginning surface preparation.
   3. Prior to blasting, remove any grease and oil using solvent cleaning to meet SSPC-SP 1.
   4. Remove weld spatter, slivers and similar surface discontinuities.
   5. Ease sharp corners resulting from shearing, flame cutting or grinding.

B. Shop prime structural steel members. Do not prime surfaces that will be fireproofed, field welded, in contact with concrete, or high strength bolted with slip-critical connections.
   1. Extend priming of members partially embedded in concrete or mortar to a depth of 2 inches (50.8 mm).

C. Priming: Immediately after surface preparation, apply primer according to manufacturer92s instructions to provide a dry film thickness of not less than 1.5 mils (0.038 mm). Use priming methods that result in full coverage of joints, corners, edges, and exposed surfaces.
   1. Stripe paint corners, crevices, bolts, welds, and sharp edges.
   2. Apply two coats of shop primer to surfaces that are inaccessible after assembly or erection.

2.05 GALVANIZING

A. Hot-Dip Galvanized Finish: Apply zinc coating by hot-dip process to AESS indicated for galvanizing according to ASTM A123/A123M. Fabricate such that all connections of assemblies are made in the field with bolted connections where possible.

2.06 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Structural Requirements:
   1. Comply with quality control requirements per AISC 360, Chapter N and AISC 303, Section 10. Refer to Section 05 1200 for additional requirements.
   2. Quality assurance agency to review work for compliance with requirements of AISC 360, Chapter N and AISC 303, Section 10.

C. AESS 1 and 2 Acceptance: Architect to observe AESS in the shop at a viewing distance consistent with final installation and determine acceptability based on qualification data and submittals. Quality assurance agency has no responsibility for enforcing requirements related to aesthetic effect.

PART 3 EXECUTION

3.01 EXAMINATION

A. Erector to check all AESS members upon delivery for twist, kinks, gouges or other imperfections which may result in rejection of appearance of member. Coordinate remedial action with fabricator prior to erecting steel.

3.02 PREPARATION

A. Provide connections for temporary shoring, bracing and supports only where noted on approved fabrication documents. Temporary connections not shown are to be made at locations not exposed to view in final structure or as approved by Architect.

B. Handle, lift and align pieces using nylon straps or chains with softeners required to maintain appearance of AESS through process of erection.

3.03 ERECTION

A. AESS 1 and 2: Basic elements; feature elements not in close view:
   1. Employ special care to handle and erect AESS. Erect finished pieces using nylon straps or chains with softeners such that they are not damaged.

2. Place weld tabs for temporary bracing and safety cabling at points concealed from view in completed structure or where approved by Architect during pre-installation meeting. Obtain Architect approval of methods for removing temporary devices and finishing AESS members prior to erection.
3. AESS Erection Tolerances: Erect to standard frame tolerances for structural steel per Chapter 7 of AISC 303.
4. Set AESS accurately in locations and to elevations indicated and according to AISC 303 and AISC 360.
5. Remove blemishes or unsightly surfaces resulting from temporary braces or fixtures.
6. Remove all backing and run out tabs.
7. When temporary braces or fixtures are required to facilitate erection, take care to avoid any blemishes, holes or unsightly surfaces resulting from use or removal of such temporary elements.
8. Bolted Connections: Align bolt heads on same side of connection as indicated on approved fabrication or erection documents.
9. Welded Connections: Comply with AWS D1.1/D1.1M and Section 05 1200. Appearance and quality of welds to be consistent. Employ methods that will maintain alignment of members without warp exceeding tolerance of this section.
10. Remove weld spatter exposed to view.
11. Grind off projections larger than 1/16 inch (1.5875 mm) at field butt and plug welds.
12. Continuous Welds: Where continuous welding is noted on drawings, provide continuous welds of a uniform size and profile.
13. Do not enlarge holes in members by burning or by using drift pins. Ream holes that must be enlarged to admit bolts. Replace connection plates that are misaligned where holes cannot be aligned with acceptable final appearance.
14. Splice members only where indicated.
15. Obtain permission for any torch cutting or field fabrication from Architect. Finish sections thermally cut during erection to a surface appearance consistent with mock-up.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

B. Structural Requirements:
   1. Comply with quality control requirements per AISC 360, Chapter N and AISC 303, Section 10. Refer to Section 05 1200 for additional requirements.
   2. Quality assurance agency to review work for compliance with requirements of AISC 360, Chapter N and AISC 303, Section 10.

C. AESS 1 and 2 Acceptance: Architect to observe AESS in place and determine acceptability based on qualification data and submittals. Quality assurance agency has no responsibility for enforcing requirements related to aesthetic effect.

3.05 CLEANING

A. Touch-up Painting: Complete cleaning and touch-up painting of field welds, bolted connections, and abraded areas of shop paint to blend with adjacent surfaces of AESS. Perform touch-up work in accordance with manufacturer's instructions and as specified in Section 09 9113, 09 9123, and 09 9600.

B. Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas. Repair galvanized surfaces in accordance with ASTM A780/A780M.

C. See Section 01 7419 - Construction Waste Management and Disposal, for additional requirements.

END OF SECTION

SECTION 05 2100
STEEL JOIST FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Open web steel joists and shear stud connectors, with bridging, attached seats and anchors.

B. Loose bearing members, such as plates or angles, and anchor bolts for site placement.

C. Supplementary framing for floor and roof openings greater than 18 inches (450 mm).

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: Grouting base plates and bearing plates. Superstructure framing.

B. Section 05 1200 - Structural Steel Framing: Superstructure framing.

C. Section 05 3100 - Steel Decking: Bearing plates and angles.

D. Section 05 3100 - Steel Decking: Support framing for openings less than 18 inches (450 mm) in decking.

E. Section 05 5000 - Metal Fabrications: Non-framing steel fabrications attached to joists.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.

C. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

D. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

E. ASTM A563/A563M - Standard Specification for Carbon and Alloy Steel Nuts (Inch and Metric); 2021a.

F. ASTM F436/F436M - Standard Specification for Hardened Steel Washers Inch and Metric Dimensions; 2019.

G. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.

H. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.

I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).

J. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.

K. SJI 100 - Standard Specifications for K-Series, LH-Series, and DLH-Series Open Web Steel Joists, and for Joist Girders; 2020.

L. SJI Technical Digest No. 9 - Handling and Erection of Steel Joists and Joist Girders; 2008.

M. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

N. SSPC-SP 2 - Hand Tool Cleaning; 2018.

O. SSPC-SP 3 - Power Tool Cleaning; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate standard designations, joist coding, configurations, sizes, spacings, cambers, locations of joists, joist leg extensions, bridging, connections, and attachments.

C. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

D. Designer's Qualification Statement.

E. Manufacturer's Qualification Statement.

F. Erector's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Design connections not detailed on drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Perform Work, including that for headers and other supplementary framing, in accordance with SJI 100 Standard Specifications Load Tables and SJI Technical Digest No. 9.
   1. Maintain one copy of document on site.

C. Manufacturer Qualifications: Steel Joist Institute member company specializing in performing the work of this section with minimum 5 years documented experience.

D. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work.

E. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

F. Erector Qualifications: Company specializing in performing the work of this section with minimum 5 years documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Transport, handle, store, and protect products to SJI requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Joists:
   1. New Millennium Building Systems: www.newmill.com/#sle.
   2. Nucor-Vulcraft Group: www.vulcraft.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 MATERIALS

A. Open Web Joists: SJI Type K Joists:
   1. Provide bottom chord extensions as indicated.
   2. Minimum End Bearing on Steel Supports: Comply with referenced SJI standard.
   3. Minimum End Bearing on Concrete or Masonry Supports: Comply with referenced SJI standard.
   4. Finish: Shop primed.

B. Anchor Bolts, Nuts and Washers: ASTM A307, hot-dip galvanized per ASTM A153/A153M, Class C.

C. High-Strength Structural Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, with matching compatible ASTM A563/A563M nuts and ASTM F436/F436M washers.

D. Shear Stud Connectors: Made from ASTM A108 Grade 1015 bars.

E. Structural Steel For Supplementary Framing and Joist Leg Extensions: ASTM A36/A36M.

F. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.03 FINISH

A. Shop prime joists as specified.

B. Prepare surfaces to be finished in accordance with SSPC-SP 2.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 ERECTION

A. Erect joists with correct bearing on supports.

B. Allow for erection loads. Provide sufficient temporary bracing to maintain framing safe, plumb, and in true alignment.

C. Coordinate the placement of anchors for securing loose bearing members furnished as part of the work of this section.

D. After joist alignment and installation of framing, field weld joist seats to steel bearing surfaces.

E. Install supplementary framing for roof openings greater than 18 inches (450 mm).

F. Do not permit erection of decking until joists are braced, bridged, and secured or until completion of erection and installation of permanent bridging and bracing.

G. Do not field cut or alter structural members without approval of joist manufacturer.

H. After erection, prime welds, damaged shop primer, and surfaces not shop primed, except surfaces specified not to be primed.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm).

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

A. An independent testing agency will perform field quality control tests, as specified in Section 01 4000 - Quality Requirements.

END OF SECTION

SECTION 05 3100
STEEL DECKING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof deck.

B. Composite floor deck.

C. Supplementary framing for openings up to and including 18 inches (450 mm).

D. Bearing plates and angles.

1.02 RELATED REQUIREMENTS

A. Section 03 2000 - Concrete Reinforcing.

B. Section 03 3000 - Cast-in-Place Concrete: Concrete topping over metal deck.

C. Section 03 4100 - Precast Structural Concrete: Placement of embedded steel anchors, dovetail slots, bearing plates, joist seats and other steel connectors in precast concrete.

D. Section 04 2000 - Unit Masonry: Placement of anchors for bearing plates embedded in unit masonry assemblies.

E. Section 05 1200 - Structural Steel Framing: Support framing for openings larger than 18 inches (450 mm).

F. Section 05 1200 - Structural Steel Framing: Placement of embedded steel anchors for bearing plates in cast-in-place concrete.

G. Section 05 2100 - Steel Joist Framing: Support framing for openings larger than 18 inches (450 mm).

H. Section 05 2100 - Steel Joist Framing: Placement of embedded steel anchors for bearing plates and joist seats in cast-in-place concrete.

I. Section 05 5000 - Metal Fabrications: Steel angle concrete stops at deck edges.

J. Section 26 0533.16 - Boxes for Electrical Systems: Electrical, telephone, and _____ floor outlets, sleeves, and gaskets.

1.03 REFERENCE STANDARDS

A. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

B. ASTM A108 - Standard Specification for Steel Bar, Carbon and Alloy, Cold-Finished; 2018.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A510/A510M - Standard Specification for General Requirements for Wire Rods and Coarse Round Wire, Carbon Steel, and Alloy Steel; 2020.

E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.

F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.

G. ASTM B633 - Standard Specification for Electrodeposited Coatings of Zinc on Iron and Steel; 2023.

H. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.

I. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).

J. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).

K. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.

L. ICC-ES AC43 - Acceptance Criteria for Steel Deck Roof and Floor Systems; 2022.

M. SDI (DM) - Publication No.30, Design Manual for Composite Decks, Form Decks, and Roof Decks; 2007.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittals procedures.

B. Product Data: Provide deck profile characteristics, dimensions, structural properties, and finishes.

C. Shop Drawings: Indicate deck plan, support locations, projections, openings, reinforcement, pertinent details, and accessories.

D. Certificates: Certify that products furnished meet or exceed specified requirements.

E. Submit manufacturer's installation instructions.

F. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

G. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Design deck layout, spans, fastening, and joints under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications: A qualified steel fabricator that is accredited by the International Accreditation Service (IAS) Fabricator Inspection Program for Structural Steel in accordance with IAS AC172.

D. Installer Qualifications: Company specializing in performing the work of this Section with minimum 5 years of experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Cut plastic wrap to encourage ventilation.

B. Separate sheets and store deck on dry wood sleepers; slope for positive drainage.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Deck:
   1. New Millennium Building Systems; ____: www.newmill.com/#sle.
   2. Nucor-Vulcraft Group; ____: www.vulcraft.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 STEEL DECK

A. All Deck Types: Select and design metal deck in accordance with SDI Design Manual.
   1. Calculate to structural working stress design and structural properties specified.
   2. Maximum Vertical Deflection of Floor Deck: 1/360 of span.

B. Roof Deck: Non-composite type, fluted steel sheet:
   1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
   2. Minimum Base Metal Thickness: 22 gauge, 0.0299 inch (0.76 mm).
   3. Nominal Height: 1-1/2 inch (38 mm) and 3 inch.
   4. Profile: Fluted; SDI WR.
   5. Formed Sheet Width: 24 inch (600 mm) for 3" deck and 36" for 1 1/2" deck.

6. Side Joints: Lapped, mechanically fastened.
7. End Joints: Lapped, welded.

C. Composite Floor Deck: Fluted steel sheet embossed to interlock with concrete:
1. Galvanized Steel Sheet: ASTM A653/A653M, Structural Steel (SS) Grade 33/230, with G90/Z275 galvanized coating.
2. Span Design: Double.
3. Minimum Base Metal Thickness: 20 gauge, 0.0359 inch (0.91 mm).
4. Nominal Height: 3 inches (76 mm).
5. Formed Sheet Width: 36 inch (900 mm).
6. Side Joints: Lapped, mechanically fastened.

2.03 ACCESSORY MATERIALS

A. Bearing Plates and Angles: ASTM A36/A36M steel, galvanized per ASTM A123/A123M.

B. Welding Materials: AWS D1.1/D1.1M.

C. Fasteners: Galvanized hardened steel, self tapping.

D. Mechanical Fasteners: Steel; hex washer head, self-drilling, self-tapping.
1. Design Requirements for Sidelap Connections: Provide number and type of fasteners that comply with the applicable requirements of SDI (DM)SDI design method for roof deck and floor deck applications and ICC-ES AC43.

E. Flute Closures: Closed cell foam rubber, 1 inch (25 mm) thick; profiled to fit tight to the deck.

2.04 FABRICATED DECK ACCESSORIES

A. Sheet Metal Deck Accessories: Metal closure strips, wet concrete stops, and cover plates, 22 gauge, 0.0299 inch (0.76 mm) thick sheet steel; of profile and size as indicated; finished same as deck.

B. Roof Sump Pans: Formed sheet steel, 14 gauge, 0.0747 inch (1.90 mm) minimum thickness, flat bottom, sloped sides, recessed 1-1/2 inches (38 mm) below roof deck surface, bearing flange 3 inches (75 mm) wide, sealed watertight.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions prior to beginning work.

3.02 INSTALLATION

A. Erect metal deck in accordance with SDI Design Manual and manufacturer's instructions. Align and level.

B. On concrete and masonry surfaces provide minimum 4 inch (100 mm) bearing.

C. On steel supports provide minimum 1-1/2 inch (38 mm) bearing.

D. Fasten deck to steel support members at ends and intermediate supports at 12 inches (300 mm) on center maximum, parallel with the deck flute and at each transverse flute using methods specified.
1. Welding: Use fusion welds through weld washers.

E. At mechanically fastened male/female side laps fasten at 24 inches (600 mm) on center maximum unliess indicated otherwise on the drawings.

F. Drive mechanical sidelap connectors completely through adjacent lapped sheets; positively engage adjacent sheets with minimum three-thread penetration.

G. At welded male/female side laps weld at 18 inches (450 mm) on center maximum.

H. Weld deck in accordance with AWS D1.3/D1.3M.

I. At deck openings from 6 inches (150 mm) to 18 inches (450 mm) in size, provide 2 by 2 by 1/4 inch (50 by 50 by 6 mm) steel angle reinforcement. Place angles perpendicular to flutes; extend minimum two flutes beyond each side of opening and fusion weld to deck at each flute.

J. At deck openings greater than 18 inches (450 mm) in size, provide steel angle reinforcement. as specified in Section 05 1200.

K. At floor edges, install concrete stops upturned to top surface of slab, to contain wet concrete. Provide stops of sufficient strength to remain stationary without distortion.

L. At openings between deck and walls, columns, and openings, provide sheet steel closures and angle flashings to close openings.

M. Close openings above walls and partitions perpendicular to deck flutes with single row of foam cell closures.

N. Position roof drain pans with flange bearing on top surface of deck. Fusion weld at each deck flute.

O. Immediately after welding deck and other metal components in position, coat welds, burned areas, and damaged surface coating, with touch-up primer.

END OF SECTION

SECTION 05 4000
COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Formed steel stud exterior wall and interior wall framing.

B. Exterior wall sheathing.

C. Formed steel joist and purlin framing and bridging.

D. Water-resistive barrier over sheathing.

1.02 RELATED REQUIREMENTS

A. Section 04 2613 - Masonry Veneer: Veneer masonry supported by wall stud metal framing.

B. Section 05 3100 - Steel Decking.

C. Section 07 2100 - Thermal Insulation: Insulation within framing members.

D. Section 07 6200 - Sheet Metal Flashing and Trim: Head and sill flashings.

E. Section 07 9200 - Joint Sealants.

F. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

G. Section 09 5100 - Acoustical Ceilings: Ceiling suspension system.

1.03 DEFINITIONS

A. General: See AISI S240 for definitions of terms used in this section.

B. Connection: A combination of structural elements and joints used to transmit forces between two or more members.

C. Connector: A device used to transmit forces between cold-formed steel structural members or between a cold-formed steel structural member and another structural element.

1.04 REFERENCE STANDARDS

A. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.

B. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

E. ASTM A780/A780M - Standard Practice for Repair of Damaged and Uncoated Areas of Hot-Dip Galvanized Coatings; 2020.

F. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.

G. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.

H. AWS D1.3/D1.3M - Structural Welding Code - Sheet Steel; 2018, with Errata (2022).

I. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

J. ICC-ES AC38 - Acceptance Criteria for Water-Resistive Barriers; 2016, with Editorial Revision (2021).

1.05 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with work of other sections that is to be installed in or adjacent to metal framing systems, including but not limited to structural anchors, cladding anchors, utilities, insulation, and firestopping.

1.06 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on cold-formed steel structural members; include material descriptions and base steel thickness.

C. Product Data: Provide manufacturer's data on factory-made connectors and mechanical fasteners, showing compliance with requirements.

D. Shop Drawings: Indicate component details, framed openings, bearing, anchorage, loading, welds, and type and location of fasteners, and accessories or items required of related work.
   1. Indicate stud and ceiling joist layout.
   2. Describe method for securing studs to tracks and for bolted framing connections.
   3. Design Data:
      a. Shop drawings signed and sealed by a professional structural engineer.

E. Steel Framing Industry Association (SFIA) Certification:
   1. Submit documentation that metal studs and connectors used on project meet or exceed requirements of International Building Code.
   2. Submit current documentation of contractor accreditation and installer certification. Keep copies of each on-site during and after installation, and present upon request.
   3. Design Data:
      a. Shop drawings signed and sealed by a professional structural engineer.
   4. Design calculations sufficient to demonstrate compliance with design criteria; signed and sealed by a professional structural engineer.
   5. Details and calculations for factory-made connectors, signed and sealed by a professional structural engineer.

F. Evaluation Service Reports: Provide reports indicating compliance with specified requirements for cold-formed steel structural members.

G. Inspection Reports: Provide material verification Inspection Reports in accordance with requirements of AISI S240.

H. Inspection Reports: Provide Inspection Reports for welding, mechanical fastening, and cold-formed steel light-frame construction in accordance with requirements of AISI S240.

I. Manufacturer's Installation Instructions: Provide installation instructions for connections. Indicate special procedures, conditions requiring special attention. .

J. Installation Drawings: Indicate dimensioned locations of cold-formed steel structural framing.

K. Designer's Qualification Statement.

L. Manufacturer's Qualification statement.

M. SSMA Manufacturer Qualification: Submit documentation of manufacturer association membership.

N. SSFSA Manufacturer Qualification: Submit documentation of manufacturer association membership.

1.07 QUALITY ASSURANCE

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Designer Qualifications: Design framing system under direct supervision of a professional structural engineer experienced in designing this work and licensed in the State in which the Project is located.

C. SFIA Code Compliance Certification Program: www.CFsteel.org/#sle: Use metal studs and connectors certified for compliance with International Building Code.

D. Manufacturer Qualifications: Company specializing in manufacturing the types of products specified in this section, and with minimum three years of documented experience.

E. Manufacturer Qualifications: Member of Steel Stud Manufacturers Association (SSMA): www.ssma.com/#sle.

F. Manufacturer Qualifications: Member of Supreme Steel Framing System Association (SSFSA): www.ssfsa.com/#sle.

G. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and AWS D1.3/D1.3M and dated no more than 12 months before start of scheduled welding work.

H. Installer Qualifications: Company specializing in performing the work of this section with minimum three years documented experience and approved by manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Framing:
   1. ClarkDietrich: www.clarkdietrich.com/#sle.
   2. MarinoWARE; ____: www.marinoware.com/#sle.
   3. The Steel Network, Inc; _____: www.SteelNetwork.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

B. Connectors:
   1. Same manufacturer as metal framing.

2.02 PERFORMANCE REQUIREMENTS

A. Comply with requirements for Contractor's design-related professional design services indicated in Section 01 4000 - Quality Requirements.

B. Design Criteria: As indicated on drawings and in accordance with applicable codes..
   1. Able to tolerate movement of components without damage, failure of joint seals, undue stress on fasteners, or other detrimental effects when subject to seasonal or cyclic day/night temperature ranges.
   2. Able to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

C. Fabrication:
   1. Shop-fabricate cold-formed framing systems and connectors to the greatest extent possible.
   2. Deliver to project site in largest practical sections.

2.03 MATERIALS

A. Material and Product Requirements Criteria: AISI S201.

B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.
   1. Structural Grade: As required to meet design criteria.
   2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.

2.04 STRUCTURAL FRAMING COMPONENTS

A. Wall Studs and Track Sections: AISI S240; c-shaped studs and u-shaped track sections in stud-matching nominal width and compatible height.
   1. Thickness and Depth: Depth as indicated on the drawings; thickness and structural grade as required to meet design criteria. Exterior wall and soffit components shall have a minimum thickness of 43 mils.

B. Jamb Studs: AISI S240; manufactured, engineered, c-shaped with wide flanges, designed to replace conventional double-stud framing at openings.

C. Headers: AISI S240; manufactured, engineered one-member or two-member assemblies, with wide flanges, designed to replace conventional box or nested header framing at openings.
   1. Jamb Mounting Clips: Manufacturer's standard.
   2. Cripple Stud Clips: Manufacturer's standard.

D. Purlins: AISI S240; manufactured c-shaped sections.

2.05 CONNECTIONS

A. Performance Requirements: Provide connections in compliance with requirements of AISI S240.

B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S240.
   1. Structural Grade: As required to meet design criteria.
   2. Corrosion Protection Coating Designation: CP 60 in accordance with AISI S240.

C. Structural Performance: Maintain load and movement capacity required by applicable building code and specified design criteria.

D. Movement Connections: Provide mechanical anchorage devices that accommodate movement using slotted holes, shouldered screws or screws and anti-friction or stepped bushings, while maintaining structural performance of framing. Provide movement connections where indicated on drawings.
   1. Where continuous studs bypass elevated floor slab, connect stud to slab in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch (13 mm).
   2. Where top of stud wall terminates below structural floor or roof, connect studs to structure in manner allowing vertical and horizontal movement of slab without affecting studs; allow for minimum movement of 1/2 inch (13 mm).
   3. Provide top track with long leg track and head of wall movement connectors; minimum track length of 10 feet (3048 mm).

E. Fixed Connections: Provide nonmovement devices for tie-down to foundation, floor-to-floor tie-down, roof-to-wall tie-down, joist hangers, gusset plates, and stiffeners.

F. Bridging Connections: Provide mechanical load-transferring devices that accommodate wind load torsion and weak axis buckling induced by axial compression loads. Provide bridging connectors where indicated on the drawings.

2.06 MISCELLANEOUS CONNECTIONS

A. Self-Drilling, Self-Tapping Screws, Bolts, Nuts and Washers: Hot-dip galvanized per ASTM A153/A153M.

B. Anchorage Devices: Powder actuated.

C. Welding: Comply with AWS D1.1/D1.1M.

2.07 SHEATHING

A. Gypsum Board Wall Sheathing: See Section 09 2116.

2.08 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered; finish to match framing components.

B. Galvanizing Repair: Touch up bare steel with zinc-rich paint in compliance with ASTM A780/A780M.

C. Water-Resistive Barrier: ICC-ES AC38 Grade D and 60-minute plastic sheet.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

3.02 PREPARATION

A. Structural Wall Foundations: For gaps between wall bottom track and top of foundation 1/4 inch (6.4 mm) or greater, level substrate with loadbearing shims or grout between track and foundation.

3.03 INSTALLATION - GENERAL

A. Install structural members and connections in compliance with ASTM C1007.

3.04 INSTALLATION OF STUDS

A. Construct corners using minimum of three studs. Install double studs at wall openings, door and window jambs.

B. Install load-bearing studs full length in one piece. Splicing of studs is not permitted.

C. Install load-bearing studs; brace, and reinforce to develop full strength and achieve design requirements.

D. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

E. Install intermediate studs above and below openings to align with wall stud spacing.

F. Provide deflection allowance in stud track, directly below horizontal building framing at non-loadbearing framing.

G. Attach cross studs to studs for attachment of fixtures anchored to walls.

H. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

I. Touch-up field welds and damaged corrosion-protected surfaces zinc-rich paint in compliance with ASTM A780/A780M.

3.05 INSTALLATION OF JOISTS AND PURLINS

A. Install framing components in accordance with manufacturer's instructions.

B. Make provisions for erection stresses. Provide temporary alignment and bracing.

C. Set floor and ceiling joists parallel and level, with lateral bracing and bridging.

D. Touch-up field welds and damaged galvanized surfaces with primer.

3.06 INSTALLATION OF WALL SHEATHING

A. Install wall sheathing with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using self-tapping screws.

3.07 FIELD QUALITY CONTROL

A. Provide material verification inspections in accordance with requirements of AISI S240.

B. Provide inspections for welding, mechanical fastening, and cold-formed steel light-frame construction in accordance with requirements of AISI S240.

3.08 TOLERANCES

A. Studs - Vertical Alignment (Plumbness): 1/960 of span, or 1/8 inch in 10 ft (3.2 mm in 3000 mm), in accordance with ASTM C1007.

B. Stud Spacing: 1/8 inch (3.2 mm) from the designated spacing, provided that the cumulative error does not exceed the requirements of the finishing materials in accordance with ASTM C1007.

END OF SECTION

SECTION 05 5000
METAL FABRICATIONS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 07 6200 - Sheet Metal Flashing and Trim

B. Section 08 4413 - Aluminum-Framed Storefront: Coordinated adjacent construction and finish.

C. Section 08 4413 - Glazed Curtain Walls: Coordinated adjacent construction and finish.

1.02 PRICE AND PAYMENT PROCEDURES

A. See Section 01 2200 - Unit Prices, for additional requirements.

1.03 REFERENCE STANDARDS

A. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.

B. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

C. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

D. ASTM A283/A283M - Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates; 2018.

E. ASTM A307 - Standard Specification for Carbon Steel Bolts, Studs, and Threaded Rod 60 000 PSI Tensile Strength; 2021.

F. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

G. ASTM A554 - Standard Specification for Welded Stainless Steel Mechanical Tubing; 2021.

H. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

I. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.

J. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

K. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

L. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.

M. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

N. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).

O. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.

P. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

Q. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
2. Design data: Submit drawings and supporting calculations, signed and sealed by a qualified professional structural engineer.

C. Samples:Submit two samples of each accessory, illustrating color and finish.
1. Provide two samples indicating each metal thickness.
2. Provide two samples each color and finish.

D. Designer's Qualification Statement.

E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Design metal fabrications under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A501/A501M hot-formed structural tubing.

C. Plates: ASTM A283/A283M.

D. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

E. Stainless Steel, General: ASTM A666, Type 304.

F. Stainless Steel Tubing: ASTM A554, Type 304, 16 gauge, 0.0625 inch (1.59 mm) minimum metal thickness, 1-1/2 inch (38 mm) diameter.

G. Stainless Steel Bars, Shapes and Moldings: ASTM A276/A276M, Type 304.

H. Slotted Channel Fittings: ASTM A1011/A1011M.

I. Mechanical Fasteners: Same material as or compatible with materials being fastened; type consistent with design and specified quality level.

J. Bolts, Nuts, and Washers: ASTM A307, Grade A, plain.

K. Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, plain.

L. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

M. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

N. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, complying with VOC limitations of authorities having jurisdiction.

2.02 MATERIALS - ALUMINUM

A. Extruded Aluminum: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

B. Sheet Aluminum: ASTM B209/B209M, 5052 alloy, H32 or H22 temper.

2.03 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Furnish components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.04 FABRICATED ITEMS

A. Aluminum Corner Column Covers: As part of exterior at corners of exterior glazed aluminum curtain walls

B. Dimenions: As indicated on drawings and as required to in coordination design of aluminum glazed curatin wall design.

C. Ledge Angles, Shelf Angles, Channels, and Plates Not Attached to Structural Framing: For support of metal decking; prime paint finish.

D. Slotted Channel Framing: Fabricate channels and fittings from structural steel complying with the referenced standards; factory-applied, rust-inhibiting thermoset acrylic enamel finish.

2.05 FINISHES - ALUMINUM

A. Exterior Aluminum Surfaces: Same, to match, adjacent aluminum glazed curtain wall..

B. Interior Aluminum Surfaces: Same, to match, adjacent aluminum glazed curtain wall..

2.06 FABRICATION TOLERANCES

A. Items to be part of assembled alumiunum curtain wall
   1. Corner angles are specific, atypical, and vary by location specific. See details.
   2. Coordinate alignment and dimensions with aluminum curtain wall system.

B. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.

C. Maximum Offset Between Faces: 1/16 inch (1.5 mm).

D. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).

E. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).

F. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.

B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Obtain approval prior to site cutting or making adjustments not scheduled.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/8 inch (3 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/8 inch (3 mm).

C. Maximum Out-of-Position: 1/8 inch (3 mm).

END OF SECTION

SECTION 05 5100
METAL STAIRS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Stairs with concrete treads.

B. Structural steel stair framing and supports.

C. Handrails and guards.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete fill in stair pans.

B. Section 03 3000 - Cast-in-Place Concrete: Placement of metal anchors in concrete.

C. Section 04 2000 - Unit Masonry: Placement of metal fabrications in masonry.

D. Section 05 5000 - Metal Fabrications.

E. Section 05 5213 - Pipe and Tube Railings: Metal handrails for the stairs specified in this section.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. AISC 201 - AISC Certification Program for Structural Steel Fabricators, Standard for Steel Building Structures; 2006.

C. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

D. ASTM A6/A6M - Standard Specification for General Requirements for Rolled Structural Steel Bars, Plates, Shapes, and Sheet Piling; 2022.

E. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

F. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

G. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

H. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

I. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.

J. ASTM A501/A501M - Standard Specification for Hot-Formed Welded and Seamless Carbon Steel Structural Tubing; 2021.

K. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.

L. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.

M. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.

N. ASTM F3125/F3125M - Standard Specification for High Strength Structural Bolts and Assemblies, Steel and Alloy Steel, Heat Treated, Inch Dimensions 120 ksi and 150 ksi Minimum Tensile Strength, and Metric Dimensions 830 MPa and 1040 MPa Minimum Tensile Strength; 2022.

O. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

P. AWS B2.1/B2.1M - Specification for Welding Procedure and Performance Qualification; 2021.

Q. AWS D1.1/D1.1M - Structural Welding Code - Steel; 2020, with Errata (2022).

R. IAS AC172 - Accreditation Criteria for Fabricator Inspection Programs for Structural Steel AC172; 2019.

S. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

T. NAAMM AMP 510 - Metal Stairs Manual; 1992.

U. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

V. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

W. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories.
   1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.
   2. Include the design engineer's seal and signature on each sheet of shop drawings.

C. Design Data: As required by authorities having jurisdiction.

D. Welders' Qualification Statement: Welders' certificates in accordance with AWS B2.1/B2.1M and dated no more than 12 months before start of scheduled welding work.

E. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is certified under AISC 201.

F. Fabricator's Qualification Statement: Provide documentation showing steel fabricator is accredited under IAS AC172.

1.05 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

B. Welder Qualifications: Welding processes and welding operators qualified in accordance with AWS D1.1/D1.1M and dated no more than 12 months before start of scheduled welding work.

C. Fabricator Qualifications:
   1. A qualified steel fabricator that is certified by the American Institute for Steel Construction (AISC) under AISC 201.

PART 2 PRODUCTS

2.01 METAL STAIRS - GENERAL

A. Metal Stairs: Provide stairs of the design specified, complete with landing platforms, vertical and horizontal supports, railings, and guards, fabricated accurately for anchorage to each other and to building structure.
   1. Regulatory Requirements: Provide stairs and railings that comply with most stringent requirements of local, state, and federal regulations; where requirements of Contract Documents exceed those of regulations, comply with Contract Documents.
   2. Handrails: Comply with applicable accessibility requirements of ADA Standards.
   3. Structural Design: Provide complete stair and railing assemblies that comply with the following:
      a. Stair Capacity: Uniform live load of 100 lb/sq ft (4.7 kPa) and a concentrated load of 300 lb (14.4 kg) with deflection of stringer or landing framing not to exceed 1/360 of span.
      b. Railing Assemblies: Comply with applicable local code.

4. Dimensions: As indicated on drawings.
5. Shop assemble components; disassemble into largest practical sections suitable for transport and access to site.
6. No sharp or rough areas on exposed travel surfaces and surfaces accessible to touch.
7. Separate dissimilar metals using paint or permanent tape.

B. Metal Jointing and Finish Quality Levels:
1. Architectural: All joints as inconspicuous as possible, whether welded or mechanical.
a. Welded Joints: Continuously welded and ground smooth and flush.
b. Mechanical Joints: Butted tight, flush, and hairline; concealed fastenings only.
c. Exposed Edges and Corners: Eased to small uniform radius.
d. Metal Surfaces to be Painted: Sanded or ground smooth, suitable for highest quality gloss finish.

C. Fasteners: Same material or compatible with materials being fastened; type consistent with design and specified quality level.

D. Anchors and Related Components: Same material and finish as item to be anchored, except where specifically indicated otherwise; provide all anchors and fasteners required.

2.02 METAL STAIRS WITH CONCRETE TREADS

A. Jointing and Finish Quality Level: Architectural, as defined above.

B. Risers: Closed.

C. Treads: Metal pan with field-installed concrete fill.
1. Concrete Depth: 1-1/2 inches (38 mm), minimum.
2. Tread Pan Material: Steel sheet.
3. Tread Pan Thickness: As required by design; 14 gauge, 0.075 inch (1.9 mm) minimum.
4. Concrete Reinforcement: Welded wire mesh.
5. Concrete Finish: For resilient floor covering.

D. Risers: Same material and thickness as tread pans.
1. Nosing Depth: Not more than 1-1/2 inch (38 mm) overhang.
2. Nosing Return: Flush with top of concrete fill, not more than 1/2 inch (12 mm) wide.

E. Stringers: Rolled steel channels.
1. Stringer Depth: 10 inches (250 mm).
2. End Closure: Sheet steel of same thickness as risers welded across ends.

F. Railings: Steel pipe railings.

G. Finish: Shop- or factory-prime painted.

2.03 HANDRAILS AND GUARDS

A. Wall-Mounted Rails: Round pipe or tube rails unless otherwise indicated.
1. Outside Diameter: 1-1/4 inch (32 mm), minimum, to 1-1/2 inches (38 mm), maximum.

B. Guards:
1. Top Rails: Round pipe or tube rails unless otherwise indicated.
a. Outside Diameter: 1-1/4 inch (32 mm), minimum, to 1-1/2 inches (38 mm), maximum.
2. Infill at Pipe Railings: Pipe or tube rails sloped parallel to stair.
a. Outside Diameter: 1 inch (25 mm).
b. Material: Steel pipe or tube, round.
c. Vertical Spacing: Maximum 4 inches (100 mm) on center.
d. Jointing: Welded and ground smooth and flush.
3. End and Intermediate Posts: Same material and size as top rails.
a. Horizontal Spacing: As indicated on drawings.
b. Mounting: Welded to top surface of stringer.

2.04 MATERIALS

A. Steel Sections: ASTM A36/A36M.

B. Steel Tubing: ASTM A500/A500M or ASTM A501/A501M structural tubing, round and shapes as indicated.

C. Pipe: ASTM A53/A53M, Grade B Schedule 40, black finish.

D. Ungalvanized Steel Sheet: Hot- or cold-rolled, except use cold-rolled where finished work will be exposed to view.
   1. Hot-Rolled Steel Sheet: ASTM A1011/A1011M, Designation CS (commercial steel).
   2. Cold-Rolled Steel Sheet: ASTM A1008/A1008M, Designation CS (commercial steel).

E. Concrete Reinforcement: Mesh type as detailed, galvanized.

2.05 ACCESSORIES

A. Steel Bolts, Nuts, and Washers: ASTM F3125/F3125M, Type 1, and galvanized to ASTM A153/A153M where connecting galvanized components.

B. Welding Materials: AWS D1.1/D1.1M; type required for materials being welded.

C. Shop and Touch-Up Primer: SSPC-Paint 15, and comply with VOC limitations of authorities having jurisdiction.

D. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic, and comply with VOC limitations of authorities having jurisdiction.

2.06 SHOP FINISHING

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact with concrete or where field welding is required.

C. Prime Painting: Use specified shop- and touch-up primer.
   1. Preparation of Steel: In accordance with SSPC-SP 2, Hand Tool Cleaning.
   2. Number of Coats: One.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. When field welding is required, clean and strip primed steel items to bare metal.

B. Supply items required to be cast into concrete and embedded in masonry with setting templates.

3.03 INSTALLATION

A. Install components plumb and level, accurately fitted, free from distortion or defects.

B. Allow for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.

C. Provide welded field joints where specifically indicated on drawings. Perform field welding in accordance with AWS D1.1/D1.1M.

D. Other field joints may be either welded or bolted provided the result complies with the limitations specified for jointing quality levels.

E. Obtain approval prior to site cutting or creating adjustments not scheduled.

F. After erection, prime welds, abrasions, and surfaces not shop primed or galvanized, except surfaces to be in contact with concrete.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per story, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

END OF SECTION

SECTION 05 5133
METAL LADDERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Shop-fabricated metal ladders.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ANSI A14.3 - American National Standard for Ladders -- Fixed -- Safety Requirements; 2008 (Reaffirmed 2018).

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

C. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

D. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

E. SSPC-SP 2 - Hand Tool Cleaning; 2018.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings:
   1. Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
   2. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.05 QUALITY ASSURANCE

A. Design roof ladder under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located.

PART 2 PRODUCTS

2.01 MATERIALS - STEEL

A. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.02 FABRICATION

A. Fit and shop assemble items in largest practical sections, for delivery to site.

B. Fabricate items with joints tightly fitted and secured.

C. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

D. Supply components required for anchorage of fabrications. Fabricate anchors and related components of same material and finish as fabrication, except where specifically noted otherwise.

2.03 FABRICATED LADDERS

A. Ladders: Steel; in compliance with ANSI A14.3; with mounting brackets and attachments; prime paint finish.
   1. Side Rails: 3/8 by 2 inches (9 by 50 mm) members spaced at 20 inches (500 mm).
   2. Rungs: One inch (25 mm) diameter solid round bar spaced 12 inches (300 mm) on center.
   3. Space rungs 7 inches (175 mm) from wall surface.

B. Ladder to accomdate fall arrest system in complaince with current OSHA requirements.

2.04 FINISHES - STEEL

A. Prime paint steel items.
   1. Do not prime surfaces where field welding is required.
B. Prepare surfaces to be primed in accordance with SSPC-SP2.
C. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.
D. Factory prime and field paint interior ladders.

2.05 FABRICATION TOLERANCES

A. Squareness: 1/8 inch (3 mm) maximum difference in diagonal measurements.
B. Maximum Offset Between Faces: 1/16 inch (1.5 mm).
C. Maximum Misalignment of Adjacent Members: 1/16 inch (1.5 mm).
D. Maximum Bow: 1/8 inch (3 mm) in 48 inches (1.2 m).
E. Maximum Deviation From Plane: 1/16 inch (1.5 mm) in 48 inches (1.2 m).

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 PREPARATION

A. Clean and strip primed steel items to bare metal where site welding is required.

3.03 INSTALLATION

A. Install items plumb and level, accurately fitted, free from distortion or defects.
B. Provide for erection loads, and for sufficient temporary bracing to maintain true alignment until completion of erection and installation of permanent attachments.
C. Obtain approval prior to site cutting or making adjustments not scheduled.

END OF SECTION

SECTION 05 5213
PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall mounted handrails.

B. Stair railings and guardrails.

C. Free-standing railings at steps.

1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM A53/A53M - Standard Specification for Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless; 2022.

C. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

D. ASTM A500/A500M - Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes; 2021a.

E. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

F. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2022.

G. ASTM B429/B429M - Standard Specification for Aluminum-Alloy Extruded Structural Pipe and Tube; 2020.

H. ASTM B483/B483M - Standard Specification for Aluminum and Aluminum-Alloy Drawn Tube and Drawn Pipe for General Purpose Applications; 2021.

I. AWS A2.4 - Standard Symbols for Welding, Brazing, and Nondestructive Examination; 2020.

J. SSPC-Paint 15 - Steel Joist Shop Primer/Metal Building Primer; 2004.

K. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate profiles, sizes, connection attachments, anchorage, size and type of fasteners, and accessories.

1. Indicate welded connections using standard AWS A2.4 welding symbols. Indicate net weld lengths.

1.04 QUALITY ASSURANCE

A. Structural Designer Qualifications: Professional Structural Engineer experienced in design of this work and licensed in the State in which the Project is located, or personnel under direct supervision of such an engineer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 RAILINGS - GENERAL REQUIREMENTS

A. Design, fabricate, and test railing assemblies in accordance with the most stringent requirements of applicable local code.

B. Allow for expansion and contraction of members and building movement without damage to connections or members.

C. Dimensions: See drawings for configurations and heights.

D. Provide anchors and other components as required to attach to structure, made of same materials as railing components unless otherwise indicated; where exposed fasteners are unavoidable provide flush countersunk fasteners.

E. Provide slip-on non-weld mechanical fittings to join lengths, seal open ends, and conceal exposed mounting bolts and nuts, including but not limited to elbows, T-shapes, splice connectors, flanges, escutcheons, and wall brackets.

2.03 ALUMINUM MATERIALS

A. Aluminum Tube: Minimum wall thickness of 0.127 inch (3.2 mm); ASTM B429/B429M, ASTM B241/B241M, or ASTM B483/B483M.

B. Solid Bars and Flats: ASTM B211/B211M.

C. Non-Weld Mechanical Fittings: Slip-on cast aluminum, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

D. Exposed Fasteners: No exposed bolts or screws.

2.04 STEEL RAILING SYSTEM

A. Steel Tube: ASTM A500/A500M, Grade B cold-formed structural tubing.

B. Steel Pipe: ASTM A53/A53M, Grade B Schedule 80, black finish.

C. Non-Weld Mechanical Fittings: Slip-on, galvanized malleable iron castings, for Schedule 40 pipe, with flush setscrews for tightening by standard hex wrench, no bolts or screw fasteners.

D. Welding Fittings: Factory- or shop-welded from matching pipe or tube; seams continuously welded; joints and seams ground smooth.

E. Exposed Fasteners: No exposed bolts or screws.

F. Galvanizing: In accordance with requirements of ASTM A123/A123M.
   1. Touch-Up Primer for Galvanized Surfaces: SSPC-Paint 20, Type I - Inorganic.

G. Shop and Touch-Up Primer: SSPC-Paint 15, complying with VOC limitations of authorities having jurisdiction.

2.05 FABRICATION

A. Accurately form components to suit specific project conditions and for proper connection to building structure.

B. Fit and shop assemble components in largest practical sizes for delivery to site.

C. Fabricate components with joints tightly fitted and secured. Provide spigots and sleeves to accommodate site assembly and installation.

D. Welded Joints:
   1. Exterior Components: Continuously seal joined pieces by intermittent welds and plastic filler. Drill condensate drainage holes at bottom of members at locations that will not encourage water intrusion.
   2. Interior Components: Continuously seal joined pieces by intermittent welds and plastic filler.
   3. Grind exposed joints flush and smooth with adjacent finish surface. Make exposed joints butt tight, flush, and hairline. Ease exposed edges to small uniform radius.

2.06 ALUMINUM FINISHES

A. Color: To be selected by Architect from manufacturer's standard line.

B. Touch-Up Materials: As recommended by coating manufacturer for field application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field conditions are acceptable and are ready to receive work.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, with tight joints.

C. Install railings in compliance with ADA Standards for accessible design at applicable locations.

D. Anchor railings securely to structure.

3.03 TOLERANCES

A. Maximum Variation From Plumb: 1/4 inch (6 mm) per floor level, non-cumulative.

B. Maximum Offset From True Alignment: 1/4 inch (6 mm).

C. Maximum Out-of-Position: 1/4 inch (6 mm).

END OF SECTION

SECTION 05 7000
DECORATIVE METAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal surfaces at reception desk.

1.02 RELATED REQUIREMENTS

A. Section 06 2000 - Finish Carpentry: Wood handrail.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's product data, including description of materials, components, finishes, fabrication details, glass, anchors, and accessories.

C. Shop Drawings: Indicate railing system elevations and sections, details of profile, dimensions, sizes, connection attachments, anchorage, size and type of fasteners, and accessories. Indicate anchor and joint locations, brazed connections, transitions, and terminations.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in factory-provided protective coverings and packaging.

B. Protect materials against damage during transit, delivery, storage, and installation at site.

C. Inspect materials upon delivery for damage. Repair damage to be indistinguishable from undamaged areas; if damage cannot be repaired to be indistinguishable from undamaged parts and finishes, replace damaged items.

D. Prior to installation, store materials and components under cover in a dry location.

1.06 FIELD CONDITIONS

A. Do not install railings until project is enclosed and ambient temperature of space is minimum 65 degrees F (18.3 degrees C) and maximum 95 degrees F (35 degrees C).

B. Maintain ambient temperature of space at minimum 65 degrees F (18.3 degrees C) and maximum 95 degrees F (35 degrees C) for 24 hours before, during, and after railing installation.

PART 2 PRODUCTS

2.01 PRODUCT AND MANUFACTURER

A. Basis-Of-Design: Forms + Surfaces
   1. Manufacturerer: Forms + Surfaces
   2. Material: Stainless Steel.
   3. Thickness: 0.8mm
   4. Style/Finish: Linen.
   5. Color: Stainless Steel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate and site conditions are acceptable and ready to receive work.

B. Verify field dimensions of locations and areas to receive work.

C. Notify Architect immediately of conditions that would prevent satisfactory installation.

D. Do not proceed with work until detrimental conditions have been corrected.

E. Furnish components to be installed in other work to installer of that other work, including but not supports and attachments.

3.02 PREPARATION

A. Review installation drawings before beginning installation. Coordinate diagrams, templates, instructions, and directions for installation of anchorages and fasteners.

B. Clean surfaces to receive units. Remove materials and substances detrimental to the installation.

3.03 INSTALLATION

A. Comply with manufacturer's drawings and written instructions.

B. Install components plumb and level, accurately fitted, free from distortion or defects, and with tight joints, except where necessary for expansion.

C. Anchor securely to structure.

D. Conceal anchor bolts and screws whenever possible. Where not concealed, use flush countersunk fastenings.

E. Isolate dissimilar materials with bituminous coating, bushings, grommets, or washers to prevent electrolytic corrosion.

3.04 PROTECTION

A. Protect installed components and finishes from damage after installation.

B. Repair damage to exposed finishes to be indistinguishable from undamaged areas.

1. If damage to finishes and components cannot be repaired to be indistinguishable from undamaged finishes and components, replace damaged items.

END OF SECTION

SECTION 06 1053
MISCELLANEOUS ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preservative treated wood materials.

B. Fire retardant treated wood materials.

C. Subflooring--Non-combustible construction.

D. Communications and electrical room mounting boards.

E. Concealed wood blocking, nailers, and supports.

F. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. Section 09 2116 - Gypsum Board Assemblies: Gypsum-based sheathing.

1.03 REFERENCE STANDARDS

A. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

B. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).

C. ASTM D2898 - Standard Practice for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2010 (Reapproved 2017).

D. ASTM D3498 - Standard Specification for Adhesives for Field-Gluing Wood Structural Panels (Plywood or Oriented Strand Board) to Wood Based Floor System Framing; 2019a.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

F. ASTM E136 – Standard Test Method for Behavior of Materials in a Vertical Tube Furnace at 750 °C.

G. AWPA U1 - Use Category System: User Specification for Treated Wood; 2023.

H. PS 1 - Structural Plywood; 2019.

I. PS 20 - American Softwood Lumber Standard; 2021.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, and installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.

1. If no species is specified, provide species graded by the agency specified; if no grading agency is specified, provide lumber graded by grading agency meeting the specified requirements.
2. Grading Agency: Grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service

for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No.2 or Standard Grade.
   2. Boards: Standard or No.3.

2.03 CONSTRUCTION PANELS

A. Subflooring--Non-combustible construction: Structural emetitious subfloor panels.
   1. Basis-of-Design: USG Corporation: USG Structural Panel Concrete Subfloor. USG Structo-crete Panels.
   2. Size: 48-inchesx 96-inches, nominal.
   3. Thickness: 3/4-inch, nominal.
   4. Edges: Square along width; tounge and groove along length.
   5. Span: 16-inch maximum.
   6. Fire Resistance: NMoncombustible, when tested in accordance with ASTM E136
   7. Surface Burning Characteristics: Flame spread index of 0; some-developed index of 0; when tested in accordance with ASTM E84.

B. Communications and Electrical Room Mounting Boards: PS 1, A-D plywood, or medium density fiberboard; 3/4 inch (19 mm) thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

C. Gallery Walls for Exhibition Mounting as indicated on drawings: PS 1, A-D plywood, or medium density fiberboard; 3/4 inch (19 mm) thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E84.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel complying with ASTM A153/A153M for high humidity and preservative-treated wood locations, unfinished steel elsewhere.

B. Construction Adhesives: Adhesives complying with ASTM C557 or ASTM D3498.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.
   2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment:
   1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM E84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Do not use treated wood in direct contact with ground.
   2. Interior Type A: AWPA U1, Use Category UCFA, Commodity Specification H, low temperature, low hygroscopic type, chemically treated and pressure impregnated; capable of providing a maximum flame spread index of 25 when tested in accordance with ASTM

E84, with no evidence of significant combustion when test is extended for an additional 20 minutes.

a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
b. Interior rough carpentry items are to be fire retardant treated.
c. Treat rough carpentry items as indicated.
d. Do not use treated wood in applications exposed to weather or where the wood may become wet.

C. Preservative Treatment:
1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to .10 lb/cu ft retention (to .31 kg/cu m retention).
a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
b. Treat lumber exposed to weather.
c. Treat lumber in contact with roofing, flashing, or waterproofing.
d. Treat lumber in contact with masonry or concrete.
e. Treat lumber less than 18 inches (450 mm) above grade.

PART 3 EXECUTION

3.01 PREPARATION

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

C. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

3.04 ROOF-RELATED CARPENTRY

A. Coordinate installation of roofing carpentry with deck construction, framing of roof openings, and roofing assembly installation.

3.05 INSTALLATION OF CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches (610 mm) on center on edges and into studs in field of board.
1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
3. Install adjacent boards without gaps.

3.06 SITE APPLIED WOOD TREATMENT

A. Apply preservative treatment compatible with factory applied treatment at site-sawn cuts, complying with manufacturer's instructions.

B. Allow preservative to dry prior to erecting members.

3.07 CLEANING

A. Waste Disposal: See Section 01 7419 - Construction Waste Management and Disposal.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 06 2000
FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

1.02 RELATED REQUIREMENTS

A. Section 01 6200 - Architectural Wood Casework, Wood Faced Cabinet.

1.03 REFERENCE STANDARDS

A. ANSI A135.4 - Basic Hardboard; 2012 (Reaffirmed 2020).

B. ANSI A208.1 - American National Standard for Particleboard; 2022.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

D. BHMA A156.9 - Cabinet Hardware; 2020.

E. HPVA HP-1 - American National Standard for Hardwood and Decorative Plywood; 2020.

F. PS 1 - Structural Plywood; 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

B. Sequence installation to ensure utility connections are achieved in an orderly and expeditious manner.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide manufacturer's product data, storage and handling instructions for factory-fabricated units.
   2. Provide data on fire retardant treatment materials and application instructions.

C. Samples: Submit two samples of material of dimension to represent thickness, board width and variences in grain and color. Sample to illustrate finish and construction joints.

1.06 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Company with at least one project within the past 5 years with value of woodwork within 20 percent of cost of woodwork for this project.

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Locate where directed.

C. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Store finish carpentry items under cover, elevated above grade, and in a dry, well-ventilated area not exposed to heat or sunlight.

B. Protect from moisture damage.

PART 2 PRODUCTS

2.01 FINISH CARPENTRY ITEMS

A. Interior Woodwork Items:

1. Exposed surfaces for custom cabinetry.
2. Plywood for custom cabinetry.
3. Wood Base Trim.
4. Miscellaneous finish carpentry as required.

2.02 LUMBER MATERIALS

A. Salvaged Wood: Sinker Cypress.
   1. Salvaged Wood - WD-01:Sinker Cypress.
      a. Air dried prior to klin drying.
      b. Board Thickness: 1-inch thick, planed to 3/4" thick.
      c. Board Dimensions, width and length: 9"x108"
      d. Basis-Of-Design Supplier: Virgin Heart Sinker Cypress, LLC.
   2. Locations: Reception Desk as indicated on drawings. Coordinate with Architectural Wood Casework.

B. Softwood Lumber: dimensional species, _____ sawn, maximum moisture content of 6 percent, of quality suitable for opaque painted finish..
   1. Grading: In accordance with rules certified by ALSC; www.alsc.org.

2.03 SHEET MATERIALS

A. Softwood Plywood, Not Exposed to View: Any face species, medium density fiberboard core; PS 1 Grade A-B, glue type as recommended for application.

B. Hardwood Plywood: Face species as indicated, plain sawn, book matched, medium density fiberboard core; HPVA HP-1, Front Face Grade AA, Back Face Grade 1, glue type as recommended for application.

C. Particleboard: ANSI A208.1; Composed of wood chips, sawdust, or flakes of medium density, made with waterproof resin binders; of grade to suit application; sanded faces.

2.04 PANEL CORE MATERIALS

A. Basic Hardboard: Panel manufactured from inter-felted lignocellulosic fibers consolidated under heat and pressure; comply with ANSI A135.4.

2.05 FASTENINGS

A. Adhesive for Purposes Other Than Laminate Installation: Suitable for the purpose; not containing formaldehyde or other volatile organic compounds.

B. Adhesive for factory-fabricated units: Manufacturer's recommended adhesive for application.

C. Fasteners: Of size and type to suit application; suitable finish in concealed locations and see drawings or consult architect for finish in exposed locations.

D. Concealed Joint Fasteners: Threaded steel.

2.06 ACCESSORIES

A. Exposed metal specialty componets: As inddicated drawings. Consult architect where finish is not indicated..

2.07 HARDWARE

A. Hardware: Comply with BHMA A156.9.

2.08 WOOD TREATMENT

A. Factory-Treated Lumber: Comply with requirements of AWPA U1 - Use Category System for pressure impregnated wood treatments determined by use categories, expected service conditions, and specific applications.

B. Fire Retardant Treatment (FR-S Type): Chemically treated and pressure impregnated; capable of providing flame spread index of 25, maximum, and smoke developed index of 450, maximum, when tested in accordance with ASTM E84.

C. Provide identification on fire retardant treated material.

D. Redry wood after pressure treatment to maximum ____ percent moisture content.

2.09 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

3.02 INSTALLATION

A. Set and secure materials and components in place, plumb and level.

B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim to conceal larger gaps.

3.03 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch (1.6 mm).

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.79 mm).

END OF SECTION

SECTION 06 4100
ARCHITECTURAL WOOD CASEWORK

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Specially fabricated cabinet units.

B. Countertops.

C. Hardware.

1.02 RELATED REQUIREMENTS

A. Section 01 6200 - Finish Carpentry: Lumber Materials, Salaveged Wood.

B. Section 12 3600 - Countertops.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

C. BHMA A156.9 - Cabinet Hardware; 2020.

D. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, and accessories.
   1. Scale of Drawings: 1-1/2 inch to 1 foot (125 mm to 1 m), minimum.

C. Product Data: Provide data for hardware accessories.

D. Samples: Submit actual sample items of proposed pulls, hinges, shelf standards, and locksets, demonstrating hardware design, quality, and finish.

1.05 QUALITY ASSURANCE

A. Fabricator Qualifications: Company specializing in fabricating the products specified in this section with minimum five years of documented experience.
   1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.
   2. Single Source Responsibility: Provide and install this work from single fabricator.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect units from moisture damage.

1.07 FIELD CONDITIONS

A. During and after installation of custom cabinets, maintain temperature and humidity conditions in building spaces at same levels planned for occupancy.

PART 2 PRODUCTS

2.01 CABINETS

A. Quality Standard: Custom Grade, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.

B. Salvaged Wood Faced Reception Desk:
   1. Exposed Exterior Surfaces: Sinker Cypress.
   2. Exposed Interior Surfaces: Decorative Laminate.
   3. Concealed Surfaces: Manufacturer's option.

C. Plastic Laminate Faced Cabinets: Custom grade.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

B. Wood fabricated from timber recovered from riverbeds or otherwise abandoned is permitted, unless otherwise noted, provided it is clean and free of contamination; identify source; provide lumber re-graded by an inspection service accredited by the American Lumber Standard Committee, Inc.

C. Products:
   1. Salvaged Wood - WD-01:Sinker Cypress.
      a. See Product information in specifcation section 06-2000 Finish Carpentry.

2.03 LAMINATE MATERIALS

A. Manufacturers:
   1. Basis-OF-Desgin: As indicated on Finish Legend ond drawings.

B. High Pressure Decorative Laminate (HPDL): NEMA LD 3, types as recommended for specific applications.

C. Provide specific types as required and indicated on drawings.
   1. Horizontal Surfaces: HGS, 0.048 inch (1.22 mm) nominal thickness, through color, finish as indicated.
   2. Vertical Surfaces: VGS, 0.028 inch (0.71 mm) nominal thickness, through color, finish as indicated.
   3. Laminate Backer: BKL, 0.020 inch (0.51 mm) nominal thickness, undecorated; for application to concealed backside of panels faced with high pressure decorative laminate.

2.04 COUNTERTOPS

A. Countertops: See Section 12 3600.

2.05 ACCESSORIES

A. Adhesive: Type recommended by fabricator to suit application.

B. Fasteners: Size and type to suit application.

C. Bolts, Nuts, Washers, Lags, Pins, and Screws: Of size and type to suit application; galvanized or chrome-plated finish in concealed locations and stainless steel or chrome-plated finish in exposed locations.

D. Concealed Joint Fasteners: Threaded steel.

E. Grommets: Standard plastic, painted metal, or rubber grommets for cut-outs, in color to match adjacent surface.

2.06 HARDWARE

A. Hardware: BHMA A156.9, types as recommended by fabricator for quality grade specified.

B. Adjustable Shelf Supports: Standard side-mounted system using recessed metal shelf standards or multiple holes for pin supports and coordinated self rests, polished chrome finish, for nominal 1 inch (25 mm) spacing adjustments.

C. Fixed American with Disabilities Act (ADA)-Compliant Vanity and Countertop Brackets:
   1. Materials: Steel,
      a. Finish: Manufacturer's standard, factory-applied, powder coat.
      b. Color: Black.

D. Drawer and Door Pulls: as indicated on drawings..

E. Cabinet Catches and Latches:

F. Drawer Slides:
   1. Type: Full extension.
   2. Static Load Capacity: Heavy Duty grade.
   3. Mounting: Side mounted.

4. Features: Provide self closing/stay closed type.

G. Hinges: European style concealed self-closing type, steel with satin finish.

2.07 FABRICATION

A. Assembly: Shop assemble cabinets for delivery to site in units easily handled and to permit passage through building openings.

B. Edging: Fit shelves, doors, and exposed edges with specified edging. Do not use more than one piece for any single length.

C. Fitting: When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide matching trim for scribing and site cutting.

D. Plastic Laminate: Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.
   1. Apply laminate backing sheet to reverse side of plastic laminate finished surfaces.
   2. Cap exposed plastic laminate finish edges with material of same finish and pattern.

E. Provide cutouts for plumbing fixtures. Verify locations of cutouts from on-site dimensions. Prime paint cut edges.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify location and sizes of utility rough-in associated with work of this section.

3.02 INSTALLATION

A. Install work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS) requirements for grade indicated.

B. Set and secure custom cabinets in place, assuring that they are rigid, plumb, and level.

C. Use fixture attachments in concealed locations for wall mounted components.

D. Use concealed joint fasteners to align and secure adjoining cabinet units.

E. Carefully scribe casework abutting other components, with maximum gaps of 1/32 inch (0.79 mm). Do not use additional overlay trim for this purpose.

F. Secure cabinets to floor using appropriate angles and anchorages.

3.03 ADJUSTING

A. Adjust installed work.

B. Adjust moving or operating parts to function smoothly and correctly.

3.04 CLEANING

A. Clean casework, counters, shelves, hardware, fittings, and fixtures.

END OF SECTION

SECTION 06 8316
FIBERGLASS REINFORCED PANELING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fiberglass reinforced plastic panels.

1.02 REFERENCE STANDARDS

A. ASTM D5319 - Standard Specification for Glass-Fiber Reinforced Polyester Wall and Ceiling Panels; 2022.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Samples: Submit two samples 3 by 3 inch (__by__ mm) in size illustrating material and surface design of panels.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Store panels flat, indoors, on a clean, dry surface. Remove packaging and allow panels to acclimate to room temperature for 48 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fiberglass Reinforced Plastic Panels:
   1. Marlite, Inc; Smooth FRP.: www.marlite.com/#sle.

2.02 MATERIALS

A. Panels: Fiberglass reinforced plastic (FRP), complying with ASTM D5319.
   1. Surface Burning Characteristics: Maximum flame spread index of 75 and smoke developed index of 450; when system tested in accordance with ASTM E84.

B. Adhesive: Type recommended by panel manufacturer.

C. Sealant: Type recommended by panel manufacturer; white.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions and substrate flatness before starting work.

B. Verify that substrate conditions are ready to receive the work of this section.

3.02 INSTALLATION - WALLS

A. Install panels in accordance with manufacturer's instructions.

B. Cut and drill panels with carbide tipped saw blades, drill bits, or snips.

C. Apply adhesive to the back side of the panel using trowel as recommended by adhesive manufacturer.

D. Apply panels to wall with seams plumb and pattern aligned with adjoining panels.

E. Install panels with manufacturer's recommended gap for panel field and corner joints.

F. Seal gaps at floor, ceiling, and between panels with applicable sealant to prevent moisture intrusion.

G. Remove excess sealant after paneling is installed and prior to curing.

END OF SECTION

SECTION 07 1300
SHEET WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

1.02 RELATED REQUIREMENTS

1.03 ABBREVIATIONS

1.04 REFERENCE STANDARDS

A. ASTM E154/E154M - Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover; 2008a (Reapproved 2019).

B. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data for membrane.

C. Shop Drawings: Indicate special joint or termination conditions and conditions of interface with other materials.

1.06 QUALITY ASSURANCE

1.07 FIELD CONDITIONS

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 SHEET WATERPROOFING APPLICATIONS

2.02 SHEET WATERPROOFING MATERIALS

2.03 ACCESSORIES

PART 3 EXECUTION

3.01 EXAMINATION

3.02 PREPARATION

3.03 INSTALLATION - MEMBRANE

A. Install membrane waterproofing in accordance with manufacturer's instructions and NRCA (WM) applicable requirements.

B. Roll out membrane, and minimize wrinkles and bubbles.

C. Overlap edges and ends, minimum 3 inches (76 mm), seal permanently waterproof by method recommended by manufacturer, and apply uniform bead of sealant to joint edge.

D. Reinforce membrane with multiple thickness of membrane material over joints, whether joints are static or dynamic.

E. Weather lap joints on sloped substrate in direction of drainage, and seal joints and seams.

F. Flexible Flashings: Seal items watertight that penetrate through waterproofing membrane with flexible flashings.

G. Seal membrane and flashings to adjoining surfaces.

3.04 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.06 PROTECTION

A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

SECTION 07 1400
FLUID-APPLIED WATERPROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Cold-applied rubberized asphalt waterproofing.

1.02 REFERENCE STANDARDS

A. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a, with Editorial Revision (2023).

B. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.03 QUALITY ASSURANCE

1.04 FIELD CONDITIONS

A. Maintain ambient temperatures above 40 degrees F (5 degrees C) for 24 hours before and during application and until cured.

1.05 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Installer Warranty: Provide 2-year warranty for waterproofing failing to resist penetration of water commencing on Date of Substantial Completion. Complete forms in Owner's name and register with installer.

C. Extended Correction Period: Correct defective work within 2-year period commencing on Date of Substantial Completion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Cold-Applied Rubberized Asphalt Waterproofing:

2.02 FLUID-APPLIED WATERPROOFING APPLICATIONS

2.03 FLUID-APPLIED WATERPROOFING MATERIALS

A. Cold-Applied Rubberized Asphalt Waterproofing: Rubberized asphaltic compound, suitable for installation on concrete and concrete masonry.
   1. Capable of resisting water head of _____ feet (_____ m) and preventing moisture migration to interior.
   2. Cured Thickness: 60 mil, 0.060 inch (1.52 mm), minimum.
   3. Water Vapor Permeance: 1 perm (57 ng/(Pa s sq m)), maximum, when tested in accordance with ASTM E96/E96M.

2.04 ACCESSORIES

PART 3 EXECUTION

3.01 EXAMINATION

3.02 PREPARATION

3.03 INSTALLATION

A. Install waterproofing to specified minimum thickness in accordance with manufacturers instructions and NRCA (WM) applicable requirements.

B. Seal membrane and flashings to adjoining surfaces.

3.04 INSTALLATION - DRAINAGE PANEL AND PROTECTION BOARD

3.05 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.06 PROTECTION

A. Do not permit traffic over unprotected or uncovered membrane.

END OF SECTION

SECTION 07 2100
THERMAL INSULATION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Board insulation at cavity wall construction, perimeter foundation wall, and underside of floor slabs.

B. Batt insulation in exterior wall construction.

C. Batt insulation for filling perimeter window and door shim spaces and crevices in exterior wall and roof.

1.02 RELATED REQUIREMENTS

A. Section 07 5400 - Thermoplastic Membrane Roofing: Insulation and installation requirements for board insulation over low slope roof deck.

B. Section 09 8430 Sound-Absorbing Wall and Ceiling Units: Acoustical insulation.

C. Division 23 Heating, Ventilating and Air-Contintioning: Acoustical insulation and duct lining.

1.03 REFERENCE STANDARDS

A. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2022.

B. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.

C. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2022a.

D. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

E. ASTM E136 - Standard Test Method for Assessing Combustibility of Materials Using a Vertical Tube Furnace at 750 °C; 2022.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on product characteristics, performance criteria, and product limitations.

1.05 FIELD CONDITIONS

A. Do not install insulation adhesives when temperature or weather conditions are detrimental to successful installation.

PART 2 PRODUCTS

2.01 APPLICATIONS

A. Insulation Under Concrete Slabs: Extruded polystyrene (XPS) board.

B. Insulation at Perimeter of Foundation: Extruded polystyrene (XPS) board.

C. Insulation Inside Masonry Cavity Walls: Expanded polystyrene (EPS) board.

D. Insulation Inside Prefabricated Wall Panels: Extruded polystyrene (XPS) board.

E. Insulation Over Roof Deck: Polyisocyanurate board.

2.02 FOAM BOARD INSULATION MATERIALS

A. Expanded Polystyrene (EPS) Board Insulation: Comply with ASTM C578.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
   2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.

B. Extruded Polystyrene (XPS) Board Insulation: Comply with ASTM C578 with either natural skin or cut cell surfaces.
   1. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.

2. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
3. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.0 (0.88), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.

C. Extruded Polystyrene (XPS) Continuous Insulation (CI) Board: Comply with ASTM C578, and manufactured using carbon black technology.
1. Type and Compressive Resistance: Type IV, 25 psi (173 kPa), minimum.
2. Flame Spread Index (FSI): Class A - 0 to 25, when tested in accordance with ASTM E84.
3. Smoke Developed Index (SDI): 450 or less, when tested in accordance with ASTM E84.
4. Type and Thermal Resistance, R-value (RSI-value): Type IV, 5.6 (0.98), minimum, per 1 inch (25.4 mm) thickness at 75 degrees F (24 degrees C) mean temperature.
5. Board Edges: Shiplap, at long edges.

D. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, comply with ASTM C1289.
1. Roof insulation specified in section 07 5400 - Thermoplastic Membrane Roofing:

2.03 MINERAL FIBER BLANKET ACOUSTICAL INSULATION MATERIALS

A. Flexible Glass Fiber Blanket Thermal Insulation: Preformed insulation, complying with ASTM C665; friction fit.
1. Combustibility: Non-combustible, when tested in accordance with ASTM E136, except for facing, if any.
2. Formaldehyde Content: Zero.

B. Mineral Wool Blanket Thermal Insulation: Flexible or semi-rigid preformed insulation, complying with ASTM C665.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.

2.04 MINERAL FIBER BOARD ACOUSTICAL INSULATION MATERIALS

A. Duct Liners: Rigid, resin bonded fibrous glass blankets or board with a damage-resistant, flame retardant veil faced airstream surface.
1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 450 or less, when tested in accordance with ASTM E84.
3. Materials shall conform to ASTM C 423 standard for "Sound Absorbtion".
a. Noise Reduction Coefficient (NRC): 0.80
4. Color: Black.
5. Mounting: Type A.

B. Products:
1. Owens Corning: QuietR Duct Liner Baord.
2. CertainTeed: AscoustaBoard.
3. Sustitutions note permitted.

C. Adhesives as acceptable to the manufactuer for applications as indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate, adjacent materials, and insulation materials are dry and that substrates are ready to receive insulation.

B. Verify substrate surfaces are flat, free of honeycomb, fins, irregularities, or materials or substances that may impede adhesive bond.

3.02 BOARD INSTALLATION AT FOUNDATION PERIMETER

A. Install boards horizontally on foundation perimeter.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.03 BOARD INSTALLATION AT CAVITY WALLS

A. Install boards to fit snugly between wall ties.

B. Install boards horizontally on walls.

C. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

3.04 BOARD INSTALLATION UNDER CONCRETE SLABS

A. Place insulation under slabs on grade after base for slab has been compacted.

B. Cut and fit insulation tightly to protrusions or interruptions to the insulation plane.

C. Prevent insulation from being displaced or damaged while placing vapor retarder and placing slab.

3.05 ACOUSTICAL INSULATION, BLANKET AND BOARD

A. Install at locations indicated on drawings, in coordination with acoutical insulation specified in section 09 8430 Sound-Absorbing Wall and Ceiling Units.

B. Install duct lining insulation in coordination with mechanical requirements as indicated on drawings and specified in Division 23.

3.06 BATT INSTALLATION

A. Install insulation in accordance with manufacturer's instructions.

B. Install in exterior wall and roof spaces without gaps or voids. Do not compress insulation.

C. Trim insulation neatly to fit spaces. Insulate miscellaneous gaps and voids.

D. Fit insulation tightly in cavities and tightly to exterior side of mechanical and electrical services within the plane of the insulation.

3.07 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.08 PROTECTION

A. Do not permit installed insulation to be damaged prior to its concealment.

END OF SECTION

SECTION 07 2400
EXTERIOR INSULATION AND FINISH SYSTEMS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Drainage and water-resistive barriers behind insulation board.

1.02 RELATED REQUIREMENTS

A. Section 01 4533 - Code Required Special Inspections: Cast-in-Place Concrete: Air barrier and vaopr retarder.

1.03 REFERENCE STANDARDS

A. ASTM B117 - Standard Practice for Operating Salt Spray (Fog) Apparatus; 2019.

B. ASTM C297/C297M - Standard Test Method for Flatwise Tensile Strength of Sandwich Constructions; 2016.

C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2022.

D. ASTM C1063 - Standard Specification for Installation of Lathing and Furring to Receive Interior and Exterior Portland Cement-Based Plaster; 2022a.

E. ASTM C1397 - Standard Practice for Application of Class PB Exterior Insulation and Finish Systems (EIFS) and EIFS with Drainage; 2013 (Reapproved 2019).

F. ASTM D968 - Standard Test Methods for Abrasion Resistance of Organic Coatings by Falling Abrasive; 2022.

G. ASTM D2247 - Standard Practice for Testing Water Resistance of Coatings in 100 % Relative Humidity; 2015 (Reapproved 2020).

H. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

I. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

J. ASTM E2273 - Standard Test Method for Determining the Drainage Efficiency of Exterior Insulation and Finish Systems (EIFS) Clad Wall Assemblies; 2018.

K. ASTM E2486/E2486M - Standard Test Method for Impact Resistance of Class PB and PI Exterior Insulation and Finish Systems (EIFS); 2022.

L. ASTM G153 - Standard Practice for Operating Enclosed Carbon Arc Light Apparatus for Exposure of Nonmetallic Materials; 2013 (Reapproved 2021).

M. ASTM G155 - Standard Practice for Operating Xenon Arc Lamp Apparatus for Exposure of Materials; 2021.

N. ICC-ES AC219 - Acceptance Criteria for Exterior Insulation and Finish Systems; 2009, with Editorial Revision (2022).

O. ICC-ES AC235 - Acceptance Criteria for EIFS Clad Drainage Wall Assemblies; 2015, with Editorial Revision (2022).

P. Unified Facilities Criteria (UFC)

Q. NFPA 259 - Standard Test Method for Potential Heat of Building Materials; 2023, with Errata.

R. NFPA 268 - Standard Test Method for Determining Ignitability of Exterior Wall Assemblies Using a Radiant Heat Energy Source; 2022.

S. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on system materials, product characteristics, performance criteria, and system limitations.

C. Shop Drawings: Indicate wall and soffit joint patterns, joint details, and molding profiles.

D. Selection Samples: Submit manufacturer's standard range of samples illustrating available coating colors and textures.

E. Delegated Design Documents: Drawings and calculations sealed by Structural Engineer.

F. Design Data: Indicate drawings and calculations sufficient to demonstrate compliance with applicable building code; signed and sealed by Engineer of Record for prefabricated panel systems.

G. Manufacturer's Installation Instructions: Indicate preparation required, installation techniques, and jointing requirements.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Perform design under direct supervision of Professional Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

B. Maintain copy of specified installation standard and manufacturer's installation instructions at project site during installation.

C. EIFS Manufacturer Qualifications: Provide EIFS products other than insulation from the same manufacturer with qualifications as follows:

1.06 DELIVERY, STORAGE, AND HANDLING

A. Delivery: Deliver materials to project site in manufacturer's original, unopened containers with labels intact. Inspect materials and notify manufacturer of any discrepancies.

B. Storage: Store materials as directed by manufacturer's written instructions.

1.07 FIELD CONDITIONS

A. Do not prepare materials or apply EIFS under conditions other than those described in the manufacturer's written instructions.

B. Do not prepare materials or apply EIFS during inclement weather unless areas of installation are protected. Protect installed EIFS areas from inclement weather until dry.

C. Do not install coatings or sealants when ambient temperature is below 40 degrees F (5 degrees C).

D. Do not leave installed insulation board exposed to sunlight for extended periods of time.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Provide manufacturer's standard material warranty, covering a period of not less than 5 years.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design:
   1. Dryvit Systems, Inc; Dryvit Outsulation Plus MD EIFS, Class PB with Moisture Drainage: www.dryvit.com/#sle.

B. Other Acceptable Exterior Insulation and Finish Systems Manufacturers:
   1. Master Builders Solutions; Senergy Channeled Adhesive CI (Continuous Insulation) Design with MaxGrip Veneer Mortar: www.senergy.master-builders-solutions.com/en/#sle.
   2. Parex USA, Inc; Standard WaterMaster EIFS with Moisture Drainage: www.parex.com/#sle.
   3. Sto Corp; StoTherm ci: www.stocorp.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

2.02 EXTERIOR INSULATION AND FINISH SYSTEM

A. Exterior Insulation and Finish System: DRAINAGE type; reinforced finish coating on flat-backed insulation board adhesive-applied directly to water-resistive coating over substrate; provide a complete system that has been tested to show compliance with the following characteristics; include all components of specified system and substrate(s) in tested samples.

B. Allowable Wind Loading: To meet design criteria indicated on structural drawings, positive and negative, determined in accordance with ICC-ES AC219 or ICC-ES AC235, using factor of safety of 3.0.

C. Fire Characteristics:
   1. Flammability: Pass, when tested in accordance with NFPA 285.
   2. Ignitibility: No sustained flaming when tested in accordance with NFPA 268.
   3. Potential Heat of Foam Plastic Insulation Tested Independently of Assembly: No portion of the assembly having potential heat that exceeds that of the insulation sample tested for flammability (above), when tested in accordance with NFPA 259 with results expressed in Btu per square foot (mJ/sq m).

D. Adhesion of Water-Resistive Coating to Substrate: For each combination of coating and substrate, minimum flatwise tensile bond strength of 15 psi (105 kPa), when tested in accordance with ASTM C297/C297M.

E. Adhesion to Water-Resistive Coating: For each combination of insulation board and substrate, when tested in accordance with ASTM C297/C297M, maximum adhesive failure of 25 percent unless flatwise tensile bond strength exceeds 15 psi (105 kPa) in all samples.

F. Water Penetration Resistance: No water penetration beyond the plane of the base coat/insulation board interface after 15 minutes, when tested in accordance with ASTM E331 at 6.24 psf (299 Pa) differential pressure with tracer dye in the water spray; include in tested sample at least two vertical joints and one horizontal joint of same type to be used in construction; disassemble sample if necessary to determine extent of water penetration.

G. Drainage Efficiency: Average minimum efficiency of 90 percent, when tested in accordance with ASTM E2273 for 75 minutes.

H. Salt Spray Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 300 hours exposure in accordance with ASTM B117, using at least three samples matching intended assembly, at least 4 by 6 inches (100 by 150 mm) in size.

I. Freeze-Thaw Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 10 cycles, when tested in accordance with ICC-ES AC219 or ICC-ES AC235.

J. Weathering Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating when viewed under 5x magnification after 2000 hours of accelerated weathering conducted in accordance with ASTM G153 Cycle 1 or ASTM G155 Cycles 1, 5, or 9.

K. Water Degradation Resistance: No cracking, checking, crazing, erosion, blistering, peeling, delamination, or corrosion of finish coating after 14 days exposure, when tested in accordance with ASTM D2247.

L. Mildew Resistance: No growth supported on finish coating during 28 day exposure period, when tested in accordance with ASTM D3273.

M. Abrasion Resistance Of Finish: No cracking, checking or loss of film integrity when tested in accordance with ASTM D968 with 113.5 gallons (500 liters) of sand.

N. Impact Resistance: Construct system to provide the following impact resistance without exposure of broken reinforcing mesh, when tested in accordance with ASTM E2486/E2486M:
   1. High: 90 to 150 in-lb (10.2 to 17 J), for areas indicated on the drawings.

2.03 MATERIALS

A. Finish Coating Top Coat: Water-based, air curing, acrylic or polymer-based finish with integral color and texture.

B. Expanded Polystyrene (EPS) Board Insulation: Complies with ASTM C578.

C. Water-Resistive Barrier Coating: Fluid-applied air and water barrier membrane; applied to sheathing; furnished or approved by EIFS manufacturer.

2.04 ACCESSORIES

A. Insulation Adhesive: Type required by EIFS manufacturer for project substrate.

B. Trim: EIFS manufacturer's standard PVC or galvanized steel trim accessories, as required for a complete project and including starter track and drainage accessories.

C. Sealant Materials: Compatible with EIFS materials and as recommended by EIFS manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate is sound and free of oil, dirt, other surface contaminants, efflorescence, loose materials, or protrusions that could interfere with EIFS installation and is of a type and construction that is acceptable to EIFS manufacturer. Do not begin work until substrate and adjacent materials are complete and thoroughly dry.

B. Verify that substrate surface is flat, with no deviation greater than 1/4 in (6 mm) when tested with a 10 ft (3 m) straightedge.

3.02 PREPARATION

A. Install self-furring metal lath over solid substrates that are deemed unacceptable to receive adhesively applied insulation. Install in accordance with ASTM C1063, except for butt-lapping instead of overlapping.

1. Attach to concrete and concrete masonry using corrosion-resistant power or powder actuated fasteners or hardened concrete stub nails not less than 3/4 inch (19 mm) long and with heads not less than 3/8 inch (9.5 mm) wide. Ensure that fasteners are securely attached to substrate and spaced at maximum 16 inches (406 mm) on center horizontally and 7 inches (178 mm) vertically.

3.03 INSTALLATION - GENERAL

A. Install in accordance with EIFS manufacturer's instructions and ASTM C1397.

1. Where different requirements appear in either document, comply with the most stringent.
2. Neither of these documents supercedes provisions of Contract Documents that defines contractual relationships between parties or scope of this work.

3.04 INSTALLATION - WATER-RESISTIVE BARRIER

A. Apply barrier coating as recommended by coating manufacturer; prime substrate as required before application.

B. Seal substrate transitions and intersections with other materials to form continuous water-resistive barrier on exterior of sheathing, using method recommended by manufacturer.

C. At door and window rough openings and other wall penetrations, seal water-resistive barrier and flexible flashings to rough opening before installation of metal flashings, sills, or frames, using method recommended by manufacturer.

D. Lap flexible flashing or flashing tape at least 2 inches (50 mm) on each side of joint or transition.

3.05 INSTALLATION - INSULATION

A. Install in accordance with manufacturer's instructions.

B. Install back wrap reinforcing mesh at all openings and terminations that are not to be protected with trim.

C. On wall surfaces, install boards horizontally.

D. Place boards in a method to maximize tight joints. Stagger vertical joints and interlock at corners. Butt edges and ends tight to adjacent board and to protrusions. Achieve a continuous flush insulation surface, with no gaps in excess of 1/16 inch (1.6 mm).

E. Fill gaps greater than 1/16 inch (1.6 mm) with strips or shims cut from the same insulation material.

F. Rasp irregularities off surface of installed insulation board.

3.06 PROTECTION

A. Protect completed work from damage and soiling by subsequent work.

END OF SECTION

SECTION 07 2500
WEATHER BARRIERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Water-resistive barriers.

1.02 RELATED REQUIREMENTS

A. Section 01 4533 - Code Required Special Inspections: Cast-in-Place Concrete: Air barrier and vaopr retarder.

B. Section 03 3000 - Cast-in-Place Concrete: Concrete substrate.

C. Section 05 4000 - Cold-Formed Metal Framing: Exterior metal stud walls.

D. Section 04 2000 - Unit Masonry. Concrete masonry.

E. Section 07 2400 - Exterior Insulation and Finish Systems: Water-resistive barrier under exterior insulation.

F. Section 07 4213.23 - Metal Composite Material Wall Panels:

G. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashings installed in conjunction with weather barriers.

H. Section 07 9200 - Joint Sealants: Sealants applied to adjacent work.

I. Section 09 2116 - Gypsum Board Assemblies: Sheathing.

1.03 DEFINITIONS

A. Weather Barriers: Assemblies that form either water-resistive barriers, air barriers, or vapor retarders.

B. Water-Resistive Barrier: A material behind an exterior wall covering that is intended to resist liquid water that has penetrated behind the exterior covering from further intruding into the exterior wall assembly.

1.04 REFERENCE STANDARDS

A. ASTM D1970/D1970M - Standard Specification for Self-Adhering Polymer Modified Bituminous Sheet Materials Used as Steep Roofing Underlayment for Ice Dam Protection; 2021.

B. ASTM D5590 - Standard Test Method for Determining the Resistance of Paint Films and Related Coatings to Fungal Defacement by Accelerated Four-Week Agar Plate Assay; 2017 (Reapproved 2021).

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

D. ASTM E96/E96M - Standard Test Methods for Gravimetric Determination of Water Vapor Transmission Rate of Materials; 2022a, with Editorial Revision (2023).

E. ASTM E2178 - Standard Test Method for Determining Air Leakage Rate and Calculation of Air Permeance of Building Materials; 2021a.

F. ICC-ES AC148 - Acceptance Criteria for Flexible Flashing Materials; 2017, with Editorial Revision (2021).

G. ICC-ES AC212 - Acceptance Criteria for Water-Resistive Coatings Used as Water-Resistive Barriers over Exterior Sheathing; 2015, with Editorial Revision (2020).

H. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on material characteristics.

1.06 FIELD CONDITIONS

A. Maintain temperature and humidity recommended by materials manufacturers before, during, and after installation.

PART 2 PRODUCTS

2.01 WATER-RESISTIVE BARRIER MATERIALS

A. Water-Resistive Barrier: For use in Construction Types I, II, III, and IV on buildings greater than 40 feet (12.2 m) in height.
   1. Comply with NFPA 285 wall assembly requirements in accordance with local building code and authorities having jurisdiction (AHJ).

B. Water-Resistive Barrier Coating: Fluid applied, UV-resistant coating for use over various types of exterior sheathing, CMU, and precast concrete in accordance with ICC-ES AC212.
   1. Air Permeance, Building Material Air Leakage Rate: 0.004 cfm/sq ft (0.02 L/sec sq m) maximum leakage when tested at 1.57 psf (75 Pa) pressure difference in accordance with ASTM E2178.
   2. Water-Resistive Barrier over Sheathing Compliance: Complying with ICC-ES AC212.
   3. Water Vapor Permeance: Tested in accordance with ASTM E96/E96M.
      a. Procedure A: Greater than 5 perms (287 ng/(Pa s sq m)).
      b. Procedure B: Greater than 14 perms (804 ng/(Pa s sq m)).
   4. Dry Film Thickness (DFT): 10 mils, ___ inch (___ mm), minimum.
   5. Water Vapor Permeance: 10 perms (572 ng/(Pa s sq m)), minimum, when tested in accordance with ASTM E96/E96M using Procedure B - Water Method.
   6. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 120 days of weather exposure.
   7. Surface Burning Characteristics: Flame spread index of 25 or less, smoke developed index of 450 or less, Class A when tested in accordance with ASTM E84.
   8. Resistance to Fungal Growth: No growth when tested in accordance with ASTM D5590.
   9. Joint Preparation Treatment: As recommended by coating manufacturer.
   10. Products:
      a. PROSOCO, Inc; Spray Wrap MVP: www.prosoco.com/#sle.
      b. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ACCESSORIES

A. Sealants, Tapes, and Accessories Used for Sealing Water-Resistive Barrier and Adjacent Substrates: As indicated or complying with water-resistive barrier manufacturer's installation instructions.

B. Sealant for Cracks and Joints In Substrates: Resilient elastomeric joint sealant compatible with substrates and weather barrier materials.
   1. Application: Apply at 30 to 40 mil, 0.030 to 0.040 inch (0.76 to 1.02 mm) nominal thickness.

C. Flexible Flashing: Self-adhesive sheet flashing complying with ASTM D1970/D1970M, except slip resistance requirement is waived if not installed on a roof.

D. Flexible Flashing: Self-adhering or mechanically attached flashing used for wall penetrations in accordance with ICC-ES AC148 requirements.

E. Sill Plate Sealer: Closed-cell foam tape with rubberized adhesive membrane; bridges gap between foundation structure and sill plate or skirt board.
   1. Width: 5-1/2 inches (140 mm).
   2. Ultraviolet (UV) and Weathering Resistance: Approved by manufacturer for up to 30 days of weather exposure.

F. Preformed Transition Membrane: Semi-rigid silicone or polyester composition, tapered edges, and tear resistant.

G. Stainless Steel Flashing: Flexible flashing with 2 mil, 0.002 inch (0.051 mm) thick Type 304 stainless steel sheet, 8 mil, 0.008 inch (0.203 mm) of butyl adhesive and siliconized release liner.
   1. Roll Length: 50 feet (15.2 m) long.
   2. Width: 4 inches (102 mm) wide.

H. Weather Barrier Self-Sealing Flat Attachment Washers: Solid plastic flat cap washers with flexible perimeter seal attached with screws to substrate for attachment of weather barrier to help seal against air and moisture penetration through weather barrier assembly.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and conditions comply with requirements of this section.

3.02 INSTALLATION

A. Install materials in accordance with manufacturer's installation instructions.

B. Water-Resistive Barriers: Install continuous water-resistive barrier over surfaces indicated, with sheets lapped to shed water but with seams not sealed.

C. Mechanically Fastened Exterior Sheets:
   1. Install sheets shingle-fashion to shed water, with seams aligned horizontal.
   2. Overlap seams as recommended by manufacturer, 6 inches (152 mm), minimum.
   3. Overlap at outside and inside corners as recommended by manufacturer, 12 inches (305 mm), minimum.
   4. For applications indicated to be airtight, seal seams, laps, penetrations, tears, and cuts with self-adhesive tape; use only large-headed, gasketed fasteners as recommended by manufacturer.
   5. Where stud framing rests on concrete or masonry substrate, extend lower edge of barrier sheets at least 4 inches (102 mm) below bottom of framing and seal to substrate with sealant or approved mounting tape.
   6. Install water-resistive barrier over jamb flashings.
   7. Install head flashings under water-resistive barrier.
   8. At framed openings with frames having nailing flanges, extend sheet into opening and over flanges; at head of opening, seal sheet over flange and flashing.

D. Self-Adhered Sheets:
   1. Prepare substrate in accordance with sheet manufacturer's installation instructions; fill and tape joints in substrate and between dissimilar materials.
   2. Lap sheets shingle-fashion to shed water and seal laps airtight.
   3. Upon placement of sheets, firmly press onto substrate with resilient hand roller; ensure that laps are firmly adhered with no gaps or fishmouths.
   4. Use same material, or other material approved by sheet manufacturer, to seal sheets to adjacent substrates, and as flashing.
   5. At expansion joints, provide transition to joint assemblies approved by sheet manufacturer.

E. Coatings:
   1. Prepare substrate in accordance with coating manufacturer's installation instructions; treat joints in substrate and between dissimilar materials as indicated.
   2. Where exterior masonry veneer is being applied, install masonry anchors prior to placement of water-resistive barrier over masonry substrate; seal airtight around anchors.
   3. Apply bead or trowel coat of mastic sealant with minimum thickness of 1/4 inch (6 mm) along coating seams, rough cuts, and as recommended by manufacturer.
   4. Apply flashing to seal with adjacent construction and to bridge joints in coating substrate.

F. Openings and Penetrations in Exterior Water-Resistive Barriers:
   1. Install flashing over sills, covering entire sill framing member, and extend at least 5 inches (127 mm) onto water-resistive barrier and at least 6 inches (152 mm) up jambs; mechanically fasten stretched edges.

2. At openings filled with frames having nailing flanges, seal head and jamb flanges using a continuous bead of sealant compressed by flange and cover flanges with sealing tape at least 4 inches (100 mm) wide; do not seal sill flange.
3. At openings filled with nonflanged frames, seal water-resistive barrier to each side of framing at opening using flashing at least 9 inches (230 mm) wide, and covering entire depth of framing.
4. At head of openings, install flashing under water-resistive barrier extending at least 2 inches (50 mm) beyond face of jambs; seal water-resistive barrier to flashing.
5. At interior face of openings, seal gaps between window and door frames and rough framing using appropriate joint sealant over backer rod.
6. Service and Other Penetrations: Form flashing around penetrating items and seal to surface of water-resistive barrier.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Owner92s Inspection and Testing: Cooperate with Owner92s testing agency.
   1. Allow access to work areas and staging.
   2. Notify Owner92s testing agency in writing of schedule for work of this section to allow sufficient time for testing and inspection.
   3. Do not cover work of this section until testing and inspection is accepted.

3.04 PROTECTION

A. Do not leave materials exposed to weather longer than recommended by manufacturer.

END OF SECTION

SECTION 07 4113
METAL ROOF PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal roof panel system of preformed steel panels.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: Roof framing and purlins.

B. 07 7123 Manufactured gutters and downspouts.

C. Section 07 9200 - Joint Sealants: Sealing joints between metal roof panel system and adjacent construction.

1.03 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ASTM A463/A463M - Standard Specification for Steel Sheet, Aluminum-Coated, by the Hot-Dip Process; 2022.

C. ASTM A792/A792M - Standard Specification for Steel Sheet, 55% Aluminum-Zinc Alloy-Coated by the Hot-Dip Process; 2022.

D. ASTM E1592 - Standard Test Method for Structural Performance of Sheet Metal Roof and Siding Systems by Uniform Static Air Pressure Difference; 2005 (Reapproved 2017).

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Storage and handling requirements and recommendations.
   2. Installation methods.

C. Shop Drawings: Include layouts of roof panels, details of edge and penetration conditions, spacing and type of connections, flashings, underlayments, and special conditions.
   1. Show work to be field-fabricated or field-assembled.

D. Selection Samples: For each roofing system specified, submit color chips representing manufacturer's full range of available colors and patterns.

E. Manufacturer's qualification statement.

F. Installer's qualification statement.

G. Test Reports: Indicate compliance of metal roofing system to specified requirements.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section and with at least three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store roofing panels on project site as recommended by manufacturer to minimize damage to panels prior to installation.

1.07 FIELD CONDITIONS

A. Do not install metal roof panels, eave protection membrane, underlayment, or _____ when surface, ambient air, or wind chill temperatures are below 45 degrees F (7 degrees C).

PART 2 PRODUCTS

2.01 PERFORMANCE REQUIREMENTS

A. Metal Roof Panels: Provide complete roofing assemblies, including roof panels, clips, fasteners, connectors, and miscellaneous accessories, tested for compliance with the following minimum standards:
   1. Structural Design Criteria: Provide panel assemblies designed to safely support design loads at support spacing indicated, with deflection not to exceed L/180 of span length(L) when tested in accordance with ASTM E1592.
   2. Overall: Complete weathertight system tested and approved in accordance with ASTM E1592.
   3. Thermal Movement: Design system to accommodate without deformation anticipated thermal movement over ambient temperature range of 100 degrees F (56 degrees C).

2.02 METAL ROOF PANELS

A. Metal Roof Panels: Provide complete engineered system complying with specified requirements and capable of remaining weathertight while withstanding anticipated movement of substrate and thermally induced movement of roofing system.

B. Metal Panels: Factory-formed panels with factory-applied finish.
   1. Steel Panels:
      a. Aluminum-zinc alloy-coated steel complying with ASTM A792/A792M; minimum AZ50 (AZM150) coating.
      b. Aluminum-coated steel complying with ASTM A463/A463M; minimum Type 2 T2-65 (T2M-200) coating.
      c. Steel Thickness: Minimum 24 gauge, 0.024 inch (0.61 mm).
   2. Texture: Smooth.
   3. Length: Full length of roof slope, without lapped horizontal joints.
   4. Width: Maximum panel coverage of 24 inches (610 mm).

2.03 ATTACHMENT SYSTEM

A. Concealed System: Provide manufacturer's standard stainless steel or nylon-coated aluminum concealed anchor clips designed for specific roofing system and engineered to meet performance requirements, including anticipated thermal movement.

2.04 FABRICATION

A. Panels: Provide factory or field fabricated panels with applied finish and accessory items, using manufacturer's standard processes as required to achieve specified appearance and performance requirements.

2.05 FINISHES

A. Fluoropolymer Coil Coating System: Manufacturer's standard multi-coat metal coil coating system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of coil coated metal surfaces having minimum total dry film thickness (DFT) of 0.9 mil, 0.0009 inch (0.023 mm); color and gloss to match sample.

2.06 ACCESSORIES

A. Miscellaneous Sheet Metal Items: Provide flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, and equipment curbs of the same material, thickness, and finish as used for the roofing panels. Items completely concealed after installation may optionally be made of stainless steel.

B. Rib and Ridge Closures: Provide prefabricated, close-fitting components of steel with corrosion resistant finish or combination steel and closed-cell foam.

C. Sealants:
   1. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.
   2. Concealed Sealant: Non-curing butyl sealant or tape sealant.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation of preformed metal roof panels until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Coordinate roofing work with provisions for roof drainage, flashing, trim, penetrations, and other adjoining work to ensure that completed roof will be free of leaks.

B. Separate dissimilar metals by applying a bituminous coating, self-adhering rubberized asphalt sheet, or other permanent method approved by metal roof panel manufacturer.

C. At locations where metal will be in contact with wood or other absorbent material subject to wetting, seal joints with sealing compound and apply one coat of heavy-bodied bituminous paint.

3.03 INSTALLATION

A. Overall: Install roofing system in accordance with approved shop drawings and metal roof panel manufacturer's instructions and recommendations, as applicable to specific project conditions; securely anchor components of roofing system in place allowing for thermal and structural movement.

1. Install roofing system with concealed clips and fasteners, except as otherwise recommended by manufacturer for specific circumstances.
2. Minimize field cutting of panels. Where field cutting is required, use methods that will not distort panel profiles. Use of torches for field cutting is prohibited.

B. Accessories: Install necessary components that are required for complete roofing assembly, including flashings, gutters, downspouts, trim, moldings, closure strips, preformed crickets, caps, equipment curbs, rib closures, ridge closures, and similar roof accessory items.

C. Roof Panels: Install metal roof panels in accordance with manufacturer's installation instructions, minimizing transverse joints except at junction with penetrations.

3.04 CLEANING

A. Clean exposed sheet metal work at completion of installation. Remove grease and oil films, excess joint sealer, handling marks, and debris from installation, leaving the work clean and unmarked, free from dents, creases, waves, scratch marks, or other damage to the finish.

3.05 PROTECTION

A. Do not permit storage of materials or roof traffic on installed roof panels. Provide temporary walkways or planks as necessary to avoid damage to completed work. Protect roofing until completion of project.

B. Touch-up, repair, or replace damaged roof panels or accessories before Date of Substantial Completion.

END OF SECTION

SECTION 07 4213
METAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Manufactured metal panels for exterior wall panels and subgirt framing assembly, with insulation, related flashings, and accessory components.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between metal wall panel system and adjacent construction.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions and recommendations.

C. Shop Drawings: Indicate dimensions, layout, joints, construction details, support clips, _____, and methods of anchorage.

D. Samples: Submit two samples of wall panel, 12 inches by 12 inches (305 mm by 305 mm) in size illustrating finish color, sheen, and texture.

E. Installer's qualification statement.

1.04 QUALITY ASSURANCE

1.05 MOCK-UPS

A. Locate as indicated on drawings.

B. Mock-up may remain as part of work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect panels from accelerated weathering by removing or venting sheet plastic shipping wrap.

B. Store prefinished material off the ground and protected from weather; prevent twisting, bending, or abrasion; provide ventilation; slope metal sheets to ensure proper drainage.

C. Prevent contact with materials that may cause discoloration or staining of products.

1.07 FIELD CONDITIONS

A. Do not install wall panels when air temperature or relative humidity are outside manufacturer's limits.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Metal Wall Panels - Concealed Fasteners:
   1. Centria, a Nucor Company: www.centria.com/#sle.

2.02 METAL WALL PANEL SYSTEM

A. Wall Panel System: Factory fabricated prefinished metal panel system, site assembled.
   1. Basis-Of-Design: Centria Architectural Systems: EcoScreen Perforated Screen Wall: www.centria.com/
      a. Style-Rib
      b. Panel Coverage: 36-inches.
      c. Panel Depth: 1-1/2-inces.

d. Finish: Two-coat Mica System: 0.20-mil primer with 0.8-mil 70 percent PVDF fluourpolymer color coat providing a peralescent appearance, AAMD 620.
   1) Basis-Of-Design: 9946 Silvermith. Final color selection by architect from manufacturer's full line

2. Panel Pattern: Staggered pattern, 3/8-inch perforation at 9/16-inch spacing with 40-pecent open area.
3. Provide exterior wall panels and subgirt framing assembly.
4. Design and size components to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of wall.
5. Maximum Allowable Deflection of Panel: L/180 for length(L) of span.
6. Movement: Accommodate movement within system without damage to components or deterioration of seals, movement between system and perimeter components when subject to seasonal temperature cycling; dynamic loading and release of loads; and deflection of structural support framing.
7. Drainage: Provide positive drainage to exterior for moisture entering or condensation occurring within panel system.
8. Fabrication: Formed true to shape, accurate in size, square, and free from distortion or defects; pieces of longest practical lengths.
9. Corners: Factory-fabricated in one continuous piece with minimum 2-inch (51 mm) returns.

B. Subgirt Framing Assembly:
   1. Coordinate profile and attachement with strucutural drawings.

C. Internal and External Corners: Same material, thickness, and finish as exterior sheets; profile to suit system; shop cut and factory mitered to required angles.

2.03 MATERIALS

2.04 ACCESSORIES

A. Concealed Sealants: Non-curing butyl sealant or tape sealant, see Section 07 9200

B. Exposed Sealant: Elastomeric; silicone, polyurethane, or silyl-terminated polyether/polyurethane.

C. Fasteners: Fasteners: Manufacturer's standard type to suit application. Exposed fasteners same finish as panel system.

D. Field Touch-up Paint: As recommended by panel manufacturer.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that building framing members are ready to receive panels.

3.02 PREPARATION

3.03 INSTALLATION

A. Install panels on walls and soffits in accordance with manufacturer's instructions.

B. Protect concealted surfaces in contact with cementitious materials and dissimilar metals with bituminous paint; allow to dry prior to wall panel installation.

3.04 TOLERANCES

3.05 CLEANING

A. Remove site cuttings from finish surfaces.

B. Remove protective material from wall panel surfaces.

END OF SECTION

SECTION 07 4213.23
METAL COMPOSITE MATERIAL WALL PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Exterior cladding consisting of formed metal composite material (MCM) sheet, secondary supports, and anchors to structure, attached to solid backup.

B. Matching flashing and trim.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing: Panel support framing.

B. Section 07 6200 - Sheet Metal Flashing and Trim: Metal flashing components integrated with this wall system.

C. Section 07 9200 - Joint Sealants: Sealing joints between siding and adjacent construction and fixtures.

D. Section 08 4413 Glazed Aluminum Curtain Wall: Adjacent contstuction. Finish coordination.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.

B. ASHRAE Std 90.1 I-P - Energy Standard for Buildings Except Low-Rise Residential Buildings; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

E. ASTM A153/A153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2016a.

F. ASTM A276/A276M - Standard Specification for Stainless Steel Bars and Shapes; 2017.

G. ASTM A480/A480M - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip; 2022a.

H. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

I. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

J. ASTM D1781 - Standard Test Method for Climbing Drum Peel for Adhesives; 1998 (Reapproved 2021).

K. ASTM D1929 - Standard Test Method for Determining Ignition Temperature of Plastics; 2020.

L. ASTM D4145 - Standard Test Method for Coating Flexibility of Prepainted Sheet; 2010 (Reapproved 2022).

M. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

N. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

O. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

P. NFPA 285 - Standard Fire Test Method for Evaluation of Fire Propagation Characteristics of Exterior Wall Assemblies Containing Combustible Components; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Meeting: Convene one week before starting work of this section to verify project requirements, coordinate with installers of other work, establish condition and completeness of building substrate, and review manufacturers' installation instructions and warranty requirements.
   1. Require attendance by the installer and relevant sub-contractors.
   2. Include MCM sheet manufacturer’s representative and wall system manufacturer’s representative to review storage and handling procedures.
   3. Review in detail truck transportation, parking, vertical transportation, schedule, personnel, installation of adjacent materials and substrate.
   4. Review procedures for protection of work and other construction.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data - MCM Sheets: Manufacturer's data sheets on each product to be used, including thickness, physical characteristics, and finish, and:
   1. Finish manufacturer's data sheet showing physical and performance characteristics.
   2. Storage and handling requirements and recommendations.
   3. Fabrication instructions and recommendations.
   4. Specimen warranty for finish, as specified herein.

C. Product Data - Wall System: Manufacturer's data sheets on each product to be used, including:
   1. Physical characteristics of components shown on shop drawings.
   2. Storage and handling requirements and recommendations.
   3. Installation instructions and recommendations.
   4. Specimen warranty for wall system, as specified herein.

D. Shop Drawings: Show layout and elevations, dimensions and thickness of panels, connections, details and location of joints, sealants and gaskets, method of anchorage, support clips, exposed fasteners, number of anchors, supports, reinforcement, trim, flashings, and accessories.
   1. Indicate panel numbering system.
   2. Differentiate between shop and field fabrication.
   3. Indicate substrates and adjacent work with which the wall system must be coordinated.
   4. Include large-scale details of anchorages and connecting elements.
   5. Include large-scale details or schematic, exploded or isometric diagrams to fully explain flashing at a scale of not less than 1-1/2 inches per 12 inches (1:10).
   6. Include design engineer's stamp or seal on shop drawings for attachments and anchors.

E. Design Data: Submit structural calculations stamped by design engineer, for Architect's information and project record.

F. Test Report: Submit test report verifying compliance with NFPA 285 for previously-tested exterior wall assembly.

G. Manufacturer's Field Reports: Provide within 48 hours of field review. State what was observed and what changes, if any, were requested or required.

H. Designer's qualification statement.

I. Installer's qualification statement.

J. Testing agency's qualification statement.

K. Maintenance Data: Care of finishes and warranty requirements.

L. Executed Warranty: Submit warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.06 QUALITY ASSURANCE

A. Field Measurements: Verify actual dimensions by field measurement before fabrication; show recorded measurements on shop drawings.

B. Design Engineer's Qualifications: Design structural supports and anchorages under direct supervision of a Structural Engineer experienced in design of this type of work and licensed in the State in which the Project is located.

C. Manufacturer Qualifications: Company specializing in manufacturing wall panel systems specified in this section.
   1. With not less than three years of documented experience.
   2. Approved by MCM sheet manufacturer.

D. Installer Qualifications: Company specializing in performing work of type specified in this section.
   1. With minimum three years of documented experience.
   2. Approved by wall panel system manufacturer.

E. Testing Agency Qualifications: Independent agency experienced in testing assemblies of the type required for this project and having the necessary facilities for full-size mock-up testing of the type specified.

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Provide a mock-up for evaluation of fabrication workmanship.

C. Locate where directed.

D. Provide specified finish on panels.

E. Mock-up may remain as part of work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products in manufacturer's original, unopened, undamaged containers with identification labels intact.
   1. Protect finishes by applying heavy-duty removable plastic film during production.
   2. Package for protection against transportation damage.
   3. Provide markings to identify components consistently with drawings.
   4. Exercise care in unloading, storing, and installing panels to prevent bending, warping, twisting, and surface damage.

B. Store products protected from exposure to harmful weather conditions and at temperature conditions recommended by manufacturer.
   1. Store in well-ventilated space out of direct sunlight.
   2. Protect from moisture and condensation with tarpaulins or other suitable weathertight covering installed to provide ventilation.
   3. Store at a slope to ensure positive drainage of accumulated water.
   4. Do not store in enclosed space where ambient temperature can exceed 120 degrees F (49 degrees C).
   5. Avoid contact with other materials that might cause staining, denting, or other surface damage.

1.09 FIELD CONDITIONS

A. Do not install panels when air temperature or relative humidity are outside manufacturer's limits.

1.10 WARRANTY

A. Special Warranty: Provide 2-year warranty covering water tightness and integrity of seals of wall panels. Complete forms in Owner's name and register with warrantor.

B. Finish Warranty: Provide 20-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-Of-Design: ALPOLIC PE; ALPOLIC: www.alpolic-americas.com/#sle.

B. Metal Composite Material (MCM) Sheet Manufacturers:
   1. ALUCOBOND by 3A Composites USA: www.alucobondusa.com/#sle.
   2. Arconic Architectural Products: Reynobond.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 WALL PANEL SYSTEM

A. Wall Panel System: Metal panels, fasteners, and anchors designed to be supported by framing or other substrate provided by others; provide installed panel system capable of maintaining specified performance without defects, damage, or failure.
   1. Provide structural design by or under direct supervision of a Structural Engineer licensed in the State in which the Project is located.
      a. See Design Criteria on structural drawings.
   2. Provide panel jointing and weatherseal using a "wet", sealant-sealed system.
   3. Anchor panels to supporting framing without exposed fasteners.

2.03 PERFORMANCE REQUIREMENTS

A. Thermal Movement: Provide for free and noiseless vertical and horizontal thermal movement due to expansion and contraction under material temperature range of minus 20 degrees F (minus 29 degrees C) to 180 degrees F (82 degrees C) without buckling, opening of joints, undue stress on fasteners, or other detrimental effects; allow for ambient temperature at time of fabrication, assembly, and erection procedures.

B. See Design Criteria on structural drawings.
   1. Blast Design Pressure: 120 psf. Provide system tested in accordance with ASTM F2248-19.
      a. Connectors to comply with ASTM F2248 and ASTM E1300.
   2. Wind Performance: Provide system tested in accordance with ASTM E330/E330M without permanent deformation or failures of structural members under the following conditions:
   3. Design Wind Pressure: 147 MPH, Exposure B. In accordance cladding wind pressures from ASCE 7-16.
   4. Design Wind Pressure: In accordance with local building code and design criteria on Structural drawings.
   5. Maximum deflection of perimeter framing member of L/175 normal to plane of the wall; maximum deflection of individual panels of L/60.
   6. Maximum anchor deflection in any direction of 1/16 inch (1.6 mm) at connection points of framing members to anchors.

C. Water Penetration: No water penetration under static pressure when tested in accordance with ASTM E331 at a differential of 10 percent of inward acting design load, 6.27 psf (300 Pa) minimum, after 15 minutes.
   1. Water penetration is defined as the appearance of uncontrolled water on the interior face of the wall.
   2. Design to drain leakage and condensation to the exterior face of the wall.

D. Fire Performance: Use test method complying with NFPA 285.

E. Building Envelope Performance: Comply with ASHRAE Std 90.1 I-P when tested as part of building envelope assembly.

2.04 PANELS

A. Panels: 1 inch (25.4 mm) deep pans formed of metal composite material sheet by routing back edges of sheet, removing corners, and folding edges.
   1. Reinforce corners with riveted aluminum angles.

2. Provide concealed attachment to supporting structure by adhering attachment members to back of panel; attachment members may also function as stiffeners.
3. Maintain maximum panel bow of 0.8 percent of panel dimension in width and length; provide stiffeners of sufficient size and strength to maintain panel flatness without showing local stresses or read-through on panel face.
4. Fabricate panels under controlled shop conditions.
5. Where final dimensions cannot be established by field measurement before commencement of manufacturing, make allowance for field adjustments without requiring field fabrication of panels.
6. Fabricate as indicated on drawings and as recommended by MCM sheet manufacturer.
   a. Make panel lines, breaks, curves, and angles sharp and true.
   b. Keep plane surfaces free from warp or buckle.
   c. Keep panel surfaces free of scratches or marks caused during fabrication.
7. Provide joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on inside face of panel system.

2.05 MATERIALS

A. Metal Composite Material (MCM) Sheet: Two sheets of aluminum sandwiching a core of extruded thermoplastic material; no foamed insulation material content.
   1. Overall Sheet Thickness: 0.118 inch (3 mm), minimum.
   2. Bond and Peel Strength: No adhesive failure of the bond between the core and the skin nor cohesive failure of the core itself below 22.4 inch-pound/inch (100 N-mm/mm) with no degradation in bond performance, when tested in accordance with ASTM D1781, simulating resistance to panel delamination, after 8 hours of submersion in boiling water and after 21 days of immersion in water at 70 degrees F (21 degrees C).
   3. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
   4. Flammability: Self-ignition temperature of 650 degrees F (343 degrees C) or greater when tested in accordance with ASTM D1929.

B. Metal Framing Members: Include sub-girts, zee-clips, base and sill angles and channels, hat-shaped and rigid channels, and furring channels required for complete installation.
   1. Provide material strength, dimensions, configuration as required to meet applied loads and in compliance with applicable building code.

2.06 FINISHES

A. Factory Finish: Three coat fluoropolymer resin coating, approved by coating manufacturer for length of warranty specified for project, and applied by coil manufacturing facility that specializes in coil applied finishes.
   1. Coating Flexibility: Pass ASTM D4145 minimum 1T Bend at time of manufacturing.
   2. Long-Term Performance: Not less than that specified under WARRANTY in PART 1.

B. Finish: Factory finished highly polished Class I natural anodized finish; AAMA 611 AA-M12C22A41, anodic coating not less than 0.7 mil, 0.0007 inch (0.018 mm) thick.

C. Color/Texture: As selected by Architect from manufacturer's full range. Location of colored panels indicated on drawings.
   1. Anondized Color Chart.
   2. Architectural Color Chart.

2.07 ACCESSORIES

A. Flashing: Sheet aluminum; 0.040 inch (1.0 mm) thick, minimum; finish and color to match MCM sheet; see Section 07 6200 for additional requirements.

B. Support for Cladding and Continuous Insulation: Thermal clips.
   1. Thermally-broken clips that provide attachment support for girts, angles, channels, and other cladding support framing.
   2. Fasteners: As recommended by clip manufacturer.

C. Support for Cladding and Continuous Insulation: Continuous thermal Z-girts.
   1. Fiberglass reinforced plastic (FRP) girts that provide cladding attachment support for exterior wall cladding, brick veneer, CMU veneer, metal wall panels, siding, and _____.
   2. Fasteners: As recommended by clip manufacturer.

D. Anchors, Clips, and Accessories: Use one of the following:
   1. Stainless steel complying with ASTM A276/A276M, ASTM A480/A480M, or ASTM A666.
   2. Steel complying with ASTM A36/A36M and hot-dip zinc coating to ASTM A153/A153M.
   3. Steel complying with ASTM A36/A36M and hot-dip galvanized to ASTM A123/A123M, with Coating Thickness Grade of 100.

E. Fasteners:
   1. Exposed Fasteners: Stainless steel; permitted only where absolutely unavoidable and subject to prior approval of the Architect.
   2. Screws: Self-drilling or self-tapping Type 410 stainless steel or zinc-alloy steel hex washer head, with EPDM or PVC washer under heads of fasteners bearing on weather side of metal wall panels.
   3. Bolts: Stainless steel.
   4. Fasteners for Flashing and Trim: Blind fasteners of high-strength aluminum or stainless steel.

F. Bituminous Coating: Cold-applied asphalt mastic, noncorrosive compound free of asbestos, sulfur, and other deleterious impurities; 15-mil (0.38 mm) dry film thickness per coat.

G. Joint Sealer: Provide color to match wall panels silicone sealant of type approved by MCM sheet manufacturer, and in compliance with ASTM C920.

H. Provide panel system manufacturer's and installer92s standard corrosion resistant accessories, including fasteners, clips, anchorage devices, and attachments.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine dimensions, tolerances, and interfaces with other work.

B. Examine substrate on-site to determine that conditions are acceptable for product installation in accordance with manufacturer's written instructions.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Notify Architect in writing of conditions detrimental to proper and timely completion of work, and do not proceed with erection until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Protect adjacent work areas and finish surfaces from damage during installation.

3.03 INSTALLATION

A. Do not install products that are defective, including warped, bowed, dented, and broken members, and members with damaged finishes.

B. Comply with instructions and recommendations of MCM sheet manufacturer and wall system manufacturer, as well as with approved shop drawings.

C. Install wall system securely allowing for necessary thermal and structural movement; comply with wall system manufacturer's instructions for installation of concealed fasteners.

D. Do not handle or tool products during erection in manner that damages finish, decreases strength, or results in visual imperfection or failure in performance. Return component parts that require alteration to shop for refabrication, if possible, or for replacement with new parts.

E. Do not form panels in field unless required by wall system manufacturer and approved by the Architect; comply with MCM sheet manufacturer's instructions and recommendations for field forming.

F. Separate dissimilar metals; use gasket fasteners, isolation shims, or isolation tape where needed to eliminate possibility of electrolytic action between metals.

G. Where joints are designed for field-applied sealant, seal joints completely with specified sealant.

H. Install flashings as indicated on shop drawings. At flashing butt joints, provide a lap strap under flashing and seal lapped surfaces with a full bed of non-hardening sealant.

I. Install square, plumb, straight, and true, accurately fitted, with tight joints and intersections maintaining the following installation tolerances:
   1. Variation From Plane or Location: 1/2 inch in 30 feet (10 mm in 10 m) of length and up to 3/4 inch in 300 feet (20 mm in 100 m), maximum.
   2. Deviation of Vertical Member From True Line: 0.1 inch in 25 feet (3 mm in 9 m) run, maximum.
   3. Deviation of Horizontal Member From True Line: 0.1 inch in 25 feet (3 mm in 9 m) run, maximum.
   4. Offset From True Alignment Between Two Adjacent Members Abutting End To End, In Line: 0.03 inch (0.75 mm), maximum.

J. Replace damaged products.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Wall System Manufacturer's Field Services: Provide field services consisting of product use recommendations and periodic site visits for inspection of product installation in accordance with instructions.

3.05 CLEANING

A. Ensure weep holes and drainage channels are unobstructed and free of dirt and sealants.

B. Remove protective film after installation of joint sealers, after cleaning of adjacent materials, and immediately prior to completion of work.

C. Remove temporary coverings and protection of adjacent work areas.

D. Clean installed products in accordance with manufacturer's instructions.

3.06 PROTECTION

A. Protect installed panel system from damage until Date of Substantial Completion.

END OF SECTION

SECTION 07 5400
THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Adhered system with thermoplastic roofing membrane.

B. Deck sheathing.

C. Cover boards.

D. Flashings.

1.02 RELATED REQUIREMENTS

A. Section 05 3100 - Steel Decking: Placement of acoustical insulation for deck flutes.

B. Section 07 7100 - Roof Specialties: Prefabricated roofing expansion joint flashing.

1.03 REFERENCE STANDARDS

A. ASTM C208 - Standard Specification for Cellulosic Fiber Insulating Board; 2022.

B. ASTM C552 - Standard Specification for Cellular Glass Thermal Insulation; 2022.

C. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation; 2022.

D. ASTM C726 - Standard Specification for Mineral Wool Roof Insulation Board; 2017.

E. ASTM C728 - Standard Specification for Perlite Thermal Insulation Board; 2017a (Reapproved 2022).

F. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

G. ASTM C1289 - Standard Specification for Faced Rigid Cellular Polyisocyanurate Thermal Insulation Board; 2022a.

H. ASTM C1484 - Standard Specification for Vacuum Insulation Panels; 2010 (Reapproved 2018).

I. ASTM D6878/D6878M - Standard Specification for Thermoplastic Polyolefin-Based Sheet Roofing; 2021.

J. FM (AG) - FM Approval Guide; Current Edition.

K. FM DS 1-28 - Wind Design; 2015, with Editorial Revision (2022).

L. NRCA (RM) - The NRCA Roofing Manual; 2023.

M. NRCA (WM) - The NRCA Waterproofing Manual; 2021.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data indicating membrane materials, flashing materials, insulation, vapor retarder, surfacing, and fasteners.

C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

D. Warranty Documentation:
   1. Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.
   2. Submit installer's written verification that installation complies with warranty conditions for waterproof membrane.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver materials in manufacturer's original containers, dry and undamaged, with seals and labels intact, unless otherwise indicated.

B. Store materials in weather protected environment, clear of ground and moisture.

C. Ensure storage and staging of materials does not exceed static and dynamic load-bearing capacities of roof decking.

D. Protect foam insulation from direct exposure to sunlight.

1.07 FIELD CONDITIONS

A. Do not apply roofing membrane during unsuitable weather.

B. Do not apply roofing membrane when ambient temperature is below 45 degrees F (____ degrees C) or above 100 degrees F (____ degrees C).

C. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

D. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

E. Schedule applications so that no partially completed sections of roof are left exposed at end of workday.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. System Warranty: Provide manufacturer's system warranty agreeing to repair or replace roofing that leaks or is damaged due to wind or other natural causes.
   1. Warranty Term: 20 years.
   2. For repair and replacement include costs of both material and labor in warranty.
   3. Warranty terms shall not have dollar limit.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Thermoplastic Polyolefin (TPO) Membrane Roofing Materials:
   1. Carlisle SynTec Systems; Sure-Weld TPO: www.carlisle-syntec.com/#sle.
   2. GAF; _____ 60 mil: www.gaf.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Insulation:
   1. BASF Corporation; BASF Neopor GPS: www.neopor.basf.us/#sle.
   2. Carlisle SynTec Systems; SecurShield Insulation: www.carlisle-syntec.com/#sle.
   3. GAF; _____: www.gaf.com/#sle.

2.02 ROOFING

A. Thermoplastic Membrane Roofing: One ply membrane, fully adhered, over insulation.

B. Acceptable Insulation Types - Constant Thickness Application: Any of types specified.
   1. Minimum 2 layers of polyisocyanurate board.
   2. Bottom layer of cellulose, perlite, molded polystyrene, polyisocyanurate, glass fiber, extruded polystyrene, composite, or cellular glass board covered with single layer of cellulose, perlite, molded polystyrene, polyisocyanurate, glass fiber, extruded polystyrene, or composite board.

C. Acceptable Insulation Types - Tapered Application: Any of types specified.
   1. Tapered polyisocyanurate board.
   2. Tapered polyisocyanurate board covered with uniform thickness polyisocyanurate board.
   3. Uniform thickness polyisocyanurate board covered with tapered polyisocyanurate board.

2.03 MEMBRANE ROOFING AND ASSOCIATED MATERIALS

A. Membrane Roofing Materials:
   1. TPO: Thermoplastic polyolefin (TPO) complying with ASTM D6878/D6878M, sheet contains reinforcing fabrics or scrims.
      a. Thickness: 72 mil, 0.072 inch (1.8 mm), minimum.
   2. Sheet Width:

B. Seaming Materials: As recommended by membrane manufacturer.

C. Flexible Flashing Material: Same material as membrane.

2.04 DECK SHEATHING

A. Deck Sheathing: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
   1. Thickness: 5/8 inch (15.9 mm), Type X, fire-resistant.

2.05 COVER BOARDS

A. Cover Boards: Glass-mat faced gypsum panels complying with ASTM C1177/C1177M.
   1. Thickness: 5/8 inch (15.9 mm), Type X, fire-resistant.

2.06 INSULATION

A. Polyisocyanurate (ISO) Board Insulation: Rigid cellular foam, complying with ASTM C1289.
   1. Classifications:
      a. Type II: Faced with either cellulosic facers or glass fiber mat facers on both major surfaces of the core foam.
         1) Class 2 - Faced with coated glass fiber mat facers on both major surfaces of the core foam.
         2) Compressive Strength: Classes 1-2-3, Grade 1, 16 psi (110 kPa), minimum.
         3) Thermal Resistance, R-value (RSI-value): At 1-1/2 inches (38 mm) thick; Class 1, Grades 1-2-3, 8.4 (1.48), minimum, at 75 degrees F (24 degrees C).
   2. Board Size: 48 by 96 inches (1220 by 2440 mm).
   3. Board Thickness: As required to provideinidcated R-value.
   4. Board Edges: Square.

2.07 ACCESSORIES

A. Stack Boots: Prefabricated flexible boot and collar for pipe stacks through membrane; same material as membrane.

B. Sheathing Joint Tape: Paper type, ____ inches (____ mm) wide, self adhering.

C. Insulation Fasteners: Appropriate for purpose intended and approved by roofing manufacturer.

D. Membrane Adhesive: As recommended by membrane manufacturer.

E. Sealants: As recommended by membrane manufacturer.

F. Walkway Pads: Suitable for maintenance traffic, contrasting color or otherwise visually distinctive from roof membrane.
   1. Composition: Roofing membrane manufacturer's standard.
   2. Surface Color: White or Yellow.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces and site conditions are ready to receive work.

B. Verify deck is supported and secure.

C. Verify deck is clean and smooth, flat, free of depressions, waves, or projections, properly sloped and suitable for installation of roof system.

D. Verify deck surfaces are dry and free of snow or ice.

E. Verify that roof openings, curbs, and penetrations through roof are solidly set, and cant strips are in place.

3.02 PREPARATION - METAL DECK

A. Install deck sheathing on metal deck:
   1. Lay with long side at right angle to flutes; stagger end joints; provide support at ends.
   2. Cut sheathing cleanly and accurately at roof breaks and protrusions to provide smooth surface.
   3. Tape joints.

3.03 INSTALLATION, GENERAL

A. Perform work in accordance with manufacturer's instructions, NRCA (RM), and NRCA (WM) applicable requirements.

B. Do not apply roofing membrane during cold or wet weather conditions.

C. Do not apply roofing membrane when ambient temperature is outside the temperature range recommended by manufacturer.

D. Do not apply roofing membrane to damp or frozen deck surface or when precipitation is expected or occurring.

E. Do not expose materials vulnerable to water or sun damage in quantities greater than can be weatherproofed the same day.

3.04 INSTALLATION - VAPOR RETARDER AND INSULATION, UNDER MEMBRANE

A. Install vapor retarder to deck surface with adhesive in accordance with manufacturer's instructions.
   1. Extend vapor retarder under cant strips and blocking to deck edge.
   2. Install flexible flashing from vapor retarder to air seal material of wall construction, lap and seal to provide continuity of the air barrier plane.

B. Attachment of Insulation:
   1. Mechanically fasten subsequent layer of insulation to deck in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.

C. Cover Boards: Mechanically fasten cover boards in accordance with roofing manufacturer's instructions and FM (AG) Factory Mutual requirements.

D. Lay subsequent layers of insulation with joints staggered minimum 6 inches (152 mm) from joints of preceding layer.

E. Place tapered insulation to the required slope pattern in accordance with manufacturer's instructions.

F. On metal deck, place boards parallel to flutes with insulation board edges bearing on deck flutes.

G. Lay boards with edges in moderate contact without forcing. Cut insulation to fit neatly to perimeter blocking and around penetrations through roof.

H. Do not install more insulation than can be covered with membrane in same day.

3.05 INSTALLATION - MEMBRANE

A. Roll out membrane, free from wrinkles or tears. Place sheet into place without stretching.

B. Shingle joints on sloped substrate in direction of drainage.

C. Fully Adhered Application: Apply adhesive at manufacturer's recommended rate. Adhere membrane in accordance to membrane roofing system manufacturer's written instructions and warrantieed requirements.

D. Fully Adhered Application: Apply adhesive to substrate at rate of ___ gallons per square foot (___ L/sq m). Fully embed membrane in adhesive except in areas directly over or within 3 inches (76 mm) of expansion joints. Fully adhere one roll before proceeding to adjacent rolls.

E. Overlap edges and ends and seal seams by contact adhesive, minimum 3 inches (76 mm). Seal permanently waterproof. Apply uniform bead of sealant to joint edge.

F. At intersections with vertical surfaces:
   1. Extend membrane over cant strips and up a minimum of 4 inches (102 mm) onto vertical surfaces.
   2. Fully adhere flexible flashing over membrane and up to nailing strips.

G. Around roof penetrations, seal flanges and flashings with flexible flashing.

H. Coordinate installation of roof drains and sumps and related flashings.

3.06 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.07 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

B. Remove bituminous markings from finished surfaces.

C. In areas where finished surfaces are soiled by work of this section, consult manufacturer of surfaces for cleaning advice and comply with their documented instructions.

D. Repair or replace defaced or damaged finishes caused by work of this section.

3.08 PROTECTION

A. Protect installed roofing and flashings from construction operations.

B. Where traffic must continue over finished roof membrane, protect surfaces using durable materials.

END OF SECTION

SECTION 07 6200
SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Fabricated sheet metal items, including flashings, counterflashings, gutters, downspouts, sheet metal roofing, and exterior penetrations.

B. Sealants for joints within sheet metal fabrications.

1.02 RELATED REQUIREMENTS

A. Section 07 7123 - Manufactured Gutters and Downspouts.

1.03 REFERENCE STANDARDS

A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

C. ASTM A666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2023.

D. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

E. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

F. ASTM D4586/D4586M - Standard Specification for Asphalt Roof Cement, Asbestos-Free; 2007 (Reapproved 2018).

G. SMACNA (ASMM) - Architectural Sheet Metal Manual; 2012.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with SMACNA (ASMM) and CDA A4050 requirements and standard details, except as otherwise indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Stack material to prevent twisting, bending, and abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.

B. Prevent contact with materials that could cause discoloration or staining.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Anodized Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 20 gauge, 0.032 inch (0.81 mm) thick; clear anodized finish.

B. Pre-Finished Aluminum: ASTM B209/B209M, 3005 alloy, H12 or H14 temper; 18 gauge, 0.040 inch (1.02 mm) thick; plain finish shop pre-coated with silicone modified polyester coating.
   1. Polyvinylidene Fluoride (PVDF) Coating: Superior performing organic powder coating, AAMA 2605; pretreated metal with two-coat system including primer and color coat with at least 70 percent PVDF coating.
   2. Color: As indicated on drawings.

C. Stainless Steel: ASTM A666, Type 304 alloy, soft temper, 28 gauge, 0.0156 inch (0.40 mm) thick; smooth No. 4 - Brushed finish.

2.02 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Form pieces in longest possible lengths.

C. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

D. Form material with flat lock seams, except where otherwise indicated; at moving joints, use sealed lapped, bayonet-type or interlocking hooked seams.

E. Fabricate corners from one piece with minimum 18-inch (450 mm) long legs; seam for rigidity, seal with sealant.

F. Fabricate flashings to allow toe to extend 2 inches (50 mm) over roofing _____. Return and brake edges.

2.03 GUTTERS AND DOWNSPOUTS

A. Seal metal joints.

2.04 EXTERIOR PENETRATION FLASHING PANELS

A. Flashing Panels for Exterior Wall Penetrations: Premanufactured components and accessories as required to preserve integrity of building envelope; suitable for conduits and facade materials to be installed.

2.05 ACCESSORIES

A. Concealed Sealants: Non-curing butyl sealant.

B. Exposed Sealants: ASTM C920; elastomeric sealant, with minimum movement capability as recommended by manufacturer for substrates to be sealed; color to match adjacent material.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify roof openings, curbs, pipes, sleeves, ducts, and vents through roof are solidly set, reglets in place, and nailing strips located.

B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.02 PREPARATION

A. Install starter and edge strips, and cleats before starting installation.

B. Back paint concealed metal surfaces with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch (0.38 mm).

3.03 INSTALLATION

A. Secure flashings in place using concealed fasteners, and use exposed fasteners only where permitted..

B. Fit flashings tight in place; make corners square, surfaces true and straight in planes, and lines accurate to profiles.

C. Secure gutters and downspouts in place with concealed fasteners.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for field inspection requirements.

B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

3.05 SCHEDULE

A. Through-Wall Flashing in Masonry:

B. Gutters and Downspouts:

C. Scuppers:
D. Coping, Cap, Parapet, Sill and Ledge Flashings:
E. Counterflashings at Roofing Terminations (over roofing base flashings):
F. Roofing Penetration Flashings, for Pipes, Structural Steel, and Equipment Supports:

END OF SECTION

SECTION 07 7123
MANUFACTURED GUTTERS AND DOWNSPOUTS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 07 6100 - Sheet Metal Roofing.

B. Section 07 6200 - Sheet Metal Flashing and Trim.

1.02 REFERENCE STANDARDS

A. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

1.03 ADMINISTRATIVE REQUIREMENTS

A. Comply with applicable code for size and method of rain water discharge.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

1.05 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.01 MATERIALS

A. Pre-Finished Aluminum Sheet: ASTM B209/B209M, ___ alloy, ___ temper; 0.032 inch (0.8 mm) thick.
   1. Finish: Plain, shop pre-coated with modified silicone coating.
   2. Color: As selected from manufacturer's standard colors.

2.02 COMPONENTS

A. Gutters: SMACNA rectangular style profile.

B. Anchors and Supports: Profiled to suit gutters and downspouts.
   1. Anchoring Devices: In accordance with CDA requirements.
   2. Gutter Supports: as required in coordination with metal roof..

C. Fasteners: Same material and finish as gutters and downspouts, with soft neoprene washers.

2.03 FABRICATION

A. Form gutters and downspouts of profiles and size indicated.

B. Fabricate with required connection pieces.

C. Form sections square, true, and accurate in size, in maximum possible lengths, free of distortion or defects detrimental to appearance or performance. Allow for expansion at joints.

D. Hem exposed edges of metal.

E. Fabricate gutter and downspout accessories; seal watertight.

2.04 FINISHES

A. Fluoropolymer Coating: High Performance Organic Finish, AAMA 2604, multiple coat, thermally cured fluoropolymer finish system; color as indicated.

2.05 ACCESSORIES

A. Splash Pads: Precast concrete type, profiles size(s) as indicated; minimum 3,000 psi (21 MPa) compressive strength at 28 days, with minimum 5 percent air entrainment.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work.

3.02 PREPARATION

A. Paint concealed sheet metal surfaces and surfaces in contact with dissimilar metals with protective backing paint to a minimum dry film thickness of 15 mil, 0.015 inch (0.381 mm).

3.03 INSTALLATION

A. Install gutters, downspouts, and accessories in accordance with manufacturer's instructions.

END OF SECTION

SECTION 07 7200
ROOF ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Roof hatches, manual and automatic operation, including smoke vents.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used.
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Maintenance requirements.

C. Warranty Documentation:
   1. Submit manufacturer warranty.
   2. Ensure that forms have been completed in Owner's name and registered with manufacturer.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store products under cover and elevated above grade.

1.04 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 FALL PROTECTION ROOF ANCHOR

A. Basis-Of-Design: Frontline R012 Multifunction 12" Commercial Roof Anchor.
   1. Finish: Galvanized.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROOF HATCHES AND VENTS

A. Roof Hatch Manufacturers:
   1. Acudor Products Inc; Galvanized Steel Roof Hatch: www.acudor.com/#sle.
   2. Bilco Company; Type TB (various types and special size): www.bilco.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Roof Hatches and Smoke Vents: Factory-assembled aluminum frame and cover, complete with operating and release hardware.
   1. Style: Provide flat metal covers unless otherwise indicated.
   2. Mounting Substrate: Provide frames and curbs suitable for mounting on standing seam metal roof panel system.

C. Frames and Curbs: One-piece curb and frame with integral cap flashing to receive roof flashings; extended bottom flange to suit mounting.
   1. Material: Mill finished aluminum, 11 gauge, 0.0907 inch (2.3 mm) thick.
   2. Insulation: Manufacturer's standard; 1 inch (25 mm) rigid glass fiber, located on outside face of curb.

D. Metal Covers: Flush, insulated, hollow metal construction.
   1. Capable of supporting 40 psf (1.92 kPa) live load.
   2. Material: Mill finished aluminum; outer cover 11 gauge, 0.0907 inch (2.3 mm) thick, liner 0.04 inch (1.0 mm) thick.
   3. Insulation: Manufacturer's standard 1 inch (25 mm) rigid glass fiber.
   4. Gasket: Neoprene, continuous around cover perimeter.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using methods recommended by manufacturer for achieving acceptable results for applicable substrate under project conditions.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions, in manner that maintains roofing system weather-tight integrity.

3.04 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

B. Clean installed work to like-new condition.

3.05 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

END OF SECTION

SECTION 07 8400
FIRESTOPPING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Firestopping systems.

B. Firestopping of joints and penetrations in fire-resistance-rated and smoke-resistant assemblies, whether indicated on drawings or not, and other openings indicated.

1.02 RELATED REQUIREMENTS

A. Section 01 7000 - Execution and Closeout Requirements: Cutting and patching.

B. Section 09 2116 - Gypsum Board Assemblies: Gypsum wallboard fireproofing.

1.03 REFERENCE STANDARDS

A. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.

B. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).

C. ASTM E2174 - Standard Practice for On-Site Inspection of Installed Firestop Systems; 2020a.

D. ASTM E2393 - Standard Practice for On-Site Inspection of Installed Fire Resistive Joint Systems and Perimeter Fire Barriers; 2020a.

E. ASTM E2837 - Standard Test Method for Determining the Fire Resistance of Continuity Head-of-Wall Joint Systems Installed Between Rated Wall Assemblies and Nonrated Horizontal Assemblies; 2013 (Reapproved 2017).

F. ITS (DIR) - Directory of Listed Products; Current Edition.

G. FM (AG) - FM Approval Guide; Current Edition.

H. UL 1479 - Standard for Fire Tests of Penetration Firestops; Current Edition, Including All Revisions.

I. UL (DIR) - Online Certifications Directory; Current Edition.

J. UL (FRD) - Fire Resistance Directory; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Schedule of Firestopping: List each type of penetration, fire rating of the penetrated assembly, and firestopping test or design number.

C. Product Data: Provide data on product characteristics, performance ratings, and limitations.

D. Manufacturer's qualification statement.

E. Installer's qualification statement.

1.05 QUALITY ASSURANCE

A. Fire Testing: Provide firestopping assemblies of designs that provide the scheduled fire ratings when tested in accordance with methods indicated.
   1. Listing in UL (FRD), FM (AG), or ITS (DIR) will be considered as constituting an acceptable test report.
   2. Valid evaluation report published by ICC Evaluation Service, Inc. (ICC-ES) at www.icc-es.org will be considered as constituting an acceptable test report.
   3. Submission of actual test reports is required for assemblies for which none of the above substantiation exists.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

C. Installer Qualifications: Company specializing in performing the work of this section and:

1. Licensed by local authorities having jurisdiction (AHJ).

1.06 FIELD CONDITIONS

A. Comply with firestopping manufacturer's recommendations for temperature and conditions during and after installation; maintain minimum temperature before, during, and for three days after installation of materials.

B. Provide ventilation in areas where solvent-cured materials are being installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Firestopping Manufacturers:
   1. 3M Fire Protection Products; _____: www.3m.com/firestop/#sle.
   2. A/D Fire Protection Systems Inc; _____: www.adfire.com/#sle.
   3. Hilti, Inc; _____: www.hilti.com/#sle.
   4. Specified Technologies Inc; _____: www.stifirestop.com/#sle.
   5. Tremco Commercial Sealants & Waterproofing; TREMstop Acrylic: www.tremcosealants.com/#sle.

2.02 MATERIALS

A. Firestopping Materials: Any materials meeting requirements.

B. Primers, Sleeves, Forms, Insulation, Packing, Stuffing, and Accessories: Provide type of materials as required for tested firestopping assembly.

2.03 FIRESTOPPING ASSEMBLY REQUIREMENTS

A. Head-of-Wall (HW) Joint System Firestopping at Joints Between Fire-Rated Wall Assemblies and Non-Rated Horizontal Assemblies: Use system that has been tested according to ASTM E2837 to have fire resistance F Rating equal to required fire rating of wall assembly.
   1. Movement: Provide systems that have been tested to show movement capability as indicated.

B. Through Penetration Firestopping: Use system that has been tested according to ASTM E814 to have fire resistance F Rating equal to required fire rating of penetrated assembly.
   1. Temperature Rise: Provide systems that have been tested to show T Rating as indicated.
   2. Air Leakage: Provide systems that have been tested to show L Rating as indicated.
   3. Watertightness: Provide systems that have been tested to show W Rating as indicated.
   4. Listing by FM (AG), ITS (DIR), UL (DIR), or UL (FRD) in their certification directories will be considered evidence of successful testing.

2.04 FIRESTOPPING FOR FLOOR-TO-FLOOR, FLOOR-TO-WALL, HEAD-OF-WALL, AND WALL-TO-WALL JOINTS

A. Gypsum Board Walls:
   1. Wall-to-Wall Joints That Have Not Been Tested For Movement Capabilities (Static-S):
      a. 1 Hour Construction: UL System WW-S-0063; Specified Technologies Inc. SpeedFlex TTG Track Top Gasket.
   2. Head-of-Wall Joints at Underside of Steel Beam and Concrete Over Metal Deck Floor with Sprayed On Fireproofing:
      a. 1 Hour Construction: UL System HW-D-0259; Hilti CFS-SP WB Firestop Joint Spray and CP 672.
   3. Head-of-Wall Joints at Concrete Over Metal Deck:
      a. 1 Hour Construction: UL System HW-D-0365; Specified Technologies Inc. SpeedFlex Joint Profile System.
      b. 1 Hour Construction: UL System HW-D-0548; Specified Technologies Inc. SpeedFlex Joint Profile System.
      c. 1 Hour Construction: UL System HW-D-0749; Specified Technologies Inc. SpeedFlex TTG Track Top Gasket.

d. 1 Hour Construction: UL System HW-D-0256; Tremco, TREMstop Acrylic Firestop Sealant.

4. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Parallel to Ribs:
   a. 1 Hour Construction: UL System HW-D-0184; Hilti CP 606 Flexible Firestop Sealant.
5. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Perpendicular to Ribs, Cut to Fit Ribs:
   a. 1 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.
6. Head-of-Wall Joints at Concrete Over Metal Deck, Wall Perpendicular to Ribs, Not Cut to Fit:
   a. 1 Hour Construction: UL System HW-D-0045; Hilti CP 606 Flexible Firestop Sealant.

2.05 FIRESTOPPING PENETRATIONS THROUGH CONCRETE AND CONCRETE MASONRY CONSTRUCTION

A. Penetrations Through Floors By:
   1. Multiple Penetrations in Large Openings:
      a. 2 Hour Construction: UL System F-A-8012; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade or CFS-S SIL SL Firestop Silicone Sealant Self-Leveling.
   2. Uninsulated Metallic Pipe, Conduit, and Tubing:
   3. Electrical Cables Not In Conduit:
      a. 2 Hour Construction: UL System F-A-3032; Specified Technologies Inc. Ready Split Sleeve.
      b. 2 Hour Construction: UL System F-A-3058; Specified Technologies Inc. EZ-Path Series 44 Fire-Rated Pathway.
   4. Electrical Busways:
      a. 3 Hour Construction: UL System C-AJ-6017; Hilti CFS-S SIL GG Firestop Silicone Sealant Gun-Grade or CFS-S SIL SL Firestop Silicone Sealant Self-Leveling.
   5. Insulated Pipes:
      a. 2 Hour Construction: UL System F-A-5015; Hilti CP 680-P/M Cast-In Device.

B. Penetrations Through Walls By:
   1. Uninsulated Metallic Pipe, Conduit, and Tubing:
   2. Insulated Pipes:
      a. 2 Hour Construction: UL System C-AJ-5090; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   3. HVAC Ducts, Uninsulated:
      a. 2 Hour Construction: UL System W-J-7109; Hilti FS-ONE MAX Intumescent Firestop Sealant, or CP 606 Flexible Firestop Sealant.
   4. HVAC Ducts, Insulated:
      a. 2 Hour Construction: UL System W-J-7112; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.06 FIRESTOPPING PENETRATIONS THROUGH GYPSUM BOARD WALLS

A. Blank Openings:
   1. 1 Hour Construction: UL System W-L-0020; Specified Technologies Inc. Composite Sheet.
   2. 1 Hour Construction: UL System W-L-0032; Specified Technologies Inc. FP Intumescent Firestop Plug.
   3. 1 Hour Construction: UL System W-L-3334; Hilti CP 653 Speed Sleeve.

B. Penetrations By:
   1. Uninsulated Metallic Pipe, Conduit, and Tubing:
      a. 1 Hour Construction: UL System W-L-1164; Hilti FS-ONE MAX Intumescent Firestop Sealant.
      b. 1 Hour Construction: UL System W-L-1222; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
      c. 1 Hour Construction: UL System W-L-1477; Specified Technologies Inc. EZ Firestop Grommet.

d. 1 Hour Construction: UL System W-L-1506; Hilti CFS-D Firestop Cable Disc.

2. Uninsulated Non-Metallic Pipe, Conduit, and Tubing:
   a. 1 Hour Construction: UL System W-L-2078; Hilti CP 643N/644 Firestop Collar.
   b. 1 Hour Construction: UL System W-L-2128; Hilti FS-ONE MAX Intumescent Firestop Sealant.
   c. 1 Hour Construction: UL System W-L-2243; Specified Technologies Inc. SSW Wrap Strips.
   d. 1 Hour Construction: UL System W-L-2493; Specified Technologies Inc. RTC Range-Taking Collar.
3. Electrical Cables Not In Conduit:
   a. 1 Hour Construction: UL System W-L-3374; Specified Technologies Inc. FP Intumescent Firestop Plug.
   b. 1 Hour Construction: UL System W-L-3378; Specified Technologies Inc. EZ Firestop Grommet.
   c. 1 Hour Construction: UL System W-L-3393; Hilti CFS-SL RK Retrofit Sleeve Kit for Existing Cables.
4. Cable Trays with Electrical Cables:
   a. 1 Hour Construction: UL System W-L-4011; Hilti CFS-BL Firestop Block.
   b. 1 Hour Construction: UL System W-L-4060; Hilti FS-ONE MAX Intumescent Firestop Sealant.
5. Insulated Pipes:
   a. 1 Hour Construction: UL System W-L-5121; Specified Technologies Inc. LCI Intumescent Firestop Sealant.
   b. 1 Hour Construction: UL System W-L-5273; Specified Technologies Inc. LC Endothermic Firestop Sealant.
6. HVAC Ducts, Insulated:
   a. 1 Hour Construction: UL System W-L-7238; Specified Technologies Inc. FyreFlange HVAC Firestop Angle.
   b. 1 Hour Construction: UL System W-L-7156; Hilti FS-ONE MAX Intumescent Firestop Sealant.

2.07 FIRESTOPPING SYSTEMS

A. Firestopping: Any material meeting requirements.
   1. Fire Ratings: Use system that is listed by FM (AG), ITS (DIR), or UL (FRD) and tested in accordance with ASTM E814, ASTM E119, or UL 1479 with F Rating equal to fire rating of penetrated assembly and minimum T Rating Equal to F Rating and in compliance with other specified requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify openings are ready to receive the work of this section.

3.02 PREPARATION

A. Clean substrate surfaces of dirt, dust, grease, oil, loose material, or other materials that could adversely affect bond of firestopping material.

B. Remove incompatible materials that could adversely affect bond.

3.03 INSTALLATION

A. Install materials in manner described in fire test report and in accordance with manufacturer's instructions, completely closing openings.

3.04 FIELD QUALITY CONTROL

A. Independent Testing Agency: Inspection agency employed and paid by Owner, will examine penetration firestopping in accordance with ASTM E2174 and ASTM E2393.

B. Repair or replace penetration firestopping and joints at locations where inspection results indicate firestopping or joints do not meet specified requirements.

3.05 CLEANING

A. Clean adjacent surfaces of firestopping materials.

END OF SECTION

SECTION 07 9200
JOINT SEALANTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Nonsag gunnable joint sealants.

B. Self-leveling pourable joint sealants.

C. Joint backings and accessories.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM C661 - Standard Test Method for Indentation Hardness of Elastomeric-Type Sealants by Means of a Durometer; 2015 (Reapproved 2022).

B. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

C. ASTM C834 - Standard Specification for Latex Sealants; 2017 (Reapproved 2023).

D. ASTM C920 - Standard Specification for Elastomeric Joint Sealants; 2018.

E. ASTM C1087 - Standard Test Method for Determining Compatibility of Liquid-Applied Sealants with Accessories Used in Structural Glazing Systems; 2023.

F. ASTM C1193 - Standard Guide for Use of Joint Sealants; 2016 (Reapproved 2023).

G. ASTM C1248 - Standard Test Method for Staining of Porous Substrate by Joint Sealants; 2022.

H. ASTM C1382 - Standard Test Method for Determining Tensile Adhesion Properties of Sealants when Used in Exterior Insulation and Finishing Systems (EIFS) Joints; 2016 (Reapproved 2023).

I. ASTM D2240 - Standard Test Method for Rubber Property--Durometer Hardness; 2015 (Reapproved 2021).

J. ASTM D412 - Standard Test Methods for Vulcanized Rubber and Thermoplastic Elastomers--Tension; 2016 (Reapproved 2021).

K. ASTM E119 - Standard Test Methods for Fire Tests of Building Construction and Materials; 2022.

L. SCAQMD 1168 - Adhesive and Sealant Applications; 1989, with Amendment (2022).

M. UL 263 - Standard for Fire Tests of Building Construction and Materials; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Submit manufacturer's technical datasheets for each product to be used; include the following:
   1. Physical characteristics, including movement capability, VOC content, hardness, cure time, and color availability.
   2. List of backing materials approved for use with the specific product.
   3. Substrates that product is known to satisfactorily adhere to and with which it is compatible.
   4. Substrates the product should not be used on.

C. Color Cards for Selection: Where sealant color is not specified, submit manufacturer's color cards showing standard colors available for selection.

D. Executed warranty.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

B. Testing Agency Qualifications: Independent firm specializing in performing testing and inspections of the type specified in this section.

C. Preconstruction Laboratory Testing: Arrange for sealant manufacturer(s) to test each combination of sealant, substrate, backing, and accessories.
   1. Adhesion Testing: In accordance with ASTM C794.
   2. Compatibility Testing: In accordance with ASTM C1087.

D. Field Quality Control Plan:
   1. Visual inspection of entire length of sealant joints.
   2. Field testing agency's qualifications.
   3. Field Quality Control Log Form: Show same data fields as on Preinstallation Field Adhesion Test Log, with known information filled out and lines for multiple tests per sealant/substrate combinations; include visual inspection and specified field testing; allow for possibility that more tests than minimum specified may be necessary.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 JOINT SEALANT APPLICATIONS

A. Scope:
   1. Exterior Joints: Seal open joints, whether or not the joint is indicated on drawings, unless specifically indicated not to be sealed. Exterior joints to be sealed include, but are not limited to:
      a. Wall expansion and control joints.
      b. Joints between door, window, and other frames and adjacent construction.
      c. Joints between different exposed materials.
      d. Openings below ledge angles in masonry.
      e. Other joints indicated below.
   2. Interior Joints: Do not seal interior joints unless specifically indicated to be sealed. Interior joints to be sealed include, but are not limited to, the following items.
      a. Joints between door, window, and other frames and adjacent construction.
      b. Other joints indicated below.
   3. Do not seal the following types of joints:
      a. Intentional weep holes in masonry.
      b. Joints indicated to be treated with manufactured expansion joint cover, or some other type of sealing device.
      c. Joints where sealant is specified to be provided by manufacturer of product to be sealed.
      d. Joints where installation of sealant is specified in another section.
      e. Joints between suspended panel ceilings/grid and walls.

B. Type ___ - Exterior Joints: Use nonsag nonstaining silicone sealant, unless otherwise indicated.

C. Type ___ - Interior Joints: Use nonsag polyurethane sealant, unless otherwise indicated.

2.02 JOINT SEALANTS - GENERAL

A. Sealants and Primers: Provide products having lower volatile organic compound (VOC) content than indicated in SCAQMD 1168.

B. Colors: To match adjacent surfaces.

2.03 NONSAG JOINT SEALANTS

A. Nonstaining Silicone Sealant: ASTM C920, Grade NS, Uses M and A; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 50 percent, minimum.

2. Nonstaining to Porous Stone: Nonstaining to light-colored natural stone when tested in accordance with ASTM C1248.
3. Dirt Pick-Up: Reduced dirt pick-up compared to other silicone sealants.
4. Color: To match adjacent surfaces. Consult architect where adjacent to material color change..
5. Service Temperature Range: Minus 20 to 180 degrees F (Minus 29 to 82 degrees C).
6. Products:
    a. Dow; DOWSIL 756 SMS Building Sealant: www.dow.com/#sle.
    b. Dow; DOWSIL 790 Silicone Building Sealant: www.dow.com/#sle.
    c. Dow; DOWSIL 791 Silicone Weatherproofing Sealant: www.dow.com/#sle.
    d. Dow; DOWSIL 795 Silicone Building Sealant: www.dow.com/#sle.
    e. Sika Corporation; Sikasil WS-290: www.usa.sika.com/#sle.
    f. Sika Corporation; Sikasil WS-295: www.usa.sika.com/#sle.
    g. Sika Corporation; Sikasil 728NS: www.usa.sika.com/#sle.

B. Type ___ - Mildew-Resistant Silicone Sealant: ASTM C920, Grade NS, Uses M and A; single component, mildew resistant; not expected to withstand continuous water immersion or traffic.
1. Color: To match adjacent surfaces. Consult architect where adjacent to material color change..
2. Products:
    a. Everkem Diversified Products, Inc; TruSil 100: www.everkemproducts.com/#sle.
    b. Pecora Corporation; Pecora 898 NST (Non-Staining Technology): www.pecora.com/#sle.
    c. Sika Corporation; Sikasil GP: www.usa.sika.com/#sle.
    d. Substitutions: See Section 01 6000 - Product Requirements.

C. Type ___ - Low Modulus, Silyl-Terminated Polyether (STPE) Joint Sealant: ASTM C920, Type S, Grade NS, Uses NT, A, M, Class 100/50. Tested in accordance with ASTM C1382.
1. Movement Capability: Plus and minus ___ percent, minimum.
2. Color: Match adjacent surfaces. Consult architect where material colors vary..
3. Service Temperature Range: 40 to 100 degrees F (4 to 38 degrees C).
4. Products:
    a. Sto Corp; StoSeal STPE Sealant: www.stocorp.com/#sle.
    b. Substitutions: See Section 01 6000 - Product Requirements.

D. Type ___ - Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; not expected to withstand continuous water immersion or traffic.
1. Movement Capability: Plus and minus 50 percent, minimum.
2. Color: To be selected by Architect from manufacturer's standard range.
3. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).
4. Products:
    a. Pecora Corporation; DynaTrol II: www.pecora.com/#sle.
    b. Pecora Corporation; DynaFlex: www.pecora.com/#sle.
    c. Sherwin-Williams Company; Stampede-1/-TX Polyurethane Sealant: www.sherwin-williams.com/#sle.
    d. Sika Corporation; Sikaflex-1a: www.usa.sika.com/#sle.
    e. Sika Corporation; Sikaflex-15 LM: www.usa.sika.com/#sle.
    f. Sika Corporation; Sikaflex-2c NS: www.usa.sika.com/#sle.
    g. Substitutions: See Section 01 6000 - Product Requirements.

E. Type ___ - Polyurethane Sealant for Continuous Water Immersion: ASTM C920, Grade NS, Uses M and A; single or multicomponent; explicitly approved by manufacturer for continuous water immersion; suitable for traffic exposure when recessed below traffic surface.
1. Movement Capability: Plus and minus 35 percent, minimum.
2. Hardness Range: 20 to 35, Shore A, when tested in accordance with ASTM C661.
3. Color: To be selected by Architect from manufacturer's standard range.

F. Type ___ - Nonsag Traffic-Grade Polyurethane Sealant: ASTM C920, Grade NS, Uses M and A; single or multi-component; explicitly approved by manufacturer for continuous water immersion and traffic without the necessity to recess sealant below traffic surface.
   1. Movement Capability: Plus and minus 25 percent, minimum.
   2. Hardness Range: 20 to 30, Shore A, when tested in accordance with ASTM C661.
   3. Color: Match adjacent finished surfaces.

G. Type ___ - Acrylic-Urethane Sealant: ASTM C920, Grade NS, Uses M and A; single component; paintable; not expected to withstand continuous water immersion or traffic.
   1. Movement Capability: Plus and minus 12-1/2 percent, minimum.
   2. Hardness Range: 15 to 40, Shore A, when tested in accordance with ASTM C661.
   3. Color: Match adjacent surfaces. Consult architect where material colors vary..
   4. Service Temperature Range: Minus 40 to 180 degrees F (Minus 40 to 82 degrees C).
   5. Products:
      a. DAP Products Inc; DYNAFLEX 920 Sealant: www.dapspecline.com/#sle.
      b. Franklin International, Inc; Titebond UA 920 Sealant: www.titebond.com/#sle.
      c. Sherwin-Williams Company; Shermax Urethanized Elastomeric Sealant: www.sherwin-williams.com/#sle.

H. Type ___ - Acrylic Emulsion Latex: Water-based; ASTM C834, single component, nonstaining, nonbleeding, nonsagging; not intended for exterior use.
   1. Color: Standard colors matching finished surfaces, Type OP (opaque).
   2. Grade: ASTM C834; Grade 0 Degrees F (Minus 18 Degrees C).
   3. Products:
      a. Franklin International, Inc; Titebond Painter's Plus Caulk: www.titebond.com/#sle.
      b. Sherwin-Williams Company; White Lightning 3006 Siliconized Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
      c. Sherwin-Williams Company; 850A Acrylic Latex Caulk: www.sherwin-williams.com/#sle.
      d. Tremco Commercial Sealants & Waterproofing; Tremstop Smoke and Sound: www.tremcosealants.com/#sle.
      e. Substitutions: See Section 01 6000 - Product Requirements.

I. Type ___ - Acrylic Latex Sealant: ASTM C834; for use as acoustical sealant and in firestopping systems for expansion joints and through penetrations.
   1. Color: Standard colors matching finished surfaces.
   2. Color: To be selected by Architect from manufacturer's standard range.
   3. Fire Rated System: Complies with UL 263 and ASTM E119 with UL fire resistance classifications.

2.04 SELF-LEVELING JOINT SEALANTS

A. Type ____ - Self-Leveling Silicone Sealant: ASTM C920, Grade P, Uses M and A; single or multicomponent, explicitly approved by manufacturer for traffic exposure when recessed below traffic surface; not expected to withstand continuous water immersion.
   1. Movement Capability: Plus 100 percent, minus 50 percent, minimum.
   2. Color: To be selected by Architect from manufacturer's standard range.

2.05 ACCESSORIES

A. Backer Rod: Cylindrical cellular foam rod with surface that sealant will not adhere to, compatible with specific sealant used, and recommended by backing and sealant manufacturers for specific application.

B. Preformed Extruded Silicone Joint Seal: Pre-cured low-modulus silicone extrusion, in sizes to fit applications indicated on drawings, combined with a neutral-curing liquid silicone sealant for bonding joint seal to substrates.
   1. Size: 1 inch (25.4 mm) wide, in rolls 100 feet (30.5 m) long.
   2. Thickness: 0.78 inch (19.8 mm), with ridges along outside bottom edges for bonding area.
   3. Color: As selected by Architect..

4. Durometer Hardness, Type A: 26 to 32, minimum, when tested in accordance with ASTM D2240.
5. Tensile Strength: 218 psi (1.5 MPa), in accordance with ASTM D412.
6. Elongation at Break: 554 percent, in accordance with ASTM D412.
7. Products:
   a. Tremco Commercial Sealants & Waterproofing; Spectrem Simple Seal: www.tremcosealants.com/#sle.
   b. Substitutions: See Section 01 6000 - Product Requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that joints are ready to receive work.

B. Verify that backing materials are compatible with sealants.

C. Verify that backer rods are of the correct size.

3.02 PREPARATION

A. Remove loose materials and foreign matter that could impair adhesion of sealant.

B. Clean joints, and prime as necessary, in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C1193.

D. Mask elements and surfaces adjacent to joints from damage and disfigurement due to sealant work; be aware that sealant drips and smears may not be completely removable.

E. Concrete Floor Joints That Will Be Exposed in Completed Work: Test joint filler in an inconspicuous area to verify that it does not stain or discolor slab.

3.03 INSTALLATION

A. Install this work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Provide joint sealant installations complying with ASTM C1193.

C. Install bond breaker backing tape where backer rod cannot be used.

D. Install sealant free of air pockets, foreign embedded matter, ridges, and sags, and without getting sealant on adjacent surfaces.

E. Do not install sealant when ambient temperature is outside manufacturer's recommended temperature range, or will be outside that range during the entire curing period, unless manufacturer's approval is obtained and instructions are followed.

F. Nonsag Sealants: Tool surface concave, unless otherwise indicated; remove masking tape immediately after tooling sealant surface.

G. Concrete Floor Joint Filler: After full cure, shave joint filler flush with top of concrete slab.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Perform field quality control inspection/testing as specified in PART 1 under QUALITY ASSURANCE article.

C. Remove and replace failed portions of sealants using same materials and procedures as indicated for original installation.

END OF SECTION

SECTION 08 1113
HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated hollow metal doors and frames.
B. Hollow metal frames for wood doors.
C. Fire-rated hollow metal doors and frames.
D. Thermally insulated hollow metal doors with frames.
E. Sound-rated hollow metal doors and frames.
F. Commercial security hollow metal doors and frames.
G. Detention security hollow metal doors and frames.
H. Blast-resistant hollow metal doors and frames.
I. Hurricane-resistant hollow metal doors and frames.

1.02 RELATED REQUIREMENTS

A. Section 08 7100 - Door Hardware.
B. Section 08 8000 - Glazing: Glass for doors and borrowed lites.
C. Section 09 9113 - Exterior Painting: Field painting.
D. Section 09 9123 - Interior Painting: Field painting.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.
B. ANSI/SDI A250.4 - Test Procedure and Acceptance Criteria for Physical Endurance for Steel Doors, Frames and Frame Anchors; 2022.
C. ANSI/SDI A250.8 - Specifications for Standard Steel Doors and Frames (SDI-100); 2017.
D. ANSI/SDI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 2020.
E. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
F. ASTM A1008/A1008M - Standard Specification for Steel, Sheet, Cold-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, Required Hardness, Solution Hardened, and Bake Hardenable; 2021a.
G. ASTM A1011/A1011M - Standard Specification for Steel, Sheet and Strip, Hot-Rolled, Carbon, Structural, High-Strength Low-Alloy, High-Strength Low-Alloy with Improved Formability, and Ultra-High Strength; 2018a.
H. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).
I. BHMA A156.115 - Hardware Preparation in Steel Doors and Frames; 2016.
J. FBC TAS 201 - Impact Test Procedures; Testing Application Standard; 1994.
K. FBC TAS 202 - Criteria for Testing Impact and Non-Impact Resistant Building Envelope Components Using Uniform Static Air Pressure; Testing Application Standard; 1994.
L. FBC TAS 203 - Criteria for Testing Products Subject To Cyclic Wind Pressure Loading; Testing Application Standard; 1994.
M. FLA (PAD) - Florida Building Code Online - Product Approval Directory; Current Edition.
N. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.
O. ITS (DIR) - Directory of Listed Products; Current Edition.

P. Miami (APD) - Approved Products Directory; Miami-Dade County; Current Edition.

Q. NAAMM HMMA 830 - Hardware Selection for Hollow Metal Doors and Frames; 2002.

R. NAAMM HMMA 831 - Hardware Locations for Hollow Metal Doors and Frames; 2011.

S. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2022.

T. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; 2022.

U. UFC 4-010-01 - DoD Minimum Antiterrorism Standards for Buildings; 2018, with Editorial Revision (2022).

V. UL (DIR) - Online Certifications Directory; Current Edition.

W. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced standards/guidelines.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and any indicated finish requirements.

D. Design Submittals: Manufacturer to submit anchor design analysis calculations for blast-resistant doors signed and sealed by specialty design engineer experienced in this type of work and licensed in the State in which the Project is located.

1.05 QUALITY ASSURANCE

A. Wind Load Requirements: 130 mph exposure C, ASCE 7

B. Manufacturer Qualifications: Provide hollow metal doors and frames from SDI Certified manufacturer: https://steeldoor.org/sdi-certified/#sle.

C. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

D. Maintain at project site copies of reference standards relating to installation of products specified.

E.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Hollow Metal Doors and Frames:
   1. Ceco Door, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   2. Curries, an Assa Abloy Group company; _____: www.assaabloydss.com/#sle.
   3. Republic Doors, an Allegion brand; ____: www.republicdoor.com/#sle.
   4. Steelcraft, an Allegion brand; ____: www.allegion.com/#sle.

2.02 PERFORMANCE REQUIREMENTS

A. Requirements for Hollow Metal Doors and Frames:
   1. Steel Sheet: Comply with one or more of the following requirements; galvannealed steel complying with ASTM A653/A653M, cold-rolled steel complying with ASTM A1008/A1008M, or hot-rolled pickled and oiled (HRPO) steel complying with ASTM A1011/A1011M, commercial steel (CS) Type B, for each.
   2. Accessibility: Comply with ICC A117.1 and ADA Standards.
   3. Exterior Door Top Closures: Flush end closure channel, with top and door faces aligned.
   4. Door Edge Profile: Manufacturers standard for application indicated.
   5. Typical Door Face Sheets: Flush.

6. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings. Style: Manufacturer's standard.
7. Hardware Preparations, Selections and Locations: Comply with NAAMM HMMA 830 and NAAMM HMMA 831 or BHMA A156.115 and ANSI/SDI A250.8 (SDI-100) in accordance with specified requirements.
8. Zinc Coating for Typical Interior and/or Exterior Locations: Provide metal components zinc-coated (galvanized) and/or zinc-iron alloy-coated (galvannealed) by the hot-dip process in accordance with ASTM A653/A653M, with manufacturer's standard coating thickness, unless noted otherwise for specific hollow metal doors and frames.
    a. Based on SDI Standards: Provide at least A40/ZF120 (galvannealed) when necessary, coating not required for typical interior door applications, and at least A60/ZF180 (galvannealed) for corrosive locations.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 HOLLOW METAL DOORS

A. Door Finish: Factory primed and field finished.

B. Exterior Doors: Thermally insulated.
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 2 - Heavy-duty.
    b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model 1 - Full Flush.
    d. Door Face Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
    e. Zinc Coating: A60/ZF180 galvannealed coating; ASTM A653/A653M.
2. Door Thermal Resistance: R-Value of 6.0 minimum, for installed thickness of polystyrene.
3. Door Thickness: 1-3/4 inches (44.5 mm), nominal.
4. Door Finish: Factory primed and field finished.

C. Interior Doors, Non-Fire-Rated:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 2 - Heavy-duty.
    b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model 1 - Full Flush.
    d. Door Face Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
2. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

D. Fire-Rated Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 2 - Heavy-duty.
    b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
    c. Model 1 - Full Flush.
    d. Door Face Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
2. Fire Rating: As indicated on Door Schedule, tested in accordance with UL 10C and NFPA 252 ("positive pressure fire tests").
3. Provide units listed and labeled by UL (DIR) or ITS (DIR).
    a. Attach fire rating label to each fire rated unit.
4. Door Core Material: Manufacturers standard core material/construction in compliance with requirements.
5. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

E. Type ___, Sound-Rated Interior Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
    a. Level 1 - Standard-duty.

b. Physical Performance Level C, 250,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 20 gauge, 0.032 inch (0.8 mm), minimum.

2. Door Thickness: As required to meet acoustic requirements indicated.

F. Blast-Resistant Exterior Doors:
1. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 2 - Heavy-duty.
b. Physical Performance Level B, 500,000 cycles; in accordance with ANSI/SDI A250.4.
c. Door Face Metal Thickness: 18 gauge, 0.042 inch (1.0 mm), minimum.
2. Blast Resistance: Complies with U.S. Department of Defense (DoD) UFC 4-010-01 standards with "High" levels of protection.
3. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements..
4. Door Thickness: 1-3/4 inch (44.5 mm).
5. Hinge Rail and Reinforcement: Non-beveled edge, reinforced with continuous steel channel, 12 gauge, 0.093 inch (2.3 mm) minimum metal thickness, welded at 5 inch (127 mm) on center maximum, and compatible with 4-1/2 inch (114 mm) full mortise template and continuous geared hinges.

G. Hurricane-Resistant Doors:
1. Comply with Florida Building Code (FBC) test protocols for High Velocity Hurricane Zone (HVHZ) FBC TAS 201, FBC TAS 202 and FBC TAS 203.
2. Design and size door and frame components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M.
a. Design Wind Loads: Comply with requirements of authorities having jurisdiction.
b. Wind-Borne Debris Resistance: Door and frame components shall have FLA (PAD) approval or Miami (APD) approval for Large and Small Missile impact and pressure cycling at design wind loads.
3. Based on SDI Standards: ANSI/SDI A250.8 (SDI-100).
a. Level 3 - Extra Heavy-duty.
b. Physical Performance Level A, 1,000,000 cycles; in accordance with ANSI/SDI A250.4.
c. Model 1 - Full Flush.
d. Door Face Metal Thickness: 16 gauge, 0.053 inch (1.3 mm), minimum.
4. Door Core Material: Manufacturers standard core material/construction and in compliance with requirements.
5. Door Thickness: 1-3/4 inches (44.5 mm), nominal.

2.04 HOLLOW METAL FRAMES

A. Comply with standards and/or custom guidelines as indicated for corresponding door in accordance with applicable door frame requirements.

B. Coordinate door frame prepatation with hardware and access control wiring and requirements.

C. Frame Finish: Factory primed and field finished.

D. Exterior Door Frames: Knock-down type.
1. Weatherstripping: Separate, see Section 08 7100.

E. Interior Door Frames, Non-Fire Rated: Full profile/continuously welded type.

F. Door Frames, Fire-Rated: Knock-down type.
1. Fire Rating: Same as door, labeled.

G. Sound-Rated Door Frames: Knock-down type.

H. Commercial and/or Detention Security-Resistant Door Frames: With same security resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.

I. Blast-Resistant Door Frames: With same blast resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.

J. Hurricane-Resistant Door Frames: With same hurricane resistance as door; face welded or full profile/continuously welded construction, ground smooth, fully prepared and reinforced for hardware installation.

K. Frames for Wood Doors: Comply with frame requirements in accordance with corresponding door.

2.05 FINISHES

A. Primer: Rust-inhibiting, complying with ANSI/SDI A250.10, door manufacturer's standard.

B. Bituminous Coating: Cold-applied asphalt mastic, compounded for 15 mil, 0.015 inch (0.4 mm) dry film thickness (DFT) per coat; provide inert-type noncorrosive compound free of asbestos fibers, sulfur components, and other deleterious impurities.
   1. Fire-Rated Frames: Comply with fire rating requirements indicated.

2.06 ACCESSORIES

A. Astragals for Double Doors:
   1. Exterior Doors: Steel, Z-shaped.
   2. Fire-Rated Doors: Steel, shape as required for fire rating.

B. Silencers: Resilient rubber, fitted into drilled hole; provide three on strike side of single door, three on center mullion of pairs, and two on head of pairs without center mullions.

C. Temporary Frame Spreaders: Provide for factory- or shop-assembled frames.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Verify that finished walls are in plane to ensure proper door alignment.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation.

3.03 INSTALLATION

A. Install doors and frames in accordance with manufacturer's instructions and related requirements of specified door and frame standards or custom guidelines indicated.

B. Install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Install door hardware as specified in Section 08 7100.

3.04 TOLERANCES

A. Maximum Diagonal Distortion: 1/16 inch (1.6 mm) measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

B. Adjust sound control doors so that seals are fully engaged when door is closed.

3.06 SCHEDULE

A. Refer to Door and Frame Schedule on the drawings.

END OF SECTION

SECTION 08 1416
FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush and flush glazed configuration; fire-rated, non-rated, acoustical, special function, and _____.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames.

B. Section 08 7100 - Door Hardware.

C. Section 08 8000 - Glazing.

D. Section 09 9123 - Interior Painting: Field finishing of doors.

E. Section 09 9300 - Staining and Transparent Finishing: Field finishing of doors.

1.03 REFERENCE STANDARDS

A. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

B. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

C. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging, and inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic; do not store in damp or wet areas or areas where sunlight might bleach veneer; seal top and bottom edges with tinted sealer if stored more than one week, and break seal on site to permit ventilation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Masonite Architectural; Aspiro Select Wood Veneer Doors: www.architectural.masonite.com/#sle.
   2. VT Industries, Inc; ____: www.vtindustries.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 DOORS AND PANELS

A. Doors: See drawings for locations and additional requirements.
   1. Quality Standard: Custom Grade, Heavy Duty performance, in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), unless noted otherwise.
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at each location.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with UL 10C - Positive Pressure; Underwriters Laboratories Inc (UL) or Intertek/Warnock Hersey (WHI) labeled without any visible seals when door is open.

3. Wood veneer facing for field transparent finish as indicated on drawings.
4. Wood veneer facing for field opaque finish as indicated on drawings.

2.03 DOOR AND PANEL CORES

A. Fire-Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

2.04 DOOR FACINGS

A. Veneer Facing for Transparent Finish: Red oak, veneer grade in accordance with quality standard indicated, plain sliced (flat cut), with book match between leaves of veneer, running match of spliced veneer leaves assembled on door or panel face.
   1. Vertical Edges: Any option allowed by quality standard for grade.
   2. "Pair Match" each pair of doors; "Set Match" pairs of doors within 10 feet (3 m) of each other when doors are closed.

B. Veneer Facing for Opaque Finish: Medium density overlay (MDO), in compliance with indicated quality standard.

C. Facing Adhesive: Type I - waterproof.

2.05 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:

C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   1. Exception: Doors to be field finished.

E. Provide edge clearances in accordance with the quality standard specified.

2.06 FINISHES - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI (AWS) or AWMAC/WI (NAAWS), Section 5 - Finishing for grade specified and as follows:
   1. Transparent:
      a. System - 5, Varnish, Conversion.
      b. Stain: As selected by Architect.
      c. Sheen: Semigloss.

B. Factory finish doors in accordance with approved sample.

C. Seal door top edge with color sealer to match door facing.

2.07 ACCESSORIES

A. Glazing: See Section 08 8000.

B. Glazing Stops: Wood, of same species as door facing, butted corners; prepared for countersink style tamper proof screws.

C. Astragals for Fire-Rated Double Doors: Steel, T shaped, overlapping and recessed at face edge, specifically for double doors.

D. Door Hardware: See Section 08 7100.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.02 TOLERANCES

A. Comply with specified quality standard for fit and clearance tolerances.

B. Comply with specified quality standard for telegraphing, warp, and squareness.

3.03 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

3.04 SCHEDULE

A. See Door and Frame Schedule appended to this section.

END OF SECTION

SECTION 08 3100
ACCESS DOORS AND PANELS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall-mounted access units.

B. Wall- and ceiling-mounted access units.

1.02 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; Current Edition.

B. UL (FRD) - Fire Resistance Directory; Current Edition.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide sizes, types, finishes, hardware, scheduled locations, and details of adjoining work.

C. Shop Drawings: Indicate exact position of each access door and/or panel unit.

D. Project Record Documents: Record actual locations of each access unit.

1.04 QUALITY ASSURANCE

PART 2 PRODUCTS

2.01 ACCESS DOORS AND PANELS ASSEMBLIES

A. Wall-Mounted Units with Return Air Grille:
   1. Size: 12 by 12 inches (305 by 305 mm).
   2. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
   3. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
   4. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

B. Wall-Mounted Units in Wet Areas:
   1. Size: 12 by 12 inches (305 by 305 mm).
   2. Door/Panel: Hinged, standard duty, with tool-operated spring or cam lock and no handle.
   3. Wall Mounting Criteria: Provide surface-mounted face frame and door surface flush with frame surface.
   4. Gypsum Board Mounting Criteria: Provide drywall bead frame with door surface flush with wall surface.
   5. Masonry Mounting Criteria: Provide surface-mounted frame with door surface flush with frame surface.

C. Fire-Rated Wall-Mounted Units:
   1. Wall Fire-Rating: As indicated on drawings.
   2. Size: 12 by 12 inches (305 by 305 mm).
   3. Door/Panel: Insulated double-surface panel, with tool-operated spring or cam lock and no handle.

D. Fire-Rated Ceiling-Mounted Units:
   1. Ceiling Fire-Rating: As indicated on drawings.
   2. Size: 12 by 12 inches (305 by 305 mm).

2.02 WALL- AND CEILING-MOUNTED ACCESS UNITS

A. Wall- and Ceiling-Mounted Units: Factory-fabricated door and frame, fully assembled units with corner joints welded, filled and ground flush; square and without rack or warp; coordinate requirements with type of installation assembly being used for each unit.
   1. Material: Steel.
   2. Door Style: Single thickness with rolled or turned in edges.

3. Frames: 16-gauge, 0.0598-inch (1.52 mm) minimum thickness.
4. Heavy-Duty Frames: 14-gauge, 0.0747-inch (1.89 mm) minimum thickness.
5. Door Panels to Receive Wall/Ceiling Finish: Surface recessed 5/8 inch (15.9 mm) back from wall face.
6. Insulation: Non-combustible mineral wool or glass fiber.
7. Units in Fire-Rated Assemblies: Fire rating as required by applicable code for fire-rated assembly that access doors are being installed.
    a. Provide products listed by ITS (DIR) or UL (FRD) as suitable for purpose indicated.
8. Steel Finish: Primed.
9. Primed and Factory Finish: Polyester powder coat; _____ .
10. Hardware:
    a. Hardware for Fire-Rated Units: As required for listing.
    b. Hinges for Non-Fire-Rated Units: Concealed, constant force closure spring type.
    c. Latch/Lock: Tamperproof tool-operated cam latch.

2.03 WALL-MOUNTED ACCESS UNITS WITH RETURN AIR GRILLES

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings are correctly sized and located.

3.02 PREPARATION

3.03 INSTALLATION

A. Install units in accordance with manufacturer's instructions.

B. Install frames plumb and level in openings, and secure units rigidly in place.

C. Position units to provide convenient access to concealed equipment when necessary.

END OF SECTION

SECTION 08 3326
OVERHEAD COILING GRILLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Overhead coiling metal grilles and operating hardware; electrically or manually operated.

B. Wiring from electric circuit disconnect to operator and to control station.

1.02 RELATED REQUIREMENTS

A. Section 26 0583 - Wiring Connections: Power to disconnect.

1.03 REFERENCE STANDARDS

A. ITS (DIR) - Directory of Listed Products; Current Edition.

B. NEMA 250 - Enclosures for Electrical Equipment (1000 Volts Maximum); 2020.

C. NEMA ICS 2 - Industrial Control and Systems Controllers, Contactors and Overload Relays Rated 600 Volts; 2008 (Reaffirmed 2020).

D. NEMA MG 1 - Motors and Generators; 2021.

E. UL (DIR) - Online Certifications Directory; Current Edition.

F. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide, _____, general construction component connections and details, and electrical equipment.

C. Shop Drawings: Indicate pertinent dimensioning, anchorage methods, hardware locations, and installation details.

1.05 QUALITY ASSURANCE

A. Products Requiring Electrical Connection: Listed and classified by ITS (DIR), UL (DIR), or testing firm acceptable to authorities having jurisdiction as suitable for purpose specified.

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Overhead Coiling Grilles:
   1. Cornell Iron Works, Inc; _____: www.cornelliron.com/#sle.
   2. The Cookson Company; ____: www.cooksondoor.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

2.02 GRILLES AND COMPONENTS

A. Grille: Aluminum; horizontal bar curtain, coiling on overhead counterbalanced shaft.
   1. Finish: Anodized, color as selected by Architect.
   2. Mounting: As indicated on drawings.

B. Curtain: Round horizontal bars connected with vertical links.
   1. Horizontal bars: 5/16 inch (8 mm) diameter.
   2. Bar spacing: 1-1/2 inch (38 mm) on center.
   3. Tube spacers: 1/2 inch (13 mm) diameter.
   4. Spacer spacing: 3-1/4 inch (83 mm) on center.
   5. Link spacing: 9 inch (229 mm) on center.
   6. Bar Ends: Provide with nylon runners for quiet operation.
   7. Bottom Bar: Back-to-back angles with tubular resilient cushion.

C. Guides: Extruded aluminum angles, of profile to retain grille in place with snap-on trim, mounting brackets of same metal.

D. Hood Enclosure and Trim: Sheet metal; completely covering operating mechanisms; internally reinforced to maintain rigidity and shape.
   1. Material: Same metal as grille.

E. Lock Hardware:

F. Roller Shaft Counterbalance: Steel pipe and helical steel spring system, capable of producing torque sufficient to ensure smooth operation of curtain from any position and capable of holding position at mid-travel; with adjustable spring tension; requiring 25 lb (10 kg) nominal force to operate.

2.03 MATERIALS

A. Aluminum: ASTM B221 (ASTM B221M).

2.04 ELECTRIC OPERATION

A. Operator, Controls, Actuators, and Safeties: Comply with UL 325; provide products listed by ITS (DIR), UL (DIR), or testing agency acceptable to authorities having jurisdiction.
   1. Provide interlock switches on motor operated units.

B. Electric Operators:
   1. Mounting: Side mounted, outboard of jamb. See drawings.
   2. Motor Enclosure:
      a. Interior Coiling Grilles: NEMA MG 1, Type 1; open drip proof.
   3. Motor Rating: 1/3 hp (250 W); continuous duty.
   4. Motor Voltage: 120 volts, single phase, 60 Hz.
   5. Motor Controller: NEMA ICS 2, full voltage, reversing magnetic motor starter.
   6. Controller Enclosure: NEMA 250 Type 1.
   7. Opening Speed: 6 inches per second (150 mm/sec).
   8. Brake: Adjustable friction clutch type, activated by motor controller.
   9. Manual override in case of power failure.
   10. Refer to Section 26 0583 for electrical connections.

C. Control Station: Provide standard three button (Open-Close-Stop) momentary-contact control device for each operator complying with UL 325.
   1. 24 volt circuit.
   2. Surface mounted, at exterior location as indicated on drawings.
   3. Entrapment Protection Devices: Provide sensing devices and safety mechanisms complying with UL 325.
      a. Primary Device: Provide electric sensing edge, wireless sensing, NEMA 1 photo eye sensors, or NEMA 4X photo eye sensors as required with momentary-contact control device.

D. Safety Edge: Located at bottom of coiling grill, full width, electro-mechanical sensitized type, wired to stop and reverse grill direction upon striking object, hollow neoprene covered.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that adjacent construction is suitable for door installation.

B. Verify that electrical services have been installed and are accessible.

C. Verify that door opening is plumb, header is level, and dimensions are correct.

D. Notify Architect of any unacceptable conditions or varying dimensions.

E. Commencement of installation indicates acceptance of substrate and door opening conditions.

3.02 INSTALLATION

A. Install grille unit assembly in accordance with manufacturer's instructions.

B. Use anchorage devices to securely fasten assembly to wall construction and building framing without distortion or stress.

C. Securely and rigidly brace components suspended from structure. Secure guides to structural members only.

D. Fit and align assembly including hardware; level and plumb, to provide smooth operation.

E. Coordinate installation of electrical service with Section 26 0583.

F. Complete wiring from disconnect to unit components.

G. Install enclosure and perimeter trim.

3.03 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation From Plumb: 1/16 inch (1.5 mm).

C. Maximum Variation From Level: 1/16 inch (1.5 mm).

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch per 10 ft (3 mm per 3 m) straight edge.

3.04 ADJUSTING

A. Adjust grille, hardware and operating assemblies for smooth and noiseless operation.

3.05 CLEANING

A. Clean grille and components.

B. Remove labels and visible markings.

END OF SECTION

SECTION 08 4313
ALUMINUM-FRAMED STOREFRONTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum doors and frames for installation in glazed aluminum curtain walls.

B. Weatherstripping.

1.02 RELATED REQUIREMENTS

A. Section 07 9200 - Joint Sealants: Sealing joints between frames and adjacent construction.

B. Section 08 4229 - Automatic Entrances.

C. Section 08 4413 - Glazed Aluminum Curtain Walls.

D. Section 08 7100 - Door Hardware: Hardware items other than specified in this section.

E. Section 08 8000 - Glazing: Glass and glazing accessories.

1.03 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

B. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.

C. ASTM A36/A36M - Standard Specification for Carbon Structural Steel; 2019.

D. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

E. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

H. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

I. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

J. FLA (PAD) - Florida Building Code Online - Product Approval Directory; Current Edition.

K. SSPC-Paint 20 - Zinc-Rich Coating (Type I - Inorganic, and Type II - Organic); 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate with installation of other components that comprise the exterior enclosure.

B. Preinstallation Meeting: Conduct a preinstallation meeting one week before starting work of this section; require attendance by all affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, glass and infill, door hardware, and internal drainage details.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related work, expansion and contraction joint location and details, and field welding required.

1. Include design engineer's stamp or seal on shop drawings for attachments and anchors.

D. Hardware Schedule: Complete itemization of each item of hardware to be provided for each door, cross-referenced to door identification numbers in Contract Documents.

1.06 QUALITY ASSURANCE

A. Designer Qualifications: Design structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed in the State in which the Project is located.

B. Manufacturer Qualifications: Company specializing in performing work of type specified and with at least three years of documented experience.
   1. Provide certified glass products through ANSI accredited certifications that include plant audits and independent laboratory performance testing.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.08 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.09 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 BASIS OF DESIGN -- FRAMING FOR MONOLITHIC GLAZING

A. Center-Set Style, Wind-Borne-Debris Resistance Tested:

B. Front-Set Style:
   1. Basis of Design: YKK, YES 50D.

C. Other Manufacturers: Not permitted; provide the product identified as "Basis of Design".

2.02 BASIS OF DESIGN -- SWINGING DOORS

A. Entrance Doors, Various Stile Widths:
   1. Basis of Design: YKK 50H wide stile.
   2. Blast Mitigation Tested:
      a. See Design Criteria on Structural drawings.

B. Wind-Borne-Debris Resistance Tested:
   1. Basis of Design: Large & Small Missile Impact – To 90 PSF.

C. Interior Wide Stile, Monolithic Glazing:
   1. Basis of Design: YKK 50 D wide stile.

2.03 ALUMINUM-FRAMED STOREFRONT

A. Provide door framing as required for installation in for installation in glazed aluminum curtain walls. See section 08 4413 - Glazed Aluminum Curtain Walls.

B. See Design Criteria on Structural drawings for blast and wind resistance requirements.

C. Performance Requiements: Door and door frames to be coordinated with performance requirements of glazed aluminum curtain wall system.
   1. See Design Criteria on Structural drawings for blast and wind resistance requirements.
   2. See section 08 4413 - Glazed Aluminum Curtain Walls.
   3. Air Leakage: 0.06 cfm/sq ft (0.3 L/sec sq m) maximum leakage of storefront wall area when tested in accordance with ASTM E283/E283M at 1.57 psf (75 Pa) pressure difference.

D. Aluminum-Framed Storefront: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.

1. Finish: Class I color anodized.
   a. Factory finish all surfaces that will be exposed in completed assemblies.
2. Fabrication: Joints and corners flush, hairline, and weatherproof, accurately fitted and secured; prepared to receive anchors and hardware; fasteners and attachments concealed from view; reinforced as required for imposed loads.
3. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
4. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
5. Expansion/Contraction: Provide for expansion and contraction within system components caused by cycling temperature range of 170 degrees F (95 degrees C) over a 12 hour period without causing detrimental effect to system components, anchorages, and other building elements.
6. Movement: Allow for movement between storefront and adjacent construction, without damage to components or deterioration of seals.
7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

E. Performance Requirements
   1. Wind Loads: Design and size components to withstand the specified load requirements without damage or permanent set, when tested in accordance with ASTM E330/E330M, using loads 1.5 times the design wind loads and 10 second duration of maximum load.

2.04 COMPONENTS

A. Aluminum Door Frames Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.
   1. See Design Criteria on Structural drawings for blast and wind resistance requirements.
   2. Framing members for interior applications need not be thermally broken.
   3. Framing members for interior applications need not meet blast or wind Design Criteria.
   4. Glazing Stops: Flush.
   5. Cross-Section: As indicated on drawings.
   6. Structurally Reinforced Members: Extruded aluminum with internal reinforcement of structural steel member.

B. Glazing: See Section 08 8000.

C. Swing Doors: As idnidcated by Basis-Of-Design..

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209/B209M.

C. Structural Steel Sections: ASTM A36/A36M; galvanized in accordance with requirements of ASTM A123/A123M.

D. Fasteners: Stainless steel.

E. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

F. Touch-Up Primer for Galvanized Steel Surfaces: SSPC-Paint 20, zinc rich.

2.06 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.
   1. Coordinate finish with adjacent curtain wall assembly.

2.07 HARDWARE

A. Other Door Hardware: See Section 08 7100.

B. Other Door Hardware: Storefront manufacturer's standard type to suit application.

1. Finish on Hand-Contacted Items: Polished chrome.
2. For each door, include butt hinges and pivots.

C. Weatherstripping: Wool pile, continuous and replaceable; provide on all doors.

D. Sill Sweep Strips: Resilient seal type, retracting, of neoprene; provide on all doors.

E. Threshold: Extruded aluminum, one piece per door opening, ribbed surface; provide on all doors.

F. Automatic Door Operators and Actuators: See Section 08 4229.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other work.

B. Verify that storefront wall openings and adjoining water-resistive and/or air barrier seal materials are ready to receive work of this section.

3.02 INSTALLATION

A. Install wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Where fasteners penetrate sill flashings, make watertight by seating and sealing fastener heads to sill flashing.

H. Pack fibrous insulation in shim spaces at perimeter of assembly to maintain continuity of thermal barrier.

I. Set thresholds in bed of sealant and secure.

J. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm per m) non-cumulative or 0.06 inch per 10 feet (1.5 mm per 3 m), whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

3.04 FIELD QUALITY CONTROL

3.05 ADJUSTING

A. Adjust operating hardware and sash for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 08 4413
GLAZED ALUMINUM CURTAIN WALLS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 05 5000 - Metal Fabrications: Aluminum corner covers.

B. Section 08 8000 - Glazing.

1.02 REFERENCE STANDARDS

A. AAMA CW-10 - Care and Handling of Architectural Aluminum from Shop to Site; 2015.

B. AAMA 501.2 - Quality Assurance and Diagnostic Water Leakage Field Check of Installed Storefronts, Curtain Walls, and Sloped Glazing Systems; 2015.

C. AAMA 501.4 - Recommended Static Test Method for Evaluating Window Wall, Curtain Wall and Storefront Systems Subjected to Seismic and Wind-Induced Inter-Story Drift; 2018.

D. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.

E. AAMA 1503 - Voluntary Test Method for Thermal Transmittance and Condensation Resistance of Windows, Doors and Glazed Wall Sections; 2009.

F. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

G. ASTM B209/B209M - Standard Specification for Aluminum and Aluminum-Alloy Sheet and Plate; 2021a.

H. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

I. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

J. ASTM C794 - Standard Test Method for Adhesion-in-Peel of Elastomeric Joint Sealants; 2018 (Reapproved 2022).

K. ASTM E283/E283M - Standard Test Method for Determining Rate of Air Leakage Through Exterior Windows, Skylights, Curtain Walls, and Doors Under Specified Pressure Differences Across the Specimen; 2019.

L. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

M. ASTM E331 - Standard Test Method for Water Penetration of Exterior Windows, Skylights, Doors, and Curtain Walls by Uniform Static Air Pressure Difference; 2000 (Reapproved 2023).

N. ASTM E1996 - Standard Specification for Performance of Exterior Windows, Curtain Walls, Doors, and Impact Protective Systems Impacted by Windborne Debris in Hurricanes; 2020.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide component dimensions, describe components within assembly, anchorage and fasteners, internal drainage details, glazing, _____, and infill.

C. Shop Drawings: Indicate system dimensions, framed opening requirements and tolerances, affected related Work, expansion and contraction joint location and details, and field welding required.

D. Design Data: Provide framing member structural and physical characteristics and engineering calculations, and identify dimensional limitations; include load calculations at points of attachment to building structure.

E. Structural Sealant Glazing (SSG): Submit product data and calculations showing compliance with performance requirements.

F. Test Reports: Submit results of full-size mock-up testing. Reports of tests previously performed on the same design are acceptable.

G. Field Quality Control Submittals: Report of field testing for water penetration and air leakage.

H. Designer's Qualification Statement.

I. Manufacturer's Qualification Statement.

J. Installer's Qualification Statement.

K. Warranty: Submit manufacturer warranty and ensure forms have been completed in Owner's name and registered with manufacturer.

1.04 QUALITY ASSURANCE

A. Designer Qualifications: Design curtain wall and its structural support framing components under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the State in which the Project is located.

B. Verify that each component is appropriate for use in structural sealant glazing (SSG) application in regards to at least the following properties: size, shape, dimensions, material, durability, storage conditions, and color.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Handle products of this section in accordance with AAMA CW-10.

B. Protect finished aluminum surfaces with wrapping. Do not use adhesive papers or sprayed coatings that bond to aluminum when exposed to sunlight or weather.

1.06 FIELD CONDITIONS

A. Do not install sealants when ambient temperature is less than 40 degrees F (5 degrees C). Maintain this minimum temperature during and 48 hours after installation.

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty against failure of glass seal on insulating glass units, including interpane dusting or misting. Include provision for replacement of failed units. Complete forms in Owner's name and register with installer.

C. Finish Warranty: Provide 5-year manufacturer warranty against excessive degradation of exterior finish. Include provision for replacement of units with excessive fading, chalking, or flaking. Complete forms in Owner's name and register with warrantor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Glazed Aluminum Curtain Walls Manufacturers:
   1. Basis-Of-Design: YKK AP America, Inc; YHC 300 OG: www.ykkap.com/commercial/#sle.
      a. Mullion depth varies by location, as indicated on drawings.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 BASIS OF DESIGN - CURTAIN WALL SYSTEMS

A. Basis-Of-Design: YKK AP America, Inc; YHC 300 OG:
   1. Mullion depth varies by location, as indicated on drawings.

B. Strucutral requirements for wind, blast and seismic as indicated on Structural drawings.

2.03 CURTAIN WALL

A. Aluminum-Framed Curtain Wall: Factory fabricated, factory finished aluminum framing members with infill, and related flashings, anchorage and attachment devices.
   1. Outside glazed, with pressure plate and mullion cover, where indicated on drawings.
   2. Mullion Dimenions: Dimenions vary. See locations, as indicated on drawings:
      a. Vertical Mullion Dimensions: 3 inches wide by 10-1/2 inches deep.
      b. Vertical Mullion Dimensions: 3 inches wide by 7-3/4 inches deep.

3. Provide flush joints and corners, weathersealed, accurately fitted and secured; prepared to receive anchors; fasteners and attachments concealed from view; reinforced as required for imposed loads.
4. Construction: Eliminate noises caused by wind and thermal movement, prevent vibration harmonics, and prevent "stack effect" in internal spaces.
5. System Internal Drainage: Drain to the exterior by means of a weep drainage network any water entering joints, condensation occurring in glazing channel, and migrating moisture occurring within system.
6. Maintain continuous air barrier and/or vapor retarder seal throughout assembly, primarily in line with inside pane of glazing and inner sheet of infill panel and heel bead of glazing compound.
7. Perimeter Clearance: Minimize space between framing members and adjacent construction while allowing expected movement.

B. Structural Performance Requirements: Design and size components to withstand the following load requirements without damage or permanent set.
1. See Design Criteria on structural drawings.
2. Blast Loads:
   a. Comply with the requirements of US Department Of Defense, Unified Facilites Criteria (UFC).
   b. Measure performance by testing in accordancde with ASTM F2248-19.
3. Design Wind Loads: Comply with the requirements of ASCE 7.
   a. Measure performance by testing in accordance with ASTM E330/E330M, using test loads equal to 1.5 times the design wind loads and 10 second duration of maximum pressure.
   b. Member Deflection: For spans less than 13 feet 6 inches (4115 mm), limit member deflection to flexure limit of glass in any direction, and maximum of 1/175 of span or 3/4 inch (19 mm), whichever is less and with full recovery of glazing materials.
   c. Member Deflection: For spans over 13 feet 6 inches (4115 mm) and less than 40 feet (12.2 m), limit member deflection to flexure limit of glass in any direction, and maximum of 1/240 of span plus 1/4 inch (1/240 of span plus 6.4 mm), with full recovery of glazing materials.
4. Seismic Loads: Design and size components to withstand seismic loads and sway displacement in accordance with requirements of ASCE 7.
5. Interstory Differential Lateral Movement: Meeting pass/fail criteria of AAMA 501.4 for Use Group I, Standard Occupancy, when tested at design displacement of 0.010 times greater adjacent story height, maximum, and 1.5 times design displacement, through three complete cycles.
6. Wind-Borne-Debris Resistance: Identical full-size glazed assembly without auxiliary protection tested by independent agency in accordance with ASTM E1996 for Wind Zone 3 - Enhanced Protection for Large and Small Missile impact and pressure cycling at design wind pressure.
7. Movement: Accommodate the following movement without damage to components or deterioration of seals:
   a. Expansion and contraction caused by 180 degrees F (82 degrees C) surface temperature.
   b. Expansion and contraction caused by cycling temperature range of 170 degrees F (77 degrees C) over a 12 hour period.
   c. Movement of curtain wall relative to perimeter framing.
   d. Deflection of structural support framing, under permanent and dynamic loads.

C. Water Penetration Resistance on Manufactured Assembly: No uncontrolled water on indoor face when tested as follows:
1. Test Pressure Differential: 20 psf (960 Pa).
2. Test Method: ASTM E331.

D. Air Leakage: 0.06 cfm/sq ft (0.3 L/sec sq m) maximum leakage of wall area when tested in accordance with ASTM E283/E283M at 6.24 psf (300 Pa) pressure difference across assembly.

E. Thermal Performance Requirements:
   1. Condensation Resistance Factor of Framing: 50, minimum, measured in accordance with AAMA 1503.
   2. Thermal Resistance of Framing:.45 (deg F hr sq ft)/Btu (_____ (K sq m)/W), minimum.

2.04 COMPONENTS

A. Aluminum Framing Members: Tubular aluminum sections, thermally broken with interior section insulated from exterior, drainage holes and internal weep drainage system.

B. Glazing: See Section 08 8000.
   1. For Exterior Framing: Type Insulated Glass Unit as indicated on drawings..
   2. For Interior Framing: Type Monolithic Glass as inidcated on drawings..
   3. Glass Spandrel Panels: Type Insulated Glass Unit as indicated on drawings..

2.05 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M).

B. Sheet Aluminum: ASTM B209/B209M.

C. Fasteners: Stainless steel; type as required or recommended by curtain wall manufacturer.

D. Exposed Flashings: Aluminum sheet, 20-gauge, 0.032-inch (0.81 mm) minimum thickness; finish to match framing members.

E. Concealed Flashings: Sheet aluminum, 26-gauge, 0.017-inch (0.43 mm) minimum thickness.

F. Weatherseal Sealant: Silicone, with adhesion in compliance with ASTM C794; compatible with glazing accessories.

G. Sill Flashing Sealant: Elastomeric, silicone or polyurethane, and compatible with flashing material.

H. Glazing Gaskets: Type to suit application to achieve weather, moisture, and air infiltration requirements.

I. Glazing Accessories: See Section 08 8000.

2.06 FINISHES

A. Class I Natural Anodized Finish: AAMA 611 AA-M12C22A41 Clear anodic coating not less than 0.7 mils (0.018 mm) thick.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify dimensions, tolerances, and method of attachment with other related work.

B. Verify that anchorage devices have been properly installed and located.

3.02 INSTALLATION

A. Install curtain wall system in accordance with manufacturer's instructions.

B. Attach to structure to permit sufficient adjustment to accommodate construction tolerances and other irregularities.

C. Provide alignment attachments and shims to permanently fasten system to building structure.

D. Align assembly plumb and level, free of warp or twist. Maintain assembly dimensional tolerances, aligning with adjacent work.

E. Provide thermal isolation where components penetrate or disrupt building insulation.

F. Install sill flashings. Turn up ends and edges; seal to adjacent work to form water tight dam.

G. Touch-up minor damage to factory applied finish; replace components that cannot be satisfactorily repaired.

3.03 TOLERANCES

A. Maximum Variation from Plumb: 0.06 inch per 3 feet (1.5 mm/m) noncumulative or 0.5 inches per 100 feet (12 mm/30 m), whichever is less.

B. Maximum Misalignment of Two Adjoining Members Abutting in Plane: 1/32 inch (0.8 mm).

C. Sealant Space Between Curtain Wall Mullions and Adjacent Construction: Maximum of 3/4 inch (19 mm) and minimum of 1/4 inch (6 mm).

3.04 FIELD QUALITY CONTROL

A. Provide services of curtain wall manufacturer's field representative to observe for proper installation of system and submit report.

B. See Section 01 4000 - Quality Requirements for general testing and inspection requirements.

C. Water-Spray Test: Provide water spray quality test of installed curtain wall components in accordance with AAMA 501.2 during construction process and before installation of interior finishes.
   1. Perform a minimum of two tests in each designated area as indicated on drawings.
   2. Conduct tests in each area prior to 10 percent and 50 percent completion of this work.

D. Repair or replace curtain wall components that have failed designated field testing, and retest to verify performance complies with specified requirements.

3.05 ADJUSTING

A. Adjust operating sash for smooth operation.

3.06 CLEANING

A. Remove protective material from pre-finished aluminum surfaces.

3.07 PROTECTION

A. Protect installed products from damage until Date of Substantial Completion.

END OF SECTION

SECTION 087100
DOOR HARDWARE

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 commercial door hardware for the following:

1. Swinging doors.
2. Sliding doors.
3. Other doors to the extent indicated.

B. Door hardware includes, but is not necessarily limited to, the following:

1. Mechanical door hardware.
2. Electromechanical door hardware.
3. Automatic operators.
4. Cylinders specified for doors in other sections.

C. Related Sections:

1. Division 08 Section “Door Schedule”.
2. Division 08 Section “Hollow Metal Doors and Frames”.
3. Division 08 Section “Flush Wood Doors”.
4. Division 08 Section “Aluminum-Framed Entrances and Storefronts”.
5. Division 08 Section “Automatic Door Operators”.

D. Codes and References: Comply with the version year adopted by the Authority Having Jurisdiction.

1. ANSI A117.1 - Accessible and Usable Buildings and Facilities.
2. ICC/IBC - International Building Code.
3. NFPA 70 - National Electrical Code.
4. NFPA 80 - Fire Doors and Windows.
5. NFPA 101 - Life Safety Code.
6. NFPA 105 - Installation of Smoke Door Assemblies.
7. UL/ULC and CSA C22.2 - Standards for Automatic Door Operators Used on Fire and Smoke Barrier Doors and Systems of Doors.
8. State Building Codes, Local Amendments.

E. Standards: All hardware specified herein shall comply with the following industry standards as applicable. Any undated reference to a standard shall be interpreted as referring to the latest edition of that standard:

1. ANSI/BHMA Certified Product Standards - A156 Series.

2. UL10C - Positive Pressure Fire Tests of Door Assemblies.
3. ANSI/UL 294 - Access Control System Units.
4. UL 305 - Panic Hardware.
5. ANSI/UL 437- Key Locks.

1.3 SUBMITTALS

A. Product Data: Manufacturer's product data sheets including installation details, material descriptions, dimensions of individual components and profiles, operational descriptions and finishes.

B. Door Hardware Schedule: Prepared by or under the supervision of supplier, detailing, fabrication and assembly of door hardware, as well as procedures and diagrams. Coordinate the final Door Hardware Schedule with doors, frames, and related work to ensure proper size, thickness, hand, function, and finish of door hardware.

1. Format: Comply with scheduling sequence and vertical format in DHI's "Sequence and Format for the Hardware Schedule."

2. Organization: Organize the Door Hardware Schedule into door hardware sets indicating complete designations of every item required for each door or opening. Organize door hardware sets in same order as in the Door Hardware Sets at the end of Part 3. Submittals that do not follow the same format and order as the Door Hardware Sets will be rejected and subject to resubmission.

3. Content: Include the following information:

    a. Type, style, function, size, label, hand, and finish of each door hardware item.
    b. Manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Location of door hardware set, cross-referenced to Drawings, both on floor plans and in door and frame schedule.
    e. Explanation of abbreviations, symbols, and codes contained in schedule.
    f. Mounting locations for door hardware.
    g. Door and frame sizes and materials.
    h. Warranty information for each product.

4. Submittal Sequence: Submit the final Door Hardware Schedule at earliest possible date, particularly where approval of the Door Hardware Schedule must precede fabrication of other work that is critical in the Project construction schedule. Include Product Data, Samples, Shop Drawings of other work affected by door hardware, and other information essential to the coordinated review of the Door Hardware Schedule.

C. Shop Drawings: Details of electrified access control hardware indicating the following:

1. Wiring Diagrams: Upon receipt of approved schedules, submit detailed system wiring diagrams for power, signaling, monitoring, communication, and control of the access control system electrified hardware. Differentiate between manufacturer-installed and field-installed wiring. Include the following:

a. Elevation diagram of each unique access controlled opening showing location and interconnection of major system components with respect to their placement in the respective door openings.
b. Complete (risers, point-to-point) access control system block wiring diagrams.
c. Wiring instructions for each electronic component scheduled herein.

2. Electrical Coordination: Coordinate with related sections the voltages and wiring details required at electrically controlled and operated hardware openings.

D. Keying Schedule: After a keying meeting with the owner has taken place prepare a separate keying schedule detailing final instructions. Submit the keying schedule in electronic format. Include keying system explanation, door numbers, key set symbols, hardware set numbers and special instructions. Owner must approve submitted keying schedule prior to the ordering of permanent cylinders/cores.

E. Informational Submittals:

1. Product Test Reports: Indicating compliance with cycle testing requirements, based on evaluation of comprehensive tests performed by manufacturer and witnessed by a qualified independent testing agency.

F. Operating and Maintenance Manuals: Provide manufacturers operating and maintenance manuals for each item comprising the complete door hardware installation in quantity as required in Division 01, Closeout Procedures.

1.4 QUALITY ASSURANCE

A. Manufacturers Qualifications: Engage qualified manufacturers with a minimum 5 years of documented experience in producing hardware and equipment similar to that indicated for this Project and that have a proven record of successful in-service performance.

B. Certified Products: Where specified, products must maintain a current listing in the Builders Hardware Manufacturers Association (BHMA) Certified Products Directory (CPD).

C. Installer Qualifications: A minimum 3 years documented experience installing both standard and electrified door hardware similar in material, design, and extent to that indicated for this Project and whose work has resulted in construction with a record of successful in-service performance.

D. Door Hardware Supplier Qualifications: Experienced commercial door hardware distributors with a minimum 5 years documented experience supplying both mechanical and electromechanical hardware installations comparable in material, design, and extent to that indicated for this Project. Supplier recognized as a factory direct distributor by the manufacturers of the primary materials with a warehousing facility in Project's vicinity. Supplier to have on staff a certified Architectural Hardware Consultant (AHC) available during the course of the Work to consult with Contractor, Architect, and Owner concerning both standard and electromechanical door hardware and keying.

E. Source Limitations: Obtain each type and variety of door hardware specified in this section from a single source unless otherwise indicated.

1. Electrified modifications or enhancements made to a source manufacturer's product line by a secondary or third party source will not be accepted.

2. Provide electromechanical door hardware from the same manufacturer as mechanical door hardware, unless otherwise indicated.

F. Each unit to bear third party permanent label indicating compliance with the referenced testing standards.

G. Keying Conference: Conduct conference to comply with requirements in Division 01 Section "Project Meetings." Keying conference to incorporate the following criteria into the final keying schedule document:

1. Function of building, purpose of each area and degree of security required.
2. Plans for existing and future key system expansion.
3. Requirements for key control storage and software.
4. Installation of permanent keys, cylinder cores and software.
5. Address and requirements for delivery of keys.

H. Pre-Submittal Conference: Conduct coordination conference in compliance with requirements in Division 01 Section "Project Meetings" with attendance by representatives of Supplier(s), Installer(s), and Contractor(s) to review proper methods and the procedures for receiving, handling, and installing door hardware.

1. Prior to installation of door hardware, conduct a project specific training meeting to instruct the installing contractors' personnel on the proper installation and adjustment of their respective products. Product training to be attended by installers of door hardware (including electromechanical hardware) for aluminum, hollow metal and wood doors. Training will include the use of installation manuals, hardware schedules, templates and physical product samples as required.
2. Inspect and discuss electrical roughing-in, power supply connections, and other preparatory work performed by other trades.
3. Review sequence of operation narratives for each unique access controlled opening.
4. Review and finalize construction schedule and verify availability of materials.
5. Review the required inspecting, testing, commissioning, and demonstration procedures

I. At completion of installation, provide written documentation that components were applied according to manufacturer's instructions and recommendations and according to approved schedule.

1.5 DELIVERY, STORAGE, AND HANDLING

A. Inventory door hardware on receipt and provide secure lock-up and shelving for door hardware delivered to Project site. Do not store electronic access control hardware, software or accessories at Project site without prior authorization.

B. Tag each item or package separately with identification related to the final Door Hardware Schedule, and include basic installation instructions with each item or package.

C. Deliver, as applicable, permanent keys, cylinders, cores, access control credentials, software and related accessories directly to Owner via registered mail or overnight package service. Instructions for delivery to the Owner shall be established at the "Keying Conference".

1.6 COORDINATION

A. Templates: Obtain and distribute to the parties involved templates for doors, frames, and other work specified to be factory prepared for installing standard and electrified hardware. Check Shop Drawings of other work to confirm that adequate provisions are made for locating and installing hardware to comply with indicated requirements.

B. Door and Frame Preparation: Doors and corresponding frames are to be prepared, reinforced and pre-wired (if applicable) to receive the installation of the specified electrified, monitoring, signaling and access control system hardware without additional in-field modifications.

1.7 WARRANTY

A. General Warranty: Reference Division 01, General Requirements. Special warranties specified in this Article shall not deprive Owner of other rights Owner may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

B. Warranty Period: Written warranty, executed by manufacturer(s), agreeing to repair or replace components of standard and electrified door hardware that fails in materials or workmanship within specified warranty period after final acceptance by the Owner. Failures include, but are not limited to, the following:

1. Structural failures including excessive deflection, cracking, or breakage.
2. Faulty operation of the hardware.
3. Deterioration of metals, metal finishes, and other materials beyond normal weathering.
4. Electrical component defects and failures within the systems operation.

C. Warranty Period: Unless otherwise indicated, warranty shall be one year from date of Substantial Completion.

PART 2 - PRODUCTS

2.1 SCHEDULED DOOR HARDWARE

A. General: Provide door hardware for each door to comply with requirements in Door Hardware Sets and each referenced section that products are to be supplied under.

B. Designations: Requirements for quantity, item, size, finish or color, grade, function, and other distinctive qualities of each type of door hardware are indicated in the Door Hardware Sets at the end of Part 3. Products are identified by using door hardware designations, as follows:

1. Named Manufacturer's Products: Product designation and manufacturer are listed for each door hardware type required for the purpose of establishing requirements. Manufacturers' names are abbreviated in the Door Hardware Schedule.

C. Please note that ASSA ABLOY is transitioning the Yale Commercial brand to Arrow. This affects only the brand name; the products and product numbers will remain unchanged. The brand transition is expected to be complete in or about May of 2024, and products shipping after that time will be branded Arrow.

D. Substitutions: Requests for substitution and product approval for inclusive mechanical and electromechanical door hardware in compliance with the specifications must be submitted in writing and in accordance with the procedures and time frames outlined in Division 01, Substitution Procedures. Approval of requests is at the discretion of the architect, owner, and their designated consultants.

2.2 HANGING DEVICES

A. Hinges: ANSI/BHMA A156.1 butt hinges with number of hinge knuckles and other options as specified in the Door Hardware Sets.

1. Quantity: Provide the following hinge quantity:

    a. Two Hinges: For doors with heights up to 60 inches.
    b. Three Hinges: For doors with heights 61 to 90 inches.
    c. Four Hinges: For doors with heights 91 to 120 inches.
    d. For doors with heights more than 120 inches, provide 4 hinges, plus 1 hinge for every 30 inches of door height greater than 120 inches.

2. Hinge Size: Provide the following, unless otherwise indicated, with hinge widths sized for door thickness and clearances required:

    a. Widths up to 3’0”: 4-1/2” standard or heavy weight as specified.
    b. Sizes from 3’1” to 4’0”: 5” standard or heavy weight as specified.

3. Hinge Weight and Base Material: Unless otherwise indicated, provide the following:

    a. Exterior Doors: Heavy weight, non-ferrous, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate standard weight.
    b. Interior Doors: Standard weight, steel, ball bearing or oil impregnated bearing hinges unless Hardware Sets indicate heavy weight.

4. Hinge Options: Comply with the following:

    a. Non-removable Pins: With the exception of electric through wire hinges, provide set screw in hinge barrel that, when tightened into a groove in hinge pin, prevents removal of pin while door is closed; for the all out-swinging lockable doors.

5. Manufacturers:

    a. Hager Companies (HA) - BB Series, 5 knuckle.
    b. McKinney (MK) - TA/T4A Series, 5 knuckle.
    c. dormakaba Best (ST) - F/FBB Series, 5 knuckle.

B. Continuous Geared Hinges: ANSI/BHMA A156.26 Grade 1-600 continuous geared hinge. with minimum 0.120-inch thick extruded 6063-T6 aluminum alloy hinge leaves and a minimum overall width of 4 inches. Hinges are non-handed, reversible and fabricated to template screw locations. Factory trim hinges to suit door height and prepare for electrical cut-outs.

1. Manufacturers:.

    a. Hager Companies (HA).

b. Pemko (PE).
c. Dormakaba Best (ST).

2.3 POWER TRANSFER DEVICES

A. Electrified Quick Connect Transfer Hinges: Provide electrified transfer hinges with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets with a 1-year warranty. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

a. McKinney (MK) - QC (# wires) Option.

B. Concealed Quick Connect Electric Power Transfers: Provide concealed wiring pathway housing mortised into the door and frame for low voltage electrified door hardware. Furnish with Molex™ standardized plug connectors and sufficient number of concealed wires (up to 12) to accommodate the electrified functions specified in the Door Hardware Sets. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Wire nut connections are not acceptable.

1. Manufacturers:

a. Securitron (SU) - EL-CEPT Series.

C. Electric Door Wire Harnesses: Provide electric/data transfer wiring harnesses with standardized plug connectors to accommodate up to twelve (12) wires. Connectors plug directly to through-door wiring harnesses for connection to electric locking devices and power supplies. Provide sufficient number and type of concealed wires to accommodate electric function of specified hardware. Provide a connector for through-door electronic locking devices and from hinge to junction box above the opening. Wire nut connections are not acceptable. Determine the length required for each electrified hardware component for the door type, size and construction, minimum of two per electrified opening.

1. Provide one each of the following tools as part of the base bid contract:

a. McKinney (MK) - Electrical Connecting Kit: QC-R001.
b. McKinney (MK) - Connector Hand Tool: QC-R003.

2. Manufacturers:

a. McKinney (MK) - QC-C Series.

2.4 DOOR OPERATING TRIM

A. Flush Bolts and Surface Bolts: Provide products conforming to ANSI/BHMA A156.3 and A156.16, Grade 1.

1. Flush bolts to be furnished with top rod of sufficient length to allow bolt retraction device location approximately six feet from the floor.
2. Furnish dust proof strikes for bottom bolts.

3. Surface bolts to be minimum 8” in length and U.L. listed for labeled fire doors and U.L. listed for windstorm components where applicable.
4. Provide related accessories (mounting brackets, strikes, coordinators, etc.) as required for appropriate installation and operation.

5. Manufacturers:

    a. Burns Manufacturing (BU).
    b. Rockwood (RO).
    c. Trimco (TC).

B. Coordinators: ANSI/BHMA A156.3 door coordinators consisting of active-leaf, hold-open lever and inactive-leaf release trigger. Model as indicated in hardware sets.

1. Manufacturers:

    a. Door Controls International (DC).
    b. Rockwood (RO).
    c. Trimco (TC).

C. Door Push Plates and Pulls: ANSI/BHMA A156.6 door pushes and pull units of type and design specified in the Hardware Sets. Coordinate and provide proper width and height as required where conflicting hardware dictates.

1. Push/Pull Plates: Minimum .050 inch thick, size as indicated in hardware sets, with beveled edges, secured with exposed screws unless otherwise indicated.
2. Door Pull and Push Bar Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door unless otherwise indicated.
3. Offset Pull Design: Size, shape, and material as indicated in the hardware sets. Minimum clearance of 2 1/2-inches from face of door and offset of 90 degrees unless otherwise indicated.
4. Pulls, where applicable, shall be provided with a 10” clearance from the finished floor on the push side to accommodate wheelchair accessibility.
5. Fasteners: Provide manufacturer's designated fastener type as indicated in Hardware Sets.

6. Manufacturers:

    a. Burns Manufacturing (BU).
    b. Rockwood (RO).
    c. Trimco (TC).

2.5 CYLINDERS AND KEYING

A. General: Cylinder manufacturer to have minimum (10) years experience designing secured master key systems and have on record a published security keying system policy.

1. Manufacturers:

    a. Corbin Russwin Hardware (RU).

B. Cylinder Types: Original manufacturer cylinders able to supply the following cylinder formats and types:

1. Threaded mortise cylinders with rings and cams to suit hardware application.
2. Rim cylinders with back plate, flat-type vertical or horizontal tailpiece, and raised trim ring.
3. Bored or cylindrical lock cylinders with tailpieces as required to suit locks.
4. Tubular deadlocks and other auxiliary locks.
5. Mortise and rim cylinder collars to be solid and recessed to allow the cylinder face to be flush and be free spinning with matching finishes.
6. Keyway: Match Facility Standard.

C. Large Format Interchangeable Cores: Provide removable cores (LFIC) as specified, core insert, removable by use of a special key, and for use with only the core manufacturer's cylinder and door hardware.

D. Keying System: Each type of lock and cylinders to be factory keyed.

1. Supplier shall conduct a "Keying Conference" to define and document keying system instructions and requirements.
2. Furnish factory cut, nickel-silver large bow permanently inscribed with a visual key control number as directed by Owner.
3. Existing System: Field verify and key cylinders to match Owner's existing system.

E. Key Quantity: Provide the following minimum number of keys:

1. Change Keys per Cylinder: Two (2)
2. Master Keys (per Master Key Level/Group): Five (5).
3. Construction Keys (where required): Ten (10).

F. Construction Keying: Provide construction master keyed cylinders.

G. Key Registration List (Bitting List):

1. Provide keying transcript list to Owner's representative in the proper format for importing into key control software.
2. Provide transcript list in writing or electronic file as directed by the Owner.

2.6 MECHANICAL LOCKS AND LATCHING DEVICES

A. Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed. Locksets are to be manufactured with a corrosion resistant steel case and be field-reversible for handing without disassembly of the lock body.

1. Heavy duty mortise locks shall have a ten-year warranty.

2. Where specified, provide status indicators with highly reflective color and wording for “locked/unlocked” or “vacant/occupied” with custom wording options if required. Indicator to be located above the cylinder with the inside thumb-turn not blocking the visibility of the indicator status. Indicator window size to be a minimum of 2.1” x 0.6” with a curved design allowing a 180-degree viewing angle with protective covering to prevent tampering.

3. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ML2000 Series.
    b. Schlage (SC) – L900 Series

c. Sargent Manufacturing (SA) – 8200 Series

2.7 ELECTROMECHANICAL LOCKING DEVICES

A. Electromechanical Mortise Locksets, Grade 1 (Heavy Duty): ANSI/BHMA A156.13, Series 1000, Operational Grade 1 Certified Products Directory (CPD) listed, subject to same compliance standards and requirements as mechanical mortise locksets, electrified locksets to be of type and design as specified below and in the hardware sets.

1. Electrified Lock Options: Where indicated in the Hardware Sets, provide electrified options including: outside door lock/unlock trim control, latchbolt and lock/unlock status monitoring, deadbolt monitoring, and request-to-exit signaling. Support end-of-line resistors contained within the lock case. Unless otherwise indicated, provide electrified locksets standard as fail secure.

2. Energy Efficient Design: Provide lock bodies which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.

3. Manufacturers:

   a. Corbin Russwin Hardware (RU) - ML20900 Series.
   b. Sargent Manufacturing (SA) - 8200 Series.
   c. Schlage (SC) - L9000 EL/EU/RX Series.

2.8 LOCK AND LATCH STRIKES

A. Strikes: Provide manufacturer's standard strike with strike box for each latch or lock bolt, with curved lip extended to protect frame, finished to match door hardware set, unless otherwise indicated, and as follows:

1. Flat-Lip Strikes: For locks with three-piece antifriction latchbolts, as recommended by manufacturer.
2. Extra-Long-Lip Strikes: For locks used on frames with applied wood casing trim.
3. Aluminum-Frame Strike Box: Provide manufacturer's special strike box fabricated for aluminum framing.
4. Double-lipped strikes: For locks at double acting doors. Furnish with retractable stop for rescue hardware applications.

B. Standards: Comply with the following:

1. Strikes for Mortise Locks and Latches: BHMA A156.13.
2. Strikes for Bored Locks and Latches: BHMA A156.2.
3. Strikes for Auxiliary Deadlocks: BHMA A156.36.
4. Dustproof Strikes: BHMA A156.16.

2.9 CONVENTIONAL EXIT DEVICES

A. General Requirements: All exit devices specified herein shall meet or exceed the following criteria:

1. Exit devices shall have a five-year warranty.

2. At doors not requiring a fire rating, provide devices complying with NFPA 101 and listed and labeled for "Panic Hardware" according to UL305. Provide proper fasteners as required by manufacturer including sex nuts and bolts at openings specified in the Hardware Sets.

3. Where exit devices are required on fire rated doors, provide devices complying with NFPA 80 and with UL labeling indicating "Fire Exit Hardware". Provide devices with the proper fasteners for installation as tested and listed by UL. Consult manufacturer's catalog and template book for specific requirements.

4. Except on fire rated doors, provide exit devices with hex key dogging device to hold the pushbar and latch in a retracted position. Provide optional keyed cylinder dogging on devices where specified in Hardware Sets.

5. Devices must fit flat against the door face with no gap that permits unauthorized dogging of the push bar. The addition of filler strips is required in any case where the door light extends behind the device as in a full glass configuration.

6. Lever Operating Trim: Where exit devices require lever trim, furnish manufacturer's heavy duty escutcheon trim with threaded studs for thru-bolts.

    a. Lock Trim Design: As indicated in Hardware Sets, provide finishes and designs to match that of the specified locksets.
    b. Where function of exit device requires a cylinder, provide a cylinder (Rim or Mortise) as specified in Hardware Sets.

7. Vertical Rod Exit Devices: Where surface or concealed vertical rod exit devices are used at interior openings, provide as less bottom rod (LBR) unless otherwise indicated. Provide dust proof strikes where thermal pins are required to project into the floor.

8. Narrow Stile Applications: At doors constructed with narrow stiles, or as specified in Hardware Sets, provide devices designed for maximum 2" wide stiles.

9. Dummy Push Bar: Nonfunctioning push bar matching functional push bar.

10. Rail Sizing: Provide exit device rails factory sized for proper door width application.

11. Through Bolt Installation: For exit devices and trim as indicated in Door Hardware Sets.

B. Conventional Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices furnished in the functions specified in the Hardware Sets. Exit device latch to be stainless steel, pullman type, with deadlock feature.

    1. Manufacturers:

        a. Corbin Russwin Hardware (RU) - ED4000 / ED5000 Series.
        b. Sargent Manufacturing (SA) – 80 Series
        c. Dormakaba Best (PR) – Apex 2000 Series

2.10 ELECTROMECHANICAL EXIT DEVICES

A. Electromechanical Push Rail Exit Devices (Heavy Duty): ANSI/BHMA A156.3, Grade 1 Certified Products Directory (CPD) listed panic and fire exit hardware devices subject to same compliance standards and requirements as mechanical exit devices. Electrified exit devices to be of type and design as specified below and in the hardware sets.

1. Energy Efficient Design: Provide devices which have a holding current draw of 15mA maximum, and can operate on either 12 or 24 volts. Locks are to be field configurable for fail safe or fail secure operation.

2. Where conventional power supplies are not sufficient, include any specific controllers required to provide the proper inrush current.

3. Manufacturers:

    a. Corbin Russwin Hardware (RU) - ED5000 Series.
    b. dormakaba Precision (PR) - Apex 2000 Series.
    c. Sargent Manufacturing (SA) - 80 Series.

2.11 DOOR CLOSERS

A. All door closers specified herein shall meet or exceed the following criteria:

1. General: Door closers to be from one manufacturer, matching in design and style, with the same type door preparations and templates regardless of application or spring size. Closers to be non-handed with full sized covers.

2. Standards: Closers to comply with UL-10C for Positive Pressure Fire Test and be U.L. listed for use of fire rated doors.

3. Size of Units: Comply with manufacturer's written recommendations for sizing of door closers depending on size of door, exposure to weather, and anticipated frequency of use. Where closers are indicated for doors required to be accessible to the Americans with Disabilities Act, provide units complying with ANSI ICC/A117.1.

4. Closer Arms: Provide heavy duty, forged steel closer arms unless otherwise indicated in Hardware Sets.

5. Closers shall not be installed on exterior or corridor side of doors; where possible install closers on door for optimum aesthetics.

6. Closer Accessories: Provide door closer accessories including custom templates, special mounting brackets, spacers and drop plates as required for proper installation. Provide through-bolt and security type fasteners as specified in the hardware sets.

B. Door Closers, Surface Mounted (Large Body Cast Iron): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted, heavy duty door closers with complete spring power adjustment, sizes 1 thru 6; and fully operational adjustable according to door size, frequency of use, and opening force. Closers to be rack and pinion type, one piece cast iron body construction, with adjustable backcheck and separate non-critical valves for closing sweep and latch speed control.

1. Large body cast iron surface mounted door closers shall have a 30-year warranty.

2. Manufacturers:

    a. Norton Rixson (NO) - 9500 Series.
    b. LCN Closers (LC) - 4040XP Series.
    c. Norton Rixson (NO) - 9500 Series.

C. Door Closers, Surface Mounted (Unitrol): ANSI/BHMA A156.4, Grade 1 Certified Products Directory (CPD) listed surface mounted closers with door stop mechanism to absorb dead stop shock on arm and top hinge. Hold-open arms to have a spring loaded mechanism in addition to shock absorber assembly. Arms to be provided with rigid steel main arm and secondary arm lengths proportional to the door width.

1. Manufacturers:

    a. Norton Rixson (NO)
    b. LCN Closers (LC)
    c. Norton Rixson (NO)

2.12 ELECTROHYDRAULIC DOOR OPERATORS

A. General: Provide low energy operators of size recommended by manufacturer for door size, weight, and movement; for condition of exposure; and for compliance with UL 325. Coordinate operator mechanisms with door operation, hinges, and activation devices.

1. Fire-Rated Doors: Provide door operators for fire-rated door assemblies that comply with NFPA 80 for fire-rated door components and are listed and labeled by a qualified testing agency.

B. Standard: Conforming to ANSI/BHMA A156.19.

C. Performance Requirements:

1. Opening Force if Power Fails: Not more than 15 lbf required to release a latch if provided, not more than 30 lbf required to manually set door in motion, and not more than 15 lbf required to fully open door.
2. Entrapment Protection: Not more than 15 lbf required to prevent stopped door from closing or opening.

D. Configuration: Surface mounted or in-ground as required. Door operators to control single swinging and pair of swinging doors.

E. Operation: Power opening and spring closing operation capable of meeting ANSI A117.1 accessibility guideline. Provide time delay for door to remain open before initiating closing cycle as required by ANSI/BHMA A156.19. When not in automatic mode, door operator to function as manual door closer with fully adjustable opening and closing forces, with or without electrical power.

F. Features: Operator units to have full feature adjustments for door opening and closing force and speed, backcheck, motor assist acceleration from 0 to 30 seconds, time delay, vestibule interface delay, obstruction recycle, and hold open time from 0 up to 30 seconds.

G. Provide outputs and relays on board the operator to allow for coordination of exit device latch retraction, electric strikes, magnetic locks, card readers, safety and motion sensors and specified auxiliary contacts.

H. Brackets and Reinforcements: Manufacturer's standard, fabricated from aluminum with nonferrous shims for aligning system components.

I. Manufacturers: Subject to compliance with requirements, provide products by one of the following:

1. Norton Rixson (NO) - 6000 Series.

2.13 ARCHITECTURAL TRIM

A. Door Protective Trim

1. General: Door protective trim units to be of type and design as specified below or in the Hardware Sets.

2. Size: Fabricate protection plates (kick, armor, or mop) not more than 2" less than door width (LDW) on stop side of single doors and 1” LDW on stop side of pairs of doors, and not more than 1" less than door width on pull side. Coordinate and provide proper width and height as required where conflicting hardware dictates. Height to be as specified in the Hardware Sets.

3. Where plates are applied to fire rated doors with the top of the plate more than 16” above the bottom of the door, provide plates complying with NFPA 80. Consult manufacturer’s catalog and template book for specific requirements for size and applications.

4. Protection Plates: ANSI/BHMA A156.6 protection plates (kick, armor, or mop), fabricated from the following:

    a. Stainless Steel: 300 grade, 050-inch thick.

5. Options and fasteners: Provide manufacturer's designated fastener type as specified in the Hardware Sets. Provide countersunk screw holes.

6. Manufacturers:

    a. Burns Manufacturing (BU).
    b. Rockwood (RO).
    c. Trimco (TC).

2.14 DOOR STOPS AND HOLDERS

A. General: Door stops and holders to be of type and design as specified below or in the Hardware Sets.

B. Door Stops and Bumpers: ANSI/BHMA A156.16, Grade 1 door stops and wall bumpers. Provide wall bumpers, either convex or concave types with anchorage as indicated, unless floor or other types of door stops are specified in Hardware Sets. Do not mount floor stops where they will

impede traffic. Where floor or wall bumpers are not appropriate, provide overhead type stops and holders.

1. Manufacturers:

    a. Burns Manufacturing (BU).
    b. Rockwood (RO).
    c. Trimco (TC).

C. Overhead Door Stops and Holders: ANSI/BHMA A156.8, Grade 1 Certified Products Directory (CPD) listed overhead stops and holders to be surface or concealed types as indicated in Hardware Sets. Track, slide, arm and jamb bracket to be constructed of extruded bronze and shock absorber spring of heavy tempered steel. Provide non-handed design with mounting brackets as required for proper operation and function.

1. Manufacturers:

    a. Norton Rixson (RF).
    b. Sargent Manufacturing (SA).

2.15 ARCHITECTURAL SEALS

A. General: Thresholds, weatherstripping, and gasket seals to be of type and design as specified below or in the Hardware Sets. Provide continuous weatherstrip gasketing on exterior doors and provide smoke, light, or sound gasketing on interior doors where indicated. At exterior applications provide non-corrosive fasteners and elsewhere where indicated.

B. Smoke Labeled Gasketing: Assemblies complying with NFPA 105 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for smoke control ratings indicated, based on testing according to UL 1784.

1. Provide smoke labeled perimeter gasketing at all smoke labeled openings.

C. Fire Labeled Gasketing: Assemblies complying with NFPA 80 that are listed and labeled by a testing and inspecting agency acceptable to authorities having jurisdiction, for fire ratings indicated, based on testing according to UL-10C.

1. Provide intumescent seals as indicated to meet UL10C Standard for Positive Pressure Fire Tests of Door Assemblies, and NPFA 252, Standard Methods of Fire Tests of Door Assemblies.

D. Sound-Rated Gasketing: Assemblies that are listed and labeled by a testing and inspecting agency, for sound ratings indicated.

E. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips are easily replaceable and readily available from stocks maintained by manufacturer.

F. Manufacturers:

1. National Guard Products (NG).
2. Pemko (PE).
3. Reese Enterprises, Inc. (RE).

2.16 ELECTRONIC ACCESSORIES

A. Key Switches: Key switches furnished standard with stainless steel single gang face plate with a 12/24VDC bi-color LED indicator. Integral backing bracket permits integration with any 1 1/4" or 1 1/2" mortise type cylinder. Key switches available as momentary or maintained action and in narrow face plate options.

1. Manufacturers:

a. Securitron (SU) - MK Series.

B. Touchless Switches: FCC certified microwave sensing switch used for REX or activation of various access control devices in place of a traditional wired switch. Unit to have an adjustable sensing zone from 4” to 24”. At exterior locations furnish foam gaskets and weather covers. Provide single gang or double gang unit as specified in the hardware sets.

1. Manufacturers:

a. Norton Rixson (NO) - 700 Series.

C. Door Position Switches: Door position magnetic reed contact switches specifically designed for use in commercial door applications. On recessed models the contact and magnetic housing snap-lock into a 1" diameter hole. Surface mounted models include wide gap distance design complete with armored flex cabling. Provide SPDT, N/O switches with optional Rare Earth Magnet installation on steel doors with flush top channels.

1. Manufacturers:

a. Securitron (SU) - DPS Series.

D. Linear Power Supplies: Provide Nationally Recognized Testing Laboratory Listed 12VDC or 24VDC (field selectable) filtered and regulated power supplies. Include battery backup option with integral battery charging capability in addition to operating the DC load in event of line voltage failure. Provide the least number of units, at the appropriate amperage level, sufficient to exceed the required total draw plus 50% for the specified electrified hardware and access control equipment.

1. Manufacturers:

a. Securitron (SU) - BPS Series.
b. Corbin Russwin (RU) 784.

E. Intelligent Switching Power Supplies: Provide power supplies with single, dual or multi-voltage configurations at 12 and/or 24VDC. Power Supply shall have battery backup function with an integrated battery charging circuit. The power supply shall have a standard, integrated Fire Alarm Interface (FAI). The power supply shall provide capability for secondary voltage, power distribution, direct lock control and network monitoring through add on modules. The power supply shall be expandable up to 16 individually protected outputs. Output modules shall provide individually protected, continuous outputs and/or individually protected, relay controlled outputs. Network modules shall provide remote monitoring functions such as status reporting, fault reporting and information logging.

1. Manufacturers:

a. Securitron (SU) - AQL Series.

2.17 FABRICATION

A. Fasteners: Provide door hardware manufactured to comply with published templates generally prepared for machine, wood, and sheet metal screws. Provide screws according to manufacturers recognized installation standards for application intended.

2.18 FINISHES

A. Standard: Designations used in the Hardware Sets and elsewhere indicate hardware finishes complying with ANSI/BHMA A156.18, including coordination with traditional U.S. finishes indicated by certain manufacturers for their products.

B. Provide quality of finish, including thickness of plating or coating (if any), composition, hardness, and other qualities complying with manufacturer's standards, but in no case less than specified by referenced standards for the applicable units of hardware

C. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Examine scheduled openings, with Installer present, for compliance with requirements for installation tolerances, labeled fire door assembly construction, wall and floor construction, and other conditions affecting performance.

B. Notify architect of any discrepancies or conflicts between the door schedule, door types, drawings and scheduled hardware. Proceed only after such discrepancies or conflicts have been resolved in writing.

3.2 PREPARATION

A. Hollow Metal Doors and Frames: Comply with ANSI/DHI A115 series.

B. Wood Doors: Comply with ANSI/DHI A115-W series.

3.3 INSTALLATION

A. Install each item of mechanical and electromechanical hardware and access control equipment to comply with manufacturer's written instructions and according to specifications.

1. Installers are to be trained and certified by the manufacturer on the proper installation and adjustment of fire, life safety, and security products including: hanging devices; locking devices; closing devices; and seals.

B. Mounting Heights: Mount door hardware units at heights indicated in following applicable publications, unless specifically indicated or required to comply with governing regulations:

1. Standard Steel Doors and Frames: DHI's "Recommended Locations for Architectural Hardware for Standard Steel Doors and Frames."
2. DHI TDH-007-20: Installation Guide for Doors and Hardware.
3. Where indicated to comply with accessibility requirements, comply with ANSI A117.1 "Accessibility Guidelines for Buildings and Facilities."
4. Provide blocking in drywall partitions where wall stops or other wall mounted hardware is located.

C. Retrofitting: Install door hardware to comply with manufacturer's published templates and written instructions. Where cutting and fitting are required to install door hardware onto or into surfaces that are later to be painted or finished in another way, coordinate removal, storage, and reinstallation of surface protective trim units with finishing work specified in Division 9 Sections. Do not install surface-mounted items until finishes have been completed on substrates involved.

D. Thresholds: Set thresholds for exterior and acoustical doors in full bed of sealant complying with requirements specified in Division 7 Section "Joint Sealants."

E. Storage: Provide a secure lock up for hardware delivered to the project but not yet installed. Control the handling and installation of hardware items so that the completion of the work will not be delayed by hardware losses before and after installation.

3.4 FIELD QUALITY CONTROL

A. Field Inspection (Punch Report): Reference Division 01 Sections “Closeout Procedures”. Produce project punch report for each installed door opening indicating compliance with approved submittals and verification hardware is properly installed, operating and adjusted. Include list of items to be completed and corrected, indicating the reasons or deficiencies causing the Work to be incomplete or rejected.

1. Organization of List: Include separate Door Opening and Deficiencies and Corrective Action Lists organized by Mark, Opening Remarks and Comments, and related Opening Images and Video Recordings.

3.5 ADJUSTING

A. Initial Adjustment: Adjust and check each operating item of door hardware and each door to ensure proper operation or function of every unit. Replace units that cannot be adjusted to operate as intended. Adjust door control devices to compensate for final operation of heating and ventilating equipment and to comply with referenced accessibility requirements.

3.6 CLEANING AND PROTECTION

A. Protect all hardware stored on construction site in a covered and dry place. Protect exposed hardware installed on doors during the construction phase. Install any and all hardware at the latest possible time frame.

B. Clean adjacent surfaces soiled by door hardware installation.

C. Clean operating items as necessary to restore proper finish. Provide final protection and maintain conditions that ensure door hardware is without damage or deterioration at time of owner occupancy.

3.7 DEMONSTRATION

A. Instruct Owner's maintenance personnel to adjust, operate, and maintain mechanical and electromechanical door hardware.

3.8 DOOR HARDWARE SETS

A. The hardware sets represent the design intent and direction of the owner and architect. They are a guideline only and should not be considered a detailed hardware schedule. Discrepancies, conflicting hardware and missing items should be brought to the attention of the architect with corrections made prior to the bidding process. Omitted items not included in a hardware set should be scheduled with the appropriate additional hardware required for proper application and functionality.

1. Quantities listed are for each pair of doors, or for each single door.

2. The supplier is responsible for handing and sizing all products.

3. Where multiple options for a piece of hardware are given in a single line item, the supplier shall provide the appropriate application for the opening.

4. At existing openings with new hardware the supplier shall field inspect existing conditions prior to the submittal stage to verify the specified hardware will work as required. Provide alternate solutions and proposals as needed.

B. Manufacturer’s Abbreviations:

1. MK - McKinney
2. PE - Pemko
3. RO - Rockwood
4. RU - Corbin Russwin
5. OT - Other
6. RF - Rixson
7. NO - Norton
8. SU - Securitron

X

Hardware Sets

Set: 1.0

Doors: 101A

1	Continuous Hinge	CFM__SLF-HD1 PT - DOOR HEIGHT		PE
1	Rim Exit Device, Nightlatch	ED4200 K157ET M92 MELR M52 CT6R	630	RU
2	Interchangeable Core	CR8000	626	RU
1	Mortise Cylinder Housing	CR1070 (CAM/LENGTH TO SUIT)	630	RU
1	Pull	RM201 Mtg-Type 1XHD	US32D	RO
1	Automatic Opener	6011/6021 (TO SUIT)	689	NO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
1	Sweep (w/ drip edge)	3452CNB		PE
1	Frame Harness	QC-C1500P		MK
1	Door Harness	QC-CXXX- LENGTH TO SUIT		MK
1	Card Reader	Provided By Security Supplier		OT
1	Position Switch	DPS-M/W-BK (TO SUIT)		SU
2	Wall Wave Switch	700		NO
1	Power Supply	AQLxx-R8E1 (TO SUIT)		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		
1	Electric Power Transfer	EL-CEPT	630	SU

Notes:
• Perimeter and meeting stile gasket by door / frame manufacturer.
• Keyswitch powers operator switches. Switch to be turned off when door is locked.
• Doors to be dogged during the day.
• Electronic Operation: Outside, Card reader signals power supply to retract exit device latch allowing entry by door pull or automatic operator by wall switch. Key override. Inside, Free egress at all times by exit device with request to exit in panic bar or automatic operator by wall switch with request to exit switch in operator switch. In case of power loss, door remains locked and latched.

Set: 2.0

Doors: 102A, 102B

1	Continuous Hinge	CFM__SLF-HD1 - DOOR HEIGHT		PE
1	Rim Exit Device, Exit Only	ED4200 EO M61 CT6R	630	RU
1	Interchangeable Core	CR8000	626	RU
1	Surface Closer	UNI9500	689	NO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
1	Sweep (w/ drip edge)	3452CNB		PE
1	Position Switch	DPS-M/W-BK (TO SUIT)		SU

Notes:

• Perimeter and meeting stile gasket by door / frame manufacturer.
• Open from exterior with key only, no pulls.
•Pushing on panic bar sounds alarm. Key arms/disarms alarm function. Free egress at all times.

Set: 3.0

Doors: 104

2	Continuous Hinge	CFM__SLF-HD1 PT - DOOR HEIGHT		PE
1	Concealed Vert Rod Exit, Exit Only	ED5800 EO M92 MELR M52 CT6R	630	RU
1	Concealed Vert Rod Exit, Nightlatch	ED5800 K157ET M92 MELR M52 CT6R	630	RU
3	Interchangeable Core	CR8000	626	RU
2	Mortise Cylinder Housing	CR1070 (CAM/LENGTH TO SUIT)	630	RU
2	Pull	RM201 Mtg-Type 1XHD	US32D	RO
1	Surface Closer	UNI9500	689	NO
1	Automatic Opener	6011/6021 (TO SUIT)	689	NO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
2	Sweep (w/ drip edge)	3452CNB		PE
2	Frame Harness	QC-C1500P		MK
2	Door Harness	QC-CXXX- LENGTH TO SUIT		MK
2	Door Position Switch	DPS-M/W-BK (TO SUIT)		SU
2	Wall Wave Switch	700		NO
1	Keyswitch	MKAN		SU
1	Power Supply	AQLxx-R8E1		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		OT
2	Electric Power Transfer	EL-CEPT	630	SU

Notes:
• Perimeter and meeting stile gasket by door / frame manufacturer.
• Keyswitch powers operator switches. Switch to be turned off when door is locked.
• Doors to be dogged prior to automatic operation.
• Electronic operation: Outside, Free ingress at all times by door pull/push plate or automatic operator by wall switch. Inside, Free egress at all times by push plate/door pull or automatic operator by wall switch.

Set: 4.0

Doors: 101B, 129A

1	Continuous Hinge	CFM__SLF-HD1 - DOOR HEIGHT		PE
1	Rim Exit Device, Nightlatch	ED4200 K157ET M92 M52 CT6R	630	RU
2	Interchangeable Core	CR8000	626	RU

1	Mortise Cylinder Housing	CR1070 (CAM/LENGTH TO SUIT)	630	RU
1	Pull	RM201 Mtg-Type 1XHD	US32D	RO
1	Surface Closer	UNI9500	689	NO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
1	Sweep (w/ drip edge)	3452CNB		PE
1	Position Switch	DPS-M/W-BK (TO SUIT)		SU

Notes:

• Perimeter and meeting stile gasket by door / frame manufacturer.
• Door to remain unlocked during the day.

Set: 5.0

Doors: 129B

1	Continuous Hinge	CFM__SLF-HD1 - DOOR HEIGHT		PE
1	Rim Exit Device, Nightlatch	ED4200 K157ET M52 CT6R	630	RU
2	Interchangeable Core	CR8000	626	RU
1	Mortise Cylinder Housing	CR1070 (CAM/LENGTH TO SUIT)	630	RU
1	Automatic Opener	6011/6021 (TO SUIT)	689	NO
2	Wall Wave Switch	700		NO
1	Keyswitch	MKAN		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		

Notes:
• Perimeter and meeting stile gasket by door / frame manufacturer.
• Keyswitch powers operator switches. Switch to be turned off when door is locked.
• Doors to be dogged prior to automatic operation.
• Electronic operation: Outside, Free ingress at all times by door pull/push plate or automatic operator by wall switch. Inside, Free egress at all times by push plate/door pull or automatic operator by wall switch.

Set: 6.0

Doors: 100B, 119B, 124B

1	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
1	Rim Exit Device, Nightlatch	ED5200 K157ET CT6R	630	RU
1	Interchangeable Core	CR8000	626	RU
1	Pull	RM201 Mtg-Type 1XHD	US32D	RO
1	Surface Closer	UNI9500	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
1	Gasketing (Head/Jambs)	S773BL		PE

1	Sweep (w/ drip edge)	3452CNB		PE
1	Position Switch	DPS-M/W-BK (TO SUIT)		SU

Set: 7.0

Doors: 123B

1	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
1	Continuous Hinge	CFM__HD1 PT - DOOR HEIGHT		PE
1	Flush Bolt (Automatic, set)	2842/2962 (TO SUIT)	US26D	RO
1	Fail Secure Lock	ML20906-SEC 102T M92 CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Coordinator	2600 Series x Wear Plates	Black	RO
2	Mounting Bracket	2601AB / C (type as req)	Black	RO
2	Surface Closer	UNI9500	689	NO
2	Kick Plate	K1050 10" CSK	US32D	RO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
1	Gasketing (Head/Jambs)	S773BL		PE
2	Sweep (w/ drip edge)	3452CNB		PE
1	Astragal (Overlapping)	357SP		PE
1	Astragal (Meeting Edge)	S771C		PE
1	Frame Harness	QC-C1500P		MK
1	Door Harness	QC-CXXX- LENGTH TO SUIT		MK
1	Card Reader	Provided By Security Supplier		OT
2	Position Switch	DPS-M/W-BK (TO SUIT)		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		OT

Notes:
• Electronic Operation: Valid card unlocks outside lever or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss, door remains locked and latched.

Set: 8.0

Doors: 126, 127

2	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
2	Flush Bolt (Manual)	555/557 (TO SUIT)	US26D	RO
1	Storeroom Lock	ML2057 102T CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Surf Overhead Stop	9-X36	630	RF
2	Surface Closer	UNI9500	689	NO
2	Kick Plate	K1050 10" CSK	US32D	RO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
1	Gasketing (Head/Jambs)	S773BL		PE

2	Sweep (w/ drip edge)	3452CNB		PE
1	Astragal (Overlapping)	357SP		PE
1	Astragal (Meeting Edge)	S771C		PE
2	Position Switch	DPS-M/W-BK (TO SUIT)		SU

Set: 9.0

Doors: 128B

1	Continuous Hinge	CFM__HD1 - DOOR HEIGHT		PE
1	Storeroom Lock	ML2057 102T CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Surface Closer	PR9500H	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Threshold	252x3AFG MSES25SS		PE
1	Rain Guard	346C		PE
1	Gasketing (Head/Jambs)	S773BL		PE
1	Sweep (w/ drip edge)	3452CNB		PE
1	Position Switch	DPS-M/W-BK (TO SUIT)		SU

Notes:
•Template closer to swing and hold open

Set: 10.0

Doors: 101D, 103, 129D

4	Hinge (heavy weight)	T4A3786	US26D	MK
1	Rim Exit Device, Nightlatch	ED4200 K157ET M52 CT6R	630	RU
2	Interchangeable Core	CR8000	626	RU
1	Mortise Cylinder Housing	CR1070 (CAM/LENGTH TO SUIT)	630	RU
1	Pull	RM201 Mtg-Type 1XHD	US32D	RO
1	Surface Closer	UNI9500	689	NO

Notes:
• Perimeter/meeting stile seals by frame/door supplier.
• Door to remain dogged down during occupancy.

Set: 11.0

Doors: 101C, 129C

1	Continuous Hinge	CFM__SLF-HD1 - DOOR HEIGHT		PE
1	Rim Exit Device, Nightlatch	ED4200 K157ET M52 CT6R	630	RU
2	Interchangeable Core	CR8000	626	RU
1	Mortise Cylinder Housing	CR1070 (CAM/LENGTH TO SUIT)	630	RU

1	Pull	RM201 Mtg-Type 1XHD	US32D	RO
1	Automatic Opener	6011/6021 (TO SUIT)	689	NO
2	Wall Wave Switch	700		NO
1	Keyswitch	MKAN		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		

Notes:
• Perimeter and meeting stile gasket by door / frame manufacturer.
• Keyswitch powers operator switches. Switch to be turned off when door is locked.
• Doors to be dogged prior to automatic operation.
• Electronic operation: Outside, Free ingress at all times by door pull/push plate or automatic operator by wall switch. Inside, Free egress at all times by push plate/door pull or automatic operator by wall switch.

Set: 12.0

Doors: 119A

2	Hinge (heavy weight)	T4A3786	US26D	MK
1	Electric Hinge (heavy weight)	T4A3786-QC12	US26D	MK
1	Rim Exit Device, Passage	ED5200 102910ET M61 M91 M93	630	RU
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
3	Silencer	608/609 (TO SUIT)		RO
1	Frame Harness	QC-C1500P		MK
1	Door Harness	QC-CXXX- LENGTH TO SUIT		MK
1	Card Reader	Provided By Security Supplier		OT
1	Position Switch	DPS-M/W-BK (TO SUIT)		SU
1	Harness	709F989		RU
1	Power Supply	784		OT
1	Power Supply	AQLxx-R8E1 (TO SUIT)		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		

Notes:
• Electronic Operation: Valid card shunts alarm function; Depressing touchbar with no valid card permits free egress with alarm sounding. Free egress and ingress at all times. Key on panic device arms/disarms alarm function.

Set: 13.0

Doors: 124A

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Rim Exit Device, Nightlatch	ED5200 102957ET CT6R	630	RU
1	Interchangeable Core	CR8000	626	RU

1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
3	Silencer	608/609 (TO SUIT)		RO

Set: 14.0

Doors: 201

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Fire Rated Rim Exit, Nightlatch	ED5200A 102957ET CT6R	630	RU
1	Interchangeable Core	CR8000	626	RU
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
1	Gasketing (Head/Jambs)	S88BL		PE

Set: 15.0

Doors: 100A

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Fire Rated Rim Exit, Passage	ED5200A 102910ET	630	RU
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
1	Gasketing (Head/Jambs)	S88BL		PE

Set: 16.0

Doors: 113

5	Hinge (heavy weight)	T4A3786	US26D	MK
1	Electric Hinge (heavy weight)	T4A3786-QC12	US26D	MK
1	Dust Proof Strike	570	US26D	RO
1	Flush Bolt (Automatic, set)	2842/2962 (TO SUIT)	US26D	RO
1	Fail Secure Lock	ML20906-SEC 102T M92 CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Coordinator	2600 Series x Wear Plates	Black	RO
2	Mounting Bracket	2601AB / C (type as req)	Black	RO
2	Surface Closer	R/PR9500 (TO SUIT)	689	NO
2	Kick Plate	K1050 10" CSK	US32D	RO
2	Silencer	608/609 (TO SUIT)		RO
1	Frame Harness	QC-C1500P		MK
1	Door Harness	QC-CXXX- LENGTH TO SUIT		MK
1	Card Reader	Provided By Security Supplier		OT
2	Position Switch	DPS-M/W-BK (TO SUIT)		SU

1	Power Supply	AQLxx-R8E1 (TO SUIT)		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		

Notes:
• Electronic Operation: Valid card unlocks outside lever or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss or fire alarm, door remains locked and latched.

Set: 17.0

Doors: 123A

5	Hinge (heavy weight)	T4A3786	US26D	MK
1	Electric Hinge (heavy weight)	T4A3786-QC12	US26D	MK
1	Dust Proof Strike	570	US26D	RO
1	Flush Bolt (Automatic, set)	2842/2962 (TO SUIT)	US26D	RO
1	Fail Secure Lock	ML20906-SEC 102T M92 CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Coordinator	2600 Series x Wear Plates	Black	RO
2	Conc Overhead Stop	1-x36	630	RF
2	Surface Closer	R/PR9500 (TO SUIT)	689	NO
2	Kick Plate	K1050 10" CSK	US32D	RO
2	Silencer	608/609 (TO SUIT)		RO
1	Frame Harness	QC-C1500P		MK
1	Door Harness	QC-CXXX- LENGTH TO SUIT		MK
1	Card Reader	Provided By Security Supplier		OT
2	Position Switch	DPS-M/W-BK (TO SUIT)		SU
1	Power Supply	AQLxx-R8E1 (TO SUIT)		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		

Notes:
• Electronic Operation: Valid card unlocks outside lever or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss or fire alarm, door remains locked and latched.

Set: 18.0

Doors: 112

2	Hinge (heavy weight)	T4A3786	US26D	MK
1	Electric Hinge (heavy weight)	T4A3786-QC12	US26D	MK
1	Fail Secure Lock	ML20906-SEC 102T M92 CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO

3	Silencer	608/609 (TO SUIT)	RO
1	Frame Harness	QC-C1500P	MK
1	Door Harness	QC-CXXX- LENGTH TO SUIT	MK
1	Card Reader	Provided By Security Supplier	OT
1	Position Switch	DPS-M/W-BK (TO SUIT)	SU
1	Power Supply	AQLxx-R8E1 (TO SUIT)	SU
1	Wiring Diagram	Elevation and Point to Point as Specified	

Notes:
• Electronic Operation: Valid card unlocks outside lever or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss or fire alarm, door remains locked and latched.

Set: 19.0

Doors: 122A, 122B

2	Hinge (heavy weight)	T4A3786	US26D	MK
1	Electric Hinge (heavy weight)	T4A3786-QC12	US26D	MK
1	Fail Secure Lock	ML20906-SEC 102T M92 CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
1	Gasketing (Head/Jambs)	S88BL		PE
1	Frame Harness	QC-C1500P		MK
1	Door Harness	QC-CXXX- LENGTH TO SUIT		MK
1	Card Reader	Provided By Security Supplier		OT
1	Position Switch	DPS-M/W-BK (TO SUIT)		SU
1	Power Supply	AQLxx-R8E1 (TO SUIT)		SU
1	Wiring Diagram	Elevation and Point to Point as Specified		

Notes:
• Electronic Operation: Valid card unlocks outside lever or key retracts latchbolt. Request to exit shows authorized egress. Free egress at all times. In case of power loss or fire alarm, door remains locked and latched.

Set: 20.0

Doors: 116

6	Hinge, Full Mortise	TA2714	US26D	MK
1	Dust Proof Strike	570	US26D	RO
2	Flush Bolt (Manual)	555/557 (TO SUIT)	US26D	RO
1	Storeroom Lock	ML2057 102T CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU

2	Surf Overhead Stop	10-X36	630	RF
2	Silencer	608/609 (TO SUIT)		RO

Set: 21.0

Doors: 106, 111, 125

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Storeroom Lock	ML2057 102T CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
3	Silencer	608/609 (TO SUIT)		RO

Set: 22.0

Doors: 128A

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Classroom Lock	ML2055 102T CT6R	626	RU
1	Interchangeable Core	CR8000	626	RU
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
3	Silencer	608/609 (TO SUIT)		RO

Set: 23.0

Doors: 109

3	Hinge, Full Mortise	TA2714	US26D	MK
1	Privacy Lock	ML2060 102T V21	626	RU
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO
1	Kick Plate	K1050 10" CSK	US32D	RO
1	Mop Plate	K1050 4" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
3	Silencer	608/609 (TO SUIT)		RO
1	Coat Hook	RM802	US32D	RO

Set: 24.0

Doors: 107, 108

3	Hinge (heavy weight)	T4A3786	US26D	MK
1	Door Pull	RM3300-13 Mtg-Type 1	US32D	RO
1	Push Plate	70C	US32D	RO
1	Surface Closer	R/PR9500 (TO SUIT)	689	NO

1	Kick Plate	K1050 10" CSK	US32D	RO
1	Mop Plate	K1050 4" CSK	US32D	RO
1	Door Stop	403/441CU (TO SUIT)	US26D	RO
3	Silencer	608/609 (TO SUIT)		RO

Set: 25.0

Doors: 103C

0	All Hardware	BY DOOR SUPPLIER		

Set: 26.0

Doors: 115, 117

1	Cylinder/Core	Provided by Door Supplier		OT
1	All Hardware	BY DOOR SUPPLIER		

END OF SECTION

SECTION 08 8000
GLAZING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Insulating glass units.

B. Glazing units.

C. Plastic sheet glazing units.

D. Laminated glass interlayers.

E. Decorative Glass.

1.02 RELATED REQUIREMENTS

A. Section 08 1113 - Hollow Metal Doors and Frames: Glazed lites in doors and borrowed lites.

B. Section 08 1416 - Flush Wood Doors: Glazed lites in doors.

C. Section 08 3223 - Sliding and Folding Glazed Walls and Doors: Glazing provided by door manufacturer.

D. Section 08 4313 - Aluminum-Framed Storefronts: Glazing provided as part of storefront assembly.

E. Section 08 4413 - Glazed Aluminum Curtain Walls: Glazing provided as part of wall assembly.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; Current Edition.

B. ANSI Z97.1 - American National Standard for Safety Glazing Materials Used in Buildings - Safety Performance Specifications and Methods of Test; 2015 (Reaffirmed 2020).

C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

D. ASTM C1172 - Standard Specification for Laminated Architectural Flat Glass; 2019.

E. ASTM C1376 - Standard Specification for Pyrolytic and Vacuum Deposition Coatings on Flat Glass; 2021a.

F. ASTM E1300 - Standard Practice for Determining Load Resistance of Glass in Buildings; 2016.

G. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

H. NFRC 100 - Procedure for Determining Fenestration Product U-factors; 2020.

I. NFRC 200 - Procedure for Determining Fenestration Product Solar Heat Gain Coefficient and Visible Transmittance at Normal Incidence; 2020.

J. NFRC 300 - Test Method for Determining the Solar Optical Properties of Glazing Materials and Systems; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by each of the affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data on Insulating Glass Unit, Glazing Unit, Plastic Sheet Glazing Unit, Plastic Film, and _____ Glazing Types: Provide structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

D. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.

1. See Section 01 6000 - Product Requirements, for additional provisions.
2. Extra Insulating Glass Units: One of each glass size and each glass type.

1.06 QUALITY ASSURANCE

1.07 FIELD CONDITIONS

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Float Glass Manufacturers:
   1. Cardinal Glass Industries; _____: www.cardinalcorp.com/#sle.
   2. Vitro Architectural Glass (formerly PPG Glass); _____: www.vitroglazings.com/#sle.

B. Laminated Glass Manufacturers:
   1. Cardinal Glass Industries; _____: www.cardinalcorp.com/#sle.

2.02 PERFORMANCE REQUIREMENTS - EXTERIOR GLAZING ASSEMBLIES

A. Provide type and thickness of exterior glazing assemblies to support assembly dead loads, and to withstand live loads caused by positive and negative wind pressure acting normal to plane of glass.
   1. Comply with ASTM E1300 for design load resistance of glass type, thickness, dimensions, and maximum lateral deflection of supported glass.
   2. Provide glass edge support system sufficiently stiff to limit the lateral deflection of supported glass edges to less than 1/175 of their lengths under specified design load.
   3. Glass thicknesses listed are minimum.

B. Blast Resistance: Provide completed assemblies that meet blast resistant requirements as outlined in UFC-4-010-01, Section B-3.1, untilizing "Conventional Construction Standoff Distances".

C. Weather-Resistive Barrier Seals: Provide completed assemblies that maintain continuity of building enclosure water-resistive barrier, vapor retarder, and/or air barrier.
   1. In conjunction with weather barrier related materials described in other sections, as follows:

D. Thermal and Optical Performance: Provide exterior glazing products with performance properties as indicated. Performance properties are in accordance with manufacturer's published data as determined with the following procedures and/or test methods:
   1. Center of Glass U-Value: Comply with NFRC 100 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   2. Center of Glass Solar Heat Gain Coefficient (SHGC): Comply with NFRC 200 using Lawrence Berkeley National Laboratory (LBNL) WINDOW 6.3 computer program.
   3. Solar Optical Properties: Comply with NFRC 300 test method.

2.03 GLASS MATERIALS

A. Float Glass: Provide float glass based glazing unless otherwise indicated.
   1. Kind HS - Heat-Strengthened Type: Complies with ASTM C1048.
   2. Kind FT - Fully Tempered Type: Complies with ASTM C1048.

B. Laminated Glass: Float glass laminated in accordance with ASTM C1172.
   1. Laminated Safety Glass: Complies with ANSI Z97.1 - Class B or 16 CFR 1201 - Category I impact test requirements.

2.04 INSULATING GLASS UNITS

A. Manufacturers:
   1. Cardinal Glass Industries; _____: www.cardinalcorp.com/#sle.
   2. Pilkington North America Inc; _____: www.pilkington.com/na/#sle.
   3. Vitro Architectural Glass (formerly PPG Glass); _____: www.vitroglazings.com/#sle.

4. Substitutions: See Section 01 6000 - Product Requirements.

B. Fabricator: Certified by glass manufacturer for type of glass, coating, and treatment involved and capable of providing specified warranty.

C. Insulating Glass Units: Types as indicated.
1. Durability: Certified by an independent testing agency to comply with ASTM E2190.
2. Coated Glass: Comply with requirements of ASTM C1376 for pyrolytic (hard-coat) or magnetic sputter vapor deposition (soft-coat) type coatings on flat glass; coated vision glass, Kind CV; coated overhead glass, Kind CO; or coated spandrel glass, Kind CS.
3. Spacer Color: Black.
4. Edge Seal:
   a. Color: Black.
5. Purge interpane space with dry air, hermetically sealed.

D. Type GL-01 - Insulating Glass Units: Vision glass, double glazed. Low-E, HS and Laminated
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Heat-strengthened float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Tint: Clear.
   b. Coating: Low-E (passive type), on #2 surface.
4. Inboard Lite: Laminated float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Tint: Clear.
5. Total Thickness: 1 1/4 inch (____ mm). Verify and coordinate with curtain wall manufactuer.
6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.26, maximum.
7. Thermal Transmittance (U-Value), Winter - Center of Glass: 0.28, maximum.
8. Visible Light Transmittance (VLT): _____ percent, nominal.
9. Solar Heat Gain Coefficient (SHGC): 0.25, maximum.

E. Type GL-02 - Insulating Glass Units: Vision glass, double glazed. Low-E, Tempered and Laminated
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Heat-strengthened float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Tint: Clear.
4. Inboard Lite: Laminated float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Tint: Clear.
5. Total Thickness: [1 1/4] inch ([____] mm). Verify and coordinate with curtain wall manufactuer.
6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.26, maximum.
7. Thermal Transmittance (U-Value), Winter - Center of Glass: [0.28], maximum.
8. Solar Heat Gain Coefficient (SHGC): 0.25, maximum.

F. Type GL-03 - Insulating Glass Units: Spandrel, double glazed. Low-E, HS and Laminated
1. Applications: Exterior glazing unless otherwise indicated.
2. Space between lites filled with air.
3. Outboard Lite: Heat-strengthened float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Tint: Clear.
4. Inboard Lite: Laminated float glass, 1/4 inch (6.4 mm) thick, minimum.
   a. Tint: Surface 3: clear
   b. Tint: Surface 4: Opacified with a.acid-etched appearnce.
5. Total Thickness: [1 1/4] inch ([____] mm). Verify and coordinate with curtain wall manufactuer.
6. Thermal Transmittance (U-Value), Summer - Center of Glass: 0.26, maximum.
7. Thermal Transmittance (U-Value), Winter - Center of Glass: [0.28], maximum.
8. Solar Heat Gain Coefficient (SHGC): [0.25], maximum.

G. Type GL-08 - Interior double glazed unit: HS Fully Tempered, Laminated: Glazing provided by partition manufacturer; see section 102239.13 - Folding Glass-Panel Partitions.

2.05 GLAZING UNITS

A. Type GL-04 - Monolithic Exterior Vision Glazing:
   1. Applications: Exterior glazing unless otherwise indicated.
   2. Glass Type: Laminated, Fully tempered, Heat-strengthed glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch (6.4 mm), nominal.

B. Type GL-05 - Monolithic Interior Vision Glazing:
   1. Applications: Interior glazing unless otherwise indicated.
   2. Glass Type: Fully tempered float glass.
   3. Tint: Acid-etched..
   4. Thickness: 1/4 inch (6.4 mm), nominal.

C. Type [GL-06] - Monolithic Interior Vision Glazing:
   1. Applications: Interior glazing unless otherwise indicated.
   2. Glass Type: Fully tempered float glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch (6.4 mm), nominal.

D. Type [GL-7] - Monolithic Interior Vision Glazing:
   1. Applications: Interior glazing unless otherwise indicated.
   2. Glass Type: Heat-strengthed glass.
   3. Tint: Clear.
   4. Thickness: 1/4 inch (6.4 mm), nominal.

E. Type DG-01 - Back-Painted Safety Glass: Back-painted on one surface and highly opaque.
   1. Applications: Locations as indicated on drawings.
   2. Glazing Type: tempered; laminated safety glass; clarity as required by color, finish and treatment..
   3. Thickness: As required for application.
   4. Size: As indicated on drawings
   5. Special Treatments: As indicated on Finish Legend and drawings..
   6. Colors: As indicated on Finish Legend.
   7. Finish: Style as indicated on Finish Legend..

2.06 PLASTIC SHEET GLAZING UNITS

A. Type P-6 - Acrylic Sheet:
   1. Application: Locations as indicated on drawings.
   2. Class A or B Flame Spread rating required, per location inidicated on drawings.
   3. Type: Monolithic (single layer solid) sheet.
   4. Ultraviolet stabilized.
   5. Tint: Custome colors vary. To be selected by Architect..
   6. Thickness: 1/2 inch (12 mm).

2.07 LAMINATED GLASS INTERLAYERS

PART 3 EXECUTION

3.01 VERIFICATION OF CONDITIONS

A. Verify that openings for glazing are correctly sized and within tolerances, including those for size, squareness, and offsets at corners.

B. Verify that surfaces of glazing channels or recesses are clean, free of obstructions that may impede moisture movement, weeps are clear, and support framing is ready to receive glazing system.

3.02 PREPARATION

A. Clean contact surfaces with appropriate solvent and wipe dry within maximum of 24 hours before glazing. Remove coatings that are not tightly bonded to substrates.

B. Seal porous glazing channels or recesses with substrate compatible primer or sealer.

C. Prime surfaces scheduled to receive sealant where required for proper sealant adhesion.

3.03 INSTALLATION, GENERAL

A. Install glazing in compliance with written instructions of glass, gaskets, and other glazing material manufacturers, unless more stringent requirements are indicated, including those in glazing referenced standards.

3.04 FIELD QUALITY CONTROL

A. Glass and Glazing product manufacturers to provide field surveillance of the installation of their products.

B. Monitor and report installation procedures and unacceptable conditions.

3.05 CLEANING

A. Remove excess glazing materials from finish surfaces immediately after application using solvents or cleaners recommended by manufacturers.

B. Remove nonpermanent labels immediately after glazing installation is complete.

C. Clean glass and adjacent surfaces after sealants are fully cured.

D. Clean glass on both exposed surfaces not more than 4 days prior to Date of Substantial Completion in accordance with glass manufacturer's written recommendations.

3.06 PROTECTION

A. After installation, mark pane with an 'X' by using removable plastic tape or paste; do not mark heat absorbing or reflective glass units.

B. Remove and replace glass that is damaged during construction period prior to Date of Substantial Completion.

3.07 SCHEDULES

A. Glazing Types listed in Part 2 of this specificaiton section. See Glazing Type locations as indicated on drawings. Consult architect where further clarification is required.

B. Aluminum-Framed Storefront Glazing: Glass Type _____, install glass using dry method, and with glass thickness as required to comply with performance requirements indicated in Section 08 4313.

C. Glazed Aluminum Curtain Wall Glazing: Glass Type _____, install glass using dry method, and with glass thickness required to comply with performance requirements indicated in Section 08 4413.

D. Aluminum Entrance Window Glazing: Glass Type _____, install glass using wet/dry method with Type GC-___ glazing compound.

END OF SECTION

SECTION 08 8300
MIRRORS

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. Section 09 3000 - Tiling: Tile substrate at mirrors.

B. Section 10 2800 - Toilet, Bath, and Laundry Accessories: Metal mirror frames.

1.02 REFERENCE STANDARDS

A. ASTM C1036 - Standard Specification for Flat Glass; 2021.

B. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2018.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data on Mirror Types: Submit structural, physical and environmental characteristics, size limitations, special handling and installation requirements.

C. Product Data on Glazing Compounds: Submit chemical, functional, and environmental characteristics, limitations, special application requirements, and identify available colors.

1.04 QUALITY ASSURANCE

1.05 FIELD CONDITIONS

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MATERIALS

A. Mirror Design Criteria: Select materials and/or provide supports as required to limit mirror material deflection to 1/200, or to the flexure limit of glass, with full recovery of glazing materials, whichever is less.

B. Mirror Glass; Type ____: ASTM C1036, Type 1 - Transparent Flat, Class 1 - Clear, Quality - Q1 (high-quality mirrors); silvering, protective coating, and quality requirements in compliance with ASTM C1503.
   1. Thickness: 1/4 inch (6 mm).
   2. Size: As indicated on drawings.

2.02 ACCESSORIES

A. Spacer Shims: Neoprene, 50 to 60 Shore A durometer hardness.

B. Mirror Attachment Accessories: Stainless steel clips.

C. Channel Frame: One piece, channel frame, stainless steel, Type 430, satin finish, 1/2 inch by 1/2 inch by 3/8 inch deep (12.7 mm by 12.7 mm by 9.5 mm deep) with 90 degree mitered corners.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces of mirror frames or recesses are clean, free of obstructions, and ready for installation of mirrors.

3.02 PREPARATION

A. Clean contact surfaces with solvent and wipe dry.

3.03 INSTALLATION

A. Installation and installation materials to be coordinated and compatible with tile substrates.

B. Install mirrors in accordance with manufacturer's recommendations.

C. Set mirrors plumb and level, and free of optical distortion.

D. Set mirrors with edge clearance free of surrounding construction including countertops or backsplashes.

E. Frameless Mirrors: Set mirrors in proper place with adhesive, applied in accordance with adhesive manufacturer's instructions.

3.04 CLEANING

A. Clean mirrors and adjacent surfaces.

END OF SECTION

SECTION 08 9100
LOUVERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Louvers, frames, and accessories.

1.02 REFERENCE STANDARDS

A. AAMA 2605 - Voluntary Specification, Performance Requirements and Test Procedures for Superior Performing Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

B. AMCA 511 - Certified Ratings Program Product Rating Manual for Air Control Devices; 2021, with Editorial Revision (2022).

C. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

D. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data describing design characteristics, maximum recommended air velocity, design free area, materials and finishes.

C. Shop Drawings: Indicate louver layout plan and elevations, opening and clearance dimensions, and tolerances; head, jamb and sill details; blade configuration, screens, blank-off areas required, and frames.

D. Test Reports: Independent agency reports showing compliance with specified performance criteria.

PART 2 PRODUCTS

2.01 LOUVERS

A. Louvers: Factory fabricated and assembled, complete with frame, mullions, and accessories; AMCA Certified in accordance with AMCA 511.
   1. Wind Load Resistance: Design to resist positive and negative wind load as required by code without damage or permanent deformation.
   2. Drainable Blades: Continuous rain stop at front or rear of blade aligned with vertical gutter recessed into both jambs of frame.
   3. Screens: Provide insect screens at intake louvers and bird screens at exhaust louvers.

2.02 MATERIALS

A. Extruded Aluminum: ASTM B221 (ASTM B221M), ____ alloy, ____ temper.

2.03 FINISHES

A. Superior Performing Organic Coatings System: Manufacturer's standard multi-coat superior performing organic coatings system complying with AAMA 2605, including at least 70 percent polyvinylidene fluoride (PVDF) resin, and at least 80 percent of aluminum extrusion and panels surfaces having minimum total dry film thickness (DFT) of 1.2 mils, 0.0012 inch (0.030 mm).

2.04 ACCESSORIES

A. Blank-Off Panels: Same material as louver, painted black on exterior side; provide where duct connected to louver is smaller than louver frame, sealing off louver area outside duct.

B. Screens: Frame of same material as louver, with reinforced corners; removable, screw attached; installed on inside face of louver frame.

C. Insect Screen: 18 x 16 size aluminum mesh.

D. Flashings: Of same material as louver frame, formed to required shape, single length in one piece per location.

E. Sealant for Setting Sills and Sill Flashing: Non-curing butyl type.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install louver assembly in accordance with manufacturer's instructions.

B. Install louvers level and plumb.

C. Install flashings and align louver assembly to ensure moisture shed from flashings and diversion of moisture to exterior.

D. Secure louver frames in openings with concealed fasteners.

3.02 ADJUSTING

A. Adjust operable louvers for freedom of movement of control mechanism. Lubricate operating joints.

3.03 CLEANING

A. Clean surfaces and components.

END OF SECTION

SECTION 09 2116
GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Performance criteria for gypsum board assemblies.
B. Metal stud wall framing.
C. Metal channel ceiling framing.
D. Resilient sound isolation clips.
E. Gypsum sheathing.
F. Cementitious backing board.
G. Gypsum wallboard.
H. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing: Structural steel stud framing.
B. Section 07 2100 - Thermal Insulation: Acoustic insulation.
C. Section 07 2500 - Weather Barriers: Water-resistive barrier over sheathing.
D. Section 07 8400 - Firestopping: Top-of-wall assemblies at fire-resistance-rated walls.
E. Section 07 9200 - Joint Sealants: Sealing acoustical gaps in construction other than gypsum board or plaster work.

1.03 REFERENCE STANDARDS

A. AISI S100 - North American Specification for the Design of Cold-Formed Steel Structural Members; 2016, with Supplement (2020).
B. AISI S201 - North American Standard for Cold-Formed Steel Framing - Product Data; 2017.
C. AISI S220 - North American Standard for Cold-Formed Steel Nonstructural Framing; 2020.
D. AISI S240 - North American Standard for Cold-Formed Steel Structural Framing; 2015, with Errata (2020).
E. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.
F. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2019.
G. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.
H. ASTM A653/A653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2022.
I. ASTM A1003/A1003M - Standard Specification for Steel Sheet, Carbon, Metallic- and Nonmetallic-Coated for Cold-Formed Framing Members; 2015.
J. ASTM C1007 - Standard Specification for Installation of Load Bearing (Transverse and Axial) Steel Studs and Related Accessories; 2020.
K. ASTM C475/C475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2017 (Reapproved 2022).
L. ASTM C557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003 (Reapproved 2017).
M. ASTM C665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2017.

N. ASTM C754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2020.

O. ASTM C840 - Standard Specification for Application and Finishing of Gypsum Board; 2020.

P. ASTM C954 - Standard Specification for 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; 2022.

Q. ASTM C1002 - Standard Specification for Steel Self-Piercing Tapping Screws for Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2022.

R. ASTM C1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2019.

S. ASTM C1177/C1177M - Standard Specification for Glass Mat Gypsum Substrate for Use as Sheathing; 2017.

T. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.

U. ASTM C1280 - Standard Specification for Application of Exterior Gypsum Panel Products for Use as Sheathing; 2018.

V. ASTM C1325 - Standard Specification for Fiber-Mat Reinforced Cementitious Backer Units; 2022.

W. ASTM C1396/C1396M - Standard Specification for Gypsum Board; 2017.

X. ASTM D3273 - Standard Test Method for Resistance to Growth of Mold on the Surface of Interior Coatings in an Environmental Chamber; 2021.

Y. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).

Z. ASTM E413 - Classification for Rating Sound Insulation; 2022.

AA. ASTM E1966 - Standard Test Method for Fire-Resistive Joint Systems; 2015 (Reapproved 2019).

AB. GA-216 - Application and Finishing of Gypsum Panel Products; 2021.

AC. GA-226 - Application of Gypsum Board to Form Curved Surfaces; 2019.

AD. GA-600 - Fire Resistance and Sound Control Design Manual; 2021.

AE. ICC (IBC) - International Building Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

AF. UL (FRD) - Fire Resistance Directory; Current Edition.

AG. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

AH. UL 723 - Standard for Test for Surface Burning Characteristics of Building Materials; Current Edition, Including All Revisions.

AI. UL 2079 - Standard for Tests for Fire Resistance of Building Joint Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data:
   1. Provide data on metal framing, gypsum board, accessories, and joint finishing system.
   2. Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

C. Steel Framing Industry Association (SFIA) Certification:

1.06 QUALITY ASSURANCE

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store gypsum products and accessories indoors and keep above freezing. Elevate boards above floor, on nonwicking supports, in accordance with manufacturer's recommendations.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C840 and GA-216.

B. Interior Partitions, Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 45-49 calculated in accordance with ASTM E413, based on tests conducted in accordance with ASTM E90.

C. Seismic Performance: Ceiling systems designed to withstand the effects of earthquake motions in accordance with ASCE 7 for Seismic Design Category D, E, or F and complying with the following:

D. Grid Suspension Systems: Provide grid suspension systems in accordance with ASTM C840 and GA-216 complying with the following:
   1. Rate asse
   2. ICC-ES Evaluation Report No. _____.

E. Fire-Resistance-Rated Assemblies: Provide completed assemblies with the following characteristics:
   1. Fire-Resistance-Rated Partitions: as indicated on drawings..
   2. Head of Fire-Resistance-Rated Partitions: as indicated on drawings.; as specifed in section 07 8400-Firestopping.
   3. ICC IBC Item Numbers: Comply with applicable requirements of ICC IBC for the particular assembly.
   4. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.
   5. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL (FRD).

2.02 METAL FRAMING MATERIALS

A. Material and Product Requirements Criteria: AISI S201.

B. Steel Sheet: ASTM A1003/A1003M, subject to the ductility limitations indicated in AISI S220 or equivalent.
   1. Structural Grade: As required to meet design criteria.
   2. Corrosion Protection Coating Designation: G40, or equivalent in accordance with AISI S220.

C. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. ClarkDietrich; ____: www.clarkdietrich.com/#sle.
   2. MarinoWARE; ____: www.marinoware.com/#sle.
   3. Steel Construction Systems; _____: www.steelconsystems.com/#sle.
   4. Substitutions: See Section 01 6000 - Product Requirements.

D. Nonstructural Framing System Components: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 for the spacing indicated, with maximum deflection of wall framing of L/120 at 5 psf (L/120 at 240 Pa).
   1. Studs: C-shaped with knurled or embossed faces.
   2. Runners: U shaped, sized to match studs.
   3. Ceiling Channels: C-shaped.
   4. Furring Members: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).
   5. Furring Members: U-shaped sections, minimum depth of 3/4 inch (19 mm).
   6. Furring Members: Zee-shaped sections, minimum depth of 1 inch (25 mm).

7. Resilient Furring Channels: Single or double leg configuration; 1/2 inch (13 mm) channel depth.
    a. Products:
        1) Same manufacturer as other framing materials.
8. Resilient Sound Isolation Clips: Steel resilient clips with molded rubber isolators, attaches to framing; improves noise isolation performance of wall and floor-ceiling assemblies.
9. Sill Plate Isolation Pads: Acoustical separation between sole plate and subfloor.

E. Shaft Wall Studs and Accessories: AISI S220; galvanized sheet steel, of size and properties necessary to comply with ASTM C754 and specified performance requirements.

F. Area Separation Wall Studs and Accessories: AISI S220; galvanized sheet steel, of size and properties necessary to comply with specified performance requirements.

G. Partition Head To Structure Connections: Provide track fastened to structure with legs of sufficient length to accommodate deflection, for friction fit of studs cut short and fastened as indicated on drawings.

H. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection and prevent rotation of studs while maintaining structural performance of partition.
1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI S100.
2. Material: ASTM A653/A653M steel sheet, SS Grade 50/340, with G60/Z180 hot-dipped galvanized coating.

I. Deflection and Firestop Track: Intumescent strip factory-applied to track flanges expands when exposed to heat or flames to provide a perimeter joint seal.

J. Preformed Top Track Firestop Seal:
1. Provide components UL-listed for use in UL-listed fire-resistance-rated head of partition joint systems indicated on drawings.

K. Non-structural Framing Accessories:
1. Ceiling Hangers: Type and size as specified in ASTM C754 for spacing required.
2. Partial Height Wall Framing Support: Provides stud reinforcement and anchored connection to floor.

L. Grid Suspension Systems: Steel grid system of main tees and support bars connected to structure using hanging wire.

2.03 BOARD MATERIALS

A. Manufacturers - Gypsum-Based Board:
1. American Gypsum Company; ____: www.americangypsum.com/#sle.
2. CertainTeed Corporation; ____: www.certainteed.com/#sle.
3. Georgia-Pacific Gypsum; ____: www.gpgypsum.com/#sle.
4. Gold Bond Building Products, LLC provided by National Gypsum Company; ____: www.goldbondbuilding.com/#sle.
5. USG Corporation; ____: www.usg.com/#sle.
6. Substitutions: See Section 01 6000 - Product Requirements.

B. Gypsum Wallboard: Paper-faced gypsum panels as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
    a. Mold resistant board is required at all locations.
3. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X board, UL or WH listed.
4. Thickness:
    a. Vertical Surfaces: 5/8 inch (16 mm) and 1/2 inch (13 mm).
    b. Ceilings: 5/8 inch (16 mm) and 1/2 inch (13 mm).

5. Mold-Resistant, Paper-Faced Products:
    a. American Gypsum Company; M-Bloc: www.americangypsum.com/#sle.
    b. American Gypsum Company; M-Bloc Type X: www.americangypsum.com/#sle.
    c. American Gypsum Company; M-Bloc Type C: www.americangypsum.com/#sle.
    d. Georgia-Pacific Gypsum; ToughRock Mold-Guard: www.gpgypsum.com/#sle.
    e. Gold Bond Building Products, LLC provided by National Gypsum Company; Gold Bond XP Fire-Shield Gypsum Board: www.goldbondbuilding.com/#sle.
    f. USG Corporation; Sheetrock Brand EcoSmart Panels Mold Tough Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.

C. Backing Board For Wet Areas: One of the following products:
1. Application: Surfaces behind tile in wet areas including plumbing walls in kitchen, cafe, and toilets..
2. Mold Resistance: Score of 10, when tested in accordance with ASTM D3273.
3. ANSI Cement-Based Board: Non-gypsum-based; aggregated Portland cement panels with glass fiber mesh embedded in front and back surfaces complying with ANSI A118.9 or ASTM C1325.
    a. Thickness: 1/2 inch (13 mm).
4. Glass Mat Faced Board: Coated glass mat water-resistant gypsum backing panel as defined in ASTM C1178/C1178M.
    a. Fire-Resistance-Rated Type: Type X core, thickness 5/8 inch (16 mm).

D. Ceiling Board: Special sag resistant gypsum ceiling board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings, unless otherwise indicated.
2. Thickness: 1/2 inch (13 mm).
3. Edges: Tapered.

E. Exterior Sheathing Board: Sizes to minimize joints in place; ends square cut.
1. Application: Exterior sheathing, unless otherwise indicated.
2. Glass Mat Faced Sheathing: Glass mat faced gypsum substrate as defined in ASTM C1177/C1177M.
3. Edges: Square.
4. Glass Mat Faced Products:
    a. American Gypsum Company; M-Glass Exterior Sheathing Type X: www.americangypsum.com/#sle.
    b. CertainTeed Corporation; GlasRoc Type X Exterior Sheathing: www.certainteed.com/#sle.
    c. Georgia-Pacific Gypsum; DensGlass Fireguard Sheathing: www.gpgypsum.com/#sle.
    d. USG Corporation; Securock Brand UltraLight Glass-Mat Sheathing Firecode X 5/8 in. (15.9 mm): www.usg.com/#sle.

F. Exterior Soffit Board: Exterior gypsum soffit board as defined in ASTM C1396/C1396M; sizes to minimize joints in place; ends square cut.
1. Application: Ceilings and soffits in protected exterior areas, unless otherwise indicated.
2. At Assemblies Indicated with Fire-Resistance Rating: Use type required by indicated tested assembly; if no tested assembly is indicated, use Type X.
3. Types: Regular and Type X, in locations indicated.
4. Type X Thickness: 5/8 inch (16 mm).
5. Type C Thickness: 5/8 inch (16 mm).
6. Regular Type Thickness: 1/2 inch (13 mm).
7. Edges: Tapered.
8. Products:
    a. American Gypsum Company; Exterior Soffit Gypsum Wallboard Type X: www.americangypsum.com/#sle.
    b. CertainTeed Corporation; 5/8" Soffitboard Type C: www.certainteed.com/#sle.
    c. CertainTeed Corporation; 5/8" Soffitboard Type X: www.certainteed.com/#sle.

d. Georgia-Pacific Gypsum; ToughRock Fireguard C Soffit Board: www.gpgypsum.com/#sle.

2.04 GYPSUM BOARD ACCESSORIES

A. Acoustic Insulation: See Section 07 2100.

B. Water-Resistive Barrier: See Section 07 2500.

C. Finishing Accessories: ASTM C1047, extruded aluminum alloy (6063 T5) or galvanized steel sheet ASTM A924/A924M G90, unless noted otherwise.
   1. Types: As detailed or required for finished appearance.

D. Beads, Joint Accessories, and Other Trim: ASTM C1047, rigid plastic, galvanized steel, or rolled zinc, unless noted otherwise.
   1. Corner Beads: Low profile, for 90 degree outside corners.
   2. Wall Mounted Deflection Beads: Flexible gasket and bead with 1-1/8 inch (29 mm) flange.
      a. Fire-Resistance Rated: 1 hour when joint system tested in accordance with ASTM E1966 or UL 2079.
   3. Expansion Joints:
      a. Fire-Resistance Rated: 1 hour when joint system tested in accordance with UL 2079.
      b. Type: V-shaped metal with factory-installed protective tape.
      c. Type: Off-angle inside corner expansion.

E. Ceiling Pockets with Prewired Raceway: UL 325 listed, extruded aluminum shade pocket with removable closure panel and ceiling tile support, for recess mounting in acoustical tile or drywall ceilings; size and configuration as indicated on drawings.
   1. Designed to accommodate installation of motor control and wiring accessories within pocket.

F. Moisture Guard Trim: ASTM C1047, rigid plastic, 48 inch (1219.2 mm) length, applied to bottom edge of gypsum board.

G. Joint Materials: ASTM C475/C475M and as recommended by gypsum board manufacturer for project conditions.

H. Finishing Compound: Surface coat and primer, takes the place of skim coating.

I. Screws for Fastening of Gypsum Panel Products to Cold-Formed Steel Studs Less than 0.033 inches (0.84 mm) in Thickness and Wood Members: ASTM C1002; self-piercing tapping screws, corrosion-resistant.

J. Screws for Fastening of Gypsum Panel Products to Steel Members from 0.033 to 0.112 inch (0.84 to 2.84 mm) in Thickness: ASTM C954; steel drill screws, corrosion-resistant.

K. Anchorage to Substrate: Tie wire, nails, screws, and other metal supports, of type and size to suit application; to rigidly secure materials in place.

L. Adhesive for Attachment to Wood, ASTM C557 and Metal:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 SHAFT WALL INSTALLATION

A. Shaft Wall Framing: Install in accordance with manufacturer's installation instructions.

B. Shaft Wall Liner: Cut panels to accurate dimensions and install sequentially between special friction studs.

3.03 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C1007AISI S220 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated.

C. Studs: Space studs at 16 inches on center (at 406 mm on center).

1. Extend partition framing to structure where indicated and to ceiling in other locations.
2. Partitions Terminating at Ceiling: Attach ceiling runner securely to ceiling track in accordance with manufacturer's instructions.
3. Partitions Terminating at Structure: Attach extended leg top runner to structure, maintain clearance between top of studs and structure, and brace both flanges of studs with continuous bridging.

3.04 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.

3.05 BOARD INSTALLATION

A. Comply with ASTM C840, GA-216, and manufacturer's instructions. Install to minimize butt end joints, especially in highly visible locations.

B. Fire-Resistance-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

C. Exterior Sheathing: Comply with ASTM C1280. Install sheathing vertically, with edges butted tight and ends occurring over firm bearing.
   1. Seal joints, cut edges, and holes with water-resistant sealant.
   2. Paper-Faced Sheathing: Immediately after installation, protect from weather by application of water-resistive barrier.

D. Exterior Soffits: Install exterior soffit board perpendicular to framing, with staggered end joints over framing members or other solid backing.

E. Cementitious Backing Board: Install over steel framing members and plywood substrate where indicated, in accordance with ANSI A108.11 and manufacturer's instructions.

F. Installation on Metal Framing: Use screws for attachment of gypsum board except face layer of nonrated double-layer assemblies, which may be installed by means of adhesive lamination.

G. Curved Surfaces: Apply gypsum board to curved substrates in accordance with GA-226.

3.06 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Moisture Guard Trim: Install on bottom edge of gypsum board according to manufacturer's instructions and in locations indicated on drawings.

3.07 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board and Exterior Glass Mat Faced Sheathing: Use fiberglass joint tape, embed and finish with setting type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, embed with drying type joint compound and finish with drying type joint compound.

C. Finish gypsum board in accordance with levels defined in ASTM C840, as follows:
   1. Level 1: Fire-resistance-rated wall areas above finished ceilings, whether or not accessible in the completed construction.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

E. Where Level 5 finish is indicated, spray apply high build drywall surfacer over entire surface after joints have been properly treated; achieve a flat and tool mark-free finish.

3.08 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

3.09 CLEANING

A. See Section 01 7000 - Execution and Closeout Requirements for additional requirements.

B. Clean _____.

END OF SECTION

SECTION 09 3000
TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for floor applications.

B. Tile for wall applications.

C. Cementitious backer board as tile substrate.

D. Coated glass mat backer board as tile substrate.

E. Ceramic trim.

F. Non-ceramic trim.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2017 (Reaffirmed 2022).

B. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 2017.

C. ANSI A108.1c - Contractor's Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex-Portland Cement Mortar; 1999 (Reaffirmed 2021).

D. ANSI A108.2 - American National Standard General Requirements: Materials, Environmental and Workmanship; 2019.

E. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesive or Water Cleanable Tile-Setting Epoxy Adhesive; 2019.

F. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 2021.

G. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grout Epoxy; 1999 (Reaffirmed 2019).

H. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (Reaffirmed 2019).

I. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (Reaffirmed 2019).

J. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 2017 (Reaffirmed 2022).

K. ANSI A108.11 - American National Standard Specifications for Interior Installation of Cementitious Backer Units; 2018.

L. ANSI A108.12 - American National Standard for Installation of Ceramic Tile with EGP (Exterior Glue Plywood) Latex-Portland Cement Mortar; 1999 (Reaffirmed 2019).

M. ANSI A108.13 - American National Standard for Installation of Load Bearing, Bonded, Waterproof Membranes for Thin-Set Ceramic Tile and Dimension Stone; 2005 (Reaffirmed 2021).

N. ANSI A108.19 - American National Standard Specifications for Interior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs by the Thin-Bed Method Bonded with Modified Dry-Set Cement Mortar or Improved Modified Dry-Set Cement Mortar; 2020.

O. ANSI A108.20 - American National Standard Specifications for Exterior Installation of Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs; 2020.

P. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 2019.

Q. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 2019.

R. ANSI A118.12 - American National Standard Specifications for Crack Isolation Membranes for Thin-Set Ceramic Tile and Dimension Stone Installation; 2014 (Reaffirmed 2019).

S. ASTM C1178/C1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2018.

T. TCNA (HB) - Handbook for Ceramic, Glass, and Stone Tile Installation; 2023.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene a preinstallation meeting one week before starting work of this section; require attendance by affected installers.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

1.06 QUALITY ASSURANCE

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for general requirements for mock-up.

B. Construct tile mock-up where indicated on drawings, incorporating all components specified for the location.
   1. Minimum size of mock-up is indicated on drawings.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: All products by the same manufacturer.
   1. Florida Tile.
      a. As indicated on Finish Legend and drawings.
   2. Mosaic Tile Comany.
      a. As indicated on Finish Legend and drawings.
   3. Substitutions: Not permitted.

B. Porcelain Tile, Type Floor and Wall.: ANSI 326.3.
   1. Edges: Pressed..
   2. Surface Finish: Matte..
   3. Color(s): as indicated on Finish Legend and drawings..
   4. Pattern: Pressed.
   5. Trim Units: Matching bullnose, cove base, and cove shapes in sizes coordinated with field tile.

2.02 TRIM AND ACCESSORIES

A. Non-Ceramic Trim: As indicated on Finish Legend., style and dimensions to suit application, for setting using tile mortar or adhesive.
   1. Applications:
      a. Transition between floor finishes of different heights.
      b. Tile to carpet.
   2. Manufacturers:
      a. Schluter-Systems: www.schluter.com/#sle.

2.03 SETTING MATERIALS

2.04 GROUTS

A. Provide setting and grout materials from same manufacturer.

B. Standard Grout: ANSI A118.6 standard cement grout.
   1. Applications: Use this type of grout where indicated and where no other type of grout is indicated.
   2. Use sanded grout for joints 1/8 inch (3.2 mm) wide and larger; use unsanded grout for joints less than 1/8 inch (3.2 mm) wide.

2.05 MAINTENANCE MATERIALS

A. Tile Sealant: Gunnable, silicone, siliconized acrylic, or urethane sealant; moisture and mildew resistant type.
   1. Applications: Between tile and plumbing fixtures.

B. Grout Sealer: Liquid-applied, moisture and stain protection for existing or new Portland cement grout.
   1. Composition: Water-based colorless silicone.

2.06 ACCESSORY MATERIALS

A. Tile Transitions Strips.
   1. Maufacturer: Schluter Sytesms.
      a. As indicated on Finish Legend and drawings.

B. Concrete Floor Slab Crack Isolation Membrane: Material complying with ANSI A118.12; not intended as waterproofing.
   1. Crack Resistance: No failure at 1/8 inch (3.2 mm) gap, minimum.

C. Backer Board: Cementitious type complying with ANSI A118.9; high density, glass fiber reinforced, 7/16 inch (11 mm) thick; 2 inch (51 mm) wide coated glass fiber tape for joints and corners.

D. Backer Board: Coated glass mat type complying with ASTM C1178/C1178M; inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.

E. Mesh Tape: 2 inch (50 mm) wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that subfloor surfaces are dust free and free of substances that could impair bonding of setting materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for tiling installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by tiling material manufacturer and setting material manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of setting material to a feather edge.

3.03 INSTALLATION - GENERAL

A. Install tile, thresholds, and stair treads and grout in accordance with applicable requirements of ANSI A108.1a through ANSI A108.20, manufacturer's instructions, and TCNA (HB) recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make grout joints without voids, cracks, excess mortar or excess grout, or too little grout.

E. Form internal angles square and external angles bullnosed.

F. Install non-ceramic trim in accordance with manufacturer's instructions.

G. Sound tile after setting. Replace hollow sounding units.

H. Keep control and expansion joints free of mortar, grout, and adhesive.

I. Prior to grouting, allow installation to completely cure; minimum of 48 hours.

J. Grout tile joints unless otherwise indicated. Use standard grout unless otherwise indicated.

K. At changes in plane and tile-to-tile control joints, use tile sealant instead of grout, with either bond breaker tape or backer rod as appropriate to prevent three-sided bonding.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Over interior concrete substrates, install in accordance with TCNA (HB) Method F113, dry-set or latex-Portland cement bond coat, with standard grout, unless otherwise indicated.
   1. Use uncoupling membrane under all tile unless other underlayment is indicated.

B. Install tile-to-tile floor movement joints in accordance with TCNA (HB) Method EJ171F.

3.05 INSTALLATION - WALL TILE

A. Over cementitious backer units on studs, install in accordance with TCNA (HB) Method W244, using membrane at toilet rooms.

B. Over coated glass mat backer board on studs, install in accordance with TCNA (HB) Method W245.

C. Over gypsum wallboard on wood or metal studs install in accordance with TCNA (HB) Method W243, thin-set with dry-set or latex-Portland cement bond coat, unless otherwise indicated.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

3.08 SCHEDULE

A. Schedule as indicated on Finish Legend. See drawings for locations and patterns.

END OF SECTION

SECTION 09 5100
ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Shop Drawings: Indicate grid layout and related dimensioning.

C. Product Data: Provide data on suspension system components and acoustical units.

D. Samples: Submit two full size samples illustrating material and finish of acoustical units.

E. Samples: Submit two samples each, 12 inches (____ mm) long, of suspension system main runner, cross runner, and perimeter molding.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Acoustical Units: Quantity equal to 5 percent of total installed.

1.06 QUALITY ASSURANCE

1.07 FIELD CONDITIONS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C), and maximum humidity of 40 percent prior to, during, and after acoustical unit installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Tiles/Panels:
   1. Armstrong World Industries, Inc; ____: www.armstrongceilings.com/#sle.

B. Suspension Systems:
   1. Same as for acoustical units.
   2. Armstrong World Industries, Inc; ____: www.armstrongceilings.com/#sle.

2.02 ACOUSTICAL UNITS

A. Acoustical Panels: Painted mineral fiber, with the following characteristics:
   1. Application(s): As indicated on Finish Legend and drawings..
   2. Classification: ASTM E1264 Type III.
   3. Size: 24 by 24 inches (610 by 610 mm).
   4. Thickness: 3/4 inch (19 mm).
   5. Panel Edge: Varies. See Finish Legend..
   6. Tile Edge: Varies. See Finish Legend..
      a. Joint: Kerfed and rabbeted.
   7. Color: See Finish Legend.
   8. Suspension System: Exposed grid.

9. Suspension System: Varies. See Finish Legend..
10. Products:
    a. Armstrong World Industries, Inc: www.armstrongceilings.com/#sle.
    b. Substitutions: See Section 01 6000 - Product Requirements.

2.03 SUSPENSION SYSTEM(S)

A. Metal Suspension Systems - General: Complying with ASTM C635/C635M; Refer to Basis-Of-Design products.

2.04 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified.

B. Hanger Wire: 12 gauge, 0.08 inch (2 mm) galvanized steel wire.

C. Perimeter Moldings: Same metal and finish as grid.

D. Touch-up Paint: Type and color to match acoustical and grid units.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 PREPARATION

A. Install after major above-ceiling work is complete.

B. Coordinate the location of hangers with other work.

3.03 INSTALLATION - SUSPENSION SYSTEM

A. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

B. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
    1. Use longest practical lengths.

C. Suspension System, Non-Seismic: Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

D. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

E. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

F. Support fixture loads using supplementary hangers located within 6 inches (152 mm) of each corner, or support components independently.

G. Do not eccentrically load system or induce rotation of runners.

3.04 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

E. Cutting Acoustical Units:
    1. Make field cut edges of same profile as factory edges.

3.05 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

3.06 CLEANING

A. Replace damaged or abraded components.

END OF SECTION

SECTION 09 6500
RESILIENT FLOORING

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM F1861 - Standard Specification for Resilient Wall Base; 2021.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; including sizes, patterns and colors available; and installation instructions.

C. Shop Drawings: Indicate seaming plans and floor patterns.

D. Selection Samples: Submit manufacturer's complete set of color samples for Architect's initial selection.

1.03 DELIVERY, STORAGE, AND HANDLING

A. Upon receipt, immediately remove any shrink-wrap and check materials for damage and the correct style, color, quantity and run numbers.

B. Store all materials off of the floor in an acclimatized, weather-tight space.

C. Maintain temperature in storage area between 55 degrees F (13 degrees C) and 90 degrees F (72 degrees C).

D. Protect roll materials from damage by storing on end.

PART 2 PRODUCTS

2.01 SHEET FLOORING

2.02 RESILIENT BASE

A. Resilient Base - Type ____: ASTM F1861, Type TS, rubber, vulcanized thermoset; style as scheduled.
   1. Basis-of-Design: TightLock Carpet andResilient Wall Base by Johsonite: www.johnsonite.com/#sle.
   2. Other Manufacturers:
      a. Mannington Commercial: www.manningtoncommercial.com#sle.
      b. Roppe Corporation: www.roppe.com/#sle.
      c. Substitutions: See Section 01 6000 - Product Requirements.
   3. Height: 4 inches (100 mm).
   4. Thickness: 0.080 inch (2.0 mm).
   5. Finish: As selected from manfacturer's full line..
   6. Color: To be selected by Architect from manufacturer's full range.
   7. Accessories: Premolded external corners and internal corners.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are flat to tolerances acceptable to flooring manufacturer, free of cracks that might telegraph through flooring, clean, dry, and free of curing compounds, surface hardeners, and other chemicals that might interfere with bonding of flooring to substrate.

3.02 PREPARATION

A. Clean substrate.

3.03 INSTALLATION - GENERAL

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install in accordance with manufacturer's written instructions.

3.04 INSTALLATION - SHEET FLOORING

A. Lay flooring with joints and seams parallel to longer room dimensions, to produce minimum number of seams. Lay out seams to avoid widths less than 1/3 of roll width; match patterns at seams.

3.05 INSTALLATION - RESILIENT BASE

A. Fit joints tightly and make vertical. Maintain minimum dimension of 18 inches (45 mm) between joints.

B. Install base on solid backing. Bond tightly to wall and floor surfaces.

3.06 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean in accordance with manufacturer's written instructions.

3.07 PROTECTION

A. Prohibit traffic on resilient flooring for 48 hours after installation.

3.08 SCHEDULE

A. As indicated on drawings.

END OF SECTION

SECTION 09 6623
RESINOUS MATRIX TERRAZZO FLOORING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Epoxy matrix terrazzo with ground and polished finish.

B. Divider strips.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete subfloor with steel trowel finish.

1.03 REFERENCE STANDARDS

A. NTMA (GRAD) - Aggregate Gradation Standards; Current Edition.

B. NTMA (EPOXY) - Epoxy Terrazzo Specifications; Current Edition.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.05 QUALITY ASSURANCE

A. Perform work in accordance with NTMA recommendations as posted at their web site at www.ntma.com.

1.06 MOCK-UP

A. Construct mock-up of terrazzo illustrating appearance of finished work in each configuration required. Size mock-up to be not less than 3 by 3 feet (1 by 1 m).

B. Locate where directed.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store terrazzo materials in a dry, secure area.

B. Maintain minimum temperature of 60 degrees F (16 degrees C).

C. Keep products away from fire or open flame.

1.08 FIELD CONDITIONS

A. Do not install terrazzo when temperature is below 50 degrees F (10 degrees C) or above 90 degrees F (32 degrees C).

B. Maintain temperature within specified range 24 hours before, during, and 72 hours after installation of flooring.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis of Design - Resinous Matrix Terrazzo Flooring: Terrazzo & Marble Supply Companies; Terroxy Resin Systems: www.tmsupply.com/#sle.

2.02 EPOXY MATRIX TERRAZZO APPLICATIONS

A. Floors:
   1. Thickness: 3/8 inch (9 mm), nominal.
   2. Color(s): To be selected by Architect.
   3. Aggregate Type: Marble chips.
   4. Aggregate Size: No. 2.

B. Wall Base:
   1. Thickness: Same as floors.
   2. Style: Coved.
   3. Aggregate Type and Size: Same as floors.

2.03 MATERIALS

A. Epoxy Matrix Terrazzo: Aggregate and matrix mix applied to substrate, troweled flat, and ground smooth.

B. Matrix: Two component resin and epoxy hardener with mineral filler and color pigment, non-volatile, thermo-setting.
   1. Products:
      a. Terrazzo & Marble Supply Companies; Terroxy Epoxy Matrix: www.tmsupply.com/#sle.

C. Aggregate: Type as indicated; sized in accordance with NTMA aggregate gradation standards; color(s) as indicated, uniform in color.

D. Finishing Grout: Epoxy, color to match terrazzo matrix.

2.04 ACCESSORIES

A. Divider and Control Joint Strip Height: To suit thickness of terrazzo topping, with allowance for grinding.

B. Base Cap, Base Divider Strip, and Separator Strip: Match divider strips.

C. Primer: _____.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive terrazzo.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive terrazzo.

C. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of materials to subfloor surfaces.

D. Cementitious Subfloor Surfaces: Verify that substrates are ready for terrazzo flooring installation by testing for moisture and alkalinity (pH).
   1. Obtain instructions if test results are not within limits recommended by terrazzo flooring manufacturer.

E. Verify that required floor-mounted utilities are in correct location.

3.02 PREPARATION

A. Clean substrate of foreign matter.

B. Prepare concrete subfloor by mechanically abrading surface in accordance with manufacturer's instructions.

C. Apply primer in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Saw cut substrate to install divider and control joint strips.

B. Install control joint strips straight and flat to locations indicated.

C. Install divider strips according to pattern approved on shop drawings.

D. Install base and border divider and control joint strips to match floor pattern.

E. Install terminating cap strip at top of base; attach securely to wall substrate.

F. Place terrazzo mix over substrate to thickness indicated.

3.04 FINISHING

A. Finish terrazzo to NTMA requirements.

B. Grind terrazzo surfaces with power disc machine; sequence with coarse to fine grit abrasive, using a wet method or using a dry grinder with vacuum to control dust.

C. Apply grout to fill voids exposed from grinding.

D. Remove grout coat by grinding, using a fine grit abrasive.

3.05 TOLERANCES

3.06 CLEANING

A. Immediately after terrazzo has dried, apply sealer in accordance with manufacturer's instructions.

B. Polish surfaces in accordance with manufacturer's instructions.

3.07 PROTECTION

A. Protect finished terrazzo from damage due to subsequent construction until Date of Substantial Completion.

END OF SECTION

SECTION 09 6813
TILE CARPETING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Carpet tile, fully adhered.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 03 3000 - Cast-in-Place Concrete: Restrictions on curing compounds for concrete slabs and floors to receive adhesive-applied flooring.

1.03 REFERENCE STANDARDS

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on specified products, describing physical and performance characteristics; sizes, patterns, colors available, and method of installation.

C. Shop Drawings: Indicate layout of joints.

D. Samples: Submit two carpet tiles illustrating color and pattern design for each carpet color selected.

E. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Carpet Tiles: Quantity equal to 5 percent of total installed of each color and pattern installed.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in installing carpet tile with minimum three years documented experience and approved by carpet tile manufacturer.

1.06 FIELD CONDITIONS

A. Store materials in area of installation for minimum period of 24 hours prior to installation.

PART 2 PRODUCTS

2.01 MANUFACTURERS

2.02 MATERIALS

A. Tile Carpeting, Type CPT-01: as indicated on Finish Legend/, manufactured in one color dye lot.

2.03 ACCESSORIES

A. Edge Strips: As indicated on Finish Legend and selected by Architect, color as selected by Architect.

B. Adhesives:
   1. Compatible with materials being adhered; maximum VOC content as specified in Section 01 6116.

C. Carpet Tile Adhesive: Recommended by carpet tile manufacturer; releasable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that subfloor surfaces are dust-free and free of substances that could impair bonding of adhesive materials to subfloor surfaces.

B. Cementitious Subfloor Surfaces: Verify that substrates are ready for flooring installation by testing for moisture and alkalinity (pH).

1. Obtain instructions if test results are not within limits recommended by flooring material manufacturer and adhesive materials manufacturer.

3.02 PREPARATION

A. Prepare floor substrates as recommended by flooring and adhesive manufacturers.

B. Remove subfloor ridges and bumps. Fill minor or local low spots, cracks, joints, holes, and other defects with subfloor filler.

C. Apply, trowel, and float filler to achieve smooth, flat, hard surface. Prohibit traffic until filler is cured.

D. Vacuum clean substrate.

3.03 INSTALLATION

A. Starting installation constitutes acceptance of subfloor conditions.

B. Install carpet tile in accordance with manufacturer's instructions.

C. Blend carpet from different cartons to ensure minimal variation in color match.

D. Cut carpet tile clean. Fit carpet tight to intersection with vertical surfaces without gaps.

E. Lay carpet tile in square pattern, with pile direction parallel to next unit, set parallel to building lines.

F. Trim carpet tile neatly at walls and around interruptions.

G. Complete installation of edge strips, concealing exposed edges.

3.04 CLEANING

A. Remove excess adhesive without damage, from floor, base, and wall surfaces.

B. Clean and vacuum carpet surfaces.

END OF SECTION

SECTION 09 7200
WALL COVERINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wall covering and borders.

1.02 REFERENCE STANDARDS

A. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on wall covering and adhesive.

C. Shop Drawings: Indicate wall elevations with seaming layout.

D. Samples: Submit two samples of wall covering, ____by____ inch (____by____ mm) in size illustrating color, finish, and texture.

E. Test Reports: Indicate verification of flame and smoke ratings, when tested by UL.

F. Manufacturer's Installation Instructions: Indicate special procedures.

G. Maintenance Data: Submit data on cleaning, touch-up, and repair of covered surfaces.

H. Manufacturer's Qualification Statement.

I. Installer's Qualification Statement.

1.04 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.05 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Locate where directed.

C. Mock-up may remain as part of the Work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Inspect roll materials at arrival on site, to verify acceptability.

B. Protect packaged adhesive from temperature cycling and cold temperatures.

C. Do not store roll goods on end.

1.07 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the adhesive or wall covering product manufacturer.

B. Maintain these conditions 24 hours before, during, and after installation of adhesive and wall covering.

PART 2 PRODUCTS

2.01 WALL COVERINGS

A. General Requirements:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.

B. Wall Covering: Graphic Mural, complying with the following:
   1. Basis-of-Design: "DigiBrick" by Fetch Graphics.

2. Vinyl Film: UV-resistant vinyl film with pressure sensative permanent adhesive on back; high resolution imagees and indicated on Drawings and suitable fo exterior application.
3. Digital file of artwork content to be provided by OWner.
4. Substrate Sealer: Clear sealer as recommended by manufacturer.

C. Adhesive: Type recommended by wall covering manufacturer to suit application to substrate with a VOC content of 70 g/l or less for adhesives used inside the weatherproofing system.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are prime painted and ready to receive work, and comply with requirements of wall covering manufacturer.

3.02 PREPARATION

A. Wash impervious surfaces with tetra-sodium phosphate, rinse and neutralize; wipe dry.

B. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

3.03 INSTALLATION

A. Apply adhesive and wall covering in accordance with manufacturer's instructions.

B. Apply wall covering smooth, without wrinkles, gaps or overlaps. Eliminate air pockets and ensure full bond to substrate surface.

C. Remove excess adhesive while wet from seam before proceeding to next wall covering sheet. Wipe clean with dry cloth.

3.04 CLEANING

A. Clean wall coverings of excess adhesive, dust, dirt, and other contaminants.

B. Reinstall wall plates and accessories removed prior to work of this section.

END OF SECTION

SECTION 09 8300
ACOUSTIC FINISHES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Field application of acoustic plaster.

B. Surface preparation.

1.02 REFERENCE STANDARDS

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets for products specified.

1.04 QUALITY ASSURANCE

A. Applicator Qualifications: Company specializing in installing work of the type specified in this section, and with at least three years of documented experience.

1.05 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional requirements.

B. Provide acoustical ceiling tile with applied acoustic coating indicating color and finish.

C. Locate where directed.

D. Mock-ups may remain as part of the work.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Coatings:
   1. Basis-OF-Design: Pyrok StarSilent; "Superfine" finish..
   2. Other Manufacturers:
      a. Fellert Even Better System; "Silk" finish..
      b. Armstrong, Acoustibuilt; "Fine" texture"

2.02 ACOUSTIC COATINGS

A. General:
   1. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.

B. Plaster System: Suspended 1-inch thick seamless acoustic plaster system, with no hard backing. Provide manufactuer's complete system materials.
   1. Substrate: Fiberglass Board:
   2. Primer as recommended by plaster manufacturer.
   3. Plaster as indicated.
      a. Color: White.

C. Performance Requirements.
   1. Noise Reduction Coefficient (NRC): 0.80.

D. Accessory Materials: Provide primers, sealers, cleaning agents, and clean up materials as required for completion of acoustic finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin application of acoustic finishes until substrates have been properly prepared.

B. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

3.02 APPLICATION

A. Acoustic Coatings: Apply in accordance with manufacturer's written instructions.
   1. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.
   2. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

3.03 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements for additional requirements.

3.04 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.05 PROTECTION

A. Protect finishes from subsequent construction operations.

END OF SECTION

SECTION 09 8414

ACOUSTIC STRETCHED-FABRIC WALL AND CEILING SYSTEMS - NOVAWALL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Acoustic stretched-fabric wall system.

B. Acoustic stretched-fabric ceiling system.

C. Accessories as required for complete installation.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ANSI A208.2 - Medium Density Fiberboard (MDF) for Interior Applications; 2022.

B. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

D. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2023.

E. ASTM E2573 - Standard Practice for Specimen Preparation and Mounting of Site-Fabricated Stretch Systems to Assess Surface Burning Characteristics; 2019.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Installation methods.
   4. Specimen warranty.

C. Shop Drawings: Details indicating typical transitions to other finish surfaces.

D. Verification Samples:
   1. For each fabric specified, minimum size 12 inch (305 mm) square, representing actual product in color, texture, and pattern.

E. Maintenance Contract.

1.05 QUALITY ASSURANCE

A. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect fabric, acoustical backing, and track from excessive moisture in shipment, storage, and handling.

B. Do not deliver materials to project until wet work such as concrete and plaster has been completed.

C. Store products in manufacturer's unopened packaging until ready for installation.

D. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 MOCK-UP

A. See Section 01 4000 - Quality Requirements for additional mock-up requirements.

B. Construct mock-up of acoustic stretched-fabric wall system at location indicated by Architect.

1. Minimum mock-up dimensions; 96 by 96 inches (2440 by 2440 mm).
2. Approved mock-up may remain as part of the Work.

1.08 FIELD CONDITIONS

A. Do not begin installation until interior conditions have reached temperature and humidity that will be maintained during occupancy.

B. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Acoustic Stretched-Fabric Wall and Ceiling System:
   1. Novawall Systems, Inc; 1-inch Classic Panel with square edge: www.novawall.com/#sle.

2.02 ACOUSTIC STRETCHED-FABRIC SYSTEM

A. Acoustic Stretched-Fabric System: Field installed, fabric is stretched and set into framework and laid over acoustic material anchored to substrate. Framework consists of continuous perimeter and intermediate mounting frames anchored to substrate, and designed to permit removal and replacement of fabric within framed areas without affecting adjacent areas.
   1. Surface Burning Characteristics: Flame Spread Index of 25, maximum; Smoke Developed Index of 450, maximum; when whole system is tested in accordance with ASTM E84 using mounting specified in ASTM E2573 for stretched systems.
   2. Noise Reduction Coefficient (NRC): 0.80, minimum, when tested in accordance with ASTM C423, Type A mounting per ASTM E795.

2.03 MATERIALS

A. Frame: Extruded polymer framing system with serrated jaws of sufficient strength to hold fabric in place after repeated applications.

B. Acoustic Material:
   1. 1-inch Fiberglass Core (6-pound density, unbacked.
   2. Ensure that thickness of acoustic material fills depth of frame as necessary for application without use of support blocking.

C. Rigid Blocking: Fire-retardant treated medium density fiberboard complying with ANSI A208.2, in thickness to meet project requirements.

D. Fabric: Heavy-duty fire-retardant commercial fabric, as provided by manufacturer of acoustic stretched-fabric system; color, pattern, and texture as indicated on Finish Legend.

E. Fasteners: As recommended by manufacturer of acoustic stretched-fabric system in accordance with project requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Begin installation only after substrates have been properly prepared.

B. Verify that casework, markerboards, door and window jambs, finished ceiling, and other finished items adjacent or abutting the acoustic stretched-fabric system have been properly installed.

C. When preparation of substrate is the responsibility of another installer, notify Architect of unsatisfactory preparation prior to proceeding with this work.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation of this work.

B. Prepare substrate surfaces using methods as recommended by the manufacturer for achieving acceptable result as required for this work.

C. Remove wall plates and other obstacles, and properly prepare substrates to receive frames and acoustic material in accordance with manufacturer's instructions.

3.03 INSTALLATION

A. Install acoustic stretched-fabric system at locations indicated in accordance with approved shop drawings and manufacturer's instructions.

3.04 CLEANING

A. Clean exposed surfaces of acoustic stretched-fabric system in compliance with manufacturers instructions for cleaning and repair of minor damage to exposed surfaces.

3.05 PROTECTION

A. Protect installed materials upon completion of this work, using methods that will ensure that the finished work is without damage or deterioration upon Date of Substantial Completion.

3.06 MAINTENANCE

A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

B. Provide a separate maintenance contract for specified maintenance service.

END OF SECTION

SECTION 09 8430
SOUND-ABSORBING WALL AND CEILING UNITS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sound-absorbing panels.

1.02 RELATED REQUIREMENTS

A. Section 09 5100 - Acoustical Ceilings: Ceiling suspension system.

1.03 REFERENCE STANDARDS

A. ASTM C423 - Standard Test Method for Sound Absorption and Sound Absorption Coefficients by the Reverberation Room Method; 2023.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

C. ASTM E795 - Standard Practices for Mounting Test Specimens During Sound Absorption Tests; 2023.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's printed data sheets for products specified.

C. Shop Drawings: Fabrication and installation details, panel layout, fabric orientation, and wood grain orientation.

D. Verification Samples: Fabricated samples of each type of panel specified; 12 by 12 inch (305 by 305 mm), showing construction, edge details, and fabric covering.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect acoustical units from moisture during shipment, storage, and handling. Deliver in factory-wrapped bundles; do not open bundles until units are needed for installation.

B. Store units flat, in dry, well-ventilated space; do not stand on end.

C. Protect edges from damage.

1.07 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for additional mock-up requirements.

B. Construct mock-up of acoustical units at location as indicated by Architect.
   1. Minimum mock-up dimensions; 96 by 96 inches (2440 by 2440 mm).
   2. Mock-up may remain as part of work.

PART 2 PRODUCTS

2.01 ACOUSTICAL INSULATION PANEL

A. Manufacturers:
   1. EchoTouch by TechNature: www.technature.ca/; 416-594-6558..
   2. Echo Eliminator Bonded Acoustical Cotton (BAC) Pad by Acoustical Surfaces, Inc: www.acousticalsurfaces.com/; 952-448-5300..

B. Acoustical Cotton Board for Ceilings:
   1. Sound Absorption: Noise Reduction Coefficient (NRC) of 1.0 for 2-inch thick material when tested in accordance with ASTM C423 for Type A mounting, per ASTM E795.
   2. Density: 3 lb/cu ft (___ kg/cu m).
   3. Surface Burning Characteristics: Flame Spread Index of 25, maximum; Smoke Developed Index of 50, maximum; when tested in accordance with ASTM E84 and UL 723.
   4. Color: White where indicated on drawings.
   5. Color: Black where indicated on drawings.

6. Adhesive: Type recommended by ceiling covering manufacturer to suit application.

2.02 ACCESSORIES

A. Mechanical Fasteners:
   1. Hilti X-IE6 insulation faster.
   2. Gemco Type 0912 insulation hander with perforated base and S-250 self-locking washer (black) and black dome cap from Goodloe E. More, Danville, IL, 800-331-1164.
   3. Substitutions not permitted.

B. Panel Adhesive: Acceptable to acoustical panel manufacturer for application as indicated.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine substrates for conditions detrimental to installation of acoustical units. Proceed with installation only after unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Install acoustical units in locations as indicated, following manufacturer's installation instructions.

B. Install mounting accessories and supports in accordance with shop drawings.

C. Align panels accurately, with edges plumb and top edges level. Scribe to fit accurately at adjoining work and penetrations.

D. Attach ceiling panels at locations and heights as indicated.

3.03 CLEANING

A. Clean sound-absorptive panels upon completion of installation from dust and other foreign materials, following manufacturer's instructions.

3.04 PROTECTION

A. Provide protection of installed acoustical panels until Date of Substantial Completion.

B. Replace panels that cannot be cleaned and repaired to satisfaction of the Architect.

END OF SECTION

SECTION 09 9113
EXTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish exterior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated, including the following:
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.
   2. Exposed surfaces of steel lintels and ledge angles.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, and operating parts of equipment.
   5. Floors, unless specifically indicated.
   6. Glass.
   7. Precast Concrete Wall Panels.
   8. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 09 9123 - Interior Painting.

B. Section 21 0553 - Identification for Fire Suppression Piping and Equipment: Painted identification.

C. Section 22 0553 - Identification for Plumbing Piping and Equipment: Painted identification.

D. Section 23 0553 - Identification for HVAC Piping and Equipment: Painted identification.

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2019.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.

D. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

E. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

F. SSPC-SP 13 - Surface Preparation of Concrete; 2018.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:

1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
2. MPI product number (e.g. MPI #47).
3. Cross-reference to specified paint system(s) product is to be used in; include description of each system.

1.06 QUALITY ASSURANCE

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.08 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the paint product manufacturer's temperature ranges.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.

B. Paints:
1. Behr Process Corporation; _____: www.behr.com/#sle.
2. PPG Paints; _____: www.ppgpaints.com/#sle.
3. Sherwin-Williams Company; _____: www.sherwin-williams.com/#sle.
4. Benjamin Moore.

C. Primer Sealers: Same manufacturer as top coats.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless required to be a field-catalyzed paint.
1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
4. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
5. Supply each paint material in quantity required to complete entire project's work from a single production run.
6. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is described explicitly in manufacturer's product instructions.

B. Volatile Organic Compound (VOC) Content:
1. Provide paints and finishes that comply with the most stringent requirements specified in the following:

a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

C. Flammability: Comply with applicable code for surface burning characteristics.

D. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

E. Colors: As indicated in Color Schedule.
1. Allow for minimum of three colors for each system, unless otherwise indicated, without additional cost to Owner.
2. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint E-TR-C - Transparent Finish on Concrete Floors:
1. Sealer: Water Based Sealer for Concrete Floors; MPI #99.
2. Sealer Sheen:
a. Eggshell: MPI gloss level 3; use this sheen at all locations.

B. Paint CE-OP-3L - Masonry/Concrete, Opaque, Latex, 3 Coat:
1. One coat of block filler.
2. Semi-gloss: Two coats of latex enamel; ____.
3. Flat: Two coats of latex enamel; ____.

C. Paint GE-OP-3L - Exterior Gypsum Board and Exterior Plaster, Opaque, Latex, 3 Coat:
1. One coat of latex primer sealer.
2. Flat: Two coats of latex; ____.

D. Paint ME-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
1. One coat of latex primer.
2. Gloss: Two coats of latex enamel; ____.

E. Paint ME-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
1. Touch-up with rust-inhibitive primer recommended by top coat manufacturer.

F. Paint MgE-OP-3L - Galvanized Metals, Latex, 3 Coat:
1. One coat galvanize primer.
2. Gloss: Two coats of latex enamel; ____.

G. Paint MaE-OP-3A - Aluminum and Copper, Unprimed, Alkyd, 3 Coat:
1. One coat etching primer.
2. Gloss: Two coats of alkyd enamel; ____.
3. Semi-gloss: Two coats of alkyd enamel; ____.

H. Paint E-Pav - Pavement Marking Paint:
1. White: One coat, with reflective particles; _____.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.
1. Alkali Resistant Water Based Primer; MPI #3.
2. Anti-Corrosive Alkyd Primer for Metal; MPI #79.
3. Water Based Primer for Galvanized Metal; MPI #134.
4. Rust-Inhibitive Water Based Primer; MPI #107.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

D. Test shop-applied primer for compatibility with subsequent cover materials.

E. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Exterior Plaster and Stucco: 12 percent.
   2. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
   3. Exterior Wood: 15 percent, measured in accordance with ASTM D4442.
   4. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces for finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Remove mildew from impervious surfaces by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

F. Concrete:
   1. Remove release agents, curing compounds, efflorescence, and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces to be coated exceeds that permitted in manufacturer's written instructions.
   2. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

G. Masonry:
   1. Remove efflorescence and chalk. Do not coat surfaces if moisture content or alkalinity of surfaces or if alkalinity of mortar joints exceed that permitted in manufacturer's written instructions. Allow to dry.
   2. Prepare surface as recommended by top coat manufacturer.

H. Exterior Gypsum Board: Fill minor defects with exterior filler compound. Spot prime defects after repair.

I. Exterior Plaster: Fill hairline cracks, small holes, and imperfections with exterior patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high alkali surfaces.

J. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

K. Exterior Wood Surfaces to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

3.03 APPLICATION

A. Exterior Wood to Receive Opaque Finish: If final painting must be delayed more than 2 weeks after installation of woodwork, apply primer within 2 weeks and final coating within 4 weeks.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

F. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 9123
INTERIOR PAINTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints.

C. Scope: Finish interior surfaces exposed to view, unless fully factory-finished and unless otherwise indicated.
   1. Both sides and edges of plywood backboards for electrical and telecom equipment before installing equipment.

D. Do Not Paint or Finish the Following Items:
   1. Items factory-finished unless otherwise indicated; materials and products having factory-applied primers are not considered factory finished.
   2. Items indicated to receive other finishes.
   3. Items indicated to remain unfinished.
   4. Fire rating labels, equipment serial number and capacity labels, bar code labels, and operating parts of equipment.
   5. Floors, unless specifically indicated. See drawings.
   6. Glass.
   7. Concealed pipes, ducts, and conduits.

1.02 RELATED REQUIREMENTS

A. Section 01 6116 - Volatile Organic Compound (VOC) Content Restrictions.

B. Section 05 5100 - Metal Stairs: Shop-primed items.

C. Section 21 0553 - Identification for Fire Suppression Piping and Equipment: Painted identification.

D. Section 21 0553 - Identification for Fire Suppression Piping and Equipment: Color coding scheme for items to be painted under this section.

E. Section 22 0553 - Identification for Plumbing Piping and Equipment: Painted identification.

F. Section 23 0553 - Identification for HVAC Piping and Equipment: Painted identification.

G. Section 26 0553 - Identification for Electrical Systems: Painted identification.

H. Section 32 1723 - Pavement Markings: Painted pavement markings.

I. Section 33 1600 - Water Utility Storage Tanks: Painting inside and outside of tanks.

1.03 DEFINITIONS

A. Comply with ASTM D16 for interpretation of terms used in this section.

1.04 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. ASTM D16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2019.

C. ASTM D4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Based Materials; 2020.

D. CARB (SCM) - Suggested Control Measure for Architectural Coatings; California Air Resources Board; 2020.

E. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

F. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

G. SSPC-SP 1 - Solvent Cleaning; 2015, with Editorial Revision (2016).

H. SSPC-SP 6 - Commercial Blast Cleaning; 2007.

I. SSPC-SP 13 - Surface Preparation of Concrete; 2018.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide complete list of products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g., "alkyd enamel").
   2. MPI product number (e.g., MPI #47).
   3. Cross-reference to specified paint system products to be used in project; include description of each system.

C. Samples: Submit three paper "draw down" samples, 8-1/2 by 11 inches (216 by 279 mm) in size, illustrating range of colors available for each finishing product specified.
   1. Where sheen is specified, submit samples in only that sheen.

D. Certification: By manufacturer that paints and finishes comply with VOC limits specified.

E. Maintenance Data: Submit data including finish schedule showing where each product/color/finish was used, product technical data sheets, material safety data sheets (MSDS), care and cleaning instructions, touch-up procedures, repair of painted and finished surfaces, and color samples of each color and finish used.

F. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. See Section 01 6000 - Product Requirements, for additional provisions.
   2. Extra Paint and Finish Materials: 1 gal (4 L) of each color; from the same product run, store where directed.
   3. Label each container with color in addition to the manufacturer's label.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified, with minimum three years documented experience.

B. Applicator Qualifications: Company specializing in performing the type of work specified with minimum _____ years experience and approved by manufacturer.

1.07 MOCK-UP

A. See Section 01 4000 - Quality Requirements, for general requirements for mock-up.

B. Provide panel, 8 feet (8 m) long by ____ feet (____ m) wide, illustrating paint color, texture, and finish.

C. Provide door and frame assembly illustrating paint color, texture, and finish.

D. Locate where directed by Architect.

E. Mock-up may remain as part of the work.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.09 FIELD CONDITIONS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

C. Provide lighting level of 80 fc (860 lux) measured mid-height at substrate surface.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Provide paints and finishes from the same manufacturer to the greatest extent possible.
   1. If a single manufacturer cannot provide specified products; minor exceptions will be permitted provided approval by Architect is obtained using the specified procedures for substitutions.
   2. Substitution of MPI-approved products by a different manufacturer is preferred over substitution of unapproved products by the same manufacturer.

B. Paints:
   1. Behr Process Corporation: www.behr.com/#sle.
   2. PPG Paints: www.ppgpaints.com/#sle.
   3. Sherwin-Williams Company: www.sherwin-williams.com/#sle.

2.02 PAINTS AND FINISHES - GENERAL

A. Paints and Finishes: Ready-mixed, unless intended to be a field-catalyzed paint.
   1. Where MPI paint numbers are specified, provide products listed in Master Painters Institute Approved Product List, current edition available at www.paintinfo.com, for specified MPI categories, except as otherwise indicated.
   2. Provide paints and finishes of a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating, with good flow and brushing properties, and capable of drying or curing free of streaks or sags.
   3. Provide materials that are compatible with one another and the substrates indicated under conditions of service and application, as demonstrated by manufacturer based on testing and field experience.
   4. For opaque finishes, tint each coat including primer coat and intermediate coats, one-half shade lighter than succeeding coat, with final finish coat as base color.
   5. Supply each paint material in quantity required to complete entire project's work from a single production run.
   6. Do not reduce, thin, or dilute paint or finishes or add materials unless such procedure is specifically described in manufacturer's product instructions.

B. Flammability: Comply with applicable code for surface burning characteristics.

C. Sheens: Provide the sheens specified; where sheen is not specified, sheen will be selected later by Architect from the manufacturer's full line.

D. Colors: As indicated on drawings.
   1. Extend colors to surface edges; colors may change at any edge as directed by Architect.

2.03 PAINT SYSTEMS - INTERIOR

A. Paint I-OP - Interior Surfaces to be Painted, Unless Otherwise Indicated: Including gypsum board, concrete, concrete masonry units, brick, wood, plaster, uncoated steel, shop primed steel, galvanized steel, aluminum, and acoustical ceilings.
   1. Two top coats and one coat primer.
   2. Top Coat(s): Institutional Low Odor/VOC Interior Latex; MPI #143, 144, 145, 146, 147, or 148.

B. Paint I-OP-MD-DT - Medium Duty Door/Trim: For surfaces subject to frequent contact by occupants, including metals and wood:

1. Medium duty applications include doors, door frames, railings, handrails, guardrails, and balustrades.
2. Two top coats and one coat primer.
3. Top Coat(s): Interior Epoxy-Modified Latex; MPI #115 or 215.

C. Paint I-OP-MD-WC - Medium Duty Vertical and Overhead: Including gypsum board, plaster, concrete, concrete masonry units, uncoated steel, shop primed steel, galvanized steel, and aluminum.
1. Two top coats and one coat primer.

D. Paint I-OP-DF - Dry Fall: Metals; exposed structure and overhead-mounted services in utilitarian spaces, including shop primed steel deck, structural steel, metal fabrications, galvanized ducts, galvanized conduit, galvanized piping, and _____.
1. One top coat over pre-primed or galvanized metal..
2. Top Coat: Latex Dry Fall for pre-primed metal; MPI #118, 155, or 226.
3. Top Coat: Water Based Dry Fall for Galvanized Steel; MPI #131, 133, or 158.
4. Primer: Where required: As recommended by top coat manufacturer for specific substrate.

E. Paint I-TR-C - Transparent Finish on Concrete Floors.
1. 2 coats sealer.
2. Sealer: Water Based Sealer for Concrete Floors; MPI #99.

F. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat:
1. One coat of latex primer sealer.

G. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
1. One coat of latex primer.

H. Paint MgI-OP-3L - Galvanized Metals, Latex, 3 Coat:
1. One coat galvanize primer.

I. Paint GI-OP-3LA - Gypsum Board/Plaster, Latex-Acrylic, 3 Coat:
1. One coat of alkyd primer sealer.

2.04 PRIMERS

A. Primers: Provide the following unless other primer is required or recommended by manufacturer of top coats.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Provide primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials as required for final completion of painted surfaces.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces is below the following maximums:
1. Gypsum Wallboard: 12 percent.
2. Plaster and Stucco: 12 percent.
3. Masonry, Concrete, and Concrete Masonry Units: 12 percent.
4. Interior Wood: 15 percent, measured in accordance with ASTM D4442.
5. Concrete Floors and Traffic Surfaces: 8 percent.

3.02 PREPARATION

A. Clean surfaces thoroughly and correct defects prior to application.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

C. Remove or mask surface appurtenances, including electrical plates, hardware, light fixture trim, escutcheons, and fittings, prior to preparing surfaces or finishing.

D. Seal surfaces that might cause bleed through or staining of topcoat.

E. Concrete:
   1. Prepare surface as recommended by top coat manufacturer and according to SSPC-SP 13.

F. Masonry:
   1. Prepare surface as recommended by top coat manufacturer.

G. Concrete Floors and Traffic Surfaces: Remove contamination, acid etch and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

H. Gypsum Board: Fill minor defects with filler compound. Spot prime defects after repair.

I. Plaster: Fill hairline cracks, small holes, and imperfections with latex patching plaster. Make smooth and flush with adjacent surfaces. Wash and neutralize high-alkali surfaces.

J. Aluminum: Remove surface contamination and oils and wash with solvent according to SSPC-SP 1.

K. Galvanized Surfaces:

L. Ferrous Metal:
   1. Solvent clean according to SSPC-SP 1.
   2. Shop-Primed Surfaces: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.
   3. Remove rust, loose mill scale, and other foreign substances using methods recommended in writing by paint manufacturer and blast cleaning according to SSPC-SP 6 Commercial Blast Cleaning. Protect from corrosion until coated.

M. Wood Surfaces to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

N. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer.

O. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Remove unfinished louvers, grilles, covers, and access panels on mechanical and electrical components and paint separately.

B. Apply products in accordance with manufacturer's written instructions and recommendations in "MPI Architectural Painting Specification Manual".

C. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

D. Apply each coat to uniform appearance in thicknesses specified by manufacturer.

E. Sand wood and metal surfaces lightly between coats to achieve required finish.

F. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

G. Reinstall electrical cover plates, hardware, light fixture trim, escutcheons, and fittings removed prior to finishing.

3.04 FIELD QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for general requirements for field inspection.

B. Owner will provide field inspection.

3.05 CLEANING

A. Collect waste material that could constitute a fire hazard, place in closed metal containers, and remove daily from site.

3.06 PROTECTION

A. Protect finishes until completion of project.

B. Touch-up damaged finishes after Substantial Completion.

END OF SECTION

SECTION 09 9600
HIGH-PERFORMANCE COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. High performance coatings.

B. Surface preparation.

1.02 REFERENCE STANDARDS

A. MPI (APL) - Master Painters Institute Approved Products List; Master Painters and Decorators Association; Current Edition.

B. MPI (APSM) - Master Painters Institute Architectural Painting Specification Manual; Current Edition.

C. NFPA 101 - Life Safety Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide complete list of all products to be used, with the following information for each:
   1. Manufacturer's name, product name and/or catalog number, and general product category (e.g. "alkyd enamel").
   2. MPI product number (e.g. MPI #47).
   3. Cross-reference to specified coating system(s) product is to be used in; include description of each system.

C. Samples: Submit two samples 8 by 8 inch (203 by 203 mm) in size illustrating colors available for selection.

D. Manufacturer's Certificate: Certify that high-performance coatings comply with VOC limits specified.

E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

F. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

G. Maintenance Data: Include cleaning procedures and repair and patching techniques.

H. Maintenance Materials: Furnish the following for Owner's use in maintenance of project.
   1. Extra Coating Materials: 1 gallon (4 liters) of each type and color.
   2. Label each container with manufacturer's name, product number, color number, and room names and numbers where used.

1.04 QUALITY ASSURANCE

1.05 MOCK-UPS

A. See Section 01 4000 - Quality Requirements for general requirements for mock-ups.

B. Provide mock-up of floor , 6 feet (____ m) long by 6 feet (____ m) wide, illustrating coating.

C. Locate where directed.

D. Mock-up may remain as part of the work.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of coating, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Coating Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.07 FIELD CONDITIONS

A. Follow manufacturer's recommended procedures for producing best results, including testing of substrates, moisture in substrates, and humidity and temperature limitations.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the coating product manufacturer.

C. Do not install materials when temperature is below 55 degrees F (13 degrees C) or above 90 degrees F (32 degrees C).

D. Maintain this temperature range, 24 hours before, during, and 72 hours after installation of coating.

E. Restrict traffic from area where coating is being applied or is curing.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. High-Performance Coatings:
   1. Dur-A-Flex.
   2. Substitutions: Not permitted.

2.02 HIGH-PERFORMANCE COATINGS

A. MPI Standards: Provide products that comply with MPI standards indicated and are listed in MPI Approved Products List.

B. Provide coating systems that meet the following minimum performance criteria, unless more stringent criteria are specified:
   1. Surface Burning Characteristics: Flame spread/Smoke developed index of 0/0, maximum, when tested in accordance with ASTM E84.
   2. NFPA 101, Class A rated.

2.03 TOP COAT MATERIALS

A. Coatings - General: Provide complete multi-coat systems formulated and recommended by manufacturer for the applications indicated, in the thicknesses indicated; number of coats specified does not include primer or filler coat.

B. Urethane Coating for Floors:
   1. Number of Coats: as prescribed by manufactuers instructions for the specified system..
   2. System as indicated on Finish Legend..
      a. Products:
         1) Dur-A-Flex: Poly-Crete MDB..
         2) Substitutions: Not permitted.

C. Shellac: Pure, white type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Do not begin application of coatings until substrates have been properly prepared.

C. Verify that substrate surfaces are ready to receive work as instructed by the coating manufacturer. Obtain and follow manufacturer's instructions for examination and testing of substrates.

D. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

3.02 PREPARATION

A. Clean surfaces of loose foreign matter.

B. Remove substances that would bleed through finished coatings. If unremovable, seal surface with shellac.

C. Remove finish hardware, fixture covers, and accessories and store.

3.03 PRIMING

A. Apply primer to all surfaces, unless specifically not required by coating manufacturer. Apply in accordance with coating manufacturer's instructions.

3.04 COATING APPLICATION

A. Apply coatings in accordance with manufacturer's written instructions, to thicknesses specified and recommendations in MPI - Architectural Painting and Specification Manual.

B. Apply in uniform thickness coats, without runs, drips, pinholes, brush marks, or variations in color, texture, or finish. Finish edges, crevices, corners, and other changes in dimension with full coating thickness.

END OF SECTION

SECTION 10 1423
PANEL SIGNAGE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Panel signage.

1.02 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

1.04 DELIVERY, STORAGE, AND HANDLING

A. Package signs as required to prevent damage before installation.

B. Package room and door signs in sequential order of installation, labeled by floor or building.

C. Store tape adhesive at normal room temperature.

1.05 FIELD CONDITIONS

A. Do not install tape adhesive when ambient temperature is lower than recommended by manufacturer.

B. Maintain minimum ambient temperature during and after installation.

PART 2 PRODUCTS

2.01 REGULATORY REQUIREMENTS

A. Accessibility Requirements: Comply with ADA Standards and ICC A117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most restrictive requirements.

2.02 PANEL SIGNAGE

A. Panel Signage Type _____:
   1. Application: Room and door signs.
   2. Description: Flat signs with engraved panel media, tactile characters.
   3. Sign Size: 4 inches by 6 inches (100 mm by 152 mm).
   4. Total Thickness: 1/8 inch (3 mm).
   5. Sign Edges: Radiused.
   6. Corners: Radiused.
   7. Color and Font, unless otherwise indicated:
      a. Character Font: Helvetica, Arial, or other sans serif font.
      b. Character Case: Upper and lower case (title case).
      c. Background Color: To be selected by Architect..
      d. Character Color: Contrasting color.
   8. Material: Laminated colored plastic engraved through face to expose core as background color.
   9. Profile: Flat panel in aluminum frame.
      a. Frame Finish: Black anodized.
   10. Tactile Letters: Raised 1/32 inch minimum.
   11. Braille: Grade II, ADA-compliant.

2.03 SIGNAGE APPLICATIONS

A. Room and Door Signs:
   1. Office Doors: Identify with room names and numbers to be determined later, not those indicated on drawings; provide "window" section for replaceable occupant name.

2. Conference and Meeting Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings; provide "window" section with sliding "In Use/Vacant" indicator.
3. Service Rooms: Identify with room names and numbers to be determined later, not those indicated on drawings.
4. Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

B. Emergency Evacuation Map Panel Signs:
1. Allow for one map per elevator lobby.
2. Map content to be provided by Owner.

2.04 ACCESSORIES

A. Concealed Screws: Noncorroding metal; stainless steel, galvanized steel, chrome plated, or other.

B. Tape Adhesive: Double-sided tape, permanent adhesive.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Notify Architect if conditions are not suitable for installation of signs; do not proceed until conditions are satisfactory.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install with horizontal edges level.

C. Locate panel signs and mount at heights indicated on drawings and in accordance with ADA Standards and ICC A117.1.

D. Protect from damage until Date of Substantial Completion; repair or replace damaged items.

END OF SECTION

SECTION 10 2113.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid plastic toilet compartments.

B. Urinal and vestibule screens.

1.02 RELATED REQUIREMENTS

A. Section 10 2800 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on panel construction, hardware, and accessories.

C. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.

D. Samples: Submit two samples of partition panels, ____by____ inch (____by____ mm) in size illustrating panel finish, color, and sheen.

E. Manufacturer's Installation Instructions: Indicate special procedures.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Solid Plastic Toilet Compartments:
   1. Scranton Products; Hiny Hiders Partitions: www.scrantonproducts.com/#sle.
   2. Substitutions: Section 01 6000 - Product Requirements.

2.02 PLASTIC TOILET COMPARTMENTS

A. Solid Plastic Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE), tested in accordance with NFPA 286; ceiling-hung.
   1. Color: As indicated on Finish Legend or selected from manufacturer's full range..
   2. Doors:
      a. Thickness: 1 inch (25 mm).
      b. Width: 24 inch (610 mm).
      c. Width for Handicapped Use: 36 inch (915 mm), out-swinging.
      d. Height: 55 inch (1397 mm).
   3. Panels:
      a. Thickness: 1 inch (25 mm).
      b. Height: 55 inch (1397 mm).
   4. Pilasters:
      a. Thickness: 1 inch (25 mm).
      b. Width: As required to fit space; minimum 3 inch (76 mm).
   5. Screens: Without doors; to match compartments; mounted to wall with two panel brackets.

2.03 ACCESSORIES

A. Head Rails: Extruded aluminum, anti-grip profile.

1. Size: Manufacturer's standard size.

B. Wall and Pilaster Brackets: Stainless steel; continuous type.

C. Attachments, Screws, and Bolts: Stainless steel, tamper proof type.

D. Hinges: Stainless steel, manufacturer's standard finish.
   1. Pivot hinges, gravity type, adjustable for door close positioning; two per door.

E. Door Hardware: Stainless steel, manufacturer's standard finish.
   1. Door Latch: Slide type with exterior emergency access feature.
   2. Door Strike and Keeper with Rubber Bumper: Mount on pilaster in alignment with door latch.

F. Coat Hook: One per compartment, mounted on door.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 inch to 1/2 inch (9 mm to 13 mm) space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

E. Field touch-up of scratches or damaged finish will not be permitted. Replace damaged or scratched materials with new materials.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch (6 mm).

B. Maximum Variation From Plumb: 1/8 inch (3 mm).

3.04 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch (5 mm).

B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

SECTION 10 2239
FOLDING PANEL PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Top-supported folding panel partitions, horizontal opening.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing.

1.03 REFERENCE STANDARDS

A. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

B. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

C. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

D. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation Between Spaces Separated by Operable Partitions; 2012 (Reapproved 2020).

E. ASTM E596 - Standard Test Method for Laboratory Measurement of Noise Reduction of Sound-Isolating Enclosures; 2022.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene at project site seven calendar days prior to scheduled beginning of construction activities of this section to review section requirements.
   1. Require attendance by representatives of installer.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on partition materials, operation, hardware and accessories, electric operating components, track switching components, and colors and finishes available.

C. Design Data: Design calculations, bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, showing loads at points of attachment to the building structure.

D. Shop Drawings: Indicate opening sizes, track layout, details of track and required supports, static and dynamic loads, location and details of pass door and frame, adjacent construction and finish trim, and stacking depth.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified this section with minimum three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified and with at least three years of documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until installation.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Folding Panel Partitions - Horizontal Opening:
   1. Modernfold, a DORMA Group Company: www.modernfold.com/#sle.
   2. Substitutions: Not permitted.

2.02 FOLDING PANEL PARTITIONS - HORIZONTAL OPENING

A. Folding Panel Partitions: Center opening; paired panels; center stacking; manually operated.

B. Panel Construction:
   1. Frame: 21 gauge, ___ inch (____ mm) thick formed sheet steel frame top, bottom, jambs, and intermediates; welded construction, with acoustical insulation fill.

C. Panel Finishes:
   1. Facing: Maharam Tek-Wall Strake 300076-007 Raku.
   2. Exposed Metal Trim: Natural Choice.

D. Panel Seals:
   1. Panel to Panel Seals: Grooved and gasketed astragals, with continuous flexible ribbed vinyl seal fitted to panel edge construction; color to match panel finish.
   2. Acoustic Seals: Flexible acoustic seals at jambs, meeting mullions, ceilings, retractable floor and ceiling seals, and above track to structure acoustic seal.

E. Suspension System:
   1. Track: Formed steel; 1-1/4 by 1-1/4 inch (32 by 32 mm) size; thickness and profile designed to support loads, steel sub-channel and track connectors, and track switches.
   2. Carriers: Nylon wheels on trolley carrier at top of every second panel, sized to carry imposed loads, with threaded pendant bolt for vertical adjustment.

F. Performance:
   1. Acoustic Performance:
      a. Noise Reduction Coefficient (NRC): ASTM E596, NRC of 0.65 minimum.
   2. Surface Burning Characteristics of Panel Finish: Flame spread/smoke developed index of 25/50, maximum, when tested in accordance with ASTM E84.
   3. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.

G. Accessories:
   1. Ceiling Closure: White enameled ceiling closure; aluminum jamb and head molding, fittings and attachments, and intermediate meeting posts.
   2. Pass Door: Double door, 36 inch (____ mm) wide by 84 inch (____ mm) high opening; same design and construction as panel; fit door with perimeter acoustic gaskets, concealed closer, keyed lock, view window of _____ glass, and tool operated floor seal.

2.03 MATERIALS

A. Aluminum Extrusions: ASTM B221 (ASTM B221M), 6063 alloy, T6 temper.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install partition in accordance with manufacturer's instructions and ASTM E557.

B. Install acoustic sealant to achieve required acoustic performance.

C. Coordinate electrical connections.

3.02 ADJUSTING

A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.

B. Visually inspect partition in full extended position for light leaks to identify a potential acoustical leak.

C. Adjust partition assembly to achieve lightproof seal.

3.03 CLEANING

A. Clean finish surfaces and partition accessories.

END OF SECTION

SECTION 10 2239.13
FOLDING GLASS-PANEL PARTITIONS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior aluminum-framed folding glass-panel partitions, horizontal opening.

1.02 RELATED REQUIREMENTS

A. Section 05 1200 - Structural Steel Framing: Concealed steel support members.

B. Section 08 7100 - Door Hardware: Cylinders and keying.

1.03 REFERENCE STANDARDS

A. AAMA 611 - Voluntary Specification for Anodized Architectural Aluminum; 2020.

B. AAMA 1801 - Voluntary Specification for the Acoustical Rating of Exterior Windows, Doors, Skylights and Glazed Wall Sections; 2021.

C. AAMA 2603 - Voluntary Specification, Performance Requirements and Test Procedures for Pigmented Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

D. AAMA 2604 - Voluntary Specification, Performance Requirements and Test Procedures for High Performance Organic Coatings on Aluminum Extrusions and Panels (with Coil Coating Appendix); 2022.

E. ASCE 7 - Minimum Design Loads and Associated Criteria for Buildings and Other Structures; Most Recent Edition Cited by Referring Code or Reference Standard.

F. ASTM B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes; 2021.

G. ASTM B221M - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes (Metric); 2021.

H. ASTM C864 - Standard Specification for Dense Elastomeric Compression Seal Gaskets, Setting Blocks, and Spacers; 2005 (Reapproved 2019).

I. ASTM E90 - Standard Test Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions and Elements; 2009 (Reapproved 2016).

J. ASTM E330/E330M - Standard Test Method for Structural Performance of Exterior Windows, Doors, Skylights and Curtain Walls by Uniform Static Air Pressure Difference; 2014 (Reapproved 2021).

K. ASTM E557 - Standard Guide for Architectural Design and Installation Practices for Sound Isolation Between Spaces Separated by Operable Partitions; 2012 (Reapproved 2020).

L. ASTM E1425 - Standard Practice for Determining the Acoustical Performance of Windows, Doors, Skylight, and Glazed Wall Systems; 2014 (Reapproved 2023).

M. ASTM E2190 - Standard Specification for Insulating Glass Unit Performance and Evaluation; 2019.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Preinstallation Meeting: Convene at project site seven calendar days prior to scheduled beginning of construction activities of this section to review section requirements.
   1. Require attendance by representatives of installer.
   2. Notify Architect four calendar days in advance of scheduled meeting date.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Provide data on partition materials, operation, hardware and accessories, electric operating components, and colors and finishes available.

C. Design Data: Design calculations bearing seal and signature of structural engineer licensed to practice in the State in which the Project is located, showing loads at points of attachment to the building structure.

D. Shop Drawings: Indicate layout, dimensions, identification of components, and interface with adjacent construction.
   1. Include field measurements of openings.
   2. Include elevations showing:
      a. Locations and identification of manufacturer-supplied door hardware and fittings.
      b. Locations and sizes of cut-outs and drilled holes for other door hardware.
   3. Include details of:
      a. Requirements for support and bracing of overhead track.
      b. Installation details.
      c. Appearance of manufacturer-supplied door hardware and fittings.

E. Selection Samples: Two sets, representing manufacturer's full range of available metal, glass, and wood materials and finishes.

F. Certificates: Certify that partition system meets or exceeds specified acoustic requirements.

G. Manufacturer's Installation Instructions: Include complete preparation, installation, and cleaning requirements.

H. Manufacturer's qualification statement.

I. Installer's qualification statement.

J. Operation and Maintenance Data: For manufacturer-supplied operating hardware.

1.06 QUALITY ASSURANCE

1.07 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until installation.

1.08 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

PART 2 PRODUCTS

2.01 INTERIOR FOLDING GLASS-PANEL PARTITIONS - HORIZONTAL OPENING

A. Basis-Of-Design: Sunflex SF 55 H-S-W

B. Folding Glass-Panel Partitions: Top hung, factory-fabricated assemblies consisting of full-width aluminum-framed glass panels; complete with support and anchorage devices.

C. Performance Criteria:
   1. Acoustical Performance: Provide folding glass-panel partition assemblies tested by qualified testing agency in accordance with ASTM E90, ASTM E1425, or AAMA 1801.
   2. Structural Performance: No glazing material breakage or permanent damage to fasteners, anchors, hardware, or actuating mechanisms, when tested in accordance with ASTM E330/E330M.
      a. Installed partition system track capable of supporting imposed loads, with maximum deflection of 1/360 of span.
   3. Seismic Performance: Operable partition shall withstand effects of earthquake motions determined according to ASCE 7.

D. Configuration: As indicated on drawings.

E. Glazed Aluminum-Framed Panel Construction:
   1. Aluminum Frames: Factory finished; manufacturer's standard corner construction; nonthermally broken.
   2. Glazing: Type GL-07, double glazed glass unit, provided by door manufactuer.
   3. Glass: Clear.
   4. Panel hardware finish to match frame.

5. Panel hardware finish: As selected from manufacturer's standard line.

2.02 MATERIALS

A. Glazing: Type GL-07.
   1. Insulating Glass Units (IGU): Hermetically sealed double pane units, 1/4 inch (6 mm) thick lights, laminated float glass panes, unit thickness as indicated; certified by independent testing agency to comply with ASTM E2190.
      a. Glass: Laminated Glass: Fully tempered float glass laminated in accordance with ASTM C1172, with eased and polished edges.
   2. Setting Blocks: Manufacturer's standard type; complying with ASTM C864.

B. Aluminum Components: Complying with ASTM B221 (ASTM B221M), alloy 6063, temper as indicated, with anodized finish complying with AAMA 611, and powder coating complying with AAMA 2603 or AAMA 2604 for select colors.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify track supports are laterally braced and will permit track to be level within 1/4 inch (6 mm) of required position and parallel to the floor surface.

C. Verify floor flatness of 1/8 inch in 10 feet (3 mm in 3 m), non-cumulative.

D. Do not begin installation until supports and adjacent substrates have been properly prepared.

E. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.02 PREPARATION

A. Clean substrates thoroughly prior to installation.

B. Prepare substrates using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Install partition in accordance with manufacturer's instructions and ASTM E557.

B. Attach frame and shims to perimeter opening to accommodate construction tolerances and other irregularities.

C. Use anchorage devices to securely fasten assembly to adjacent construction without distortion or imposed stresses.

D. Fit and align partition assembly egress doors level and plumb.

3.04 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work.

B. Maximum Variation from Plumb: 1/16 inch (1.5 mm).

C. Maximum Variation from Level: 1/16 inch (1.5 mm).

D. Longitudinal or Diagonal Warp: Plus or minus 1/8 inch (3 mm) from 10 feet (3.05 m) straight edge.

3.05 ADJUSTING

A. Adjust partition assembly to provide smooth operation from stacked to full open position. Do not over-compress acoustic seals.

3.06 CLEANING

A. Thoroughly clean surfaces and materials installed as part of this work.

3.07 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals for closeout submittals.

B. Demonstrate operation of partition and identify potential operational problems.

3.08 PROTECTION

A. Protect installed products and materials until Date of Substantial Completion.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

SECTION 10 2600
WALL AND DOOR PROTECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Crash rails.

B. Protective corridor handrails.

C. Corner guards.

1.02 RELATED REQUIREMENTS

A. Section 05 4000 - Cold-Formed Metal Framing. Placement of supports in stud wall construction.

B. Section 09 2116 - Gypsum Board Assemblies: Placement of supports in stud wall construction.

C. Section 09 2216 - Non-Structural Metal Framing: Placement of supports in stud wall construction.

1.03 REFERENCE STANDARDS

A. ASTM D256 - Standard Test Methods for Determining the Izod Pendulum Impact Resistance of Plastics; 2023, with Editorial Revision.

B. ASTM F476 - Standard Test Methods for Security of Swinging Door Assemblies; 2023.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate physical dimensions, features, wall mounting brackets with mounted measurements, anchorage details, and rough-in measurements.

C. Shop Drawings: Include plans, elevation, sections, and attachment details. Show design and spacing of supports for protective corridor handrails, required to withstand structural loads.

D. Warranty Documentation: Submit manufacturer warranty and ensure that forms have been completed in Owner's name and registered with manufacturer.

1.05 DELIVERY, STORAGE, AND HANDLING

1.06 WARRANTY

A. See Section 01 7800 - Closeout Submittals for additional warranty requirements.

B. Manufacturer Warranty: Provide 5-year manufacturer warranty for metal crash rails. Complete forms in Owner's name and register with manufacturer.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Corner Guards:
   1. Basis-Of-Design Product: ProTek Systems, Inc. CG-50..

B. Metal Crash Rails:
   1. Basis-Of-Design Product: ProTek Systems, Inc. CRS-55SSV..
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 PERFORMANCE CRITERIA

A. Impact Strength: Unless otherwise noted, provide protection products and assemblies that have been successfully tested for compliance with applicable provisions of ASTM D256 and/or ASTM F476.

2.03 PRODUCT TYPES

A. Metal Crash Rails: Factory- or shop-fabricated, with preformed end wall returns, and internal and external corners:
   1. Material: Metal; Stainless Steel, type 304.
   2. Mounting: Surface.

3. Rail Type: Continuous metal bar.
4. Finishes.
    a. Stainless steel, No.4.

B. Protective Corridor Handrails: Factory- or shop-fabricated, with preformed end caps and internal and external corners:
1. Mounting: Surface.

C. Corner Guards - Surface Mounted:
1. Material: Type 304 stainless steel, No. 4 finish, _____ gauge, _____ inch (_____ mm) thick.
2. Width of Wings: 3-1/2 inches (____ mm).
3. Corner: 9-degree radius.
4. Color: As selected from manufacturer's standard colors.
5. Length: One piece.

2.04 FABRICATION

A. Fabricate components with tight joints, corners and seams.

2.05 SOURCE QUALITY CONTROL

A. See Section 01 4000 - Quality Requirements, for additional requirements.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that rough openings, concealed blocking, and anchors are correctly sized and located.

B. Verify that field measurements are as indicated on drawings.

3.02 INSTALLATION

A. Position top of corridor hand rail 36 inches (914 mm) from finished floor.

B. Position corner guard 4 inches (102 mm) above finished floor to ____ inches high (____ mm high).

C. Terminate rails 1 inch (25.4 mm) short of door openings and intersecting walls.

3.03 TOLERANCES

A. Maximum Variation From Required Height: 1/4 inch (6 mm).

B. Maximum Variation From Level or Plane For Visible Length: 1/4 inch (6 mm).

3.04 CLEANING

A. Clean wall and door protection items of excess adhesive, dust, dirt, and other contaminants.

END OF SECTION

SECTION 10 2800
TOILET, BATH, AND LAUNDRY ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Commercial toilet accessories.

B. Under-lavatory pipe supply covers.

C. Electric hand/hair dryers.

D. Diaper changing stations.

E. Utility room accessories.

1.02 RELATED REQUIREMENTS

A. Section 08 8300 - Mirrors: Other mirrors.

1.03 REFERENCE STANDARDS

A. ADA Standards - 2010 ADA Standards for Accessible Design; 2010.

B. ASTM C1036 - Standard Specification for Flat Glass; 2021.

C. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2018.

D. ASTM C1503 - Standard Specification for Silvered Flat Glass Mirror; 2018.

E. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

F. ASTM F2285 - Standard Consumer Safety Performance Specification for Diaper Changing Tables for Commercial Use; 2022.

G. ASTM G21 - Standard Practice for Determining Resistance of Synthetic Polymeric Materials to Fungi; 2015, with Editorial Revision (2021).

H. ICC A117.1 - Accessible and Usable Buildings and Facilities; 2017.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement, concealed ceiling supports, and reinforcement of toilet partitions to receive anchor attachments.

1.05 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on accessories describing size, finish, details of function, and attachment methods.

C. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Commercial Toilet, Shower, and Bath Accessories:
   1. Bobrick Companies: https://www.bobrick.com/#sle..

B. Electric Hand/Hair Dryers:

C. Diaper Changing Stations:
   1. Koala Kare Products; _____: www.koalabear.com/#sle.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.

2. Fabricate units made of metal sheet of seamless sheets with flat surfaces.

B. Mirror Glass: Annealed float glass, ASTM C1036 Type I, Class 1, Quality Q2, with silvering, protective and physical characteristics complying with ASTM C1503.

C. Mirror Glass: Tempered safety glass, ASTM C1048; and ASTM C1036 Type I, Class 1, Quality Q2, with silvering as required.

2.03 FINISHES

A. Stainless Steel: Satin finish, unless otherwise noted.

2.04 COMMERCIAL TOILET ACCESSORIES

A. TA.04: Toilet Paper Dispenser: Single Jumbo roll, surface mounted.

B. TA.10: Combination Towel Dispenser/Waste Receptacle: Semi-recessed., stainless steel; seamless wall flanges, continuous piano hinges, ____.

C. TA.09: Mirrors: Stainless steel framed, 1/4 inch (6 mm) thick annealed float glass; ASTM C1036.

D. TA.11: Mirrors: Accent Mirror.
   1. Arteriors: Wilder Mirror.
      a. Size: 47 inch (h) x 31 inch (w) x 2.5 inch (d)
      b. Color: Bronze-iron.

E. TA.05: Seat Cover Dispenser: Stainless steel, recessed, reloading by concealed opening at base, tumbler lock.

F. TA.01, TA.02, TA.03: Grab Bars: Stainless steel, smooth surface.
   1. Standard Duty Grab Bars:
      a. Push/Pull Point Load: 250 pound-force (1112 N), minimum.
      b. Dimensions: 1-1/4 inch (32 mm) outside diameter, minimum 0.05 inch (1.3 mm) wall thickness, exposed flange mounting, 1-1/2 inch (38 mm) clearance between wall and inside of grab bar.
      c. Finish: Satin.
      d. Length and Configuration: As indicated on drawings.
      e. Products:
         1) TA.01: Bobrick: B-5806x36
         2) TA.02: Bobrick: B-5806x42
         3) TA.03: Bobrick: B-5806x18.

G. TA.06: Sanitary Napkin Disposal Unit: Stainless steel, surface-mounted, self-closing door, locking bottom panel with full-length stainless steel piano-type hinge, removable receptacle.

H. TA.07: Coat Hook.
   1. Products:
   2. Bobrick: B-6727.

2.05 UNDER-LAVATORY PIPE AND SUPPLY COVERS

A. Under-Lavatory Pipe and Supply Covers:
   1. Insulate exposed drainage piping, including hot, cold, and tempered water supplies under lavatories or sinks to comply with ADA Standards.
   2. Exterior Surfaces: Smooth non-absorbent, non-abrasive surfaces.
   3. Construction: 1/8 inch (3.2 mm) flexible PVC.
      a. Surface Burning Characteristics: Flame spread index of 25 or less and smoke developed index of 450 or less, when tested in accordance with ASTM E84.
      b. Comply with ICC A117.1.
      c. Microbial and Fungal Resistance: Comply with ASTM G21.
   4. Color: White.
   5. Fasteners: Reusable, snap-locking fasteners with no sharp or abrasive external surfaces.

2.06 TA.08 DIAPER CHANGING STATIONS

A. Diaper Changing Station: Wall-mounted folding diaper changing station for use in commercial toilet facilities, meeting or exceeding ASTM F2285.
   1. Material: Stainless steel.
   2. Mounting: Recessed.

2.07 TA.13 UTILITY ROOM ACCESSORIES

A. Mop and Broom Holder: 0.05 inch (1.3 mm) thick stainless steel, Type 304, hat-shaped channel. See Plumbing Schedules.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions in locations indicated on drawings.

B. Mounting Heights: As required by accessibility regulations, unless otherwise indicated.

3.04 PROTECTION

A. Protect installed accessories from damage due to subsequent construction operations.

END OF SECTION

SECTION 10 4400
FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.01 REFERENCE STANDARDS

A. ASTM E814 - Standard Test Method for Fire Tests of Penetration Firestop Systems; 2013a (Reapproved 2017).

B. FM (AG) - FM Approval Guide; Current Edition.

C. NFPA 10 - Standard for Portable Fire Extinguishers; 2022.

D. UL (DIR) - Online Certifications Directory; Current Edition.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide extinguisher operational features.

C. Shop Drawings: Indicate locations of cabinets and cabinet physical dimensions.

1.03 FIELD CONDITIONS

A. Do not install extinguishers when ambient temperature may cause freezing of extinguisher ingredients.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Fire Extinguishers:
   1. Activar Construction Products Group, Inc. - JL Industries; Cosmic Extinguisher - Multipurpose Chemical: www.activarcpg.com/#sle.
   2. Potter-Roemer; _____: www.potterroemer.com/#sle.
   3. Substitutions: See Section 01 6000 - Product Requirements.

B. Fire Extinguisher Cabinets and Accessories:
   1. Kidde, a unit of United Technologies Corp; _____: www.kidde.com/#sle.
   2. Larsen's Manufacturing Co; _____: www.larsensmfg.com/#sle.
   3. Nystrom, Inc; _____: www.nystrom.com/#sle.
   4. Potter-Roemer; _____: www.potterroemer.com/#sle.
   5. _____.

2.02 FIRE EXTINGUISHERS

A. Fire Extinguishers - General: Comply with product requirements of NFPA 10 and applicable codes, whichever is more stringent.
   1. Provide extinguishers labeled by UL (DIR) or FM (AG) for purpose specified and as indicated.

B. Multipurpose Dry Chemical Type Fire Extinguishers: Carbon steel tank, with pressure gauge.
   1. Class: A:B:C type.
   2. Temperature range: Minus 40 degrees F (Minus 40 degrees C) to ___ degrees F (___ degrees C).

2.03 FIRE EXTINGUISHER CABINETS

A. Fire Rating: Listed and labeled in accordance with ASTM E814 requirements for fire resistance rating of walls where being installed.

B. Fire Rated Cabinet Construction: One-hour fire rated.

C. Cabinet Configuration: Recessed and Semi-recessed as indicated on plan type.
   1. Size to accommodate accessories.
   2. Provide cabinet enclosure with right angle inside corners and seams, and with formed perimeter trim and door stiles.

D. Door: 0.036 inch (0.9 mm) metal thickness, reinforced for flatness and rigidity with nylon catch. Hinge doors for 180 degree opening with two butt hinges.

E. Door Glazing: Acrylic plastic, clear, 1/8 inch (3 mm) thick, flat shape and set in resilient channel glazing gasket.

F. Cabinet Mounting Hardware: Appropriate to cabinet, with pre-drilled holes for placement of anchors.

G. Fabrication: Weld, fill, and grind components smooth.

H. Finish of Cabinet Exterior Trim and Door: No.4 - Brushed stainless steel.

I. Finish of Cabinet Interior: White colored enamel.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify rough openings for cabinet are correctly sized and located.

3.02 INSTALLATION

A. Install in accordance with manufacturer's instructions.

B. Install cabinets plumb and level in wall openings, ____ inches (____ mm) from finished floor to inside bottom of cabinet.

C. Secure rigidly in place.

D. Place extinguishers in cabinets.

END OF SECTION

SECTION 10 7500
FLAGPOLES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Aluminum Flagpoles.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete: Concrete base and foundation construction.

B. Section 26 0583 - Wiring Connections: Electrical characteristics and wiring connections.

1.03 REFERENCE STANDARDS

A. AASHTO M 36 - Standard Specification for Corrugated Steel Pipe, Metallic-Coated, for Sewers and Drains; 2016 (Reapproved 2020).

B. ASTM B241/B241M - Standard Specification for Aluminum and Aluminum-Alloy Seamless Pipe and Seamless Extruded Tube; 2022.

C. NAAMM FP 1001 - Guide Specifications for Design Loads of Metal Flagpoles; 2007.

1.04 SUBMITTALS

A. Product Data: Provide data on pole, accessories, and configurations.

B. Shop Drawings: Indicate detailed dimensions, base details, anchor requirements, and imposed loads.

C. Designer's Qualification Statement.

1.05 QUALITY ASSURANCE

A. Designer Qualifications: Design flagpole foundation under direct supervision of a Professional Structural Engineer experienced in design of this Work and licensed the State in which the Project is located.

1.06 DELIVERY, STORAGE, AND HANDLING

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Flagpoles:
   1. Concord American Flagpole; Internal - Independence: www.concordamericanflagpole.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 FLAGPOLES

A. Flagpoles: Designed in accordance with NAAMM FP 1001.
   1. Material: Aluminum.
   2. Design: Cone tapered.
   3. Mounting: Ground mounted type.
   4. Nominal Height: 30 ft (____ m); measured from nominal ground elevation.
   5. Halyard: Internal type, manual winch operation.
      a. Provide control stop device and removable handle.
      b. Provide flush access door secured with cylinder lock.

B. Performance Requirements:
   1. Wind Pressure Loading on Flagpole with Flag: Resistant without permanent deformation to 140 miles/hr (____ km/hr) wind speed, in accordance with NAAMM FP 1001; the factor of safety used is 2.5.

2.03 POLE MATERIALS

A. Aluminum: ASTM B241/B241M, 6063 alloy, T6 temper.

2.04 ACCESSORIES

A. Finial Ball: Aluminum. Size to match flagpole butt-diameter, unless indicated otherwise.

B. Truck Assembly: Cast aluminum; revolving, stainless steel ball bearings, non-fouling.
   1. Concealed revovling truck assembly.
   2. Finish truck assembly to match flagpole.

C. Halyard: 5/16 inch (8 mm) diameter stainless steel aircraft cable.

D. Counterbalance: Plastic coated counterweight and sling..

2.05 OPERATORS

A. Hand Crank: Removable _____ type.

2.06 MOUNTING COMPONENTS

A. Foundation Tube Sleeve: AASHTO M 36, corrugated 16 gauge, 0.0598 inch (1.52 mm) steel, galvanized, depth of ____ inches (____ mm) as indicated.

B. Pole Base Attachment: Flush; aluminum base with base cover.

2.07 FINISHING

A. Aluminum: Mill finish.

B. Finial: Gold anodized finish.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that concrete foundation is ready to receive work and dimensions are as indicated on shop drawings.

B. Verify that electric power is available and of the correct characteristics.

3.02 PREPARATION

A. Coat metal sleeve surfaces below grade and surfaces in contact with dissimilar materials with asphaltic paint.

3.03 INSTALLATION

A. Install flagpole, base assembly, and fittings in accordance with manufacturer's instructions.

3.04 TOLERANCES

A. Maximum Variation From Plumb: 1 inch (25 mm).

3.05 ADJUSTING

A. Adjust operating devices so that halyard and flag function smoothly.

END OF SECTION

SECTION 11 1313
LOADING DOCK BUMPERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Loading dock bumpers of molded rubber with attachment frame.

1.02 RELATED REQUIREMENTS

A. Section 03 1000 - Concrete Forming and Accessories: Placement of loading dock bumper frame anchors into concrete.

1.03 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Submit data on unit dimensions, method of anchorage, and details of construction.

C. Manufacturer's Installation Instructions: Submit installation requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Loading Dock Bumpers:

2.02 COMPONENTS

A. Loading Dock Bumpers: Molded rubber, ozone resistant, nylon reinforced, Shore A Durometer of 70, minimum, and tensile strength of 950 to 1050 psi (6550 to 7240 kPa), minimum.
   1. Projection From Wall: 3 inches (76 mm), minimum.
   2. Vertical Height: 10 inches (254 mm), minimum.
   3. Width: 5 inches (127 mm), minimum.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that anchor placement is acceptable.

3.02 INSTALLATION

A. Install dock bumpers in accordance with manufacturer's instructions.

B. Set plumb and level.

END OF SECTION

SECTION 11 1319
STATIONARY LOADING DOCK EQUIPMENT

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Recessed loading dock levelers.

B. Maintenance.

1.02 RELATED REQUIREMENTS

A. Section 03 3000 - Cast-in-Place Concrete.

B. Section 11 1313 - Loading Dock Bumpers.

1.03 REFERENCE STANDARDS

A. ANSI MH30.1 - Design, Testing, and Utilization of Dock Leveling Devices; 2022.

B. ASTM A123/A123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2017.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

1.05 QUALITY ASSURANCE

1.06 FIELD CONDITIONS

1.07 WARRANTY

A. See Section 01 7800 - Closeout Submittals, for additional warranty requirements.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Recessed Loading Dock Levelers:
   1. Blue Giant Equipment Corporation; _____: www.bluegiant.com/#sle.
   2. Rite-Hite Corp; _____: www.ritehite.com/#sle.
   3. Basis-Of-Desgin: RHH-4000 Series..

2.02 RECESSED LOADING DOCK LEVELERS

A. Recessed Loading Dock Levelers: Provide manufacturer92s standard loading dock levelers, in compliance with ANSI MH30.1 requirements, and of capacity, size, and construction as indicated, consisting of a nonslip steel platform, complete with controls, safety devices, and required accessories.
   1. Recessed Concrete Pit: Provide preformed concrete pit sized to fit dimensions of specified loading dock levelers.
      a. Ensure concrete slab is reinforced as required to support dock leveler.
      b. See Section 03 3000 for additional cast concrete requirements.
   2. Rated Capacity: Capable of supporting 30,000 lbs (13,608 kg) without permanent deflection or distortion.
   3. Platform Width: As indicated on drawings.
   4. Platform Length: As indicated on drawings.
   5. Toe Guards: Provide open sides of dock leveler with metal toe guards, equipped for entire upper operating-range.
   6. Range of Operating: Dock levelers to compensate for height differences between truck bed and loading platform, as follows; 12 inches (305 mm) above dock level, and 12 inches (305 mm) below dock level.
   7. Automatic Vertical Compensation: Floating travel of dock leveler ramp edge extended to automatically compensate for upward and downward movement of truck bed during loading and unloading operations.

8. Automatic Lateral Compensation: Tilting of dock leveler ramp edge extended and resting on truck bed to automatically compensate for canted truck bed up to 4 inches (102 mm) over width of ramp.
9. Ramp Edge Operation: Manufacturer's standard mechanism that automatically extends and supports hinged ramp edge and rests on truck bed over dock leveler's working range, allows ramp edge to yield under incoming truck impact and automatically retracts ramp edge when truck departs.

B. Hydraulic Operating System: Electric control from remote-control location, with fully hydraulic operation; electric-powered hydraulic raising and lowering of platform.
1. Electrical Power Requirements: ____ volts, three phase.
2. Packaged Unit: Provide leveler with unitized, totally enclosed, non-ventilated electric motor, pump, manifold reservoir, and valve assembly of required size, type, and capacity for operation of dock leveler indicated.
3. Independent Hinged Ramp Edge Operation: Provide electric-powered hydraulic raising and lowering of hinged ramp edge, controlled independent of platform raising and lowering.

C. Construction: Fabricate loading dock leveler frame, edge and platform supports from structural and formed steel shapes, with platform and hinged edge welded to supports, chamfer edge to minimize obstructing material-handling vehicles, and ensure entire assembly is fabricated to withstand deformation during operation and storage phases of service.
1. Ramp Traffic Support: Provide support for ramp at platform level in stored position with ramp edge retracted, and means to release supports allowing ramp to descend below platform level.
2. Ramp Maintenance Support: Provide mechanism in framework to support ramp in up position during dock leveler maintenance.

D. Finish: Manufacturer92s standard paint applied to factory-assembled and tested loading dock levelers prior to shipment.
1. Color of Surfaces: Manufacturer's standard color.
2. Color of Toe Guards: Paint with yellow and black stripes.

2.03 MATERIALS

2.04 FINISHES

A. Galvanizing: Hot-dip galvanize to minimum requirements of ASTM A123/A123M.
1. Touch up abraded areas after fabrication using specified touch-up primer for galvanized surfaces.

2.05 ACCESSORIES

A. Loading Dock Bumpers: See Section 11 1313.

B. Curb Angles at Edge of Recessed Leveler Pit: 3 inch by 3 inch (76 mm by 76 mm) galvanized steel angle, 1/4 inch (6.4 mm) thick, anchored to top edge of recessed leveler pit with 1/2 inch (12.7 mm) diameter by 6 inch (152 mm) long concrete anchors welded to angle at 6 inch (152 mm) on center.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine loading dock equipment area for compliance with requirements for installation tolerances and other conditions related to this work.

B. Examine rough-in for electrical systems of loading dock equipment to verify openings and locations are acceptable prior to installation of equipment.

3.02 PREPARATION

3.03 INSTALLATION

A. Install loading dock leveler unit in prepared opening in accordance with manufacturer's written instructions.

1. Set square and level.
2. Anchor unit securely, flush with dock, and weld back of leveling dock to pit frame; touch-up welds with primer.
3. Install electrical connections as required for fully operational system.

3.04 ADJUSTING

A. Adjust installed loading dock equipment and safety devices for smooth and balanced operation, and lubricate as recommended by manufacturer.

3.05 CLEANING

A. Clean recessed pits of debris.

3.06 CLOSEOUT ACTIVITIES

3.07 MAINTENANCE

A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

B. Provide service and maintenance of operating equipment for a period of five from Date of Substantial Completion.
   1. Includes monthly preventive maintenance, repair or replacement of worn or defective components, lubrication, cleaning, and adjusting as required for proper operation of loading dock equipment at rated speed and capacity.
   2. Provide manufacturer's authorized replacement parts and supplies.

END OF SECTION

SECTION 11 4000
FOOD SERVICE EQUIPMENT

PART 1 GENERAL

1.1 RELATED DOCUMENTS
A. The general provisions of the contract including general and supplementary conditions and general requirements apply to the work specified in this section.

1.2 RELATED WORK SPECIFIED ELSEWHERE
A. Plumbing: Refer to Division 22, including:
   1. Rough-in piping for gas and water supply and waste lines.
   2. Piping for supply and waste lines.
   3. Traps, grease traps, line strainers, tailpieces, valves, stops, shut-offs and miscellaneous fittings required for complete installation.
   4. Final connections.
   5. Indirect drains for sink compartments.

B. Mechanical: Refer to Division 23, including:
   1. Roof mounted fans and connecting ductwork not shown as part of the kitchen equipment.
   2. Final connections, including approved welded duct connections to hoods.

C. Electrical: Refer to Division 26, including:
   1. Rough-in conduit, wiring, line and disconnect switches, safety cut-offs and fittings, control panels, fuses, boxes and fittings required for complete installation.
   2. Final connections, including mounting and wiring of switches furnished as part of the food service equipment (unless otherwise indicated on the drawings).

1.3 WORK INCLUDED THIS SECTION:
A. Furnish and install all food service equipment as specified herein, including that which is reasonably inferred, with all related items necessary to complete work shown on contract drawings and/or required by these specifications.

B. Electrical Work:
   1. Interwiring of food service equipment between components within equipment, such as heating elements, switches, thermostats, motors, etc., complete with junction box as is applicable, ready for final connection.
   2. Voltages shall be as indicated on contract drawings. Any differences in electrical characteristics at job site from those shown on contract documents must be submitted to Architect for consideration prior to ordering equipment.

C. Plumbing Work:
   1. Furnish all equipment with faucets, sink waste assemblies, and trim as specified in this section.
   2. Other than sink compartments, extend all indirect waste lines to nearest floor receptor. All such drain lines to be properly sized. Drain shall terminate with proper air gap above flood rim of floor receptor. Drain lines to be copper with silver paint unless specified otherwise. Drain lines in public areas to be chrome plated where exposed to view.

D. Mechanical Work:
   1. Provide exhaust hoods with connection collars ready for final connection by HVAC Section.
   2. Provide stainless steel exposed ducts to ceiling for dishmachine.

E. Alternates: See Alternates affecting work in this section.

1.4 QUALITY ASSURANCE

A. It is required that all custom fabricated equipment such as food serving units, tables, sinks, counter tops, etc., be manufactured by a food service equipment fabricator who has the plant, personnel and engineering equipment required. Such manufacturer shall be subject to approval of Architect.
   All work in above category shall be manufactured by one manufacturer and shall be of uniform design and finish.
B. Manufacturer of this equipment must be able to show that he is now and for the past five years has been engaged in manufacture or distribution of equipment, as required under this contract, as his principal product.
C. Manufacturer of equipment herein specified shall be a recognized distributor for items of equipment specified herein which are of other manufacture than his own.
D. Only manufacturers who can meet the foregoing qualifications will be acceptable.
E. All work shall be done in an approved workmanlike manner, to the complete satisfaction of the Owner.

1.5 SUBMITTALS

A. Submit shop drawings as required by General Conditions. All shop drawings and rough-in drawings shall be CAD drafted and must be submitted in .DWF or .PDF electronic format. Multiple hard copies are not acceptable.
B. Shop drawings and bound brochures covering manufactured or "buy-out" items covering all work and equipment included in this contract shall be submitted to Architect as soon as possible after award of contract. After approval, Food Service Equipment Contractor shall furnish to Architect electronic files of shop drawings and brochures, corrected as required by virtue of review comments, for distribution to various interested trades on project. All costs of reproduction and submission shall be part of contract.
   Bound brochure and cut sheet submittals must be copied to Owner for review and comment.
C. Provide fully dimensioned rough-in plans at 1/4" scale, consisting of a separate drawing for each discipline. Each drawing shall show equipment shaded down 50%. Rough-in set shall include all required mechanical, electrical, plumbing, services for equipment and dimensioned rough-in location for same. Rough-in locations shown shall make allowances for required traps, switches, etc., thereby not requiring interpretation or adjustment on the part of other Contractors.
   Drawings shall indicate dimensions for floor depressions, wall openings, etc., for equipment. Food Service Equipment Contractor shall visit site to verify all rough-in and sleeve locations prior to installation of finished floors and shall cooperate with other Contractors involved in proper location of same. Food Service Equipment Contractor shall be responsible for any required relocations of rough-in due to errors or inaccuracies on those rough-in plans which he prepares.
D. Rough-in plans shall include all required services which relate to equipment but which may not directly connect thereto, such as convenience outlets at walls, hose stations, floor drains, etc.
E. Rough-in plans shall also include all required outlet services for equipment which is on drawing schedule, even though such equipment may not be included in this designated contract.
F. Fully dimensioned and detailed shop drawings of custom fabricated equipment items shall be submitted, drawn at 3/4" and 1 - 1/2" scale for plans, elevations and sections respectively.
   Drawings shall show all details of construction, installation, and relation to adjoining and related work where cutting or close fitting is required. Drawings shall show all reinforcements, anchorage, and other work required for complete installation of all fixtures.
G. Do not begin fabrication of custom manufactured equipment until approvals of shop drawings have been received and until field measurements have been taken by Food Service Equipment Contractor, where such measurements are necessary to assure proper conformance with intent of contract drawings and specifications.
H. Make field measurements, giving due consideration to any architectural, mechanical, or structural discrepancies which may occur during construction of building. No extra

compensation will be allowed for any difference between actual measurements secured at job site and dimensions indicated on contract drawings. Any differences which may be found at job site during field measurements shall be submitted to Architect for consideration before proceeding with fabrication of equipment.

I. Submit illustrative brochures for manufactured or "buy-out" equipment items, complete with illustrations, specifications, line drawings, rough-in requirements, and list of accessories or other specified additional requirements. Brochures shall be bound and shall include data on all equipment which is to be provided, arranged in numerical sequence which conforms to item numbers of specifications. Omission of data does not reduce obligation to provide items as specified.

J. Approval of shop schedules and brochures will be in general and shall be understood to mean that Architect has no objection to use of materials or processes shown. Approval does not relieve Food Service Equipment Contractor from responsibility for errors, omissions, or deviations from contract requirements.

1.6 SUBSTITUTIONS - STANDARDS

A. Refer to Instructions to Bidders and Division 01 for requirements.

B. All unspecified substitutions after bid must be submitted to Owner for written approval prior to acceptance.

1.7 DRAWINGS

A. Drawings which constitute part of contract documents indicate general arrangement of piping and location of equipment. Should it be necessary to deviate from arrangement indicated in order to meet structural conditions, make such deviations without expense to Owner.

B. Specifications and drawings are reasonably exact, but their extreme accuracy is not guaranteed. Drawings and specifications are for assistance and guidance of Contractor, and exact locations, distances and levels shall be governed by the building.

1.8 MANUFACTURER'S DIRECTIONS

A. Follow manufacturer's directions in all cases where manufacturers of articles used in this contract furnish directions or prints covering points not shown on drawings or specifications.

1.9 INDUSTRY STANDARDS

A. Electric operated and/or heated equipment, fabricated or otherwise, shall conform to latest standards of National Electric Manufacturers Association and of Underwriters Laboratories, Inc., and shall bear the U.L. label.

B. Cooking and hot food holding equipment shall meet minimum construction standards as noted by NSF #4.

C. Refrigeration equipment shall meet minimum construction standards as noted by NSF #7.

D. Items of food service equipment furnished shall bear the N.S.F. seal.

E. Food service equipment shall be installed in accord with N.S.F. standards.

F. Work and materials shall be in compliance with requirements of applicable codes, ordinances and regulations, including but not limited to those of Occupational Safety and Health Act (OSHA), National Fire Protection Association, State Fire Marshal, State Accident Commission, U.S. Public Health Service, State Board of Health, local health codes, etc.

G. No extra charge will be paid for furnishing items required by regulations, even though such may not be shown on drawings or called for in these specifications.

H. Rulings and interpretations of enforcing agencies shall be considered part of regulations.

PART 2 - PRODUCTS

2.1 MANUFACTURED EQUIPMENT

A. All like types of equipment such as all refrigerated and heated cabinets, all ovens, and all mixers shall be by the same manufacturer.

B. Except as may be specified otherwise under individual item specifications in “Equipment Schedule", all items of standard manufactured equipment shall be complete in accord with manufacturer's standard specification for specific unit or model called for, including finishes, components, attachments, appurtenances, etc., except as follows:
C. All items of standard equipment shall be that manufacturer's latest model at time of delivery.
D. Substitutions for manufactured equipment specified will be accorded consideration under terms set forth in "Substitutions - Standards".

2.2 FABRICATED EQUIPMENT

A. Stainless steel shall be U.S. standard gauges as called for, 18-8, Type 302, Type 304, No. 4 finish.
B. Galvanized iron shall be Armco or equal. Framework of galvanized iron shall be welded construction, having welds smooth, and where galvanizing has been burned off, touched up with high grade aluminum bronze.
C. Legs and crossrails shall be continuously welded, unless otherwise noted, and ground smooth.
D. Bottom of legs at floor shall be fitted with sanitary stainless-steel bullet type foot, with not less than 2" adjustment.
E. Legs shall be fastened to equipment as follows:
    1. To sinks by means of closed gussets. Gussets shall be stainless steel, reinforced with bushing, having set screws for securing legs.
    2. To tables and drainboards with closed gussets which shall be welded to stainless steel hat sections or channels, 14 gauge or heavier, exposed hat sections having closed ends. Bracing shall be welded to underside of tops.
F. Closed gussets shall be a 3" minimum diameter at top, continuously welded to frame members
or to sink bottom.
G. Sinks, unless otherwise specified, shall be furnished with rotary type waste outlets, without connected overflows: Atlantic Brass Works Model 772-RB; Fisher Brass Foundry Model 250A; T&S; or approved equal. Where exposed, furnish wastes chromium plated.
H. Rolls shall be 1 1/2" diameter, except as detailed contrary, with corners bullnosed, ground and polished.
I. Seams and joints shall be shop welded. Welds to be ground smooth and polished to match original finish. Materials 18 gauge or heavier shall be welded.
J. Metal tops shall be one-piece welded construction, unless specified otherwise, reinforced on underside with stainless steel hat sections or channels welded in place. Crossbracing to be not more than 30" on centers.
K. Drawers to be 18-gauge stainless steel channel type housing and drawer cradle, both housing and cradle being reinforced and welded at corners, housing being secured to underside of table top, and both housing and cradle being sized for and fitted with 18-gauge 20" x 20" x 5" deep stainless-steel drawer insert having coved corners. Drawer insert shall be easily removable from cradle without tools or having to remove entire drawer. Drawers to have stainless steel fronts. Provide with recessed flush type stainless steel pulls.
L. Support drawer on fabricated 14-gauge stainless steel interlocking channel solid delrin ball bearing wheels. Support slides shall be load rated at 200 lb. per pair. Slides to be Component Hardware S52 Series.
M. Enclosed cabinet type bases shall be made of formed steel sheets reinforced with formed steel sections to create a rigid structure. Steel shall be 18-gauge or heavier. Base shall be welded construction throughout with front rails, mullions, etc., welded to appear as one-piece construction. All exposed sections of interior and exterior shall be stainless steel, and unexposed sections shall be galvanized steel, unless specified contrary.
N. Hardware shall be solid materials and except where unexposed or specified contrary, of cast brass, chrome plated. Stampings are not acceptable. Identify all hardware with manufacturer's name and number so that broken or worn parts may be ordered and replaced.

O. Fabricate sink compartments with fully coved vertical and horizontal corners. Multiple compartment partition to be double thickness, continuously welded where sheets join at top. Front of multiple compartment sinks to be continuous on exterior. Bottoms shall be creased to drain.
P. Ends of all fixtures, splashbacks, shelves, etc., shall be finished flush to walls or adjoining fixtures.
Q. Dishtables, draintables, splashbacks and turned-up edges shall have radius bends in all horizontal and vertical corners, coved at intersections.
R. Rounded and coved corners or radius bends shall be 1/2" radius or longer.
S. Shelves in fixtures with enclosed bases shall be turned up on back and sides and feathered slightly to insure tight fit to enclosure panels. Bottom shelves shall be made for easy removal unless otherwise noted.
T. Undersides of tops to be coated with heavy-bodied resinous material compounded for permanent, non-flaking adhesion to metal, 1/8" thick, applied after reinforcing members have been installed, drying without dirt-catching crevices.

2.3 HEATING EQUIPMENT

A. Wherever electric heating equipment or thermostat control for such equipment is specified, it shall be complete, and of the materials, size and rating specified within equipment item or details. All such equipment shall be designed and installed to be easily cleaned or to be easily removed for cleaning.
B. Electrical appliances or heating element circuits of 120 volts shall not exceed 1650 watts, unless specifically shown contrary.

2.4 SWITCHES AND CONTROLS

A. Food Service Equipment Contractor shall supply on each motor driven appliance or electrical heating unit suitable control switch of proper type in accord with Underwriter's Code.
B. All internal wiring for fabricated equipment items included, all electrical devices, wiring, controls, switches, etc., built into or forming an integral part of these items shall be furnished and installed by Food Service Equipment Contractor in his factory or building site with all items complete to junction box for final connection to building lines by Electrical Contractor.
C. Provide standard 3-prong plugs to fit "U" slot grounding type receptacles, similar to No. 5262, for all equipment items powered by plugging into 110-120 volts, single phase AC. Also, provide suitable length 3-wire cord for equipment.

2.5 CONNECTION TERMINALS

A. All equipment shall be complete with connection terminals as standardized by equipment manufacturers, except where specified otherwise.

PART 3 - EXECUTION

3.1 GENERAL

A. Work under this contract and covered under this section of specifications includes but is not limited to:
    1. Cutting of holes and/or ferrules on equipment for piping, drains, electrical outlets, conduits, etc. as required to coordinate installation of food service equipment with work of other Contractors on project.
    2. Field checking of building and rough-in requirements, and submission of brochures and shop drawings, all as required hereinbefore under "Submittals".
    3. Repair of all damage to premises as result of this installation, and removal of all debris left by those engaged in this installation.
    4. Having all food service equipment fixtures completely cleaned and ready for operation when building is turned over to Owner.

3.2 INSTALLATION PROCEDURES

A. Food Service Equipment Contractor shall make arrangements for receiving his custom fabricated and "buy out" equipment and shall make delivery into building as requisitioned by his installation superintendent. He shall not consign any of his equipment to Owner or to any other Contractor unless he has written acceptance from them and has made satisfactory arrangements for the payment of all freight and handling charges.
B. Food Service Equipment Contractor shall deliver all of his custom fabricated and "buy out" equipment temporarily in its final location, permitting Trades to make necessary arrangements for connection of service lines; he shall then move equipment sufficiently to permit installation of service lines, after which he shall realign his equipment level and plumb, making final erection as shown on contract drawings.
C. All portable or counter mounted equipment weighing in excess of 25 pounds shall be mounted on 4" stainless steel adjustable legs.
D. This Contractor shall coordinate his work and cooperate with other trades working at site toward the orderly progress of the project.
E. Architect or Owner's Agent shall have access at all times to plant or shop in which custom fabricated equipment is being manufactured, from time contract is let until equipment is shipped, in order that progress of work can be checked, as well as any technical problem which may arise in coordination of equipment with building. Any approval given at this point of manufacture shall be tentative, subject to final inspection and test after complete installation.
F. Food Service Equipment Contractor shall assist Architect, Owner, and/or Owner's Agent in making any desired tests during or prior to final inspection of equipment; he shall remove immediately any work or equipment rejected by Architect, Owner, and/or Owner's Agent, replacing same with work conforming with contract requirements, and shall reimburse mechanical and/or other contractors involved for extra work made necessary by such replacement.
G. This Contractor shall keep premises free from accumulation of his waste material and rubbish, and at completion of his work shall remove his rubbish and implements, leaving areas of his work broom clean.
H. This Contractor shall provide and maintain coverings or other approved protection for finished surfaces and other parts of his equipment subject to damage during and after erection. After removal of protective coverings, all field joints shall be ground and polished, and entire work shall be thoroughly cleaned and polished.

3.3 TRIMMING AND SEALING EQUIPMENT

A. Seal completely spaces between all units to walls, ceilings, floors, and adjoining (not portable) units with enclosed bodies against entrance of food particles or vermin by means of trim strips, welding, soldering, or commercial joint material best suited to nature of equipment and adjoining surface material.
B. Close ends of all hollow sections.
C. Equipment butting against walls, ceilings, floor surfaces and corners to fit tightly against same; backsplashes or risers which fit against wall to be neatly scribed and sealed to wall with DowCorning # 732 RTV or General Electric clear silicone sealant, wiping excess sealant out of joint to fillet radius. Where required to prevent shifting of equipment and breaking wall seal, anchor item to floor or wall.
D. Treat enclosed spaces (inaccessible after equipment installation) for vermin prevention in accord with industry practice.

3.4 TESTING AND DEMONSTRATION OF EQUIPMENT

A. After completion of installation, all equipment using water, gas, and electricity shall be performance inspected and tested by factory certified service agent, including wet test of hood fire suppression systems, if so required. Food Service Equipment Contractor shall document that these inspections have been performed prior to scheduling demonstrations and Owner acceptance of equipment.
B. Food Service Equipment Contractor shall arrange to have all manufactured, mechanically operated equipment furnished under this contract demonstrated by authorized

representatives of equipment manufacturers, these representatives to instruct Owner's designated personnel in use, care and maintenance of all items of equipment after same are in working order. Demonstration and instruction shall be held on dates designated by Owner.

C. Food Service Equipment Contractor shall provide a competent service representative to be present when installation is put into operation.

3.5 EQUIPMENT HANDLING AND STORAGE

A. Deliver equipment to site, properly crated and protected, and store in safe place, protected from damage until time for installation.

3.6 GUARANTEE

A. Special Project Warranty: Provide written warranty, signed by manufacturer, agreeing to replace/repair, within warranty period, with inadequate and defective materials and workmanship, including leakage, breakage, improper assembly, or failure to perform as required, provided manufacturer's instructions for handling, installing, protecting, and maintaining units have been adhered to during warranty period. This warranty shall be in addition to, and not limitation of, the rights the Owner may have against the Contractor under the Contract Documents.

B. Warranty Period:
1 year from date of Substantial Completion, all new equipment furnished. However, manufacturer’s warranty shall prevail when the period is longer than one year.
5 years warranty period on refrigeration compressors.

3.7 OPERATING AND MAINTENANCE MANUALS

A. After completion of installation, Food Service Equipment Contractor shall present to Owner three sets of all operating and maintenance manuals, covering all mechanically operated equipment furnished under this contract, each set being neatly bound in looseleaf binder having durable cover.

B. Include in each binder a list of names, addresses and telephone numbers of local servicing agencies authorized to make necessary repairs and/or adjustments of equipment furnished under this contract.

PART 4 – FOOD SERVICE EQUIPMENT

ITEM 01 MOBILE HEATED CABINET QUANTITY AS SCHEDULED

Provide mobile heating and proofing cabinet having the following features:
A. Insulated
B. Mobile
C. Full height
D. Dutch clear polycarbonate doors
E. Removable bottom mount control module
F. Thermostat to 200°F
G. Fixed wire slides on 3" centers (17) 18" x 26" or (32) 12" x 20" x 2-1/2" pan capacity
H. 5" Casters (2 with brakes)
I. Aluminum construction
I. Voltage as scheduled, cord and plug
Mobile heated cabinet to be as manufactured by Metro, Model C539-HDC-4, Alto-Shaam, or Continental.

ITEM 02 COMBI OVEN, ELECTRIC QUANTITY AS SCHEDULED

Provide electric combi-oven with the following features:
A. Electric, boiler-free, countertop
B. Seven (7) 18" x 26" full size sheet or (16) 12" x 20" full size hotel pan capacity
C. Wi-Fi enabled control with steam/convection/combi cooking modes

D. Removable "T" style temperature probe
E. Two (2) power levels, programmable cool-down
F. Steam venting
G. Five (5) cleaning levels
H. Triple-pane door
I. High efficiency LED lighting
J. Two (2) side racks with (8) non-tilt support rails
K. Door hinged right
L. Stainless steel construction
M. Adjustable stainless steel legs
N. ENERGY STAR®
O. Voltage as scheduled, direct connection
P. Equipment stand
Q. Water filter
R. Backflow preventer
S. 7-20EVH Factory installed condensation hood

Combination oven to be as manufactured by Alto-Sham, Model 7-20E PRO, Blodgett, or Unox.

ITEM 03 WORK TABLE, W/PREP SINK(S) QUANTITY AS SCHEDULED

Provide work table with the following features:
A. 72"W x 30"D x 40-3/4"H Overall size
B. (1) 16"W x 20" Front-to-back x 12" deep sink bowl on left, lever waste with support bracket
C. 5"H Backsplash
D. 16/300 Stainless steel top, stainless steel legs & adjustable undershelf
F. 1" Stainless steel adjustable bullet feet
G. HD Deck mount faucet, 10” swing spout
H. HD Drawer, 20"W x 20" front-to-back x 5" deep

Worktable as manufactured by John Boos, Model EPT6R5-3072SSK-L, Eagle Group or Advance Tabco.

ITEM 04 WORK TABLE, 60”, S/S TOP QUANTITY AS SCHEDULED

Provide work table with the following features:
A. 60"W x 30"D
B. 16/300 Stainless steel top
C. Safety edge front & back, 90° turndown on sides
D. Stainless steel legs & adjustable undershelf
E. 5” Heavy duty casters, locking

Work table to be as manufactured by John Boos, Model No. ST6-3060SSK, Eagle Group, or Advance Tabco.

ITEM 05 ROLL-IN REFRIGERATOR QUANTITY AS SCHEDULED

Provide roll-in refrigerator with the following features:
A. Two-section
B. 78.35 Cu. ft.
C. Top mounted self-contained refrigeration system
D. (2) Full-height solid right hinged doors with lock
E. Digital temperature display/controls
F. LED interior lighting
G. Stainless steel ramp & floor accommodate roll in racks up to 72"H
H. Stainless steel interior
I. Stainless steel exterior front, sides & top
J. R290 Hydrocarbon refrigerant
K. 1/2 HP
L. Voltage as scheduled, cord and plug

Roll-in refrigerator to be as manufactured by Hoshizaki, Model RN2A-FS, Beverage Air, or Continental.

ITEM 06 NOT USED

ITEM 07 REACH-IN REFRIGERATOR QUANTITY AS SCHEDULED

Provide refrigerator with the following features:
A. Reach-in, two-section
B. 38.61 Cu. ft., bottom mounted self-contained refrigeration
C. (6) Adjustable epoxy coated shelves
D. (2) Full-height solid hinged doors with locks
E. Digital temperature display/controls
F. Temperature alarms
G. LED interior lighting
H. Stainless steel interior floor
I. Aluminum interior sides, rear, & top, stainless steel front
J. Gray painted steel exterior sides, top & rear
K. (6) 4" Casters (2 with brakes)
L. R290 Hydrocarbon refrigerant
M. Voltage as scheduled, cord and plug
N. ENERGY STAR®

Reach-in refrigerator to be as manufactured by Hoshizaki, Model No. ER2A-FS, Beverage Air, or Continental.

ITEM 08 REACH-IN FREEZER QUANTITY AS SCHEDULED

Provide freezer with the following features:
A. Reach-in, one-section
B. 17.74 Cu. ft., bottom mounted self-contained refrigeration
C. (3) Adjustable epoxy coated shelves
D. (1) Full-height solid hinged door with locks
E. Digital temperature display/controls
F. Temperature alarms
G. LED interior lighting
H. Stainless steel interior floor
I. Aluminum interior sides, rear, & top, stainless steel front
J. Gray painted steel exterior sides, top & rear
K. (6) 4" Casters (2 with brakes)
L. R290 Hydrocarbon refrigerant
M. Voltage as scheduled, cord and plug

Reach-in freezer to be as manufactured by Hoshizaki, Model No. EF1A-FS, Beverage Air, or Continental.

ITEM 09 ICE MAKER, CUBE-STYLE QUANTITY AS SCHEDULED

Provide ice maker with the following features:
A. Air-cooled
B. Self-contained condenser
C. 22"W x 24-1/2"D x 21-1/2"H
D. Up to 575-lb approximately/24 hours
E. EasyTouch display with 13 different language options
F. Date/time stamp display
G. Automatic reminder/alert icon
H. One touch asset information
I. Automatic detection of accessories
J. Continuous operating status
K. Programmable production options (time, weight, day or night)

L. One touch cleaning with displayed instructions
M. Anti-microbial protection
N. Acoustical ice sensing probe
O. Self-diagnostic technology
P. Half-dice size cubes
Q. R410 Refrigerant
R. Water filter
S. Backflow preventer
T. 6” Stainless steel adjustable legs
U. Voltage as scheduled, direct connection
V. ENERGY STAR®

Ice maker to be as manufactured by Manitowoc, Model IYT0620A, Scotsman, or Ice-O-Matic.

ITEM 09.1 ICE BIN QUANTITY AS SCHEDULED

Provide ice bin with the following features:
A. 22"W, 34"D x 50"H
B. With side-hinged front-opening door
C. Side grips
D. 383 Lbs. application capacity
E. AHRI certified 12.9 cu. ft.
F. For top-mounted ice maker
G. Duratech exterior

Ice bin to be as manufactured by Manitowoc, Model D420, Scotsman, or Ice-O-Matic.

ITEM 10 NOT USED

ITEM 11 DISHTABLE, W/POTSINKS QUANTITY AS SCHEDULED

Provide dishtable with the following features:
A. Straight design
B. 103-5/8"W x 30-3/8"D x 44-1/16"H overall size
C. (3) 18"W x 24" front-to-back x 14" deep sink compartments, lever wastes
D. (2) 24" Drainboards
E. 10"H backsplash
F. (1) Set of splash mount faucet holes with 8" centers
G. (3) Rack slides with storage bracket
H. 16/300 Stainless steel construction, stainless steel legs, bracing, & adjustable bullet feet
I. Pre-rinse unit
J. Add-on-faucet, 16" swing spout

Dishtable to be as manufactured by John Boos, Model No. DT3B18244-2D24R, Eagle Group, or Advance Tabco.

ITEM 12 DISHWASHER, DOOR TYPE QUANTITY AS SCHEDULED

Provide ventless dishwasher with the following features:
A. Extended hood (27" opening for trays)
B. Ventless heat recovery
C. High temperature sanitizing with built-in stainless steel electric booster for (40°-70° rise)
D. (40) racks/hour capacity
E. Auto start
F. Voltage as scheduled, single point direct connection
G. Door interlock switch
H. On-board service diagnostics
I. Rinse Sentry feature
J. Auto-fill

K. Detergent & chemical connections
L. Interchangeable upper & lower spray arms
M. Automatic drain valve
N. Vent fan control
O. Bottom mounted HMI controls
P. Mounted water PRV
Q. Stainless steel construction
R. Electric tank heat
S. Peg rack
T. Flat rack
U. 2 HP self-draining pump
V. Drainwater tempering kit

Dishwasher to be as manufactured by Champion, Model No. DH-6000T-VHR, Meiko, or Hobart.

ITEM 13 CLEAN DISHTABLE QUANTITY AS SCHEDULED

Provide clean dishtable with the following features:
A. Straight design
B. 60"W x 30"D x 44"H overall size
C. Right-to-left operation
D. 10"H boxed backsplash with 45° & 2" return
E. 2-1/4"H rolled edge
F. 14/300 Stainless steel top, stainless steel legs, bracing, & adjustable bullet feet

Clean dishtable to be as manufactured by John Boos, Model No. CDT6-S60SBK-L, Eagle Group, or Advance Tabco.

ITEM 14 DISHTABLE SORTING SHELF QUANTITY AS SCHEDULED

Provide sorting shelf with the following features:
A. 42"W x 18"D x 12-1/4"H
B. Wall mounted
C. Slanted
D. Tubular
E. Includes brackets
F. 16/300 stainless steel

Sorting shelf to be as manufactured by John Boos, Model No. BHS1842-TS, Advance Tabco, or Eagle.

ITEM 15 HAND SINK QUANTITY AS SCHEDULED

Provide hand sink with the following features:
A. Wall mount
B. 14"W x 10" front-to-back x 5" deep bowl
C. Splash mount electric eye faucet with 3-1/2" gooseneck spout
D. All stainless steel construction

Hand sink to be as manufactured by John Boos, Model No. PBHS-W-1410-EE, Advance Tabco, or Eagle.

ITEM 16 WIRE SHELVING UNIT QUANTITY AS SCHEDULED

Provide shelving unit with the following features:
A. Arrange using quantities and sizes as shown on plan drawings
B. 600 - 800 lb. Capacity
C. Includes (4) wire shelves & (4) posts
D. Green epoxy antimicrobial finish
E. Caster mounted, with bumpers

Wire shelving unit to be as manufactured by Quantum, Model No. WR74-2148P, Eagle Group, or Metro.

ITEM 17 MOP SINK CABINET QUANTITY AS SCHEDULED

Provide janitor cabinet with the following features:
A. 48"W x 22-1/2"D x 84"H overall size
B. Enclosed cabinet with open back for plumbing
C. (2) Lockable louvered swing doors
D. 20" x 16" x 12" deep mop sink with drain on left
E. Overhead shelf on left
F. (2) Side mounted mop/broom holder with locking cam and panel-less back on left
G. (3) Shelves and bottom storage area on right
H. (1) Service faucet with vacuum breaker and 120" hose on right
I. 18/300 stainless steel
J. Hose bib
Mop sink cabinet to be as manufactured by John Boos, Model No. PBJC-224884-L, Eagle Group, or Advance Tabco.

ITEM 18 UTILITY CART QUANTITY AS SCHEDULED

Provide bussing utility cart with the following features:
A. 39.5"W x 22"D x 37.25"H
B. Stainless construction
C. (3) Shelves
D. 5" Casters
E. 500 Lb. distributed weight capacity
F. Push handle
Utility cart to be as manufactured by Channel Manufacturing, Model No. US2135-3, Cambro, or Carlisle.

ITEM 19 UNIVERSAL PAN RACK QUANTITY AS SCHEDULED

Provide universal pan rack with the following features:
A. 20.5"W x 26"D x 64"H
B. Aluminum construction
C. End load
D. 3" Angle spacing
E. (18) 18" x 26" or (36) 13" x 18" (2 per shelf) or 12" x 20" steam table pans
F. 5” Stem casters
Universal pan rack to be as manufactured by Channel Manufacturing, Model No. UTR-18, Eagle Group, or Metro.

ITEM 20 NOT USED

ITEM 21 REACH-IN HEATED CABINET QUANTITY AS SCHEDULED

Provide heated cabinet with the following features:
A. One-section
B. Framed glass door version, (1) glass door with lock
C. (3) HD chrome plated shelves
D. Interior lighting
E. Stainless steel front, aluminum sides, stainless steel interior
F. 4" Casters
G. Voltage as scheduled, cord and plug
Reach-in heated cabinet to be as manufactured by True, Model TH-23G~FGD01, Continental, or Beverage Air.

ITEM 22 REACH-IN REFRIGERATOR QUANTITY AS SCHEDULED

Provide refrigerator with the following features:
A. Two-section
B. Framed glass door version, (2) glass doors
D. (6) PVC coated adjustable wire shelves
E. LED interior lighting
F. Stainless steel front, aluminum sides, clear coated aluminum interior with stainless steel floor
G. 4" Casters
H. R290 Hydrocarbon refrigerant
I. Voltage as scheduled, cord and plug
Reach-in heated cabinet to be as manufactured by True, Model T-35G-HC~FGD01, Continental, or Beverage Air.

ITEM 23 DISPLAY CASE QUANTITY AS SCHEDULED

Provide refrigerated/non-refrigerated display case with the following features:
A. Dual Zone (dry/refrigerated), R290 Hydrocarbon refrigerant, self-contained
B. 59-1/4"W
C. Curved glass front
D. Solid colored sides
E. (2) rear sliding glass doors
F. (3) tiered levels of adjustable white PVC coated wire shelves (6 shelves total)
G. LED interior lighting
I. Black powder coated exterior
J. White powder coated interior
K. R290 Hydrocarbon refrigerant
L. 1/4 HP
M. Voltage as scheduled, cord and plug
Refrigerated display case to be as manufactured by True, Model TGM-DZ-59-SC/SC-B-W, Federal Industries, or Structural Concepts.

ITEM 24 ESPRESSO CAPPUCCINO MACHINE QUANTITY AS SCHEDULED

Provide automated espresso coffee machine with the following features:
A. 2 Group
B. Super automatic
C. Up to 350 espresso per hour production capacity
D. (2) 10" Touch screen controls
E. Electronic micro air dosing system
F. Electric milk texturizing system
F. (2) Ceramic burr grinders
G. (2) 3.3 lb. Coffee bean hoppers
H. (1) 5.6 Liter steam boiler
I. (2) 1.5 liter coffee boilers
J. Brown & black exterior
K. Water filter
L. Backflow preventer
M. Voltage as scheduled, cord and plug
Espresso cappuccino machine to be as manufactured by Eversys Inc., Model No. ENIGMA E'4M X-WIDE, Franke, or Schaerer.

ITEM 25 REFRIGERATED PREP UNIT QUANTITY AS SCHEDULED

Provide refrigerated sandwich/salad unit with the following features:
A. Self-contained refrigeration, R290 Hydrocarbon refrigerant
B. (12) 1/6 size (4"D) poly pans
C. Stainless steel insulated cover

D. 8-7/8"D cutting board
E. (2) Full doors
F. (4) PVC coated adjustable wire shelves
G. Stainless steel top, front and sides
H. Steel back
I. Aluminum interior with stainless steel floor
J. 5" Casters
K. Voltage as scheduled, cord and plug

Sandwich mega-top to be as manufactured by True, Model TSSU-36-12M-B-HC, Continental, or Beverage Air.

ITEM 26 RAPID COOK OVEN QUANTITY AS SCHEDULED

Provide rapid cook oven with the following features:
A. Electric
B. Countertop
C. Combination impinged air
D. Bottom infrared heat & microwave cooking
E. Ventless with removable catalytic converter
F. 0.74 Cu. ft. capacity
G. Variable-speed impingement airflow
H. Independently controlled top and bottom heaters
I. Manual mode
J. 86° to 608°F temperature range
K. Up to 1024 recipes, USB port
L. Includes: (1) baking stone, (1) cooking basket, (1) aluminum paddle & (1) USB drive
M. Stainless steel interior & exterior
N. Voltage as scheduled, cord and plug

Rapid cook oven to be as manufactured by Pratica Products Inc., Model No. ROCKET EXPRESS, Turbo Chef, or APW.

ITEM 27 UNDERCOUNTER REFRIGERATOR QUANTITY AS SCHEDULED

Provide undercounter refrigerator with the following features:
A. 33 - 38°F
B. (1) Stainless steel door
C. (2) PVC coated adjustable wire shelves
D. ENERGY STAR®
E. Stainless steel top, front & sides
F. Aluminum interior with stainless steel floor
G. Front breathing
H. R290 Hydrocarbon refrigerant
I. Caster mounted, 31-5/8" work surface height
J. Voltage as scheduled, cord and plug

Undercounter refrigerator to be as manufactured by True Manufacturing Co., Inc. Model No. TUC-24-HC, Beverage Air, or Continental.

ITEM 28 DRAFT BEER COOLER QUANTITY AS SCHEDULED

Provide draft beer cooler with the following features:
A. 23-1/2"W
B. (1) 1/2 Keg capacity
C. Stainless steel counter top
D. (1) Door with lock
E. (1) Column type beer faucet
F. Stainless steel exterior, galvanized interior with stainless steel floor

G. Caster mounted
H. R290 Hydrocarbon refrigerant
I. ENERGY STAR®
J. Voltage as scheduled, cord and plug
K. Two-way manifold
L. Draft column with double faucet

Beer cooler to be as manufactured by True Manufacturing Co., Model No. TDD-1-S-HC, Beverage Air, or Continental.

ITEM 29 ICE BIN / ICE CADDY QUANTITY AS SCHEDULED

Provide mobile ice caddy with the following features:
A. With sliding lid
B. 11"W x 24"D x 29"H
C. Stainless steel
D. 53 Lb. capacity
E. Removable bottom tray
F. Drain valve in rear of unit
G. 3" Casters with brake

Mobile ice caddy to be as manufactured by BK Resources, Model BK-MIB-2411, Cambro, or Carlisle.

ITEM 30 NOT USED

ITEM 31 UNDERCOUNTER FREEZER QUANTITY AS SCHEDULED

Provide reach-in refrigerator with the following features:
A. One-section
B. 27"W
C. (2) Drawers
D. Adjustable temperature control
E. Automatic defrost
F. Aluminum interior, stainless steel & galvanized exterior
G. 3" Casters
H. Rear-mounted self-contained refrigeration, R290
I. Front breathing
J. Voltage as scheduled, cord and plug

Undercounter freezer to be as manufactured by Silver King, Model No. SKF27A-EDUS1, True, or Victory.

ITEM 32 DROP-IN SINK QUANTITY AS SCHEDULED

Provide drop-in sink with the following features:
A. 1-Compartment
B. 16-1/2"W x 17-1/2"D x 17-1/4"H overall size
C. (1) 11-1/2"W x 9-1/4" front-to-back x 6" deep bowl, lever waste
D. Deck mount faucet holes with 4" centers
E. HD Faucet
F. With left & right side splashes
G. Stainless steel construction
H. Integrated towel dispenser
I. Soap dispenser

Drop-in sink to be as manufactured by John Boos, Model No. PB- DISINK091106-STD, Eagle Group, or Advance Tabco.

ITEM 33 DROP-IN SINK QUANTITY AS SCHEDULED

Provide drop-in sink with the following features:

A. 1-Compartment
B. Self-rim design
C. 16"W x 14" front-to-back x 12" deep bowl, lever waste
D. 8" OC faucet holes (1-1/4" diameter hot & cold water, 1" diameter center hole)
E. 18/304 Stainless steel
G. HD faucet

Drop-in sink to be as manufactured by Advance Tabco, Model No. SS-1-1919-12, John Boos, or Eagle Group.

ITEM 34 UNDERCOUNTER REFRIGERATOR QUANTITY AS SCHEDULED

Provide undercounter refrigerator with the following features:
A. 33 - 38°F
B. (2) Stainless steel doors
C. (4) PVC coated adjustable wire shelves
D. ENERGY STAR®
E. Stainless steel top, front & sides
F. Aluminum interior with stainless steel floor
G. R290 Hydrocarbon refrigerant
H. Caster mounted, 31-7/8" work surface height
I. Voltage as scheduled, cord and plug

Undercounter refrigerator to be as manufactured by True Manufacturing Co., Inc. Model No. TUC-36-HC, Beverage Air, or Continental.

ITEM 35 COFFEE BREWER QUANTITY AS SCHEDULED

Provide coffee maker with the following features:
A. 18.9 Gal/hr.
B. Coffee extraction controlled with pre-infusion & pulse brew
C. Digital temperature control
D. Large spray head
E. Automatic programming
F. Stores individual recipes
G. Splashguard & optional funnel locks
H. Black finish
I. Lower hot water faucet
J. Wireless brewer-grinder interface
K. Holds (2) 1-1/2 gallon thermo-servers
L. Voltage as scheduled, direct connection
M. Water filter
N. Backflow preventer
O. Thermos service dispenser(s)

Coffee maker to be as manufactured by BUNN, Model No. 34600.0001 or approved equal.

ITEM 36 P.O.S. STATION N.I.K.C.

This item is to be furnished by Owner.

ITEMS 37-40 NOT USED

END OF SECTION 114000

Specifications

10/13/2023

Project
Museum of the Marine

From

ITEM 01 - MOBILE HEATED CABINET (2 REQ'D)



Metro Model C539-HDC-4 Dimensions: 71(h) x 27.63(w) x 31.5(d)

C5™ 3 Series Heated Holding Cabinet, with Red Insulation Armour™, mobile, full height, insulated, Dutch clear polycarbonate doors, removable bottom mount control module, thermostat to 200°F, fixed wire slides on 3" centers (17) 18" x 26" or (32) 12" x 20" x 2 1/2" pan capacity, 5" casters (2 with brakes), aluminum, 120v/60/1 ph, 2000 watts, 16.7 amps, NEMA 5 20P, cULus, NSF

2 ea 1 year warranty against manufacturing defects

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120	60	1	Cord & Plug		5-20P	16.7	2.0			

ITEM 02 - COMBI OVEN, ELECTRIC (1 REQ'D)



Alto-Shaam Model 7-20E PRO Dimensions: 37.81(h) x 43.75(w) x 46.19(d)

Prodigi™ Pro Combi Oven/Steamer, electric, boiler-free, countertop, capacity (7) 18" x 26" full size sheet or (16) 12" x 20" full size hotel pan (GN 1/1), Wi-Fi enabled control with steam/convection/combi cooking modes, removable "T" style temperature probe, (2) power levels, programmable cool-down, SafeVent™ steam venting, (5) cleaning levels, triple-pane door, high efficiency LED lighting, (2) side racks with (8) non-tilt support rails, door hinged right, stainless steel construction, adjustable stainless steel legs, EcoSmart®, cULus, UL EPH Classified, CE, IPX5, ENERGY STAR®, EAC, city-wide COA for New York City

1 ea NOTE: Subject to Manufacturer's Terms & Conditions. See Documents Section

1 ea One year parts and labor warranty, standard

1 ea It is the sole responsibility of the owner/operator/purchaser of this equipment to verify that the incoming water supply is comprehensively tested and, if required, provide a means of water treatment that would meet the compliance requirements with the manufacturers water quality standards published on the product spec sheet. Non-compliance with these minimum standards will potentially damage this equipment and/or components and VOID the original equipment manufacturers warranty

1 ea ECO

1 ea 208-240v/50/60/3-ph, 45.7-52.7 amps, 16.5-21.9kW, 4-3 AWG, NO cord or plug

1 ea Model 7-20EVH Ventech Type 1 Hood with Condensation, for 7-20E, self-contained, two-speed high-powered fans, 1242-1410 CFM, includes (2) easy clean grease filters, (2) odor filters, stainless steel construction, 1.92 amps, 0.40 kW, cULus, UL EPA, ANSI/NSF 4, CE, EAC (not available with smoking feature, or units with recessed door) (All utilities are run through the oven, no additional hookups required)

1 ea Factory install ((NET) NO FURTHER DISCOUNTS APPLY)

1 ea For Field install, Combitherm Factory Authorized Installation Program (above) MUST be selected for field install option to become available for selection

1 ea Wifi, standard

1 ea Removable "T" style temperature probe, standard

1 ea Model 5016084 Combi Oven Stand, stationary, 25-7/16" x 39-13/16" x 36-5/16" (645mm x 1010mm x 922mm), with pan slides and shelf, spacing 2-11/16" (68mm), stainless steel, for 7-20 or 10-20

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208-240	50/60	3	Direct			45.7-52.7	16.5-21.9			
2							1.92	0.40			

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1				3/4"		3/4"			

WASTE

	INDIRECT SIZE	DIRECT SIZE
1	1-1/2"	

ITEM 03 - WORK TABLE, WITH PREP SINK(S) (3 REQ'D)



John Boos Model EPT6R5-3072SSK-L Dimensions: 40.75(h) x 72(w) x 30(d)

Work Table With Prep Sink, 72"W x 30"D x 40-3/4"H overall size, (1) 16"W x 20" front-to-back x 12" deep sink bowl on left, 5"H backsplash, includes 10" swing spout faucet 4" O.C., 16/300 stainless steel top, stainless steel legs & adjustable undershelf, 1" stainless steel adjustable bullet feet, NSF, CSA-Sanitation, KD

- 3 ea Model PB-LWS-1 Straight Handle Lever Waste, for 3-1/2" industry standard sink opening, standard valve, basket strainer (includes adapter for either 2" or 1-1/2' drain outlet)
- 3 ea Model PB-LWB Lever waste support arm bracket. Not for use with PB-LWS-1 or PB-LWS-1OV straight handle lever waste.
- 3 ea Note: Provisions made at factory for installation.
- 3 ea Model DR2020SC-S30 Drawer, for 30"D work tables, 20"W x 20" front-to-back x 5" deep, stainless steel front & drawer pan, self closing, roller bearing slides, NSF, for stainless steel table tops only

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1	1/2"			1/2"					

WASTE

	INDIRECT SIZE	DIRECT SIZE
1		

PLUMBING 1 REMARKS

(1) set of 1" faucet holes, 8" centers, 3-1/2" drain opening

ITEM 04 - WORK TABLE, 60", STAINLESS STEEL TOP (3 REQ'D)



John Boos Model ST6-3060SSK Dimensions: 35.75(h) x 60(w) x 30(d)

Work Table, 60"W x 30"D, 16/300 stainless steel flat top, with Stallion Safety Edge front & back, 90° turndown on sides, stainless steel legs & adjustable undershelf, adjustable bullet feet, NSF, CSA-Sanitation, KD

- 3 st Model CAS01-R Casters, 5", heavy duty, locking, for 1-5/8" diameter legs (set of 4)

ITEM 05 - ROLL-IN REFRIGERATOR (1 REQ'D)



Hoshizaki Model RN2A-FS Dimensions: 87.5(h) x 68(w) x 38.9(d)

Steelheart Series Refrigerator, roll-in, two-section, 78.35 cu. ft., top mounted self-contained refrigeration system, (2) full-height solid hinged doors with locks, digital temperature display/controls, LED interior lighting, stainless steel ramp & floor accommodate roll in racks up to 72"H, stainless steel interior, stainless steel exterior front, sides & top, R290 Hydrocarbon refrigerant, 1 HP, NEMA 5-15P, cETLus, ETL-Sanitation

- 1 ea Warranty: 3-Year parts & labor on entire machine
- 1 ea Warranty: 5-Year parts on compressor
- 1 ea 115v/60/1-ph, 8.2 amps, standard

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1				Cord & Plug		5-15P			1		
2	115	60	1				8.2				

ITEM 06 - SPARE NO.

ITEM 07 - REACH-IN REFRIGERATOR (1 REQ'D)



Hoshizaki Model ER2A-FS Dimensions: 81.63(h) x 54.37(w) x 29.63(d)

Economy Series Refrigerator, reach-in, two-section, 38.61 cu. ft., bottom mounted self-contained refrigeration, (6) adjustable epoxy coated shelves, (2) full-height solid hinged doors with locks, digital temperature display/controls, temperature alarms, LED interior lighting, stainless steel interior floor, aluminum interior sides, rear, & top, stainless steel front, gray painted steel exterior sides, top & rear, (6) 4" casters (2 with brakes), R290 Hydrocarbon refrigerant, 1/3 HP, NEMA 5-15P, UL EPH Classified, cULus, ENERGY STAR®

1 ea Warranty: 2-Year parts & labor on entire machine

1 ea Warranty: 5-Year parts on compressor

1 ea 115v/60/1-ph, 4.3 amps, standard

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1				Cord & Plug		5-15P			1/3		
2	115	60	1				4.3				

ITEM 08 - REACH-IN FREEZER (1 REQ'D)



Hoshizaki Model EF1A-FS Dimensions: 81.63(h) x 27(w) x 29.63(d)

Economy Series Freezer, reach-in, one-section, 17.74 cu. ft., bottom mounted self-contained refrigeration, (3) adjustable epoxy coated shelves, (1) full-height solid right hinged door with lock, digital temperature display/controls, temperature alarms, LED interior lighting, stainless steel interior floor, aluminum interior sides, rear, & top, stainless steel front, gray painted steel exterior sides, top & rear, (4) 4" casters (2 with brakes), R290 Hydrocarbon refrigerant, 1/3 HP, NEMA 5-15P, UL EPH Classified, cULus

1 ea Warranty: 2-Year parts & labor on entire machine

1 ea Warranty: 5-Year parts on compressor

1 ea 115v/60/1-ph, 3.2 amps, standard

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1				Cord & Plug		5-15P			1/3		
2	115	60	1				3.2				

ITEM 09 - ICE MAKER, CUBE-STYLE (1 REQ'D)



Manitowoc Model IYT0620A Dimensions: 21.5(h) x 22(w) x 24.5(d)

Indigo NXT™ Series Ice Maker, cube-style, air-cooled, self-contained condenser, 22"W x 24-1/2"D x 21-1/2"H, production capacity up to 575 lb/24 hours at 70°/50° (465 lb AHRI certified at 90°/70°), easyTouch display with 13 different language options, date/time stamp display, automatic reminder/alert icon, one touch asset information, automatic detection of accessories, continuous operating status, programmable production options (time, weight, day or night), one touch cleaning with displayed instructions, Alpha-San anti-microbial protection, acoustical ice sensing probe, self-diagnostic technology, DuraTech™ exterior, half-dice size cubes, R410 refrigerant, NSF, cULus, CE, ENERGY STAR®

- 1 ea Model WARRANTY-ICE-SC 3 year parts & labor (Machine), 5 year parts & labor (Evaporator), 5 year parts & 3 years labor (Compressor), standard
- 1 ea (-161) 115v/60/1-ph, 12.2 amps
- 1 ea Model AR-10000-P Arctic Pure® Plus Primary Water Filter Assembly, includes head, shroud, hardware, mounting assembly, & (1) filter cartridge, 15,000 gallon capacity, 0-600 lbs./ice per day
- 1 ea Model WARRANTY-ARCPURE 3 year parts & labor warranty on cap, housing, hardware, & mounting assembly (does not refer to filter cartridge), standard
- 1 ea Model D420 Ice Bin, 22"W, 34"D x 50"H, with side-hinged front-opening door, side grips, 383 lbs. application capacity, AHRI certified 12.9 cu. ft., for top-mounted ice maker, Duratech exterior, NSF
- 1 ea Model WARRANTY-BIN/DISP 3 year parts & labor warranty, standard
- 1 ea Legs, 6" adjustable stainless steel, standard

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1				12.2				

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1				3/8"					
2									

WASTE

	INDIRECT SIZE	DIRECT SIZE
1	1/2"	
2	3/4"	

PLUMBING 1 REMARKS

Drain for ice maker

ITEM 10 - SPARE NO.

ITEM 11 - DISHTABLE, WITH POTSINKS (1 REQ'D)



John Boos Model DT3B18244-2D24R Dimensions: 44.06(h) x 103.63(w) x 30.38(d)

Dishtable/Pot Sinks, clean, straight design, 103-5/8"W x 30-3/8"D x 44-1/16"H overall size, (3) 18"W x 24" front-to-back x 14" deep compartments, (2) 24" drainboards, dish machine attachment on left side, 10"H boxed backsplash, (1) set of splash mount faucet holes with 8" centers, (3) rack slides with storage bracket, 16/300 stainless steel construction, stainless steel legs, bracing, & adjustable bullet feet, NSF, CSA-Sanitation (limited options available for this model)

- 1 ea SPECIFY DISH MACHINE BRAND AND MODEL. Certain dish machines require modification at additional cost not shown here.
- 1 ea Model PB-PRW-1LF Prerinse Unit, splash mount, flex stainless steel hose, 8" centers, 1/4 turn cramic cartridges, color coded hot/cold indicators, integral check valve, 1/2" NPT, includes 12" wall bracket, NSF, cCSAus, ADA Compliant (LEAD FREE FAUCET)

1 ea Model PB-AD-16LF Add-On-Faucet, 16" swing spout, fits on PB-PRW-1LF or PB-PRD-2LF pre-rinse units (LEAD FREE FAUCET)

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1									
2									
3									
4	1/2"			1/2"					

WASTE

	INDIRECT SIZE	DIRECT SIZE
1		
2		
3		
4		

PLUMBING 1 REMARKS
1" faucet holes, 8" centers, 3-1/2" drain opening
PLUMBING 2 REMARKS
3-1/2" drain opening
PLUMBING 3 REMARKS
3-1/2" drain opening
PLUMBING 4 REMARKS
8" centers

ITEM 12 - DISHWASHER, DOOR TYPE, VENTLESS (1 REQ'D)

Champion Model DH-6000T-VHR Dimensions: 79(h) x 33.94(w) x 31.63(d)



Genesis Dishwasher, door type, extended hood (27" opening for trays), ventless heat recovery, high temperature sanitizing with built-in stainless steel electric booster for (40°-70° rise), (40) racks/hour capacity, auto start, single point electrical connection, door interlock switch, on-board service diagnostics, Rinse Sentry feature, auto-fill, detergent & chemical connections, interchangeable upper & lower spray arms, automatic drain valve, vent fan control, bottom mounted HMI controls, mounted water PRV, stainless steel construction, electric tank heat, peg rack, flat rack, 2 HP self draining pump, NSF, cULus, ENERGY STAR®

1 ea Fuel Surcharge (NET/NET)
1 ea 1 year parts & labor warranty, standard
1 ea Complimentary factory authorized performance test included, upon equipment start-up. Consult local Champion sales representative for coordination of the start-up. If customer is beyond 60 miles from Champion authorized service agent, consult factory.
1 ea Single-point electrical connection, standard
1 ea 208-240v/60/3-ph
1 ea Straight-through design application
1 ea Drain water tempering kit, factory mounted & inter-wired

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1									2		
2	208-240	60	3								

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1				3/4"					

WASTE

	INDIRECT SIZE	DIRECT SIZE
1	1"	

ITEM 13 - CLEAN DISHTABLE (1 REQ'D)



John Boos Model CDT6-S60SBK-L Dimensions: 44.06(h) x 60(w) x 30.38(d)

Pro-Bowl Clean Dishtable, straight design, 60"W x 30"D x 44"H overall size, right-to-left operation, 10"H boxed backsplash with 45° & 2" return, 2-1/4"H rolled edge, 16/300 stainless steel top, stainless steel legs, bracing, & adjustable bullet feet, NSF

1 ea SPECIFY DISH MACHINE BRAND AND MODEL. John Boos standard opening is 20-7/8". Certain dish machines require modification at additional cost not shown here.

ITEM 14 - DISHTABLE SORTING SHELF (2 REQ'D)



John Boos Model BHS1842-TS Dimensions: 12.25(h) x 42(w) x 18(d)

Dishrack Sorting Shelf, 42"W x 18"D x 12-1/4"H, wall mounted, slanted, tubular, includes brackets, 16/300 stainless steel, NSF

ITEM 15 - HAND SINK (2 REQ'D)



John Boos Model PBHS-W-1410-EE Dimensions: 13.25(h) x 17(w) x 15.5(d)

Pro-Bowl Hand Sink, wall mount, 14"W x 10" front-to-back x 5" deep bowl, splash mount electronic eye faucet with 3-1/2" gooseneck spout, stainless steel construction (Splash Mount Electronic Eye Faucet Included)

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1	1/2"								

WASTE

	INDIRECT SIZE	DIRECT SIZE
1		

PLUMBING 1 REMARKS

2" drain opening

ITEM 16 - WIRE SHELVING UNIT (6 kt REQ'D)



Quantum Model WR74-2148P Dimensions: 74(h) x 48(w) x 21(d)

Wire Shelving Starter Kit, 48"W x 21"D x 74"H, 600 - 800 lb. capacity, includes (4) wire shelves & (4) posts, green epoxy antimicrobial finish, NSF, shipped KD

6 kt 15 year limited warranty (limited against rust and corrosion)

6 ea Model DB Donut Bumper, 3" dia., NSF

6 st Model WR-00H Casters, set of (4) 5" swivel (2 with brakes), thermoplastic resin

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ITEM 17 - MOP SINK CABINET (1 REQ'D)



John Boos Model PBJC-224884-L Dimensions: 84(h) x 48(w) x 22.5(d)

Janitor Cabinet, 48"W x 22-1/2"D x 84"H overall size, enclosed cabinet with open back for plumbing, (2) lockable louvered swing doors, left side includes: 20" x 16" x 12" deep mop sink with 3-1/2" drain, (1) over head shelf, (2) side mounted mop/broom holder with locking cam and panel-less back, right side includes: (3) shelves and bottom storage area, includes (1) service faucet with vacuum breaker and 120" hose, 18/300 stainless steel, NSF

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1									

WASTE

	INDIRECT SIZE	DIRECT SIZE
1		

PLUMBING 1 REMARKS

3-1/2" drain opening

ITEM 18 - BUSSING UTILITY TRANSPORT CART, METAL (2 REQ'D)



Channel Manufacturing Model US2135-3 Dimensions: 37.25(h) x 39.5(w) x 22(d)

Banquet / Utility Cart, Utility / Bussing Cart, 39.5"W x 22"D x 37.25"H, Stainless Construction, (3) shelves, 5" Swivel Plate Casters, 68lbs. (ITEM WEIGHT ONLY), 500 lb. distributed weight capacity, push handle, weight does not include 50 lbs. for pallet weight

2 ea Lifetime warranty against rust and corrosion

ITEM 19 - UNIVERSAL PAN RACK (3 REQ'D)



Channel Manufacturing Model UTR-18 Dimensions: 64(h) x 20.5(w) x 26(d)

Steam Table Pan Rack, Bun Pan / Steam Table Pan Rack, Standard Series, 20.5"W x 26"D x 64"H, Aluminum Construction, End Load, 3" Angle Spacing, (18) 18" x 26" or (36) 13" x 18" (2 per shelf) or 12" x 20" steam table pans (pan height determines capacity), 5" Swivel Stem Casters model # CSS45O, Made in USA, NSF, 50lbs. (ITEM WEIGHT ONLY), weight does not include 50 lbs. for pallet weight

3 ea Lifetime warranty against rust and corrosion

ITEM 20 - SPARE NO.

ITEM 21 - REACH-IN HEATED CABINET (1 REQ'D)



True Mfg. - General Foodservice Model TH-23G~FGD01 Dimensions: 78.38(h) x 27(w) x 29.75(d)

Heated Cabinet, reach-in, one-section, framed glass door version 01, (1) glass hinged door with lock, (3) heavy-duty chrome-plated adjustable shelves, interior lighting, stainless steel front, aluminum sides, stainless steel interior, 4" castors, 850 watts, 115/60/1-ph, 7.8 amps, NEMA 5-15P, cULus, UL EPH Classified, Made in USA

1 ea Door hinged right standard

1 ea 4" stem castors, standard (adds 5" to OA height)

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-15P	7.8	.85			

ITEM 22 - REACH-IN REFRIGERATOR (2 REQ'D)



True Mfg. - General Foodservice Model T-35G-HC~FGD01 Dimensions: 78.25(h) x 39.63(w) x 29.88(d)

Refrigerator, reach-in, two-section, framed glass door version 01, (2) glass doors, (6) PVC coated adjustable wire shelves, LED interior lighting, stainless steel front, aluminum sides, clear coated aluminum interior with stainless steel floor, 4" castors, R290 Hydrocarbon refrigerant, 1/3 HP, 115v/60/1-ph, 5.6 amps, NEMA 5-15P, cULus, UL EPH Classified, Made in USA

2 ea Self-contained refrigeration standard

2 ea 7 year compressor warranty, 6 years parts warranty, 5 year labor warranty standard. Please visit www.truemfg.com for specifics standard

2 ea Left door hinged left, right door hinged right standard

2 ea 4" stem castors, standard (adds 5" to OA height)

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115		1	Cord & Plug		5-15P	5.6		1/3		15.0

ITEM 23 - DISPLAY CASE, REFRIGERATED/NON-REFRIG (1 REQ'D)

True Mfg. – Specialty Retail Display Model TGM-DZ-59-SC/SC-B-W Dimensions: 49.13(h) x 59.25(w) x 39(d)



Glass Merchandiser, dual zone (dry/refrigerated), 59-1/4"W, self-contained refrigeration, with fixed curved glass front, solid colored sides, (2) rear sliding glass doors, (3) tiered levels of adjustable white PVC coated wire shelves (6 shelves total), LED interior lighting, black powder coated exterior, white powder coated interior, R290 Hydrocarbon refrigerant, 1/4 HP, 115v/60/1-ph, 10.0 amps, NEMA 5-15P, cULus, UL EPH Classified, Made in USA

1 ea Warranty - 5 year parts and labor, please visit www.Truemfg.com for specifics

1 ea Self-contained refrigeration standard

1 ea Warranty - 7 year compressor (self-contained only), please visit www.Truemfg.com for specifics

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1			5-15P	10		1/4		

ITEM 24 - ESPRESSO CAPPUCCINO MACHINE (1 REQ'D)

Eversys Inc. Model ENIGMA E'4M X-WIDE Dimensions: 30(h) x 34(w) x 26(d)



Enigma E'4M Automated Espresso Coffee Machine, 2 group, super automatic, up to 350 espresso per hour production capacity, (2) 10" touch screen controls, electronic e'Foam Micro Air Dosing (MAD) system, electronic milk texturing system, includes: (2) Everfoam steam arms, (2) ceramic burr grinders, (2) 3.3 lb coffee bean hoppers, (1) 1.5 lb grounds drawer, (1) hot water spout, (1) 5.4 liter steam boiler, (2) 1.5 liter coffee boilers, brown & black exterior, 4.6kW, 208v/60/2-ph, NEMA L6-30

1 ea 1 year labor & service, 2 year parts, standard

1 ea Pricing also includes installation, unless specifically noted otherwise.

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208	60	2	Cord & Plug		L6-30		4.6			

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1				3/8"					

WASTE

	INDIRECT SIZE	DIRECT SIZE
1	56mm	

ITEM 25 - MEGA TOP SANDWICH / SALAD PREPARATION REFRIGERATOR (1 REQ'D)

True Mfg. - General Foodservice Model TSSU-36-12M-B-HC Dimensions: 40.38(h) x 36.38(w) x 34.13(d)



Mega Top Sandwich/Salad Unit, (12) 1/6 size (4"D) poly pans, stainless steel insulated cover, 8-7/8"D cutting board, aluminum back, (2) full doors, (4) PVC coated adjustable wire shelves, stainless steel top/front/sides, GalFan coated steel back, aluminum interior with stainless steel floor, R290 Hydrocarbon refrigerant, 1/4 HP, 115v/60/1-ph, 4.5 amps, NEMA 5-15P, cULus, UL EPH Classified, Made in USA

1 ea Self-contained refrigeration standard

1 ea 7 year compressor warranty, 6 years parts warranty, 5 year labor warranty standard. Please visit www.truemfg.com for specifics standard

1 ea Castors, 5" (36" work surface height) standard

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-15P	4.5		1/4		15.0

ITEM 26 - RAPID COOK OVEN (2 REQ'D)



Pratica Products Inc. Model ROCKET EXPRESS Dimensions: 25.06(h) x 21(w) x 31.75(d)

Rocket Express Rapid Cook Oven, electric, countertop, combination impinged air, convection, bottom infrared heat & microwave cooking, ventless with removable catalytic converter, 0.74 cu. ft. capacity, touch pad controls, variable speed impingement airflow, independently controlled top and bottom heaters, manual mode, 86° to 530°F temperature range, stores up to (1024) recipes, USB port, includes: (1) baking stone, (1) cooking basket, (1) aluminum paddle & (1) USB drive, cool touch AISI430 stainless steel exterior, cETLus, ETL-Sanitation, CE

2 ea 1 year parts and labor warranty, standard

2 ea 208v/60/1-ph, 6.2 kW, 30 amps, cord, NEMA 6-30P, standard

2 ea Model EXPRESS PACKAGE 1 Rocket Express Package (Standard Accessories):

•(200603) Aluminum paddle

•(200601) Panini plate

•(200201) Solid basket

•(200902) Oven cleaner

•(200901) Oven protector

•(200905) Non-scratch scrub pad

•(200904) (2) cleaning towels

•(200903) Standard trigger sprayer

•(200906) Foaming trigger sprayer

•(200401) USB drive

(Included with oven purchase)

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	208	60	1	Cord & Plug		6-30P	30.0	6.2			

ITEM 27 - UNDERCOUNTER REFRIGERATOR (1 REQ'D)



True Mfg. - General Foodservice Model TUC-24-HC Dimensions: 31.63(h) x 24(w) x 24.75(d)

Undercounter Refrigerator, 33 - 38°F, (1) stainless steel door, (2) PVC coated adjustable wire shelves, stainless steel top, front & sides, clear coated aluminum interior with stainless steel floor, front breathing, R290 Hydrocarbon refrigerant, 1/6 HP, 115v/60/1-ph, 2.0 amps, NEMA 5-15P, cULus, UL EPH Classified, CE, Made in USA, ENERGY STAR®

1 ea Self-contained refrigeration standard

1 ea Right Hand, Standard: Unit comes with field reversible hinges & is built with hinging on right side of unit.

1 ea Bolt locks, factory installed, standard

1 ea NOTE: Four (4) stationary castors. 31-5/8" (804 mm) work surface height. Two (2) front leg

levelers included with unit for alternate use. No other castor/leg options are available for this model.

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-15P	2		1/6		

ITEM 28 - DRAFT BEER COOLER (1 REQ'D)



True Mfg. - General Foodservice Model TDD-1-S-HC Dimensions: 39.75(h) x 23.5(w) x 31.25(d)

Draft Beer Cooler, 23-1/2"W, (1) 1/2 keg capacity, stainless steel counter top, (1) door with lock, (1) column type beer faucet, stainless steel exterior, galvanized interior with stainless steel floor, castors, R290 Hydrocarbon refrigerant, 1/10 HP 115v/60/1-ph, 1.4 amps, NEMA 5-15P, cULus, UL EPH Classified, Made in USA, ENERGY STAR®

1 ea Self-contained refrigeration standard

1 ea 7 year compressor warranty, 6 years parts warranty, 5 year labor warranty standard. Please visit www.truemfg.com for specifics standard

1 ea Two-Way Manifold, for direct draw draft

1 ea Draft Column, double faucet, 3" dia., angled top

1 ea May require an additional manifold

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-15P	1.4		1/10		15.0

ITEM 29 - ICE BIN / ICE CADDY , MOBILE (1 REQ'D)



BK Resources Model BK-MIB-2411 Dimensions: 29(h) x 11(w) x 24(d)

Mobile Ice Bin, with sliding lid, 11"W x 24"D x 29"H, stainless steel, 53lb. capacity, removable bottom tray, drain valve in rear of unit, 3" casters with brake

ITEM 30 - SPARE NO.

ITEM 31 - REACH-IN UNDERCOUNTER FREEZER (1 REQ'D)



Silver King Model SKF27A-EDUS1 Dimensions: 32.16(h) x 27(w) x 29.32(d)

Undercounter Freezer, one-section, 27"W, (2) drawers, adjustable temperature control, automatic defrost, aluminum interior, stainless steel & galvanized exterior, 3" casters (2 with locks), rear-mounted self-contained refrigeration, front breathing, R290, 115v/60/1-ph, 2.0 amps, NEMA 5-15P, cETLus, ETL-Sanitation

1 ea 1 year parts & labor warranty, 5 year compressor (part only) warranty, 90 days replacement parts, standard

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-15P	2				

ITEM 32 - DROP-IN SINK (1 REQ'D)

John Boos Model PB-DISINK091106-STD Dimensions: 17.25(h) x 16.5(w) x 17.5(d)



Pro-Bowl Drop-In Sink, 1-compartment, 16-1/2"W x 17-1/2"D x 17-1/4"H overall size, (1) 11-1/2"W x 9-1/4" front-to-back x 6" deep bowl, deck mount faucet holes with 4" centers, 2" drain opening with basket drain, with left & right side splashes, integrated towel dispenser, includes soap dispenser (PB-SD-DM), stainless steel construction

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1									

WASTE

	INDIRECT SIZE	DIRECT SIZE
1		

PLUMBING 1 REMARKS

(1) set of 1" faucet holes, 4" centers, 2" drain opening

ITEM 33 - DROP-IN SINK (1 REQ'D)

Advance Tabco Model SS-1-1919-12 Dimensions: 12(h) x 19(w) x 19(d)



Smart Series™ Drop-In Sink, 1-compartment, self-rim design, 16"W x 14" front-to-back x 12" deep bowl, 8" OC faucet holes (1-1/4" diameter hot & cold water, 1" diameter center hole), 18/304 stainless steel, includes: 3-1/2" basket drain & mounting clips

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1									

WASTE

	INDIRECT SIZE	DIRECT SIZE
1	1-1/2"	

PLUMBING 1 REMARKS

8" OC faucet holes (1-1/4" diameter hot & cold water, 1" diameter center hole)

ITEM 34 - UNDERCOUNTER REFRIGERATOR (1 REQ'D)

True Mfg. - General Foodservice Model TUC-36-HC Dimensions: 29.75(h) x 36.38(w) x 30.13(d)



Undercounter Refrigerator, 33 - 38°F, (2) stainless steel doors, (4) PVC coated adjustable wire shelves, stainless steel top & sides, aluminum interior with stainless steel floor, R290 Hydrocarbon refrigerant, 1/6 HP, 115v/60/1-ph, 2.0 amps, NEMA 5-15P, cULus, UL EPH Classified, Made in USA

- 1 ea Self-contained refrigeration standard
- 1 ea 7 year compressor warranty, 6 years parts warranty, 5 year labor warranty standard. Please visit www.truemfg.com for specifics standard
- 1 ea Bolt locks, factory installed, standard
- 1 ea Castors, 1-1/2" (31-7/8" work surface height = LP)

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	115	60	1	Cord & Plug		5-15P	2		1/6		15.0

ITEM 35 - COFFEE BREWER (1 REQ'D)



BUNN Model 34600.0001 Dimensions: 35.7(h) x 21.8(w) x 20.2(d)

34600.0001 DUAL TF BrewWISE® DBC® ThermoFresh® Coffee Brewer, 18.9 gal/hr, coffee extraction controlled with pre-infusion & pulse brew, digital temperature control, large spray head, automatic programming, stores individual recipes, SplashGard® & optional funnel locks, wireless brewer-grinder interface, black finish, lower hot water faucet, wireless brewer-grinder interface, holds (2) 1-1/2 gallon ThermoFresh servers (servers sold separately), 120/240v/60/1-ph, 6600w, 27.5amps, UL, NSF

4 ea Model 44050.0200 44050.0200 TF ThermoFresh® Server with Mechanical Sight Gauge, with base & drip tray, 1-1/2 gallon, lever action dispensing, brew-through lid, portable, soft-grip bail handle, fast flow faucet, aluminum faucet guard, vacuum insulated, stainless steel liner, black finish, for use with twin or single Infusion Series brewers, NSF

ELECTRICAL

	VOLTS	CYCLE	PHASE	CONN	AFF	NEMA	AMPS	KW	HP	MCA	MOCP
1	120/240	60	1				27.5	6.6			

WATER

	HOT SIZE	HOT AFF	HOT GPH	COLD SIZE	COLD AFF	FILTERED SIZE	FILTERED AFF	CONDENSER INLET SIZE	CONDENSER OUTLET SIZE
1				3/8"					

WASTE

	INDIRECT SIZE	DIRECT SIZE
1		

ITEM 36 - POS STATION (1 REQ'D)

Foodesign Cutsheets Model BY OWNER

ITEM 37-40 - SPARE NO.

METRO®

We put space to work.®

Item # _____

Job _____

Metro C5® 3 Series Insulation Armour® Heated Holding and Proofing Cabinets

- **Insulation Armour™:** Patented insulation technology retains heat, saves energy, and provides a cool-to-touch exterior. Durable polymer construction is dent, impact, and stain resistant. Molded-in hand holds create vertical handles for mobile applications.
- **Colors:** Insulation Armour is available in Red, Blue, or Gray standard and in other colors on a promotional basis or upon request.
- **Control:** Three modules are available: Holding, Moisture, and Combination Proof and Hold. All feature an easy-to-read digital thermometer, recessed control dials, a master on/off switch, and power indicator lights. All are removable without tools for easy cleaning, and allow for future upgrades without replacing entire cabinet body.
- **Performance:** All modules provide fast heat-up and recovery through a thermostatically controlled, forced convection system.
- **Sizes:** C5 3 Series cabinets are available in Full Height (71", 1803mm), 3/4 Height (59", 1499mm), 1/2 Height (44", 1118mm), and Under Counter (32", 813mm) sizes.
- **Doors:** Solid insulated aluminum or clear polycarbonate doors are available. Full Height cabinets can be configured with full length or dutch-style doors. Clear doors provide visibility of the contents of the cabinet without the heat loss associated with opening the door.
- **Capacity:** Three slide styles provide maximum holding capacity. Choose from Universal Wire, Lip Load, or Fixed Wire.
- **Reliability:** Reliability and durability are designed into every C5. High-quality components provide a long life of worry free use.
- **Power Options:** Choose between standard high wattage or low wattage models based on the specific needs of the application.



Red Full Height Dutch Clear Doors



Red Under Counter Solid Door



Blue 1/2 Height Full Solid Door



Gray 3/4 Height Full Clear Door



Blue Full Height Full Clear Door



3 Series Removable Control Modules

- **Holding Module:** Hot holding at higher temperatures without moisture control.*
- **Moisture Module:** Hot holding and proofing. Moisture control at any temperature.
- **Combination Module:** Hot holding and proofing. Moisture control at lower temperatures (proofing).

* Note: Cabinets with holding module do not include the water pan.

All Metro Catalog Sheets are available on our website: **www.metro.com**

Metro Heated cabinets are for hot food holding applications only.

METRO®

InterMetro Industries Corporation
North Washington Street, Wilkes-Barre, PA 18705
Product Information. U.S. and Canada: 1.800.992.1776
Outside U.S. and Canada: www.metro.com/contactus

L03-270
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Information and specifications are subject to change without notice. Please confirm at time of order.

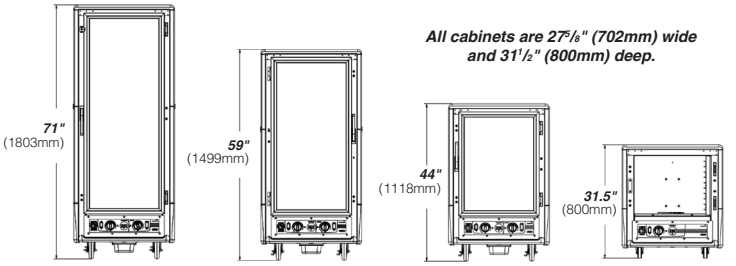
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Job _____

C5® 3 Series Insulation Armour® Heated Holding and Proofing Cabinets

METRO®
We put space to work.



- **Cabinet Material:** .063" (1.8mm) aluminum, natural interior with .125" (3.2mm) aluminum chassis.
- **Insulation Armour™:** High Density Polyethylene (HDPE).
- **Casters:** Four casters with 5" (127mm) donut neoprene wheel, double ball bearing swivel, ball bearing axel, nickel plated, two with brake. 3" rubber casters on Under Counter models.
- **Solid Doors:** Fully insulated with 1" (25.4mm) fiberglass, double panel .063" (1.8mm) aluminum, brushed exterior, natural interior.
- **Clear Doors:** Extruded aluminum powder coated frame with .090" (2.3mm) polycarbonate window.
- **Hinges:** Field reversible, double hinged, 180° swing, with long-life nylon bearings.
- **Gaskets:** High temperature, door mounted, Santoprene gaskets.
- **Latches:** Polymer high-strength magnetic pull latch with lever-action release.
- **Hand Holds:** Molded into the Insulation Armour™ on all four corners.
- **Universal Slides:** ¼" (6.4mm) dia. nickel-chrome electroplated wire, adjustable on 1½" (38mm) increments.
- **Lip Load Slides:** 1½"x1½"x.063" (38x38x1.8mm) extruded aluminum channel slides, 1½" (38mm) fixed spacing.
- **Fixed Wire Slides:** ¼" (6.4mm) dia. nickel-chrome electroplated wire, welded on 3" (76mm) spacing. Not offered in Under Counter models.
- **Drip Trough:** Smooth polymer drip trough with catch pan.
- **Holding Modules:** Removable without tools, digital thermometer, recessed control dials, master on/off switch, "Power On" light, water pan, ball bearing blower forced air system, 7½' cord, UL, CUL, and NSF Listed.

Electrical and Performance:

- **Holding Module:** 80°F (27°C) to 200°F (93°C) operating temperature range. Available:120V 2000W & 1440W, 220-240V 1681-2000W.
- **Moisture Module:** 80°F (27°C) to 200°F (93°C) operating temperature range. 35% RH at 160°F (71°C), 95% RH at 95°F (35°C). Available: 120V 2000W, 220-240V 1681-2000W.
- **Combination Module:** 80°F (27°C) to 200°F (93°C) operating temperature range. 95% RH at 95°F (35°C). Available:120V 2000W & 1440W, 220-240V 1681-2000W.
- **Clearance Requirements:** 18" (46cm) away from any cooking equipment. AVOID contact with surfaces that exceed 200°F (90°C). Minimum clearance from enclosures is 1½" (38mm) on sides and back, ½" (12.7mm) on top.

Cabinet Height
9 = Full Height
7 = 3/4 Height
5 = 1/2 Height
3 = Under Counter

Module Type
C = Combination
M = Moisture
H = Heated Holding

Slide Type
U = Universal Wire
4 = Fixed Wire
L = Lip Load Aluminum

C5 3 9 - C DC - U

NEMA 5-20P
For Standard Wattage Cabinets (120V, 16A, 60Hz, 2000W)

Door Style
FS = Full Length Solid
FC = Full Length Clear
DS = Dutch Solid *
DC = Dutch Clear *

*Please note: Dutch doors only available on full-height models. Cabinets ordered without a color designation default to Red.

Low Watt Model Number Description

C5 3 9 - C L DC - U

NEMA 5-15P
Add "L" for Lower Wattage Combination or Holding Module Cabinets (120V, 12A, 60Hz, 1440W)

Note: Under Counter holding and combination module cabinets are only available in low watt. Under Counter moisture module cabinets are available in 120V, 2000W.

Export Model Number Description

C5 3 9 - C X DC - U

NEMA 6-15P
Add "X" for Export Cabinets (220-240V, 7.6-8.3A, 50/60Hz, 1681-2000W)

Blue or Gray Model Description

C5 3 9 - C DC - U - BU

** Cabinets ordered without a color designation default to Red.

Please Note: Under Counter Cabinets are only offered in Red & Gray.

Color **
No Suffix = Red
BU = Blue
GY = Gray

Models with Accessories or Options

C5 3 9 - CDC - U A
C5 3 9 - CDC - U - BU A

An "A" suffix indicates that accessories need to be factory assembled to the cabinet. Order accessories separately.

Please Note: Under Counter Combination & Holding modules are not available in 120V, 2000W.

Options/Accessories*

- Small Item Shelf (C5-SHELF-S)
- Stainless Steel Legs (C5-SSLEGS)
- Universal Slide Pair, Chrome (C5-USLIDEPR-C)
- 6" Casters (C5-6CASTER)
- Rear Rigid Casters (C5-5RDGCSTR)
- Travel Latch (C5-TRVL)
- Flush Door Latch (C5-LATCHFLUSH-1)*
- Straight Plug, 20 Amp, 120V (C5-STRPLG-20)
- Straight Plug, 15 Amp, 120V (C5-STRPLG-15)
- Factory Left-Hand Hinging (DD3768)
- Stainless Steel Universal Slides (please call)

**Please note: (2) handles required for dutch door models*

Pan Capacity	Universal Wire Slide					Lip Load Slide	Fixed Wire Slide	
Cabinet Size	Slide Pairs Provided	Sheet Pans 18"x26"	Steam Pans 12"x20"x2.5" GN 1/1 65mm	Steam Pans 12"x20"x4" GN 1/1 100mm	Steam Pans 12"x20"x6" GN 1/1 150mm	Sheet Pans 18"x26"	Sheet Pans 18"x26"	Steam Pans 12"x20"x2.5" GN 1/1 65mm
Full Height	18	18	34	24	14	35	18	34
Full Height Dutch	18	17	32	22	12	34	17	32
3/4 Height	14	14	26	16	10	27	14	26
1/2 Height	9	8	16	10	6	17	8	16
Under Counter	5	5	10	6	4	10	N/A	N/A

an Ali Group Company

ALI GROUP
The Spirit of Excellence

Prodigi™ Pro 7-20 (E/G)

Electric or Gas

UL

Engineered for dependability, connectivity, and cost savings, Prodigi™ Pro combination ovens are an all-in-one solution for efficient and consistent food production. These ovens do the work of a convection oven, kettle, steamer, fryer, smoker and more. With advanced features and accessories and an intelligent, customizable control, Prodigi Pro combination ovens are designed to support—and connect—the most demanding kitchens.

Standard features

- Boilerless steam generation
- Absolute Humidity Control™ for selecting any humidity level from 0-100% to maximize food quality, texture, and yield
- Three cooking modes—steam, convection, and combination
- 10.1" programmable, touchscreen control with customizable home screen options, recipe categorization and filtering, lockout features and more
- Easy recipe upload/download via USB port
- ChefLinc™ remote oven management to push and pull recipes, software or oven settings from anywhere
- Four fully automated cleaning cycles
- Front-accessible and retractable rinse hose
- LED illuminated door handle to provide visual notification of the oven status
- SafeVent™ automatic steam venting at the end of the cooking cycle
- Zero clearance design



CAPACITY

7 Seven full-size sheet pans;
16* full-size hotel pans or GN 1/1 pans, two rows deep (*one less on models with smokers)
14 half-size sheet pans

Two side racks with eight non-tilt support rails; 19-7/8" (505mm) horizontal width between rails, 2-3/4" (70mm) vertical spacing between rails

168 lb (76 kg) product maximum

105 quarts (133 liters) volume maximum

Four (4) wire shelves included.

Copper Installation kits

Base kit selection on amp draw found in electrical table

Electric

- ☐ 20A (5026970)
- ☐ 30A (5026932)
- ☐ 40A (5026972)
- ☐ 50A (5026973)
- ☐ 80A (5026974)

Gas

- ☐ 20A (5026980)
- ☐ 30A (5026933)
- ☐ No cord (5026971)

CPVC Installation kits

Base kit selection on amp draw found in electrical table

Electric

- ☐ 20A (5021521)
- ☐ 30A (5021519)
- ☐ 40A (5021525)
- ☐ 50A (5021526)
- ☐ 80A (5021527)
- ☐ 125A (5021529)
- ☐ 150A (5021530)
- ☐ 200A (5021531)
- ☐ 250A (5021531)

Gas

- ☐ 20A (5021522)
- ☐ 30A (5021520)
- ☐ No cord (5021524)

Condensable Particulate Matter (CPM) emissions produced through the most aggressive testing methods available were measured at 0.77 mg/m³ for 11,660 beef patties which is below the maximum allowable level of 5.0 mg/m³ established by EPA test method 202. This product is UL listed under KNLZ in the U.S. and Canada.

ANSI/NSF 4

COA# 5760
Electric models only



7-20 Pro

Configuration for Electric Models (select one)

- ☐ Turbo
- ☐ ECO

Configuration for Gas Models (select one)

- ☐ Natural gas
- ☐ Propane

Electrical

- ☐ 120V 1ph (Gas only)
- ☐ 208–240V 1ph (Gas only)
- ☐ 208–240V 3ph
- ☐ 440–480V 3ph

Door swing

- ☐ Right hinged
- ☐ Recessed door, optional (not available with Ventech hood)

ChefLinc connection

- ☐ Wi-Fi (standard)
- ☐ Ethernet (optional)

Options (select all that apply)

- ☐ Ventech™ Hood*
- ☐ Ventech™ PLUS Hood*
- ☐ CombiSmoke® feature—smoke hot or cold with real wood chips (not available on units with hoods or units with security devices)
- ☐ Automatic grease collection system

*Electric models only

Cleaning

- ☐ Automatic tablet-based cleaning system (standard)
- ☐ Automatic liquid cleaning system (optional)

Probe choices

- ☐ Removable, quick-release, T-style probe (PR-37158) (standard)
- ☐ Removable, single-point, sous vide probe (PR-36576) (optional)
- ☐ Removable probe with stop for grease collection (5035704)

Security devices for correctional facility use

- ☐ Optional base package (not available with recessed door): includes tamper-proof screw package
- ☐ Anti-entrapment device (5017157) (optional)
- ☐ Control panel security cover (5017144) (optional)
- ☐ Hasp door lock (padlock not included) (5017145) (optional)

Water treatment

- ☐ RO System OPS175C R/5 (5031203)

Extended warranty

- ☐ One-year warranty extension

Installation options (select one)

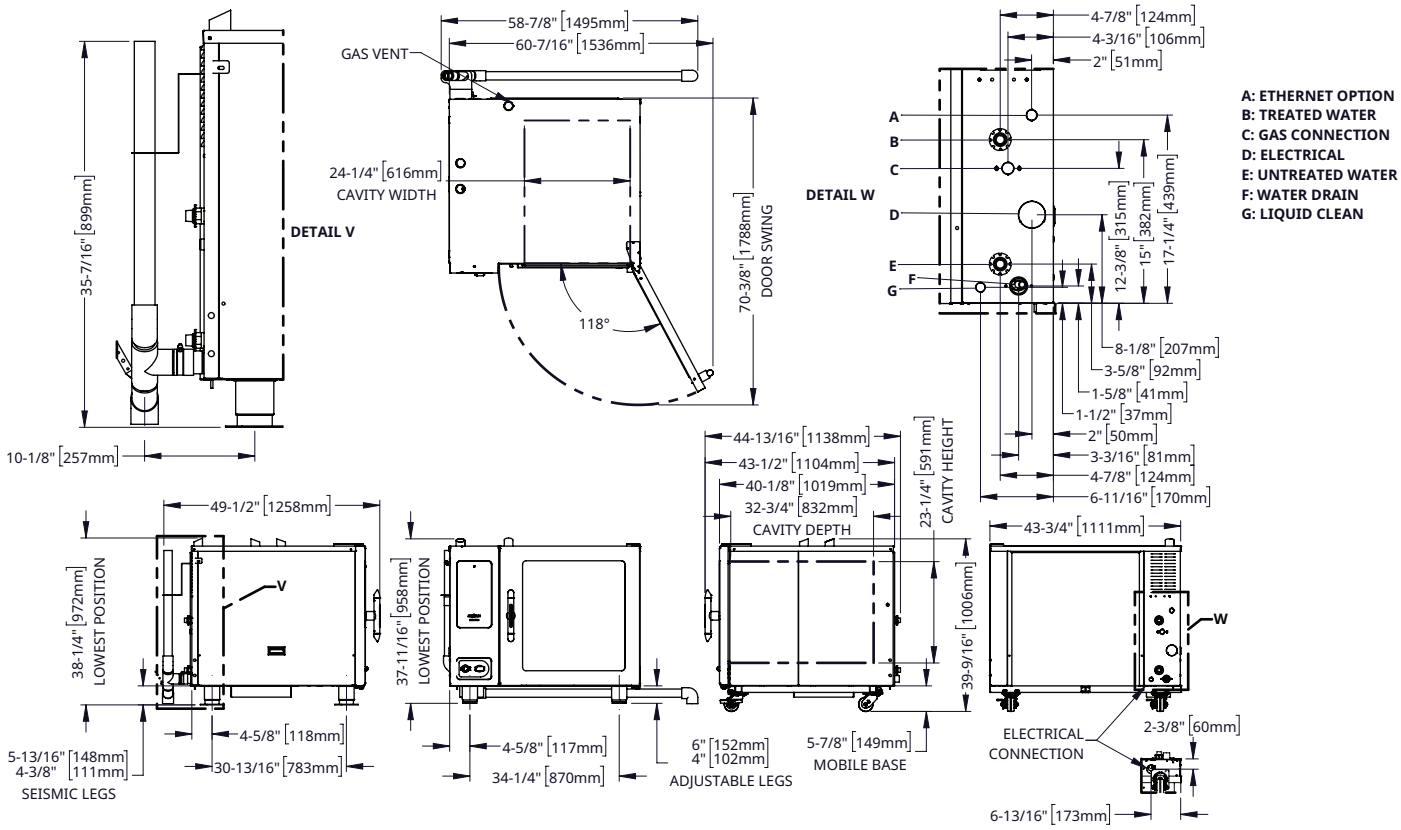
- ☐ Alto-Shaam Combination Factory Authorized Installation Program - available in the U.S. and Canada only
- ☐ Installation Start-Up Check — available through an Alto-Shaam authorized service agency

Accessories (reference accessory catalog)

Prodigi™ Pro 7-20 (E/G)

ALTO-SHAAM

DIMENSIONS — standard door



Model	Exterior (H x W x D)	Interior (H x W x D)	Net Weight
7-20	37-11/16" x 43-3/4" x 44-13/16" (958mm x 1111mm x 1138mm)	23-1/4" x 24-1/4" x 32-3/4" (591mm x 616mm x 832mm)	680 lb (308)

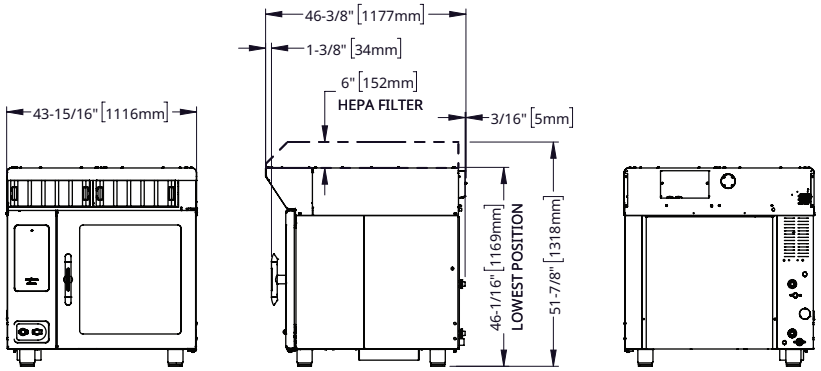
Ship Dimensions (L x W x H)*	Ship Weight
56" x 49" x 51" (1422mm x 1245mm x 1295mm)	727 lb (330 kg)

*Domestic ground shipping information. Contact factory for export weight and dimensions.

OVENS WITH VENTECH® HOOD

Electric only

Eliminate the need for a traditional kitchen hood. Ventech Type 1 hoods with condensation technology condense steam while capturing and removing grease-laden air, vapors, and lingering smoke. For more demanding locations, Ventech PLUS™ hoods include a HEPA filter. These hoods combine the fine particulate filtering of a HEPA filter with condensation technology of the standard Ventech hood.



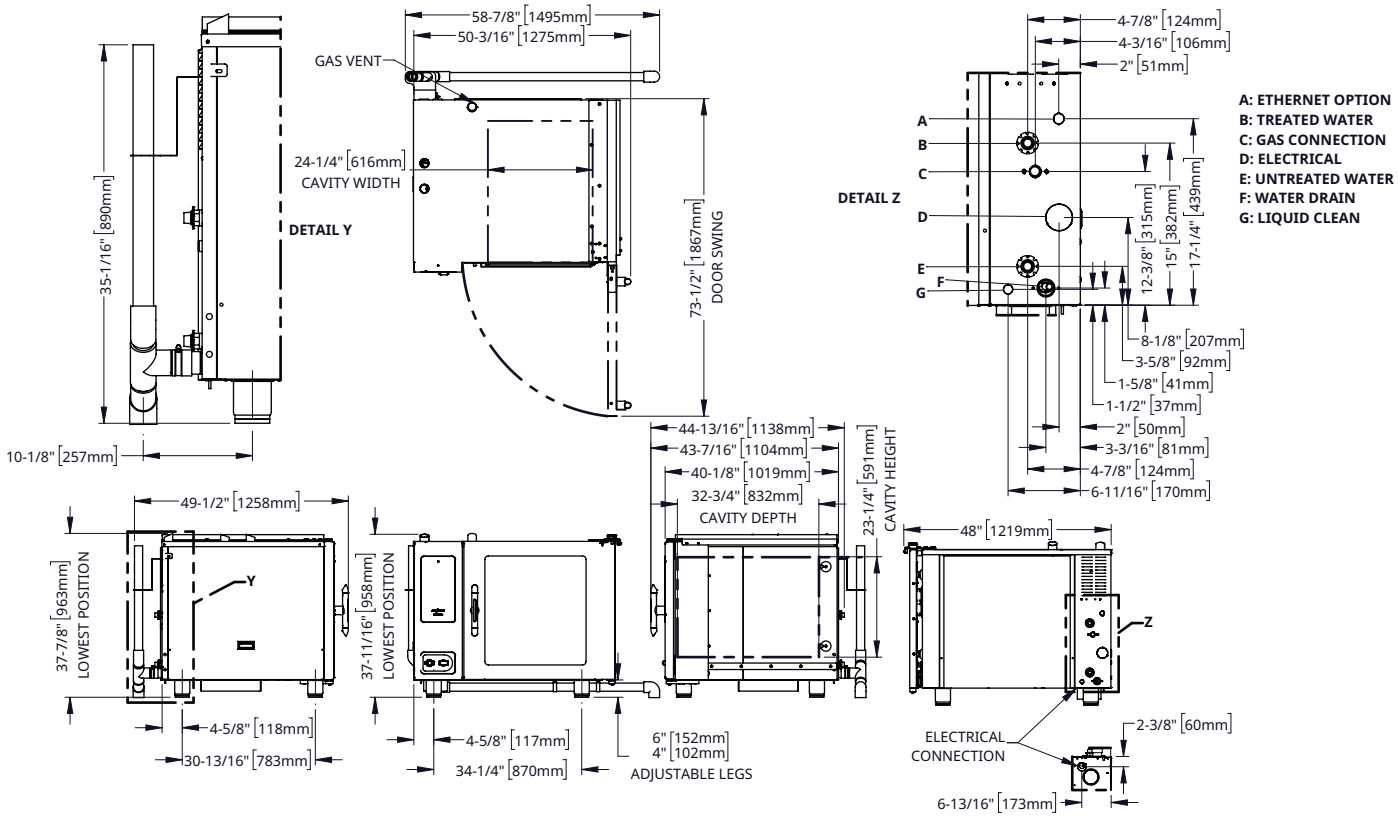
Model	Ventech Hood Exterior (H x W x D)	Net Weight	Ship Dimensions (L x W x H)*	Ship Weight*
VH-20	11-1/8" x 43-15/16" x 46-3/8" (282mm x 1116mm x 1177mm)	158 lb (72 kg)	56" x 49" x 20" (1422mm x 1245mm x 508mm)	276 lb (125 kg)
	Ventech Hood Plus Exterior (H x W x D)	**Net Weight**	**Ship Dimensions (L x W x H)***	**Ship Weight***
	17-1/8" x 43-15/16" x 46-3/8" (435mm x 1116mm x 1177mm)	211 lb (96 kg)	59" x 49" x 20" (1500mm x 1245mm x 508mm)	336 lb (152 kg)
	Oven with Ventech Hood (H x W x D)	**Net Weight**	**Ship Dimensions (L x W x H)***	**Ship Weight***
	43-1/4" x 43-15/16" x 41-11/16" (1099mm x 1116mm x 1059mm)	Call factory	56" x 45" x 65" (1422mm x 1143mm x 1651mm)	Call factory
	Oven with Ventech Hood Plus (H x W x D)	**Net Weight**	**Ship Dimensions (L x W x H)***	**Ship Weight***
	49-1/4" x 43-15/16" x 43-15/16" (1242mm x 1116mmx 1059mm)	Call factory	56" x 45" x 65" (1422mm x 1143mm x 1651mm)	Call factory

*Domestic ground shipping information. Contact factory for export weight and dimensions.

Prodigi™ Pro 7-20 (E/G)

ALTO-SHAAM

DIMENSIONS — recessed door



Model	Exterior (H x W x D)	Interior (H x W x D)	Net Weight
7-20	37-11/16" x 48" x 44-13/16" (958mm x 1219mm x 1138mm)	23-1/4" x 24-1/4" x 32-3/4" (591mm x 616mm x 832mm)	680 lb (308)

Ship Dimensions (L x W x H)*
56" x 49" x 51" (1422mm x 1245mm x 1295mm)

Ship Weight
727 lb (330 kg)

*Domestic ground shipping information. Contact factory for export weight and dimensions.

Prodigi™ Pro 7-20 (E/G)

ALTO-SHAAM



7-20E ELECTRIC

					ECO			Turbo Option*			
7-20E	V	Ph	Hz	AWG	A	Breaker	kW	A	Breaker	kW	Connection
208–240V	208	3	50/60	4	45.7	50	16.4	58.7	60	19.2	3Ø/PE
	240	3	50/60	3	52.7	60	21.9	67.7	70	25.5	3Ø/PE
440–480V	440	3	50/60	8	20.6	25	15.7	26.5	30	18.3	3Ø/PE
	480	3	50/60	8	22.4	25	18.7	28.8	35	21.8	3Ø/PE

*No-cost option on electric models.

- Electrical connections must meet all applicable federal, state, and local codes.
- For use on individual branch circuit only.
- Ovens are not supplied with an electrical cord or plug.
- For CE models use a Type B current protection device that accommodates a leakage current of 30mA.

With Smoker Option					ECO			Turbo Option*			
7-20E	V	Ph	Hz	AWG	A	Breaker	kW	A	Breaker	kW	Connection
208–240V	208	3	50/60	4	48.2	50	17.0	61.2	70	19.7	3Ø/PE
	240	3	50/60	3	55.6	60	22.6	70.6	70	26.2	3Ø/PE
440–480V	440	3	50/60	8	21.9	30	16.2	27.3	30	18.8	3Ø/PE
	480	3	50/60	8	23.8	30	19.2	30.0	35	22.3	3Ø/PE

*No-cost option on electric models.

- Electrical connections must meet all applicable federal, state, and local codes.
- For use on individual branch circuit only.
- Ovens are not supplied with an electrical cord or plug.
- For CE models use a Type B current protection device that accommodates a leakage current of 30mA.





7-20G ELECTRIC

						Without Smoker Option			With Smoker Option			
	7-20G	V	Ph	Hz	AWG	A	Breaker	kW	A	Breaker	kW	Connection
†	120V	120	1	60	12	6.8	20	0.84	12.0	20	1.5	1Ø/PE
†	208–240V	208	1	50/60	14	4.8	15	1.0	7.3	15	1.5	1Ø/PE
		240	1	50/60	14	4.2	15	1.0	7.1	15	1.7	1Ø/PE
†	208–240V	208	3	50/60	14	4.8	15	1.0	7.3	15	1.5	3Ø/PE
		240	3	50/60	14	4.2	15	1.0	7.1	15	1.7	3Ø/PE

† Per UL requirements, must be permanently connected to electrical supply source.

- Electrical connections must meet all applicable federal, state, and local codes.
- For use on individual branch circuit only.
- Ovens are not supplied with an electrical cord or plug.
- For CE models use a Type B current protection device that accommodates a leakage current of 30mA.

Prodigi™ Pro 7-20 (E/G)

ALTO-SHAAM

CLEARANCE

Top: 20" (508mm)
Left: 0" (0mm)
18" (457mm) recommended service access
Right: 0" (0mm) non-combustible surfaces
2" (51mm) combustible surfaces
Bottom: 5-1/8" (130mm)
Back: 4" (102mm) between plumbing and nearest object

CHECK FIRST

- Oven must be installed level.
- Oven must be installed on noncombustible surface.
- Use a water supply shut-off valve and back-flow preventer when required by local code.
- Exhaust hood installation is required on gas-heated models.
- Drain must not be located directly underneath the appliance unless a stand with solid top or shelf is used.

HEAT: ELECTRIC

Heat of rejection

7-20E	Heat Gain qs, BTU/hr	Heat Gain qs, kW
	1,305	0.38

NOISE: ELECTRIC

Noise emissions

Without hood system, a maximum 67 dBA was measured at 3.3 ft (1 m) from unit.

With hood system, a maximum 81 dBA was measured at 3.3 ft (1 m) from unit.

HEAT: GAS

Heat of rejection

7-20G	Heat Gain qs, BTU/hr	Heat Gain qs, kW
	549	0.16

NOISE: GAS

Noise emissions

Without hood system, a maximum 67 dBA was measured at 3.3 ft (1 m) from unit.

With hood system, a maximum 81 dBA was measured at 3.3 ft (1 m) from unit.

GAS

Gas Requirements
- Gas type must be specified on order
- Hook-up: 3/4" NPT

UL Marked Appliances	Maximum Input BTU/h	Minimum Input BTU/h	Maximum Inlet Pressure Inches WC (kPa)	Minimum Inlet Pressure Inches WC (kPa)	Maximum Fuel Consumption*	
					CFH	GPH
Natural Gas	98,000	80,000	14.0 (3.5)	5.5 (1.1)	93.3	N/A
Propane	98,000	68,000	14.0 (3.5)	9.2 (2.8)	39.2	1.1

*Assumes an average heating value for natural gs to be 1050 BTU/SCF and a specific gravity of 0.60. The assumed value for propane gas is 2,500 BTU/SCF, and a specific gravity of 1.53.

WATER

Water requirements (per oven)

Two cold water inlets — drinking quality

- One treated water inlet: 3/4" NPT male connection. Line pressure 30 psi minimum dynamic and 90 psi maximum static (200–1000 kPa) at a minimum flow rate of 0.26 gpm (1 L/min).
- One untreated water inlet: 3/4" NPT male connection. Line pressure 30 psi minimum dynamic and 90 psi maximum static (200–1000 kPa) at a minimum flow rate of 2.64 gpm (10 L/min). Water drain: 1-1/2" (40mm) connection with a vertical vent to extend above the exhaust vent. Materials must withstand temperatures up to 200°F (93°C).

CLEARANCE

Clearance requirements for water filtration system

Do not install a water filtration system behind unit.

Water Quality Standards

It is the sole responsibility of the owner/operator/purchaser of this equipment to verify that the incoming water supply is comprehensively tested and, if required, a means of "water treatment" provided that would meet compliance requirements with the published water quality standards shown below. Non-compliance with these minimum standards will potentially damage this equipment and/or components and void the original equipment manufacturer's warranty. Alto-Shaam recommends using the Alto-Shaam Reverse Osmosis System to properly treat your water.

Inlet Water Requirements		
Contaminant	Treated Water	Untreated Water
Free Chlorine	Less than 0.1 ppm (mg/L)	Less than 0.1 ppm (mg/L)
Hardness	30-70 ppm	30-70 ppm
Chloride	Less than 30 ppm (mg/L)	Less than 30 ppm (mg/L)
pH	7.0 to 8.5	7.0 to 8.5
Silica	Less than 12 ppm (mg/L)	Less than 12 ppm (mg/L)
Total Dissolved Solids (tds)	50-125 ppm	50-360 ppm

CONTACT US

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Phone: 262.251.3800 | 800.558.8744 U.S.A./Canada | Fax: 262.251.7067 | alto-shaam.com

PRO-SPC-0043 5/23 Printed in U.S.A.

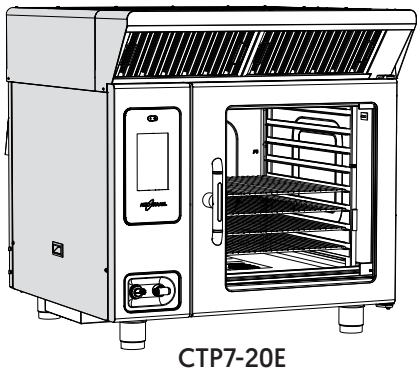
Due to ongoing product improvement, specifications are subject to change without notice.

Combitherm® CTP7-20E

Ventech™ Type 1 Hood with Condensation

Combining multiple cooking functions into a single appliance, Combitherm® ovens provide endless versatility, reliability and unmatched performance. An all-in-one solution for efficient and consistent food production. Combitherm ovens do the work of a convection oven, kettle, steamer, fryer, and more. Execute every dish, no matter how simple or complex, faster than ever with flawless precision and consistency.

Eliminate the need for a traditional kitchen hood. Ventech Type 1 hoods with condensation technology condense steam while capturing and removing grease-laden air, vapors, and lingering smoke. For more demanding locations, Ventech PLUS™ hoods include a HEPA filter. These hoods combine the fine particulate filtering of a HEPA filter with condensation technology of the standard Ventech hood.



CTP7-20E

Also available for CTC ovens. Contact factory for details.

Standard features

- Four cooking modes—steam, convection, combination, and retherm
- Programmable, touchscreen control
- Easy recipe upload/download via USB port
- Five fully automated cleaning cycles
- Front-accessible and retractable rinse hose
- LED illuminated door handle is designed for the needs of the busy kitchen, and provides visual notification of the oven status
- Absolute Humidity Control™ allows for selection any humidity level from 0-100% to maximize food quality, texture, and yield
- CoolTouch3™ triple panel glass door keeps the heat inside, while keeping the glass cool to the touch and providing 15% greater thermal retention to improve performance and efficiency
- SafeVent™ provides automatic steam venting at the end of the cooking cycle



CAPACITY

8 Eight, full-size sheet pans or eight GN 2/1 pans; sixteen full-size or GN 1/1 pans, two rows deep

2 Two side racks with eight non-tilt support rails; 19-7/8" [505mm] horizontal width between rails, 2-3/4" [70mm] vertical spacing between rails

168 lb [76 kg] product maximum

105 quarts [133 liters] volume maximum

Four [4] wire shelves included. Additional wire shelves required for maximum capacity.

Condensable Particulate Matter [CPM] emissions produced through the most aggressive testing methods available were measured at 0.77 mg/m³ for 11,660 beef patties which is below the maximum allowable level of 5.0 mg/m³ established by EPA test method 202. This product is UL listed under KNLZ in the U.S. and Canada.

Cooking appliance with integral systems for limiting the emission of grease laden air 1P35.

Configurations (select one)

- ☐ Boiler-free, standard
- ☐ Boiler-free, PROpower™
- ☐ Boiler version
- ☐ Boiler version, PROpower™

Door swing

- ☐ Right hinged

Electrical

- ☐ 208-240V, 1ph
- ☐ 208-240V, 3ph
- ☐ 380-415V, 3ph
- ☐ 440-480V, 3ph

Accessories (select all that apply)

- ☐ CombiLatch™
- ☐ Ventech Plus™ HEPA filter
- ☐ Door steam condenser, optional
- ☐ Seismic feet package, optional
- ☐ Mobile base, optional [U.S. only]
- ☐ Extended one-year warranty
- ☐ Automatic grease collection system, includes four 6-piece, self-trussing poultry racks #5014438, interior drip collection pan, and grease collection container with shut-off valve

Cleaning

- ☐ Automatic tablet-based cleaning system, standard
- ☐ Automatic liquid cleaning system, optional

Probe choices

- ☐ Removable, single-point, quick-connect core temperature probe, standard
- ☐ Removable, single-point, quick-connect sous vide temperature probe, optional
- ☐ Hard-wired, multi-point core temperature probe, optional [factory only installed]

Security devices for correctional facility use

- ☐ Optional base package [not available with recessed door]: includes tamper-proof screw package, excludes temperature probe
- ☐ Anti-entrapment device, optional
- ☐ Control panel security cover, optional
- ☐ Hasp door lock [padlock not included], optional
- ☐ Removable, single-point, quick-connect core temperature probe, optional

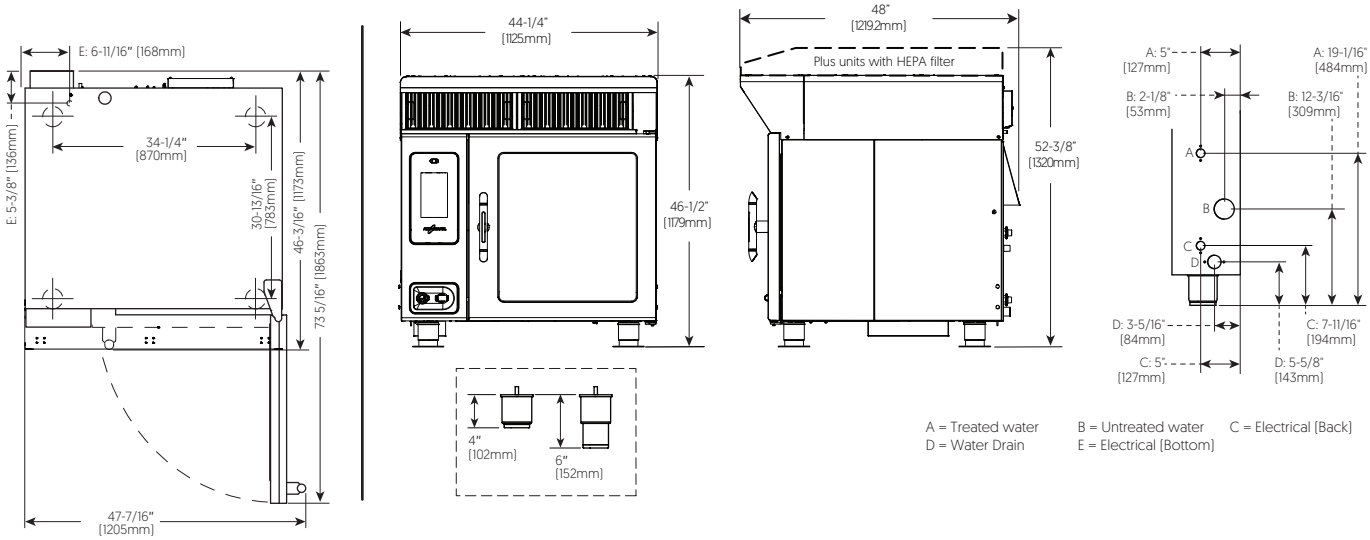
Installation options (select one)

- ☐ Alto-Shaam Combination Factory Authorized Installation Program - available in the U.S. and Canada only. Ventech hood field install extra
- ☐ Installation Start-Up Check - available through an Alto-Shaam authorized service agency

Combitherm® CTP7-20E

ALTO-SHAAM

Specification



DIMENSIONS

Model	Exterior with Ventech Hood (H x W x D)	Interior (H x W x D)
CTP7-20E	88-15/16" x 43-3/4" x 46-3/16" [2260mm x 1111mm x 1173mm]	23-1/4" x 24-1/4" x 32-3/4" [590mm x 616mm x 832mm]
		Net Weight
		801 lb [363 kg]
	Ship Dimensions (L x W x H)*	**Ship Weight***
CTP7-20E	56" x 49" x 108" [1422mm x 1245mm x 2743mm]	856 lb [388 kg]

*Domestic ground shipping information. Contact factory for export weight and dimensions.

Model	Ventech Hood Exterior (H x W x D)	
VH-20	11.12" x 44" x 46.5" [282mm x 1118mm x 1181mm]	**Net Weight**
		158 lb [72 kg]
	Ship Dimensions (L x W x H)*	**Ship Weight***
VH-20	56" x 49" x 20" [1422mm x 1245mm x 282mm]	276 lb [125 kg]

*Domestic ground shipping information. Contact factory for export weight and dimensions.

CLEARANCE

Top:	20" [508mm]
Left:	0" [0mm]
	18" [457mm] recommended service access
Right:	0" [0mm] Non-combustible surfaces
	2" [51mm] combustible surfaces
Bottom:	5-1/8" [130mm]
Back:	4" [102mm]
	4-5/16" [109mm] optional plumbing kit

CHECK FIRST

- Oven must be installed level.
- Water supply shut-off valve and back-flow preventer when required by local code.
- Drain must not be located directly underneath the appliance.

HEAT

Heat of rejection

CTP7-20E	Heat Gain qs, BTU/hr	Heat Gain qs, kW
	1,305	0.38

NOISE

Noise emissions
With hood system, a maximum 71 dBA was measured at 3.3 ft [1 m] from unit.

Combitherm® CTP7-20E

ALTO-SHAAM

ELECTRIC

					ECO Standard			PROpower™ Option**			
CTP7-20E	**V**	**Ph**	**Hz**	**Awg**	**A**	**Breaker**	**kW**	**A**	**Breaker**	**kW**	**Connection**
208–240V	208	1*	50/60	1	79.1	80	16.5	92.1	100	19.2	L1, L2/N, G
	240	1*	50/60	1/0	91.3	100	21.9	106.3	110	25.5	L1, L2/N, G
208–240V	208	3	50/60	4	45.7	50	16.5	58.7	60	19.2	L1, L2, L3, G
	240	3	50/60	3	52.7	60	21.9	67.7	70	25.5	L1, L2, L3, G
380–415V	380	3	50/60	6	28.0	32	18.7	41.7	63	21.4	L1, L2, L3, N, G
	415	3	50/60	4	30.4	32	21.9	45.4	63	25.5	L1, L2, L3, N, G
440–480V	440	3*	50/60	8	20.6	25	15.7	26.5	30	18.3	L1, L2, L3, G
	480	3*	50/60	8	22.4	25	18.7	28.8	35	21.8	L1, L2, L3, G

Electrical connections must meet all applicable federal, state, and local codes. No cord, no plug, dedicated circuit required.
*Electrical service charge applies.
**No-cost option on electric models.

WATER

Water requirements (per oven)

- Two cold water inlets - drinking quality
- One treated water inlet: 3/4" NPT connection. Line pressure 30 psi minimum dynamic and 90 psi maximum static (200-600 kPa) at a minimum flow rate of 0.26 gpm (1 L/min).
- One untreated water inlet: 3/4" NPT connection. Line pressure 30 psi minimum dynamic and 90 psi maximum static (200-600 kPa) at a minimum flow rate of 2.64 gpm (10 L/min). Water drain: 1-1/2" (40mm) connection with a vertical vent to extend above the exhaust vent. Materials must withstand temperatures up to 200°F (93°C).

CLEARANCE

Clearance requirements for water filtration system
Do not install a water filtration system behind unit.

Water Quality Standards

It is the sole responsiblity of the owner/operator/purchaser of this equipment to verify that the incoming water supply is comprehensively tested and, if required, a means of "water treatment" provided that would meet compliance requirements with the published water quality standards shown below. Non-compliance with these minimum standards will potentially damage this equipment and/or components and void the orginal equipment manufacturer's warranty. Alto-Shaam recommends using OptiPure (www.optipurewater.com) products to properly treat your water.

Inlet Water Requirements		
Contaminant	**Treated Water**	**Untreated Water**
Free Chlorine	Less than 0.1 ppm (mg/L)	Less than 0.1 ppm (mg/L)
Hardness	30-70 ppm	30-70 ppm
Chloride	Less than 30 ppm (mg/L)	Less than 30 ppm (mg/L)
pH	7.0 to 8.5	7.0 to 8.5
Silica	Less than 12 ppm (mg/L)	Less than 12 ppm (mg/L)
Total Dissolved Solids (tds)	50-125 ppm	50-360 ppm

North American Certificates and Listings

- Certificate File Number: E180237 – 20131227
- UL 710B, Standard for Recirculating Systems
- UL 197, Standard for Electric Commercial Cooking Appliances
- CSA C22.2 No. 109-M1981, Standards for Commercial Cooking Appliances
- NFPA 96
- NSF / ANSI-4
- EPA 202
- ANSI / UL 900
- ASTM F2800 Type 1 Hood

International Certificates and Listings

- EAC, EURASIAN ECONOMIC UNION DECLARATION OF CONFORMITY
- Australian Water Mark, WMTS-104-2005, Watermark Level 2
- RCM, Australian Regulatory Compliance
- CE, European Harmonized Performance and Safety Compliance
- IPX5, Ingress Protection Rating

CONTACT US
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CTP7-SPC-0022-EN 04/20 Printed in U.S.A.
Due to ongoing product improvement, specifications are subject to change without notice.

SPEC SHEET

"EPT6R5-SSK" STAINLESS STEEL PREP TABLE W/SINK

16GA Top w/Stainless Base & Adjustable Undershelf - 5" Riser

FEATURES:

- 16GA Stainless Steel Top w/5" Riser & Turndown
- Type 300 Stainless Steel With #4 Polish, Satin Finish
- 1-1/2" Stallion Edge On Front With Side Edges 90 Degree Bend Down For Table Line-Up
- (1) 16"x20"x12" Bowl
- Stainless Steel Base With Adjustable Undershelf
- Adjustable Bullet Feet
- Shipped Knocked-Down, Easy-To-Assemble
- Includes (1) Deck Mounted Faucet 4" O/C w/10" Swing Spout

SPECIFICATIONS:

- Top: Stainless Steel Tops Are Tig Welded, Exposed Welds Are Polished To Match Adjacent Surface
- Top: 16GA Stainless Steel Type 300 Stainless Steel With #4 Polish, Satin Finish
- Shelf: 18GA Stainless Steel,
- Legs: 1-5/8" Round O.D. 16GA Tubular Stainless Steel
- Gussets: Stainless Steel
- Feet: 1" Adjustable Stainless Bullet Feet

CERTIFICATIONS:



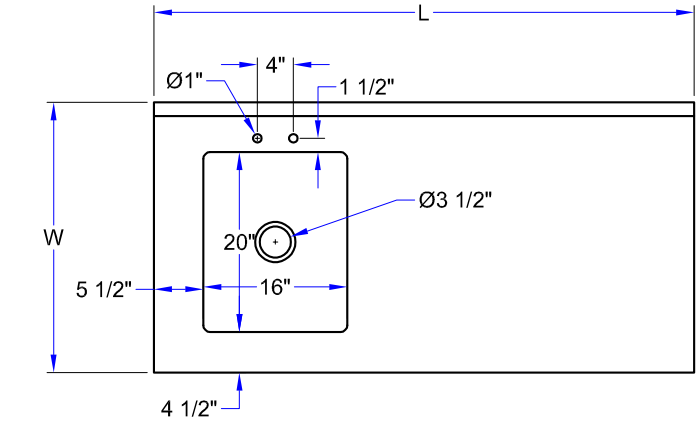
EPT6R5-3060SSK-R

"EPT6R5-SSK" STAINLESS STEEL PREP TABLE W/SINK

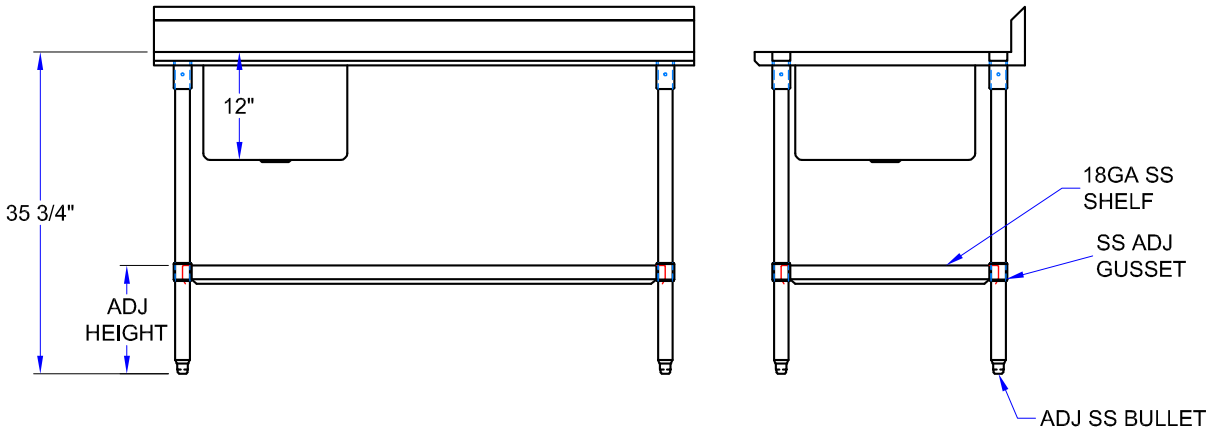
MODEL	SINK BOWL LOCATION	SIZE (L X W X H)	WEIGHT (LBS)
EPT6R5-3048SSK-L	Left	48"x30"x35-3/4"	145
EPT6R5-3048SSK-R	Right	48"x30"x35-3/4"	145
EPT6R5-3060SSK-L	Left	60"x30"x35-3/4"	171
EPT6R5-3060SSK-R	Right	60"x30"x35-3/4"	171
EPT6R5-3072SSK-L	Left	72"x30"x35-3/4"	202
EPT6R5-3072SSK-R	Right	72"x30"x35-3/4"	202

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

DETAILED SPECIFICATIONS



Units 7 Ft. & Larger Are
Furnished With Six Legs
Shelf Length = Length Minus 4.875"
Shelf Width = Width Minus 4.25"



MODEL # STRUCTURE

30 = Width Of Work Surface
5 = Ht. Of Riser w/Turndown
R = Riser Top Work Table
6 = 16GA Work Surface
EPT = Economy Prep Table

60 = Length Of Work Surface
SS = Stainless Steel Base & Shelf
K = Ships Knocked Down
L = Bowl Location

EPT6R5-3060SSK-L

"EPT6R5-SSK" STAINLESS STEEL PREP TABLE W/SINK

MODEL	SINK BOWL LOCATION	SIZE (L X W X H)	WEIGHT (LBS)
EPT6R5-3048SSK-L	Left	48"x30"x35-3/4"	145
EPT6R5-3048SSK-R	Right	48"x30"x35-3/4"	145
EPT6R5-3060SSK-L	Left	60"x30"x35-3/4"	171
EPT6R5-3060SSK-R	Right	60"x30"x35-3/4"	171
EPT6R5-3072SSK-L	Left	72"x30"x35-3/4"	202
EPT6R5-3072SSK-R	Right	72"x30"x35-3/4"	202

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

John BOOS Since 1887

ITEM #: _____ QTY: _____

MODEL #: _____

PROJECT NAME: _____

020121

3601 S. Banker St. Effingham, IL 62401 • P.O. BOX 609 • Ph: (888) 431-2667 • Fax: (800) 433-2667

FAUCETS & PARTS


PBF-FV2-SM-35GLF


PB-KV1-SM-35GLF


PB-KV1-DM-35GLF


PB-KV2-SM-35GLF


PB-KV2-DM-35GLF


PB-WR


PB-LWR-1


PB-PT1.5


PBF-SS-6

FAUCETS & PARTS

	MODEL #	QTY	DESCRIPTION	WT.
FOOT VALVE	PBF-FV2-SM-35GLF		W/ 3-1/2" GOOSENECK SPOUT (LOW LEAD)	3
KNEE VALVE	PBF-KV1-SM-35GLF		SINGLE PEDAL, SPLASH MOUNT, 3.5" GOOSE NECK (LOW LEAD)	3
	PBF-KV1-DM-35GLF		SINGLE PEDAL, DECK MOUNT, 3.5" GOOSE NECK (LOW LEAD)	2.5
	PBF-KV2-SM-35GLF		DOUBLE PEDAL, SPLASH MOUNT, 3.5" GOOSE NECK (LOW LEAD)	2
	PBF-KV2-DM-35GLF		DOUBLE PEDAL, DECK MOUNT, 3.5" GOOSE NECK (LOW LEAD)	4
WRIST BLADES	PB-WR		ADA, STAINLESS STEEL, (1 PAIR), USE W/ HEAVY DUTY FAUCETS ONLY	1
TWIST ACTION LEVER DRAINS	PB-LWR-1		FITS 3-1/2" DRAIN OPENING, 2" OUTLET	4
	PB-LWR-1OV		FITS 3-1/2" DRAIN OPENING, 2" OUTLET, W/ OVERFLOW	4
STRAIGHT ACTION LEVER DRAINS	PB-LWS-1		FITS 3-1/2" DRAIN OPENING, 2" OUTLET	4
	PB-LWS-1OV		W/ OVERFLOW, FITS 3-1/2" DRAIN OPENING	4
P-TRAPS	PB-PT1.5		FOR HAND SINKS, P-TRAP 1-1/2" & TAIL PIPE	7
MOP SINK FAUCET	PBF-SS-6		VACUUM BREAKER NOZZLE W/ 3-4" GARDEN HOSE THREAD, PAIL HOOK, TOP SUPPORT ARM, 1/2" NPT FEMALE FLANGED, W/ ADJUSTABLE INLET W/ SCREWDRIVER STOP	5
MOUNTING KIT	PB-DMMK		FOR DECK MOUNT, INCLUDES (2) 1/2" SUPPLY NIPPLES, (2) RETAINER NUTS, (2) LOCK WASHERS & (2) RUBBER WASHERS	1
	PB-SMMK-90		FOR SPLASH MOUNT, INCLUDES (2) 1/2" SUPPLY NIPPLES, (2) RETAINER NUTS, (2) LOCK WASHERS, (2) RUBBER WASHERS & (2) MALE & FEMALE SHORT 90° ELBOWS	1

SOME UNITS SHIP UNASSEMBLED FOR REDUCED SHIPPING COST. ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500"

John Boos & Co. is constantly engaged in a program of improving products and therefore reserves the right to change specifications without prior notice.

John BOOS Since 1887

ITEM #: _____ QTY: _____

MODEL #: _____

PROJECT NAME: _____

090418

3601 S. Banker St. Effingham, IL 62401 • P.O. BOX 609 • Ph: (888) 431-2667 • Fax: (800) 433-2667

"DRSC" ROLLER BEARING DRAWERS - STAINLESS STEEL

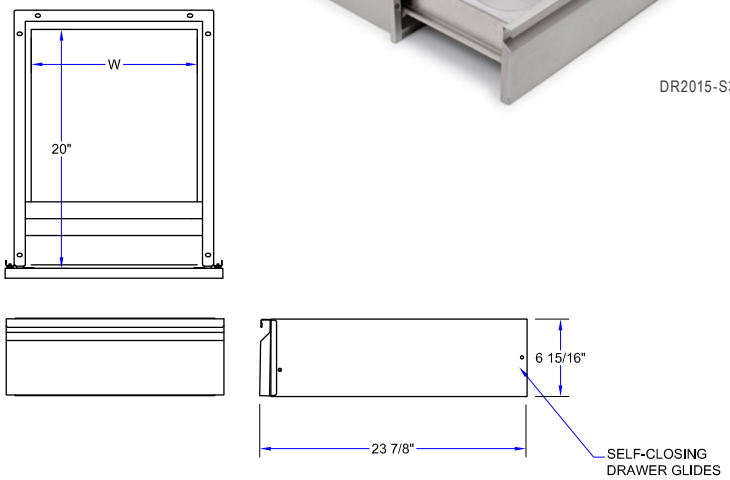
SELF CLOSING

FEATURES:

- STAINLESS STEEL FRONT AND DRAWER PAN
- STAINLESS STEEL ROLLER BEARING SLIDES
- SELF CLOSING DRAWER



DR2015-S30



ROLLER BEARING DRAWERS - STAINLESS STEEL

WOOD TOP / SBO & SBS TABLES	QTY	STAINLESS STEEL TOP / POLY TOP TABLES	QTY	DESCRIPTION	WIDTH	DEPTH	WEIGHT (LBS)
DR2015SC-W		-		FOR WOOD TOP TABLES	15"	20"	20
-		DR2015SC-S24		FOR S/S AND POLY TOP TABLES 24" WIDE	15"	20"	20
-		DR2015SC-S30		FOR S/S AND POLY TOP TABLES 30" WIDE	15"	20"	20
-		DR2015SC-S36		FOR S/S AND POLY TOP TABLES 36" WIDE	15"	20"	20
DR2020SC-W		-		FOR WOOD TOP TABLES	20"	20"	25
-		DR2020SC-S24		FOR S/S AND POLY TOP TABLES 24" WIDE	20"	20"	25
-		DR2020SC-S30		FOR S/S AND POLY TOP TABLES 30" WIDE	20"	20"	25
-		DR2020SC-S36		FOR S/S AND POLY TOP TABLES 36" WIDE	20"	20"	25

SOME UNITS SHIP UNASSEMBLED FOR REDUCED SHIPPING COST. ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500"

John Boos & Co. is constantly engaged in a program of improving products and therefore reserves the right to change specifications without prior notice.

SPEC SHEET

"ST6-SSK" STAINLESS STEEL TOP WORK TABLES

16GA Top & Stainless Steel Legs & Adjustable Undershelf

FEATURES:

- 16GA Stainless Steel Top
- Type 300 Stainless Steel With #4 Polish, Satin Finish
- Top Is Sound Deadened
- Reinforced With 1"x2" Channel Running Entire Length Of Table
- 1-1/2" Stallion Edge On Front And Rear With Side Edges 90 Degree Bend Down For Table Line-Up
- Stainless Base With Adjustable Undershelf
- Adjustable Bullet Feet
- Shipped Knocked-Down, Easy-To-Assemble

SPECIFICATIONS:

- Top: Stainless Steel Tops Are TIG Welded, Exposed Welds Are Polished To Match Adjacent Surface
- Top: 16GA Stainless Steel Type 300 Stainless Steel With #4 Polish, Satin Finish
- Shelf: 18GA Stainless Steel, (36" Wide Tables, 16GA Lower Shelf)
- Legs: 1-5/8" Round O.D. , 16GA Tubular Stainless Steel
- Gussets: Stainless Steel
- Feet: 1" Adjustable Stainless Bullet Feet

CERTIFICATIONS:



ST6-3048SSK

ACCESSORIES

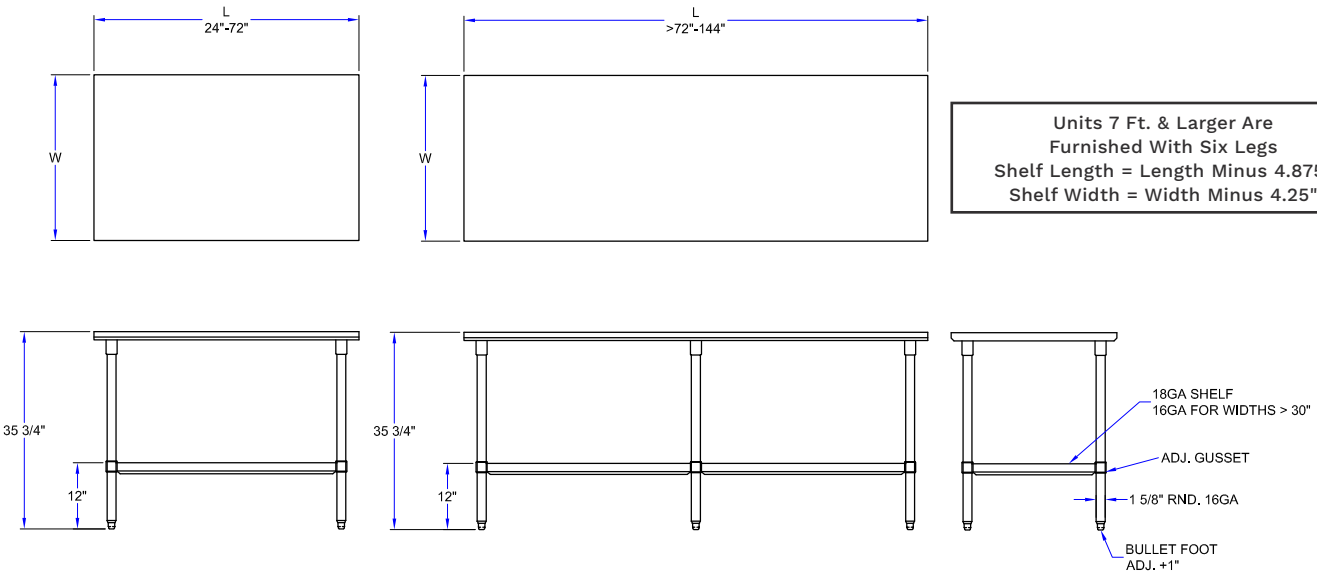
DESCRIPTION
Drawer
Drawer Lock
Casters
Overshelves
Sinks
Pot Rack

"ST6-SSK" STAINLESS STEEL TOP WORK TABLES

LENGTH	24" WIDE	WT (LBS)	30" WIDE	WT (LBS)	36" WIDE	WT (LBS)	48" WIDE	WT (LBS)
24"	**ST6-2424SSK**	42	**ST6-3024SSK**	47	**ST6-3624SSK**	56	-	-
30"	**ST6-2430SSK**	47	**ST6-3030SSK**	53	**ST6-3630SSK**	66	-	-
36"	**ST6-2436SSK**	53	**ST6-3036SSK**	60	**ST6-3636SSK**	73	-	-
48"	**ST6-2448SSK**	65	**ST6-3048SSK**	74	**ST6-3648SSK**	90	**ST6-4848SSK**	113
60"	**ST6-2460SSK**	76	**ST6-3060SSK**	88	**ST6-3660SSK**	107	**ST6-4860SSK**	134
72"	**ST6-2472SSK**	88	**ST6-3072SSK**	101	**ST6-3672SSK**	126	**ST6-4872SSK**	155
84"	**ST6-2484SSK**	107	**ST6-3084SSK**	123	**ST6-3684SSK**	152	**ST6-4884SSK**	189
96"	**ST6-2496SSK**	118	**ST6-3096SSK**	136	**ST6-3696SSK**	170	**ST6-4896SSK**	211
108"	**ST6-24108SSK**	130	**ST6-30108SSK**	149	**ST6-36108SSK**	187	**ST6-48108SSK**	234
120"	**ST6-24120SSK**	140	**ST6-30120SSK**	163	**ST6-36120SSK**	204	**ST6-48120SSK**	256
132"	**ST6-24132SSK**	152	**ST6-30132SSK**	177	**ST6-36132SSK**	221	**ST6-48132SSK**	281
144"	**ST6-24144SSK**	164	**ST6-30144SSK**	191	**ST6-36144SSK**	238	**ST6-48144SSK**	305

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

DETAILED SPECIFICATIONS



MODEL # STRUCTURE

24 = Width Of Work Surface
6 = 16GA Work Surface
ST = Stainless Steel Top
30 = Length Of Work Surface
SS = Stainless Legs & Shelf
K = Ships Knocked Down

ST6-2430SSK

"ST6-SSK" STAINLESS STEEL TOP WORK TABLES

LENGTH	24" WIDE	WT (LBS)	30" WIDE	WT (LBS)	36" WIDE	WT (LBS)	48" WIDE	WT (LBS)
24"	**ST6-2424SSK**	42	**ST6-3024SSK**	47	**ST6-3624SSK**	56	-	-
30"	**ST6-2430SSK**	47	**ST6-3030SSK**	53	**ST6-3630SSK**	66	-	-
36"	**ST6-2436SSK**	53	**ST6-3036SSK**	60	**ST6-3636SSK**	73	-	-
48"	**ST6-2448SSK**	65	**ST6-3048SSK**	74	**ST6-3648SSK**	90	**ST6-4848SSK**	113
60"	**ST6-2460SSK**	76	**ST6-3060SSK**	88	**ST6-3660SSK**	107	**ST6-4860SSK**	134
72"	**ST6-2472SSK**	88	**ST6-3072SSK**	101	**ST6-3672SSK**	126	**ST6-4872SSK**	155
84"	**ST6-2484SSK**	107	**ST6-3084SSK**	123	**ST6-3684SSK**	152	**ST6-4884SSK**	189
96"	**ST6-2496SSK**	118	**ST6-3096SSK**	136	**ST6-3696SSK**	170	**ST6-4896SSK**	211
108"	**ST6-24108SSK**	130	**ST6-30108SSK**	149	**ST6-36108SSK**	187	**ST6-48108SSK**	234
120"	**ST6-24120SSK**	140	**ST6-30120SSK**	163	**ST6-36120SSK**	204	**ST6-48120SSK**	256
132"	**ST6-24132SSK**	152	**ST6-30132SSK**	177	**ST6-36132SSK**	221	**ST6-48132SSK**	281
144"	**ST6-24144SSK**	164	**ST6-30144SSK**	191	**ST6-36144SSK**	238	**ST6-48144SSK**	305

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

John BOOS Since 1887

ITEM #: _____ QTY: _____

MODEL #: _____

PROJECT NAME: _____

021521

3601 S. Banker St. Effingham, IL 62401 • P.O. BOX 609 • Ph: (888) 431-2667 • Fax: (800) 433-2667

"CAS" CASTERS & FEET

CASTERS & FEET

MODEL #	QTY	ITEM	DESCRIPTION	SET OF
CAS01-R		CASTERS	5", HEAVY DUTY, LOCKING, FOR 1-5/8" DIAMETER LEGS	4
CAS02-R		CASTERS	5", HEAVY DUTY, LOCKING, FOR 1-5/8" DIAMETER LEGS	6
CAS03		CASTERS	2-1/2", HEAVY DUTY, LOCKING	4
CAS-RN		CASTERS	3", BLACK, LOCKING	4
CAS23-R		CASTERS	5", HEAVY DUTY, LOCKING, FOR 2" SQUARE TUBE	4
CUCCAS-DLGS		CASTERS	5", SWIVEL LOCKING PLATE CASTER	4
CAS05		FLANGE FEET	ADJUSTABLE, STAINLESS STEEL	4
CAS05H		FLANGE FEET	ADJUSTABLE WITH HOLES FOR ATTACHMENT TO FLOOR, STAINLESS STEEL	4
CASWS05-4		CASTERS	LOCKING W/ BUMPERS	4
CAS06		FLANGE FEET	ADJUSTABLE, STAINLESS STEEL	6
CAS06H		FLANGE FEET	ADJUSTABLE WITH HOLES FOR ATTACHMENT TO FLOOR, STAINLESS STEEL	6
CAS07		BULLET FOOT	ADJUSTABLE, STAINLESS STEEL	EACH
CAS07-4		BULLET FOOT	ADJUSTABLE, STAINLESS STEEL, ONE (1) EACH PER LEG OF TABLE	4
CAS07-6		BULLET FOOT	ADJUSTABLE, STAINLESS STEEL, FOR 1-5/8" DIA. LEG	6
CAS08		BULLET FOOT	ADJUSTABLE, STAINLESS STEEL, FOR 1-1/2" SQUARE LEG	EACH
CAS08-4		BULLET FOOT	ADJUSTABLE, STAINLESS STEEL, FOR 1-1/2" SQUARE LEG	4
CAS08-6		BULLET FOOT	ADJUSTABLE, STAINLESS STEEL, FOR 1-1/2" SQUARE LEG	6
CAS12-1		FLANGE FEET	ADJUSTABLE, STAINLESS STEEL, (W/ MOUNTING HOLES)	EACH
CAS14		CASTERS	5", HEAVY DUTY, LOCKING	4
CAS14-6		CASTERS	5", HEAVY DUTY, LOCKING	6
CAS15		FLANGE FEET	ADJUSTABLE, STAINLESS STEEL	EACH
CAS16		FLANGE FEET	ADJUSTABLE, STAINLESS STEEL, 3-1/2" DIA.	4
CAS17		FLANGE FEET	ADJUSTABLE, STAINLESS STEEL, 3-1/2" DIA., (TABLES 84" & LONGER WITH 6 LEGS)	6


CAS01-R


CAS03


CAS-RN


CASWS05-4


CAS07

SOME UNITS SHIP UNASSEMBLED FOR REDUCED SHIPPING COST. ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500"

John Boos & Co. is constantly engaged in a program of improving products and therefore reserves the right to change specifications without prior notice.

RN1A/RN2A-FS

One and Two Section Roll In Refrigerator

STEELHEART

RN1A-FS
02/19/20
Item # 13540

Item #: _____
Project: _____
Qty: _____
AIA#: _____

W x D x H
35” x 34.5” x 87.5”*

W x D x H
68” x 34.5” x 87.5”*





NATURAL REFRIGERANT

FACTORY WARRANTY * Parts & Labor 3 YR. Entire Machine Parts 5 YR. Compressor

Dimensions / Capacity	One Section RN1A-FS	Two Section RN2A-FS
Interior Storage Capacity (CF) (AHAM)	38.13 ft³	78.35 ft³
Overall Width x Depth (with ramp)	35” x 38.9”	68” x 38.9”
Height	87.5”	87.5”
Door Opening Width x Height	29.25” x 72.75”	29.25” x 72.75”
Depth with Door Open at 90°	65.25”	65.25”
Crated Shipping Weight	429 lbs	676 lbs
Crated Length x Depth x Height	40.5” x 39” x 93.5”	72” x 40.5” x 93.75”

Electrical / Refrigeration	One Section RN1A-FS	Two Section RN2A-FS
Voltage	115/60/1	115/60/1
HACR Breaker	15.0 Amps	15.0 Amps
Electrical Connection (NEMA)	5-15P	5-15P
Voltage Range	104-126	104-126
Ambient Temp. Range	45° to 100°F	45° to 100°F
Control Setpoint Range	31° to 52°F	31° to 52°F
Amperage	6.4	8.2
Energy Consumption (kWh/day) @ASHRAE	3.186	5.06
Heat Rejection (BTU/Hr.) @NSF	774	1376
Approx. Nominal Compres. BTU/HR (HP)	2750(1/2HP)	3730(1HP)
Refrigerant / Charge Amount (oz)	R290 / (4.6 oz)	R290 / (5.1 oz)

Warranty

* 3 Year - parts and Labor on entire machine.
5 Year - Parts on Compressor
Valid in United States, Canada, Puerto Rico and U.S. Territories. Contact factory for warranty in other countries.

Features

- **Stainless steel interior with stainless steel exterior front, sides and top**
- **Unique ducted air distribution system**
- **Environmentally friendly R290 hydrocarbon refrigerant**

- Refrigerant flow is controlled with thermostatic expansion valve
- Reinforced stainless steel ramp and floor accommodate roll in racks up to 72” tall (supplied by others)
- Energy efficient interior LED light
- Solid state digital controller with temperature alarms and LED display (Fahrenheit or Celsius)
- Cabinet and doors are insulated with 2-3/8” of CFC free, foamed in place polyurethane
- Stainless steel exterior and interior door come standard with locks
- Exclusive stepped door design to protect recessed door gasket
- Spring assisted self-closing doors with stay open feature
- Sturdy 8 gauge stainless steel hinge plate with welded hinge pin
- Extruded aluminum flush mount door handle
- Field reversible doors
- Evaporator coils are epoxy electrocoated (E-Coat) to help fight corrosion
- Energy efficient automatic hot gas condensate evaporator
- Top mount refrigeration comes standard with a condenser filter
- 10 ft. cord and plug

Note: Made to order. Allow 4-6 weeks.

Hoshizaki reserves the right to change specifications without notice.

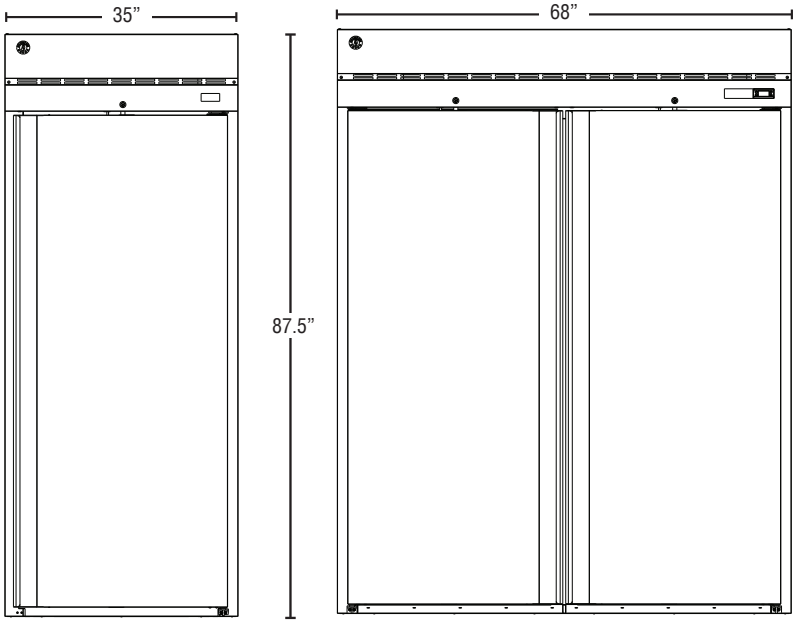
RN1A/RN2A-FS

One and Two Section Roll In Refrigerator

STEELHEART

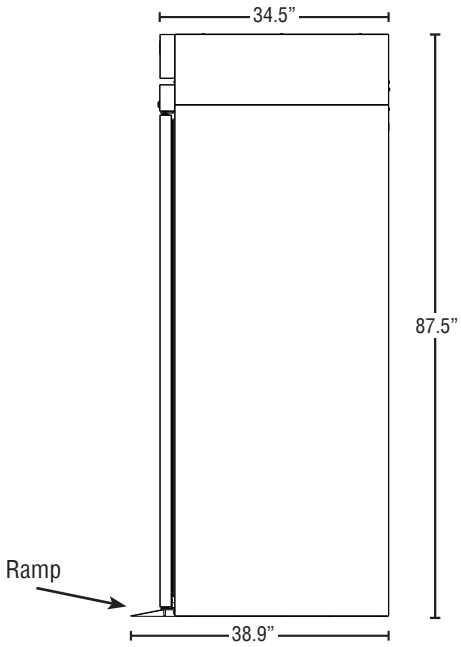
RN1A-FS
02/19/20
Item # 13540

FRONT VIEW

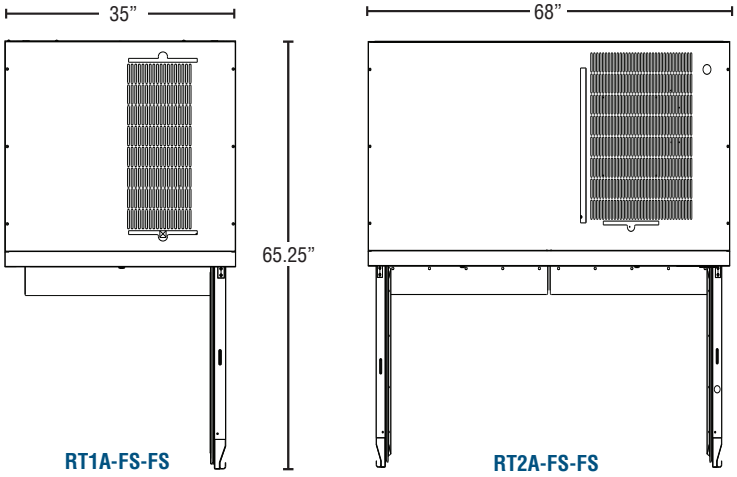


RT1A-FS-FS RT2A-FS-FS

SIDE VIEW



PLAN VIEW



RT1A-FS-FS RT2A-FS-FS

Cabinet Construction

The exterior cabinet front, sides, and top are constructed of high quality stainless steel. The exterior back, and bottom are constructed of coated steel. The cabinet interior is constructed of stainless steel. Cabinet walls and doors are insulated with 2-3/8” of environmentally friendly, CFC free, foamed in place polyurethane. An interior LED light is automatically activated when doors are opened. The reinforced ramp and floor has been designed to withstand loads up to 150 lbs. The interior cabinet is provided with stainless steel rack guides to assist with positioning roll-in racks. The cabinet can accommodate roll in carts up to 72” high.

Door Construction

Doors are constructed of a high grade stainless steel exterior and interior and are standard with locks. Hoshizaki’s exclusive “stepped” design protects the recessed gasket while product is being removed from the cabinet. Doors are provided with a one piece, full length extruded aluminum flush mount handle and are mounted on eight (8) gauge stainless steel hinge plates with a welded hinge pin. Spring assisted self-closing doors are equipped with a stay open feature past 90 degrees. Snap-in magnetic door gaskets are easily removed for cleaning. Door hinging is field reversible. The bottom gasket can be adjusted and comes factory installed.

Refrigeration System

The high efficiency refrigeration system is self-contained with an epoxy electrocoated (E-Coat) evaporator for extended life. Top mounted refrigeration system is easily accessible for service and includes a condenser filter with easy access from the top of the unit. The refrigeration system components are assembled on a high density expanded polypropylene platform that is removable from the main unit. A unique ducted air flow system achieves uniform air distribution within the cabinet to eliminate hot spots. Condensate removal is accomplished with a top mounted energy efficient non-electric evaporation system. A thermostatic expansion valve (TXV) controls the flow of environmentally friendly R290 refrigerant through the evaporator. Refrigeration system utilizes a time initiated off cycle defrost to eliminate any ice on the evaporator coil. Solid state digital controls monitor the operation and performance of the refrigeration system. The controls also provide visual high and low temperature and high and low voltage alarms. A LED display shows the cabinet temperature and is adjustable to Fahrenheit or Celsius. 115 volt units are equipped with a ten foot cord and plug (20.0 amps or less).

ER1A-FS/ER2A-FS

One and Two Section Full Stainless Refrigerator

ER1A-FS/ER2A-FS
09/20/23
Item # 13563

W x D x H
27" x 29.63" x 81.63"
(including 4" casters)

W x D x H
54.38" x 29.63" x 81.63"
(including 4" casters)

Item #: _____

Project: _____

Qty: _____

AIA#: _____





NSF / ANSI 7
2M75

2M75

NATURAL
REFRIGERANT

FACTORY WARRANTY *
Parts & Labor 2 YR Entire Machine
Parts 5 YR Compressor

Features

- Energy efficient interior LED light
- Environmentally friendly R290 hydrocarbon refrigerant
- Solid state digital controller with temperature alarms and LED display (Fahrenheit or Celsius)
- Self-closing door(s) is field reversible
- Stainless steel exterior door(s) come standard with lock(s)
- Stainless steel interior floor with aluminum sides, rear, and top
- Factory-installed casters
- Time initiated automatic defrost
- Energy efficient heated condensate removal
- Heavy duty grey epoxy coated shelves are adjustable in 1/2" increments; 3 per section. 105 lbs. capacity
- Aluminum shelf supports
- Standard with 4" casters (two with brakes)
- 9 ft. cord and plug
- Container Qty:
  ER1A-FS: 47
  ER2A-FS: 28

Dimensions / Capacity	One Section ER1A-FS	Two Section ER2A-FS
Interior Storage Capacity (CF) (AHAM)	17.8 ft³	38.61 ft³
Overall Width x Depth	27" x 29.63"	54.38" x 29.63"
Height (including 4" casters)	81.63"	81.63"
Door Opening (W x H)	22.25" x 52.1"	22.9" x 52.1"
Depth with Door Open at 90°	55.38"	55.38"
Adjustable Shelves	3	6
Shelf Dimensions (W x D)	21.5" x 23.1"	24.3" x 21.7"
Crated Shipping Weight	279 lbs	523 lbs
Crated Length x Depth x Height	31.5" x 28.75" x 84"	58" x 31.5" x 84"

Electrical / Refrigeration	One Section ER1A-FS	Two Section ER2A-FS
Voltage	115/60/1	115/60/1
HACR Breaker	15.0 Amps	15.0 Amps
Electrical Connection (NEMA)	5-15P	5-15P
Voltage Range	103-127	103-127
Ambient Temp. Range	45° to 100°F	45° to 100°F
Control Setpoint Range	33° to 39°F	33° to 39°F
Amperage	2	4.3
Energy Consumption (kWh/day) @ASHRAE	1.06	2.1
Appox. Nominal Compres. BTU/HR (HP)	1960(1/5HP)	4291(1/3HP)
Refrigerant / Charge Amount (oz.)	R290 / (2.3oz)	R290 / (3.7oz)

Options

Additional epoxy shelves
☐ HS-5511(1 section)
☐ HS-5512 (2 section)

Warranty

* 2 Year - Parts and Labor on entire machine.
5 Year - Parts on Compressor
Valid in United States, Canada, Puerto Rico and U.S. Territories. Contact factory for warranty in other countries.

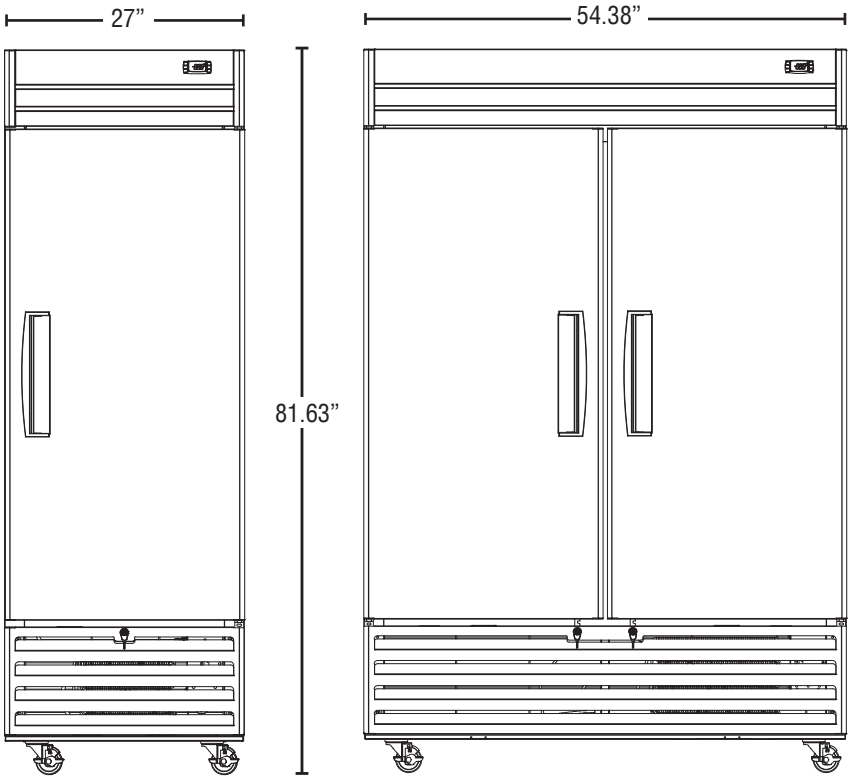
If GFCI is required, a GFCI breaker MUST be used in lieu of GFCI receptacle

We reserve the right to change specifications without notice.

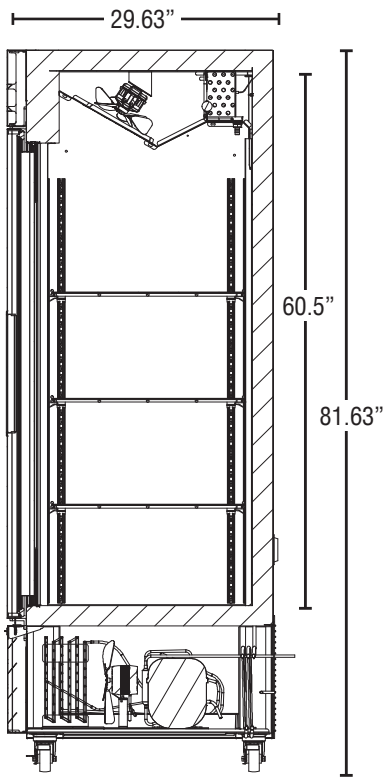
ER1A-FS/ER2A-FS

One and Two Section Full Stainless Refrigerator

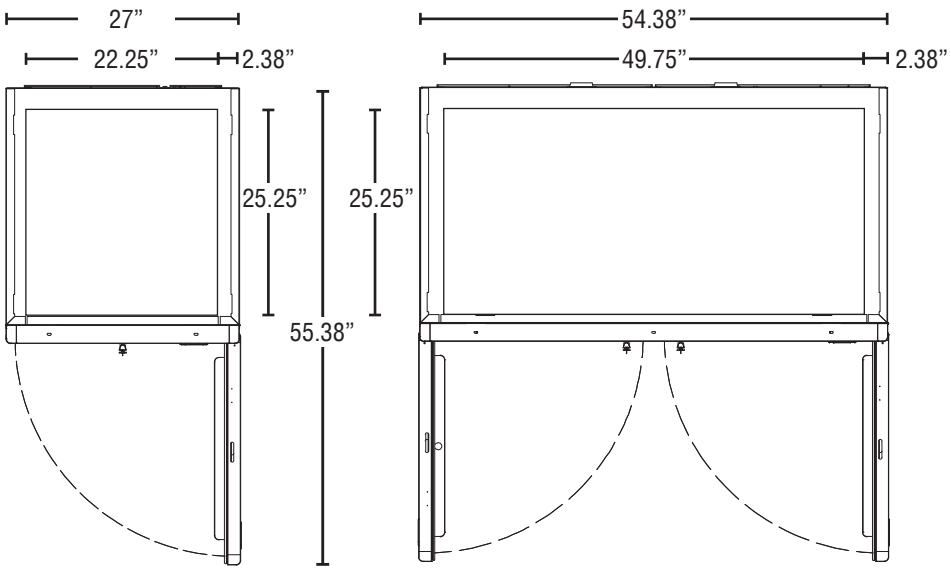
FRONT VIEW



SIDE VIEW



PLAN VIEW



EF1A-FS/EF2A-FS

One and Two Section Full Stainless Freezer

W x D x H
27" x 29.63" x 81.63"
(including 4" casters)

W x D x H
54.38" x 29.63" x 81.63"
(including 4" casters)

Item #: _____

Project: _____

Qty: _____

AIA#: _____





NSF / ANSI 7
2M75

2M75

NATURAL REFRIGERANT

FACTORY WARRANTY *
Parts & Labor 2 YR Entire Machine
Parts 5 YR Compressor

Dimensions / Capacity	One Section EF1A-FS	Two Section EF2A-FS
Interior Storage Capacity (CF) (AHAM)	17.74 ft³	38.54 ft³
Overall Width x Depth	27" x 29.63"	54.38" x 29.63"
Height (including 4" casters)	81.63"	81.63"
Door Opening (W x H)	22.25" x 52.1"	22.9" x 52.1"
Depth with Door Open at 90°	55.38"	55.38"
Adjustable Shelves	3	6
Shelf Dimensions (W x D)	21.5" x 23.1"	24.3" x 21.7"
Crated Shipping Weight	279 lbs	523 lbs
Crated Length x Depth x Height	31.5" x 28.75" x 84"	58" x 31.5" x 84"

Electrical / Refrigeration	One Section EF1A-FS	Two Section EF2A-FS
Voltage	115/60/1	115/60/1
HACR Breaker	15.0 Amps	15.0 Amps
Electrical Connection (NEMA)	5-15P	5-15P
Voltage Range	103-127	103-127
Ambient Temp. Range	45° to 100°F	45° to 100°F
Control Setpoint Range	-5° to 5°F	-5° to 5°F
Amperage	3.2	4.7
Energy Consumption (kWh/day) @ASHRAE	4.62	8.8
Appox. Nominal Compres. BTU/HR (HP)	1399(1/3HP)	2074(1/2HP)
Refrigerant / Charge Amount (oz.)	R290 / (3.5oz)	R290 / (4.2oz)

Options

Additional epoxy shelves
- ☐ HS-5511(1 section)
- ☐ HS-5512 (2 section)

Warranty

* 2 Year - Parts and Labor on entire machine.
5 Year - Parts on Compressor
Valid in United States, Canada, Puerto Rico and U.S. Territories. Contact factory for warranty in other countries.

Features

- Energy efficient interior LED light
- Environmentally friendly R290 hydrocarbon refrigerant
- Solid state digital controller with temperature alarms and LED display (Fahrenheit or Celsius)
- Self-closing door(s) is field reversible
- Stainless steel exterior door(s) come standard with lock(s)
- Stainless steel interior floor with aluminum sides, rear, and top
- Factory-installed casters
- Time initiated automatic defrost
- Energy efficient heated condensate removal
- Heavy duty grey epoxy coated shelves are adjustable in 1/2" increments; 3 per section. 105 lbs. capacity
- Aluminum shelf supports
- Standard with 4" casters (two with brakes)
- 9 ft. cord and plug
- Container Qty:
  ER1A-FS: 47
  ER2A-FS: 28

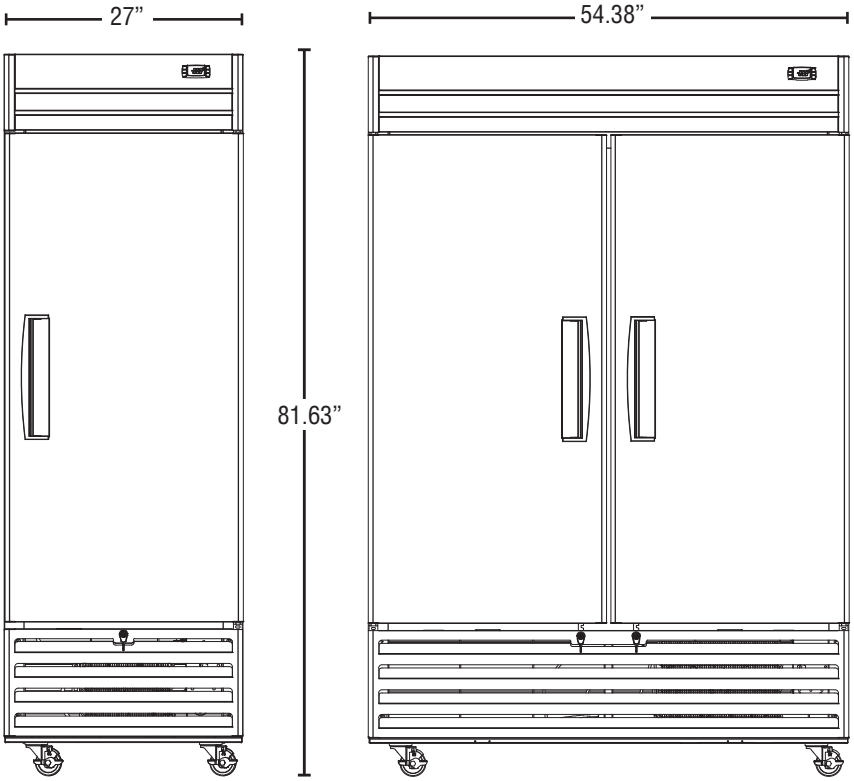
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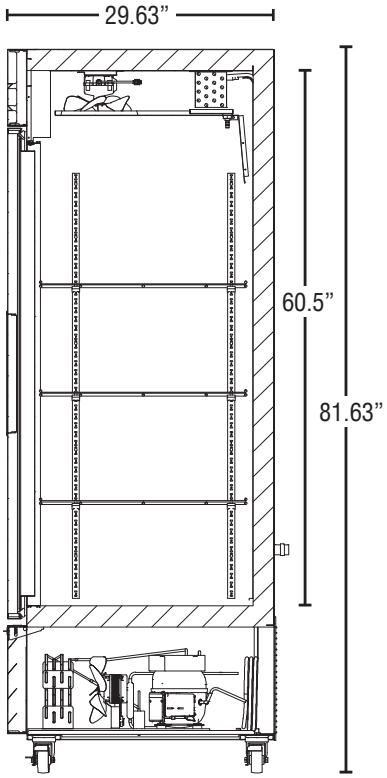
EF1A-FS/EF2A-FS

One and Two Section Full Stainless Freezer

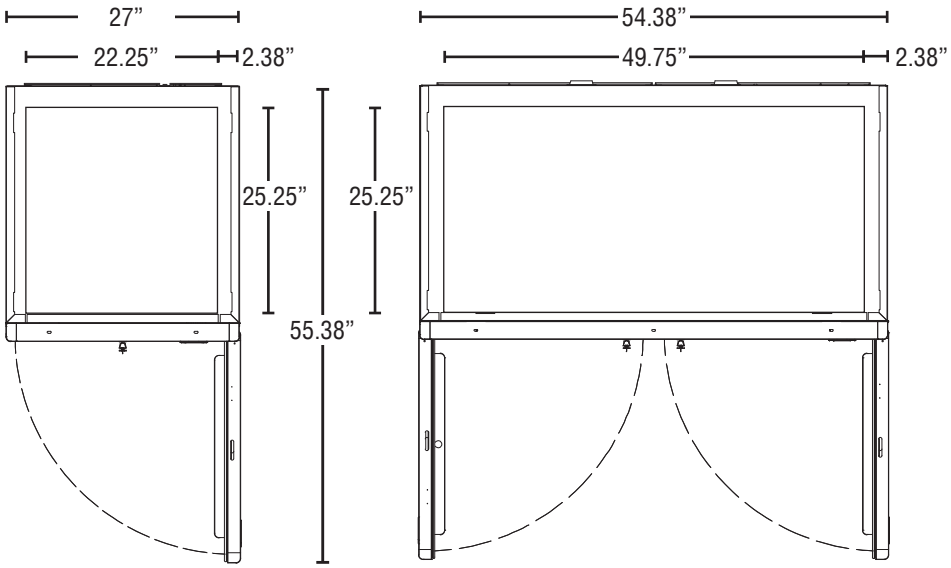
FRONT VIEW



SIDE VIEW



PLAN VIEW



Manitowoc

INDIGO NXT

iT0620 Ice Cube Machine

iT0620 Ice Cube Machine

Models

☐ IRT0620A ☐ IDT0620A ☐ IYT0620A ☐ IDT0620W ☐ IYT0620W

ENERGY STAR



Indigo NXT Series iT0620
Ice Machine on D420 Bin
*Ice machine and Bin sold separately

Designed for operators who know that ice is critical to their business, the Indigo®w Series ice machine's preventative diagnostics continually monitor itself for reliable ice production. Improvements in cleanability and programmability make your ice machine easy to own and less expensive to operate.

- **Space-Saving Design** – Measures only 16.5" high (42 cm) and 30" wide (76.20 cm) allowing it to fit on top of dispensers when a low ceiling is an issue.
- **easyTouch® Display**- New icon based touch screen takes the guess work out of owning and operating an ice machine.
- **Programmable Ice Production** – Now its super easy to program your ice machine to be off at certain times of the day to save money with fluctuating electrical rates. Also programmable by daily ice production volume and night time programming.
- **Easy to Clean Foodzone** – Hinged front door swings out for easy access. Removable water-trough, distribution tube, curtain, and sensing probes for fast and efficient cleaning. Select components made with AlphaSan® antimicrobial.
- **Intelligent Diagnostics** – Provide 24 hour preventative maintenance and diagnostic feedback for trouble free operation.
- **Acoustical Ice Sensing Probe** – Unique patented technology allows for reliable operation in challenging water conditions and environments.
- **DuraTech™ Exterior** – Provides superior corrosion resistant above stainless steel. Innovative clear-coat resists fingerprints and dirt making it easier to keep clean.
- **Available LuminIce II Virus and Bacteria Inhibitor**- Controls viruses, bacteria, mold and yeast within the food zone to keep the ice machine clean longer. A new sanitation icon lets you know the operational status.
- **Active sense** - Insures consistent ice harvest in all environmental conditions. This software solution works in conjunction with the acoustical ice sensing probe improving reliability and performance.

COMMERCIAL WARRANTY

ICE MAKER	EVAPORATOR	COMPRESSOR
3 YEAR PARTS AND LABOR	5 YEAR	5 YEAR PARTS 3 YEAR LABOR

Ice Machine Electric

115/60/1 standard
(208-230/60/1also available)

Minimum circuit ampacity:
Air-cooled: 12.2, 115v 5.9, 208-230V
Water-cooled: 11.6,-115v, 5.6,-208-230v

Maximum fuse size:
Air-cooled: 20A for 115v, 15A for 208-230v
Water-cooled: 20A, 115v and 15A, 208-230v

Specifications

BTU Per Hour:
5,400 (average),
and 6,300 (peak)

Refrigerant:
R410A CFS - Free
Lowers global warming by 48%

Operating Limits:

- Ambient Temperature Range:
  40 to 110 F (4.4 to 43.3 C)
  Water Temperature Range:
  40 to 90 F (4.4 to 32.2 C)
- Potable Water Pressure:
  Min. 20 psi (137.9 kPA)
  Max. 80 psi (551.1 kPA)
- Condenser Water Pressure:
  Min. 20 psi (137.9 kPA)
  Max. 276 psi (1902.95 kPA)

Ice Shape



Dice
⅞" x ⅞" x ⅞"
(2.22 x 2.22 x 2.22 cm)



Half Dice
⅜" x 1⅛" x ⅞"
(.95 x 2.86 x 2.22 cm)



Regular
1⅛" x 1⅛" x ⅞"
(2.86 x 2.86 x 2.22 cm)

CALIFORNIA LOW LEAD QUALIFIED Conforms to NSF-61 Annex G | AHRI CERTIFIED | NSF c UL US LISTED | CE | AQ | ISO 9001:2015 Certification

2110 South 26th Street
Manitowoc, WI 54220

Tel: 1.920.682.0161
Fax: 1.920.683.7589

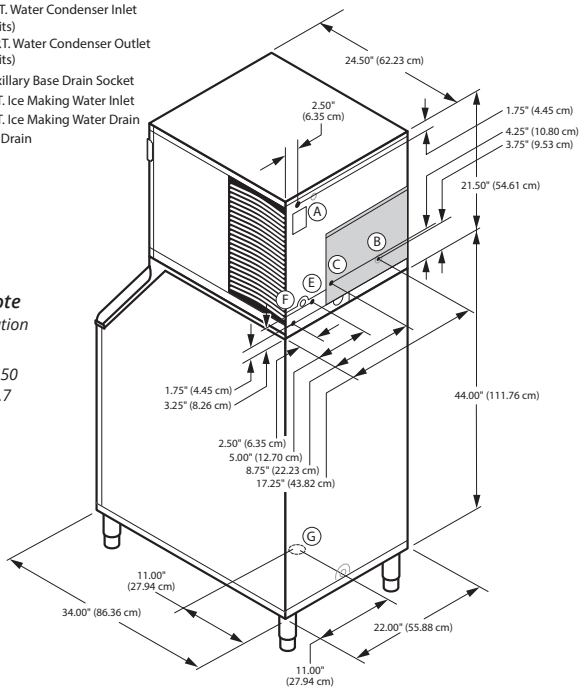
www.manitowocice.com

Manitowoc®

Indigo® NXT™ iT0620 Ice Cube Machine

iT0620 on D420 Storage Bin

Ⓐ Electrical Entrance (2) Options
Ⓑ 3/8" (0.95 cm) F.P.T. Water Condenser Inlet (water-cooled units)
Ⓒ 1/2" (1.27 cm) F.P.T. Water Condenser Outlet (water-cooled units)
Ⓓ 1/2" (1.27 cm) Auxillary Base Drain Socket
Ⓔ 3/8" (0.95 cm) F.P.T. Ice Making Water Inlet
Ⓕ 1/2" (1.27 cm) F.P.T. Ice Making Water Drain
Ⓖ 3/4" (1.91 cm) Bin Drain



Installation Note
Minimum installation clearance:

Top/side: 12" (30.50 cm)Back is 5" (12.7 cm)

Space-Saving Design



	iT0620 D-400	iT0620 D-420
Height	59.50" 151.13 cm	71.50" 181.61 cm
Width	30.00" 76.20 cm	22.00" 55.88 cm
Depth	34.00" 86.30 cm	34.00" 86.30 cm
Bin Storage	365 lbs. 166 kgs.	383 lbs. 174 kgs.

Height includes adjustable bin legs 6.00" to 8.00", (15.24 to 20.32 cm) set at 6.00" (15.24 cm).
Bin capacity is based on 90% of the volume x 33 lbs/ft3 average density of ice.

K00443 bin adapter required for D400 bin. Sold separately

Specifications

	Model	Ice Shape	Ice Production 24 Hours 70°Air/ 50°F Water	Ice Production 24 Hours 90°Air/ 70°F Water	Power Usage kWh/100 lbs. @90°Air/70°F 1 Ph	Potable Water Usage/100 lbs. 45.4 kgs. of Ice
AIR COOLED	IRT0620A	regular	525 lbs.	410 lbs.	5.29	19.9 Gal.
			238 kgs	186 kgs		75.3 L
	IDT0620A	dice	560 lbs.	450 lbs.	5.18 ★	19.9 Gal.
			254 kgs	204 kgs		75.3 L
	IYT0620A	half-dice	575 lbs.	465 lbs.	4.87 ★	19.9 Gal.
			261 kgs	211 kgs		75.3 L
WATER COOLED	IDT0620W	dice	530 lbs.	450 lbs.	4.13	19.9 Gal.
			240 kgs	204 kgs		75.3 L
	IYT0620W	half-dice	560 lbs.	485 lbs.	3.87	19.9 Gal.
			254 kgs.	220 kgs		75.3 L
	-Water-cooled Condenser Water Usage / 100 lbs. /45.4 kgs. Of Ice: 140 gal/ 530 L. -Water-cooled models are excluded from ENERGY STAR qualification.					

Order separately: Ice storage bin for all units
★ *ENERGY STAR® 3.0 qualified*

Accessories

LuminIce® II Viruses and Bacteria Inhibitor
controls viruses and bacteria in the ice machine



External Scoop holder
protect the ice scoop with the NSF approved versatile scoop holder.



Arctic Pure® Plus
reduce sediments and chlorine contaminants down to .5 microns.
Use with Pre-filter recommended



iAuCS®
schedules and performs routine ice machine cleaning automatically.



Manitowoc Ice reserves the right to make changes to the design or specifications without prior notice.

2110 South 26th Street
Manitowoc, WI 54220

Tel: 1.920.682.0161
Fax: 1.920.683.7589

www.manitowocice.com
6408D 6/22

Manitowoc

ICE MACHINE WARRANTY

Manitowoc Ice, Inc. (hereinafter referred to as the "COMPANY") warrants for a period of thirty-six months from the installation date (except as limited below) that new ice machines manufactured by the COMPANY shall be free of defects in material or workmanship under normal and proper use and maintenance as specified by the COMPANY and upon proper installation and start-up in accordance with the instruction manual supplied with the ice machine. The COMPANY'S warranty hereunder with respect to the compressor shall apply for an additional twenty-four months, excluding all labor charges, and with respect to the evaporator for an additional twenty-four months, including labor charges.

The obligation of the COMPANY under this warranty is limited to the repair or replacement of parts, components, or assemblies that in the opinion of the COMPANY are defective. This warranty is further limited to the cost of parts, components or assemblies and standard straight time labor charges at the servicing location.

Time and hourly rate schedules, as published from time to time by the COMPANY, apply to all service procedures. Additional expenses including without limitation, travel time, overtime premium, material cost, accessing or removal of the ice machine, or shipping are the responsibility of the owner, along with all maintenance, adjustments, cleaning, and ice purchases. Labor covered under this warranty must be performed by a COMPANY Contracted Service Representative or a refrigeration service agency as qualified and authorized by the COMPANY'S local Distributor. The COMPANY'S liability under this warranty shall in no event be greater than the actual purchase price paid by customer for the ice machine.

The foregoing warranty shall not apply to (1) any part or assembly that has been altered, modified, or changed; (2) any part or assembly that has been subjected to misuse, abuse, neglect, or accidents; (3) any ice machine that has been installed and/or maintained inconsistent with the technical instructions provided by the COMPANY; or (4) any ice machine initially installed more than five years from the serial number production date. This warranty shall not apply if the Ice Machine's refrigeration system is modified with a condenser, heat reclaim device, or parts and assemblies other than those manufactured by the COMPANY, unless the COMPANY approves these modifications for specific locations in writing.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR GUARANTEES OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE.

In no event shall the COMPANY be liable for any special, indirect, incidental or consequential damages. Upon the expiration of the warranty period, the COMPANY'S liability under this warranty shall terminate.

The foregoing warranty shall constitute the sole liability of the COMPANY and the exclusive remedy of the customer or user. To secure prompt and continuing warranty service, the warranty registration card or register on line within five (5) days from the installation date.

MANITOWOC ICE, INC.
2110 So. 26th St., P.O. Box 1720, Manitowoc, WI 54221-1720
Telephone: 920-682-0161 • Fax: 920-683-7585
Web Site - www.manitowocice.com
Form 80-0373-3 Rev. 01/02

Manitowoc

Arctic Pure Plus

Premium Water Filters for Ice Machines

arctic pure+

Arctic Pure Plus

Premium Water Filters for Ice Machines

Models ☐ AR-PRE-P ☐ AR-10000-P ☐ AR-20000-P ☐ AR-40000-P



AR-PRE-P

- Pre-filter, removes hard sediments, sand, dirt and rust from water, and protects solenoids, valves and inlets to the ice maker
- Compatible with **all** models



AR-10000-P

- Chlorine Reduction
- SLOW PHOS scale inhibitor
- 0.5 Microns filtration
- 15,000 gallon capacity
- Models 0-600 lbs/day



AR-20000-P

- Chlorine Reduction
- SLOW PHOS scale inhibitor
- 0.5 Microns filtration
- 20,000 gallon capacity
- Models 601-1000 lbs/day



AR-40000-P

- Chlorine Reduction
- SLOW PHOS scale inhibitor
- 0.5 Microns filtration
- 40,000 gallon capacity
- Models 1001-2500 lbs/day

Standard Features and Benefits

- 95% average reduction of chlorine from incoming water supply assures the ice tastes and smells fresher, clearer and more enjoyable
- Silver impregnated carbon block provides antimicrobial protection against potential bacteria microorganisms, algae, mold and slime on ice machine surfaces
- Engineered with SLOW PHOS (slowly soluble polyphosphate) to inhibit scale formation and corrosion
- Reduces dirt, submicron particles (down to 0.5 microns) and eliminates contaminates such as cryptosporidium and giardia cysts.
- Ultra-fine filtration (0.5 Microns) with silver impregnated carbon block and slowly soluble polyphosphates provides triple protection from harmful contaminates that can affect your ice machine's performance
- Reduces ice machine cost and maintenance frequency by reducing scale, impurities, and contaminates that can enter the machine.
- Extends the life of the ice machine, when the filters are changed every 6 months or when water pressure is below 20 psi.
- Optimizes the daily performance of the machine, allowing it run at full capacity producing the freshest and purist ice possible
- Cartridges are easy to install, safe, sanitary and can be changed out rapidly, "on the fly" without turning off the water supply
- **Certified to NSF/ANSI Standard 42, 53, 372, and CSA B483.1** by IAPMO and meets CUPC requirements.

IAPMO R&T Certifications

System Model #	Replace. Cartridge	Std. 42 Claims	Std. 53 Claims	Chlorine Red. Cap
AR-PRE-P	K00496	Part. Class 3	None	None
AR-10000-P	K00493	Chlorine & Part. Class 1	Cyst	15,000 gal
AR-20000-P	K00494	Chlorine & Part. Class 1	Cyst	20,000 gal
AR-40000-P	K00495	Chlorine & Part. Class 1	Cyst	40,000 gal

- CSAB483.1:For Canadian water standards
- *NSF/ANSI 53 cyst claim only valid at or below rated flow rate
- Warning : Do not use with water that is microbiologically unsafe or of unknown quality without adequate disinfections before or after the unit. For cold water use only. Not for residential use.

Note on Pre-filter: A pre-filter is recommended for all applications to achieve maximum filtration efficiency and cartridge life.

Warranty

3-Year parts and labor warranty on head, shroud, hardware, and mounting assembly.
(water filter cartridge not included).
Residential Warranty - 1 Year

IAPMO R&T WATER QUALITY PLATINUM SEAL IAPMO RESEARCH AND TESTING

UPC C ®

2110 South 26th Street
Manitowoc, WI 54220

Tel: 1.920.682.0161
Fax: 1.920.683.7589

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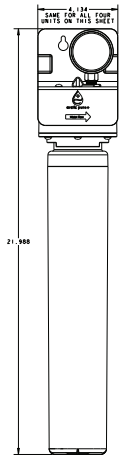
Manitowoc

arctic pure+

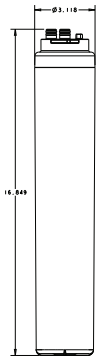
Arctic Pure Plus

Premium Water Filters for Ice Machines

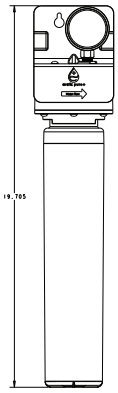
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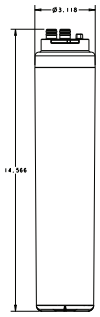
AR-PRE-P SYSTEM
4.13"W x 4.48"D x 22"H
10.5 x 11.37 x 55.9 cm



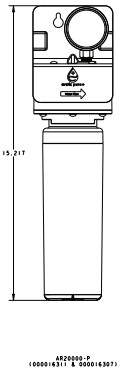
K00496 REP. CART.
3.1"W x 3.1"D x 16.8"H
7.9 x 7.9 x 42.6 cm



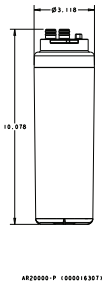
AR-10000-P SYSTEM
4.13"W x 4.48"D x 19.7"H
10.5 x 11.37 x 50.04 cm



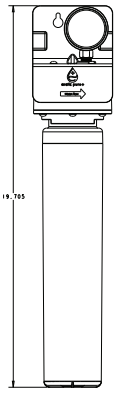
K00493 REP. CART.
3.1"W x 3.1"D x 14.6"H
7.9 x 7.9 x 37.08 cm



AR-20000-P SYSTEM
4.13"W x 4.48"D x 15.2"H
10.5 x 11.37 x 38.6 cm



K00494 REP. CART.
3.1"W x 3.1"D x 10.1"H
7.9 x 7.9 x 25.6 cm



AR-40000-P SYSTEM
4.13"W x 4.48"D x 19.7"H
10.5 x 11.37 x 50.04 cm



K00495 REP. CART.
3.1"W x 3.1"D x 14.6"H
7.9 x 7.9 x 37.08 cm

Usage Matrix

Filter System (Replacement Cartridges)	AR-PRE-P (K00496)	AR-10000-P (K00493)	AR-20000-P (K00494)	AR-40000-P (K00495)
All Under Counters (Cubers, Flakers & Nuggets) Counter Top Nugget	X	X		
Modular Cubers: IT0300-IT750, IBF0620 Modular Flaker: RFF0320 Modular Nugget: RNF320	X	X		
Modular Cubers: IT0900, IBF0820C & IBT1020C Modular Flaker: RFF0620 RFF1220C, RFF1300 Modular Nuggets: RNF0620, RNF1020C, RNF1100	X		X	
Modular Cubers: IT1200, IT1500 & IT1900, IF1400C &IF1800C Modular Flaker: RFF2200C Modular Nugget: RNF2000C	X			X

Specifications and Shipping

System	Replacement Cartridge	Filtration level	Capacity gal	Service Flow Rate (max. gpm (lpm)	Operating Air Temp F (C)	Operating Water Temp F (C)	Operating Pressure psi (bar)	Mtg. Holes from Center in (cm)	Approx. Shipping Weight lbs (kg)	Qty System Lots	Qty Cartridge Lots
AR-PRE-P	K00496	5 Micron	NA	1.5 (5.7)	40°-110°F (4.4°- 43.3°)	40°-90°F (4.4°- 32.2°)	35 -125 (2.41-8.61)	1.5 (3.81)	4 (1.81)	6	12
AR-10000-P	K00493	0.5 Microns	15,000	0.75 (2.84)				1.5 (3.81)	5 (2.26)	6	12
AR-20000-P	K00494	0.5 Microns	20,000	1.25 (4.73)				1.5 (3.81)	4 (1.81)	6	12
AR-40000-P	K00495	0.5 Microns	40,000	2.0 (7.6)				1.5 (3.81)	5 (2.26)	6	12

Installation Tips

- Install vertically with cartridge hanging down
- Allow 2.5" (6.35cm) clearance below the cartridge for easy replacement
- Flush cartridge by running water through filter for ten (10) minutes
- Use copper or polyethylene 3/8" hose for Quick Connect fitting
- Always follow local plumping codes

Operation Tips

- Change cartridge every 6 months or when pressure gauge indicates below 35 psi (which ever comes first)
- Twist 1/4 turn to left to remove cartridge. Twist 1/4 turn to the right to install cartridge (Water can be left on)
- Protect from freezing—Failure to do so may result in cracking of the filter housing and cause water leakage
- When using non-Manitowoc ice makers, consult the ice machine's manufactures for water supply usage requirements.
- It is recommended to have your water supply tested by a professional to determine your water treatment needs.

Manitowoc Ice reserves the right to make changes to the design or specifications without prior notice.

2110 South 26th Street
Manitowoc, WI 54220

Tel: 1.920.682.0161
Fax: 1.920.683.7589

www.manitowocice.com
7805B_ArcticPurePlus
06/22

ArcticPure™ Accessory Warranty

Manitowoc Ice, Inc. (hereinafter referred to as the "COMPANY") warrants for a period of thirty-six months from the installation date (except as limited below) that new ArcticPure™ Accessory sold by the COMPANY shall be free of defects in material or workmanship under normal and proper use and maintenance as specified by the COMPANY and upon proper installation and start-up in accordance with the instruction manual supplied with the ArcticPure™ Accessory.

The obligation of the COMPANY under this warranty is limited to the repair or replacement of parts, components, or assemblies that in the opinion of the COMPANY are defective. This warranty is further limited to the cost of parts, components or assemblies and standard straight time labor charges at the servicing location.

Time and hourly rate schedules, as published from time to time by the COMPANY, apply to all service procedures. Additional expenses including without limitation, travel time, overtime premium, material cost, accessing or removal of the ArcticPure™ Accessory, or shipping are the responsibility of the owner, along with all maintenance, adjustments, and cleaning costs. Labor covered under this warranty must be performed by a COMPANY Contracted Service Representative or a refrigeration service agency as qualified and authorized by the COMPANY'S local Distributor. The COMPANY'S liability under this warranty shall in no event be greater than the actual purchase price paid by the customer for the ArcticPure™ Accessory.

The foregoing warranty shall not apply to (1) any part or assembly that has been altered, modified, or changed; (2) any part or assembly that has been subjected to misuse, abuse, neglect, or accidents; (3) wear items such as cartridges or o-rings; (4) any ArcticPure™ Accessory that has been installed and/or maintained inconsistent with the technical instructions provided by the COMPANY; or (5) any ArcticPure™ Accessory initially installed more than five years from the serial number production date.

The ArcticPure™ Accessory is designed to operate only with COMPANY'S ice machines.

THIS WARRANTY IS IN LIEU OF ALL OTHER WARRANTIES OR GUARANTEES OF ANY KIND, EXPRESSED OR IMPLIED, INCLUDING ANY IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR A PARTICULAR PURPOSE. In no event shall the COMPANY be liable for any special, indirect, incidental or consequential damages. Upon the expiration of the warranty period, the COMPANY'S liability under this warranty shall terminate. The foregoing warranty shall constitute the sole liability of the COMPANY and the exclusive remedy of the customer or user.

To secure prompt and continuing warranty service, the warranty registration card must be completed and sent to the COMPANY within five (5) days from the installation date.

Complete the following and retain for your record:

Distributor/Dealer _____

Model Number _____ Serial Number _____

Installation Date _____

MANITOWOC ICE, INC.
2110 So. 26th St., P.O. Box 1720, Manitowoc, WI 54221-1720
Telephone: 920-682-0161 · Fax: 920-683-7585
Web Site - www.manitowocice.com
Form 80-1464-3 06/03

Manitowoc®

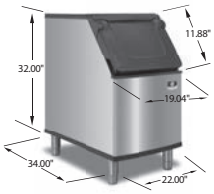
Ice Storage Bins

Model

☐ D320 ☐ D400 ☐ D420 ☐ D570 ☐ D970

D Bins

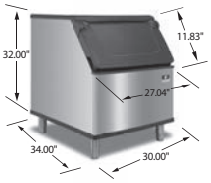
.75" (1.90 cm) Bin drain



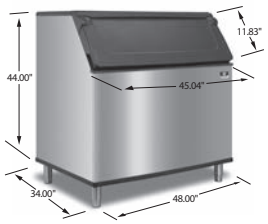
D320
264 lbs. (120 kgs)



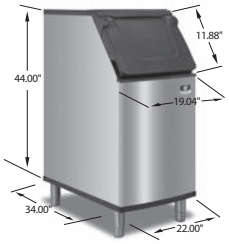
D570
532 lbs. (241 kgs)



D400
365 lbs. (166 kgs)



D970
882 lbs (400 kgs)



D420
383 lbs. (174 kgs)



Ergonomic NSF approved sanitary ice scoop included

D Bin Features

New Sanitary Scoop Ergonomic NSF approved sanitary ice scoop included with each bin. Built-in knuckle and thumb guard. Unique molded retaining lip allows maximum scooping every time. Per scoop capacity approximately 5.3/ lbs (2.4 kg)

Scoop Holder options New built-in scoop holder, keeps the ice scoop handle above the ice, or purchases the optional NSF approved External Scoop Holder Kit # K00461.

New Door design Clever built in side grips allow you to lift the bin door from anywhere you are standing (left, right or center) even when you have just one hand free.

Foamed Insulated Door Insulates the ice bin, reduces sweat on the door, helps keep ice lasting longer.

Stay up door Unique cammed bin door self-latch keeps the door in the open position and keeps the employee safe when scooping ice.

Ergonomic Door design Door is angled 53 degrees to allow for easier access to the ice in the bin especially when scooping from the bottom.

Duratech Metal Finish Manitowoc exterior material has better corrosion resistance than stainless steel, is smudge resistant and easy to keep clean.

New Bin liner Polyurethane Artic Blue bin liner accentuates the crisp clear ice from a Manitowoc Ice Machine.

Warranty

Bin & Accessories: 3 Year Parts & Labor.

	D-Bin Capacities				D-Bin Dimensions					
	*Application Capacity		**2018 AHRI Capacity		Height		Width		Depth	
D Bin Model	lbs.	kgs	Cu. ft	Cu. M	in.	cm	in.	cm	in.	cm
D320	264	119.90	8.9	0.25	38	96.5	22	55.9	34	86.4
D420	383	173.79	12.9	0.37	50	127	22	55.9	34	86.4
D400	365	165.70	12.3	0.35	38	96.5	30	76.2	34	86.4
D570	532	241.14	17.9	0.51	50	127	30	76.2	34	86.4
D970	882	400.11	29.7	0.84	50	127	48	121.9	34	86.4

*Application Capacity based on 90% of the total volume x 33 lbs/ ft3 average density of ice.
Ice must be managed
***2018 AHRI certified measurement for bin capacity

Above bin heights include leg height of of 6" / 15.24 cm
All bins include a sanitary plastic scoop and one set of adjustable legs chrome legs (6-7.75in/15.24-20.32cm).
External Scoop holder order separately Kit # K00461
Metal Scoop order separately Kit # K00463

AHRI CERTIFIED www.ahridirectory.org Ice Storage Bins AHRI Standard 820 NSF AutoQuotes ISO 9001:2015

Manitowoc Ice reserves the right to make changes to the design or specifications without prior notice.

2110 South 26th Street
Manitowoc, WI 54220

Tel: 1.920.682.0161
Fax: 1.920.683.7589

www.manitowocice.com
6453E
6/22

Manitowoc

D Bins

Indigo Ice Machines Series												
Machine			iT420	iT620	iT0300	iT450	iT0500 &iF0500N	iF0600N, iF0600C, iT0750	iF0900N, iT0900, iF0900C	iT1200, iT1200C	iF1400C, iF1800C	iT1500, iT1900
Machine Capacity @90/70 F			375	465	240	378	440	555, 530	710, 714	950, 1000	1200 1470 1600	1360, 1455
Bins	Bin Cap	Width	22"	22"	30"	30"	30"	30"	30"	30"	30"	48"
D320	264	22"	*	*								
D420	383	22"	*	*								
D400	365	30"	K00472	K00472	*	*	*	*	NR	NR	NR	
D570	532	30"	K00472	K00472	*	*	*	*	*	*	NR	
D970	882	48"	NR	NR	NR	K00470	K00470	K00470	K00470	K00470	K00471 + K00470	*

Manitowoc Flaker and Nugget Machines											
		Machine	RNP0320	RFP0320	RNP0620	RFP0620	RNF1020	RFF1220C	RNF1100	RFF1300 & RNF2000C	RFF2200C
Machine cap			251	286	451	540	825	958	825	874	1702
Bins	Bin cap	Width	22"	22"	22"	22"	22"	22"	30"	30"	36.7"
D320	264	22"	*	*	NR	NR	NR	NR			
D420	383	22"	*	*	*	*	NR	NR			
D400	365	30"	K00472	K00472	K00472	K00472	NR	NR	NR	NR	
D570	532	30"	NR	K00472	K00472	K00472	NR	NR	*	*	
D970	882	48"	NR	NR	K00473	K00473	K00473 if 2 used.	K00473 if 2 used.	K00470	K00470	K00470

An optional adapter is required when putting a narrower ice machine on a wider bin.
* No adapter is needed
NR= Not Recommend. Bin too small or too large for application.
Putting a wider machine on narrower bin is not an option.
Machines side by side must be water cooled, remote, or use a top air discharge for self-contained air cooled.
Application Bin Capacity shown in lbs using the AHRI rating based on 90% of total volume x 33 lbs/ft3 average density of ice.
Machine capacity shown in lbs/24hrs using the AHRI rating base at 90F ambient, 70F water temperature

Available Accessories

See price book for replacement: scoops, legs, specialty legs and casters

K00146 Convenient Ice Bagger

Includes bagger, D-bin adapter, and 250 bags and ties (Not for D320 or D400) Order K00068 replacement bags



K00461 External Scoop Holder

NSF approved. Can be mounted on the left or right side of bins, horizontally or vertically or on a wall.



K00463 Metal Scoop

Indestructible NFS approved aluminum alloy with sanitary knuckle and thumb guard. Works with K00461external scoop holder or hangs inside the D-Bin series. Limited life time guarantee.



K00462 Secure Fastening Kit

Securely fast the Indigo NXT ice machine head to the pre-drilled inserts on the back of the D-bin series. Stainless steel flanged feet attach to bin and can be screwed to the floor



Ice Storage Bins

Manitowoc Ice reserves the right to make changes to the design or specifications without prior notice.

2110 South 26th Street
Manitowoc, WI 54220

Tel: 1.920.682.0161
Fax: 1.920.683.7589

www.manitowocice.com
6453E
6/22

Manitowoc

LIMITED WARRANTY FOR ICE STORAGE BIN & DISPENSERS

LIMITED WARRANTY

Manitowoc Ice a division of Manitowoc FSG Operations, LLC, ("Company") warrants that new Ice Storage Bins or Dispensers sold by Company shall be free of defects in material or workmanship under normal and proper use and maintenance as specified by the Company and upon proper installation and start-up in accordance with the instruction manual supplied.

WHAT IS COVERED

- Parts and Labor for a period of three (3) years.
- Accessory Ice Transport Carts for two (2) years parts and labor.

The Ice Storage Bin / Dispenser warranty begins on the date of the original installation. This warranty shall not apply to any Ice Storage Bin or Dispenser initially installed more than five (5) years from the serial number production date.

The obligation of the Company under this warranty is limited to the repair or replacement of parts, components, or assemblies that in the sole opinion of the Company are defective. This warranty is further limited to the cost of parts, components or assemblies and standard straight time labor charges at the servicing location.

Time and hourly rate schedules, as published from time to time by the Company, apply to all service procedures. Additional expenses including without limitation, travel time, overtime premium, material cost, accessing or removal of the Ice Storage Bin / Dispenser, or shipping are the responsibility of the purchaser, along with all maintenance, adjustments, cleaning, and ice purchases. Labor covered under this warranty must be performed by an approved Company contracted Service Representative or a refrigeration service agency as qualified and authorized by the Company's local Distributor. The Company's liability under this warranty shall in no event be greater than the actual purchase price paid by purchaser for the Ice Storage Bin or Dispenser.

EXCLUSIONS FROM COVERAGE

- Repair or replacement of parts required because of misuse, improper care or storage, negligence, alteration, use of incompatible supplies or lack of specified maintenance shall be excluded.
- Normal maintenance items.
  Failures caused by adverse environmental, water conditions, or improper drainage.
- Improper or unauthorized repair.
- Any Ice Storage Bin / Dispenser that has been installed and/or maintained inconsistent with the instructions provided by the Company.
- Parts subject to damage beyond the control of Company, or to Ice Storage Bin's / Dispenser's which have been subject to accidents, damage in shipment, fire, floods, other hazards or acts of God that are beyond the control of the Company.
- This Limited Warranty shall not apply if the Ice Storage Bin / Dispenser is modified with parts and assemblies other than those manufactured by the Company, unless the Company approves these modifications for specific locations in writing prior to the commencement of such modification.

LIMITATIONS OF LIABILITY

The preceding paragraphs set forth the exclusive remedy for all claims based on failure of, or defect in, Ice Storage Bins or Dispensers sold hereunder, whether the failure or defect arises before or during the warranty period, and whether a claim, however instituted, is based on contract, indemnity, warranty, tort (including negligence), strict liability, implied by statute, common-law or otherwise , and Company and agents shall not be liable for any claims for personal injuries or consequential damages or loss, howsoever caused. Upon the expiration of the warranty period, all such liability shall terminate. THE FOREGOING WARRANTIES ARE EXCLUSIVE AND IN LIEU OF ALL OTHER WARRANTIES, WHETHER WRITTEN, ORAL, IMPLIED OR STATUTORY NO IMPLIED WARRANTY OF MERCHANTABILITY OR FITNESS FOR PARTICULAR PURPOSE SHALL APPLY, COMPANY DOES NOT WARRANT ANY PRODUCTS OR SERVICES OF OTHERS

REMEDIES

The liability of Company for breach of any warranty obligation hereunder is limited to: (i) the repair or replacement of the Ice Storage Bin or Dispenser on which the liability is based, or with respect to services, re-performance of the services; or (ii) at Company's option, the refund of the amount paid for said equipment or services. Any breach by Company with respect to any item or unit of equipment or services shall be deemed a breach with respect to that item or unit or service only

WARRANTY CLAIM PROCEDURE

Customer shall be responsible to:

- Complete and return warranty registration card or register on line within five (5) days from the installation date.
- All warranty service must be preformed by an approved Manitowoc contracted or authorized Service Representative. To schedule a service appointment contact your local Manitowoc Service Representative or visit us at www.manitowocice.com to find a Service Representative near you.

GOVERNING LAW

This Limited Warranty shall be governed by the laws of the state of Wisconsin, USA, excluding their conflicts of law principles. The United Nations Convention on Contracts for the International Sale of Goods is hereby excluded in its entirety from application to this Limited Warranty

COMPLETE AND RETAIN FOR YOUR RECORD:

Distributor/Dealer _____

Model Number _____

Serial Number _____

Installation Date _____

Manitowoc Ice
2110 South 26th Street
P.0. Box 1720
Manitowoc, WI 54221-1720
Web site: www.manitowocice.com

Rev 2 1/2/2012

John BOOS Since 1887

ITEM #: _____ QTY: _____

MODEL #: _____

PROJECT NAME: _____

071619

3601 S. Banker St. Effingham, IL 62401 • P.O. BOX 609 • Ph: (888) 431-2667 • Fax: (800) 433-2667

"DT3B" CLEAN DISHTABLE/POT SINKS

FEATURES:

- 16GA STAINLESS STEEL
- TYPE 300 STAINLESS STEEL WITH #4 POLISH, SATIN FINISH
- 14" DEEP BOWLS
- ALL CORNERS, BOTH VERTICAL AND HORIZONTAL, COVED AT 3/4" RADIUS
- BOTTOMS OF BOWLS FORMED FOR DRAINAGE TO 3-1/2" DIAMETER DIE STAMPED OPENING
- FULL LENGTH **10" HIGH BOXED BACKSPLASH,** WITH 2" RETURN TO WALL AT 45 DEGREE AND 1" TURNED DOWN REAR LIP
- 8" ON-CENTER WITH 1" FAUCET HOLES IN BACKSPLASH
- ALL OUTSIDE CORNERS OF ASSEMBLY ARE BULLNOSED
  TO PROVIDE SAFE, CLEAN, AND POLISHED EDGE
- STANDARD STAINLESS STEEL LEGS 1-5/8" DIAMETER
- LEGS LOCATED DIRECTLY UNDER SINK BOWLS, PROVIDING INCREASEDE STABILITY AND MAX WEIGHT SUPPORT

CONSTRUCTION:

- TOP: STAINLESS STEEL SINKS ARE TIG WELDED, EXPOSED WELDS ARE POLISHED TO MATCH ADJACENT SURFACE
- BASE: STAINLESS STEEL BASES ARE MIG WELDED

MATERIAL:

- BOWLS & TOP: 16GA TYPE 300 STAINLESS STEEL WITH #4 POLISH, SATIN FINISH
- LEGS: 1-5/8" ROUND O.D. STAINLESS STEEL
- BRACING: 1-1/4" ROUND O.D. STAINLESS STEEL
- GUSSETS: STAINLESS STEEL
- FEET: 1" ADJUSTABLE STAINLESS STEEL BULLET FEET



DT3B18244-2D18L

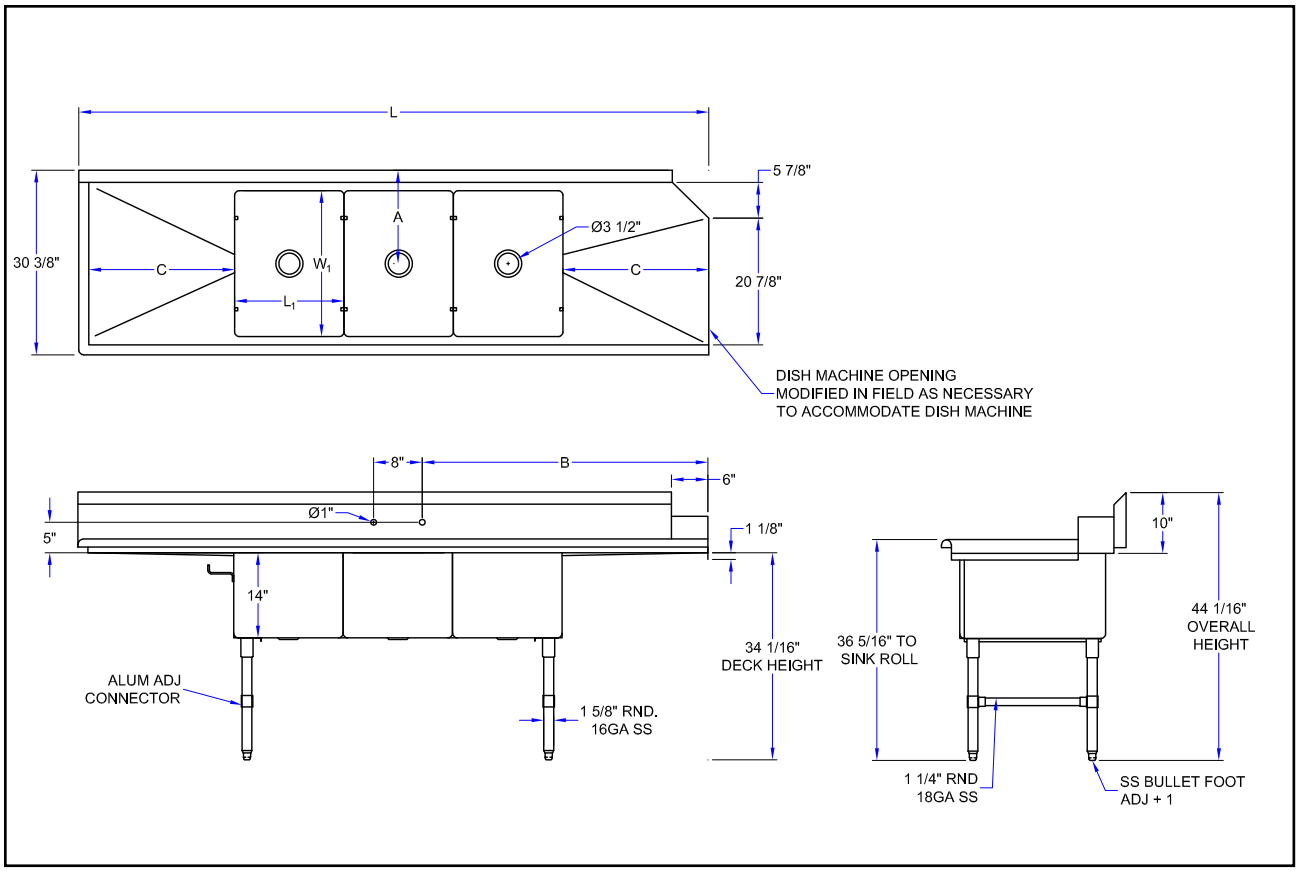
STANDARD 16GA "DT3B" SINK

MODEL	BOWL SIZE (LxWxD)	QTY
DT3B18244-2D18L	18" X 24" X 14"	
DT3B18244-2D18R	18" X 24" X 14"	
DT3B18244-2D24L	18" X 24" X 14"	
DT3B18244-2D24R	18" X 24" X 14"	
DT3B244-2D24L	24" X 24" X 14"	
DT3B244-2D24R	24" X 24" X 14"	

OPTIONAL ACCESSORIES

DESCRIPTION	QTY
FAUCETS	
ADD-A-FAUCETS	
PRE-RINSE UNITS	
LEVEL WASTE	
OVERSHELVES	
POT RACK	

DETAILED SPECIFICATIONS



STANDARD 16GA "DT3B" "B" SINK

MODEL	L	L1	W1	A	B	C
DT3B18244-2D18L	91-5/8"	18"	24"	15-3/8"	41"	18"
DT3B18244-2D18R	91-5/8"	18"	24"	15-3/8"	41"	18"
DT3B18244-2D24L	103-5/8"	18"	24"	15-3/8"	47"	24"
DT3B18244-2D24R	103-5/8"	18"	24"	15-3/8"	47"	24"
DT3B244-2D24L	121-5/8"	24"	24"	15-3/8"	56"	24"
DT3B244-2D24R	121-5/8"	24"	24"	15-3/8"	56"	24"

SOME UNITS SHIP UNASSEMBLED FOR REDUCED SHIPPING COST. ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500"

John Boos & Co. is constantly engaged in a program of improving products and therefore reserves the right to change specifications without prior notice.

SPEC SHEET

"PB-PRW" PRE-RINSE FAUCETS

Splash Mount, 8" O.C.

FEATURES:

- Triple-Ply Hose Rated To 300 PSI
- 12" Wall Bracket
- 1/4 Turn Ceramic Cartridges
- Integral Check Valves
- Color Coded Hot & Cold Indicators
- 1/2" Female Inlets

CERTIFICATIONS:

ADA Compliant



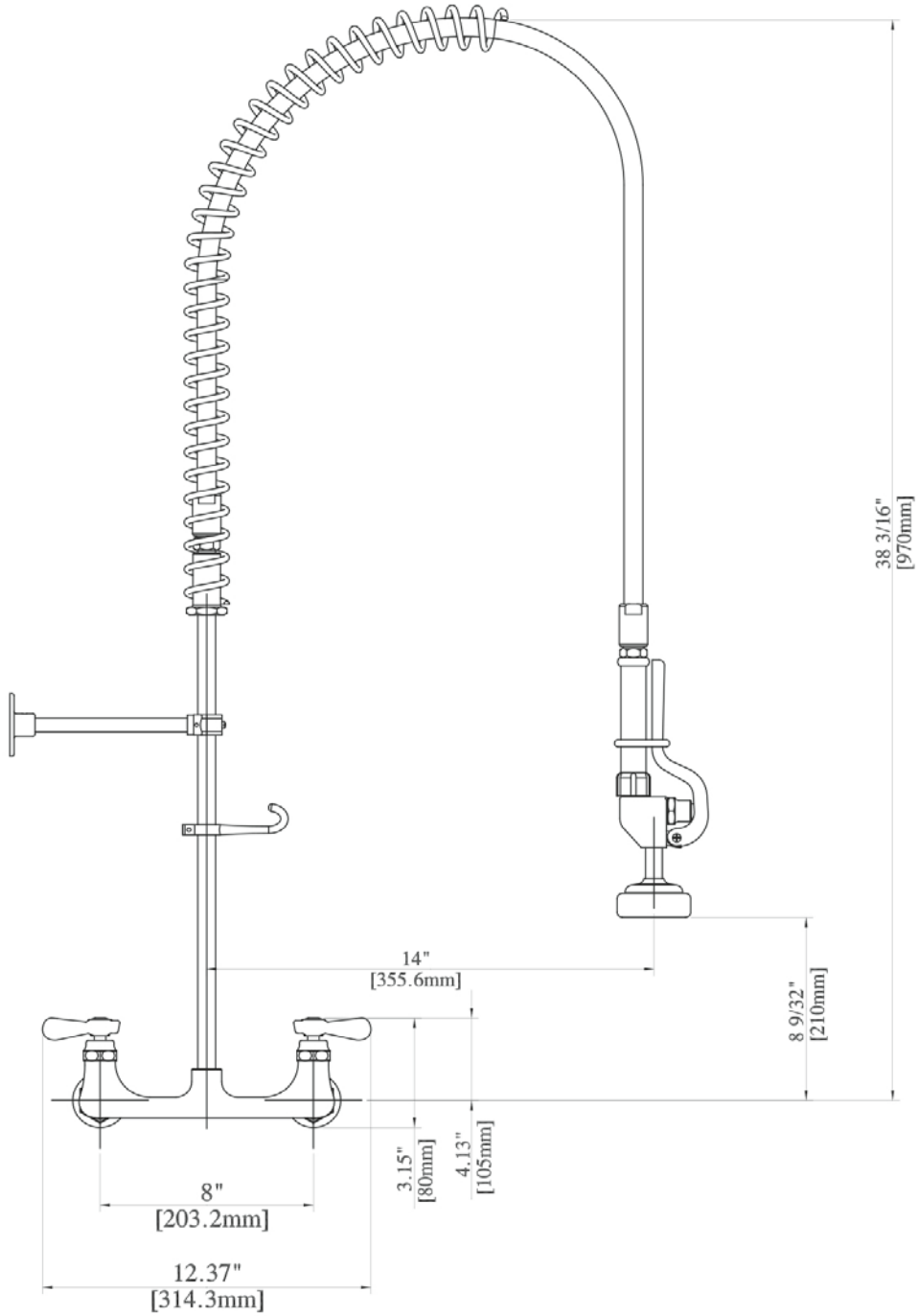
PB-PRW-1LF

"PB-PRW" PRE-RINSE FAUCETS

MODEL	DESCRIPTION	O/C	WEIGHT (LBS)
PB-PRW-1LF	Splash Mount	8"	8

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

DETAILED SPECIFICATIONS



"PB-PRW" PRE-RINSE FAUCETS

MODEL	DESCRIPTION	O/C	WEIGHT (LBS)
PB-PRW-1LF	Splash Mount	8"	8

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

John BOOS Since 1887

ITEM #: _____ QTY: _____

MODEL #: _____

PROJECT NAME: _____

103020

3601 S. Banker St. Effingham, IL 62401 • P.O. BOX 609 • Ph: (888) 431-2667 • Fax: (800) 433-2667

LOW-LEAD FAUCETS



PBF-8-S



PBF-18-DJSLF



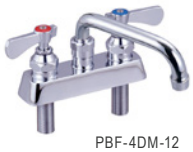
PB-PRW-1



PB-AD-8



PBF-4DM-5G



PBF-4DM-12



PBF-8HD-X-S



PBF-4-D



PBF-4SM-XG



PBF-4SM-5G



PB-MV



PBF-4DM-XG

LOW-LEAD FAUCETS

	MODEL #	QTY
PRE-RINSE UNITS	PB-PRW-1LF	
	PB-PRD-2LF	
HEAVY DUTY 8" O/C SPLASHMOUNT	PBF-8-SLF	
	PBF-10-SLF	
	PBF-12-SLF	
	PBF-14-SLF	
	PBF-16-SLF	
	PBF-18-DJSLF	
HEAVY DUTY 8" O/C DECKMOUNT	PBF-8HD-8-SLF	
	PBF-8HD-12-SLF	
ECONOMY DECKMOUNT	PBF-4-D-LF	
	PBF-4-D-10LF	
ECONOMY SPLASHMOUNT	PBF-4-S-LF	
	PBF-4-S-6LF	
	PBF-W2-6LF	
	PBF-W2-8LF	
	PBF-W2-10LF	
	PBF-W2-3GLF	
ADD-ON	PB-AD-6LF	
	PB-AD-8LF	
	PB-AD-10LF	
	PB-AD-12LF	
	PB-AD-14LF	
	PB-AD-16LF	
	PB-MV	
HEAVY DUTY 4" O/C DECKMOUNT	PBF-4DM-3GLF	
	PBF-4DM-5GLF	
	PBF-4DM-8GLF	
	PBF-4DM-10LF	
	PBF-4DM-12LF	

LOW-LEAD FAUCETS

	MODEL #	QTY
HEAVY DUTY 4" O/C SPLASHMOUNT	PBF-4SM-3GLF	
	PBF-4SM-3MGLF	
	PBF-4SM-5GLF	
	PBF-4SM-8GLF	
	PBF-4SM2-6LF	
	PBF-4SM2-8LF	
	PBF-4SM2-10LF	
	PBF-4SM2-3GLF	
	PBF-4SM2-5GLF	

	MODEL #	QTY
SINGLE HOLE SPLASHMOUNT	PBF-SEF3GLF	

	MODEL #	DESCRIPTION	WT. (LBS)
PRE-RINSE UNITS	PB-PRW-1LF	SPLASH MOUNT 8" ON-CENTER	8
	PB-PRD-2LF	DECKMOUNT	8
HEAVY DUTY 8" O/C SPLASHMOUNT	PBF-8-SLF	8" SWING SPOUT	4
	PBF-10-SLF	10" SWING SPOUT	4
	PBF-12-SLF	12" SWING SPOUT	4
	PBF-14-SLF	14" SWING SPOUT	5
	PBF-16-SLF	SINK MIXING, W/ 16" SWING NOZZLE, WALL MOUNTED, W/ 1/2" NPT	4
	PBF-18-DJSLF	18" DOUBLE JOINTED SWING SPOUT	5
HEAVY DUTY 8" O/C DECKMOUNT	PBF-8HD-8-SLF	SINK MIXING, W/ 8" SWING SPOUT, W/ 1/2" NPT	4
	PBF-8HD-12-SLF	SINK MIXING, W/ 12" SWING SPOUT, W/ 1/2" NPT	4
ECONOMY DECKMOUNT	PBF-4-D-LF	4" CENTERS, 3-1/2" GOOSENECK SPOUT (WRIST BLADES NOT AVAILABLE)	4
	PBF-4-D-10LF	4" CENTERS, 10" SWING NOZZLE, W/ 1/2" NPT	6
ECONOMY SPLASHMOUNT	PBF-4-S-LF	4" CENTERS, 3-1/2" GOOSENECK SPOUT, (WRIST BLADES NOT AVAILABLE)	2
	PBF-4-S-6LF	4" CENTERS,6 " SWING SPOUT, (WRIST BLADES NOT AVAILABLE)	
	PBF-W2-6LF	4" CENTERS, 6" SWING SPOUT (WRIST BLADES NOT INCLUDED)	2
	PBF-W2-8LF	4" CENTERS, 8" SWING SPOUT (WRIST BLADES NOT INCLUDED)	3
	PBF-W2-10LF	4" CENTERS, 10" SWING SPOUT (WRIST BLADES NOT AVAILABLE)	3
	PBF-W2-3GLF	4" CENTERS, 3-1/2" GOOSENECK SPOUT (WRIST BLADES NOT AVAILABLE)	2.5
ADD-ON	PB-AD-6LF	6" SPOUT, FITS ON PB-PRW-1LF OR PB-PRD-2LF PRE-RINSE UNITS	3
	PB-AD-8LF	8" SPOUT, FITS ON PB-PRW-1LF OR PB-PRD-2LF PRE-RINSE UNITS	3
	PB-AD-10LF	10" SPOUT, FITS ON PB-PRW-1LF OR PB-PRD-2LF PRE-RINSE UNITS	3
	PB-AD-12LF	12" SPOUT, FITS ON PB-PRW-1LF OR PB-PRD-2LF PRE-RINSE UNITS	3
	PB-AD-14LF	14" SWING SPOUT	3
	PB-AD-16LF	16" SPOUT, FITS ON PB-PRW-1LF OR PB-PRD-2LF PRE-RINSE UNITS	4
	PB-MV	TEMPERING VALVE	
HEAVY DUTY 4" O/C DECKMOUNT	PBF-4DM-3GLF	SINK MIXING, W/ 3" GOOSENECK SPOUT, W/ 1/2" NPT	4
	PBF-4DM-5GLF	SINK MIXING, W/ 5" GOOSENECK SPOUT, W/ 1/2" NPT	5
	PBF-4DM-8GLF	SINK MIXING, W/ 8" GOOSENECK SPOUT, W/ 1/2" NPT	5
	PBF-4DM-10LF	SINK MIXING, W/ 10" SWING SPOUT, W/ 1/2" NPT	6
	PBF-4DM-12LF	SINK MIXING, W/ 12" SWING SPOUT, W/ 1/2" NPT	7
HEAVY DUTY 4" O/C SPLASHMOUNT	PBF-4SM-3GLF	SINK MIXING, W/ 3-1/2" GOOSE S SPOUT, W/ 1/2" NPT	4
	PBF-4SM-3MGLF	SINK MIXING, W/ 3" MINI GOOSE S SPOUT, W/ 1/2" NPT	4
	PBF-4SM-5GLF	SINK MIXING, W/ 5" GOOSENECK SPOUT, W/ 1/2" NPT	4
	PBF-4SM-8GLF	SINK MIXING, W/ 8" GOOSENECK SPOUT, W/ 1/2" NPT	5
	PBF-4SM2-6LF	SHALLOW SOLID BODY W/ 6" SWING SPOUT	6
	PBF-4SM2-8LF	SHALLOW SOLID BODY W/ 8" SWING SPOUT	4
	PBF-4SM2-10LF	SHALLOW SOLID BODY W/ 10" SWING SPOUT	6
	PBF-4SM2-3GLF	SHALLOW SOLID BODY W/ 3-1/2" GOOSENECK SPOUT	2.5
	PBF-4SM2-5GLF	SHALLOW SOLID BODY W/ 5" GOOSENECK SPOUT	4
SINGLE HOLE SPLASHMOUNT	PBF-SEF3GLF	SINK MIXING, W/ 3-1/2" GOOSE NECK SPOUT, W/ ELECTRONIC EYE, W/ 1/2" NPT	5

SOME UNITS SHIP UNASSEMBLED FOR REDUCED SHIPPING COST. ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500"

John Boos & Co. is constantly engaged in a program of improving products and therefore reserves the right to change specifications without prior notice.

Champion®
The Dishwashing Machine Specialists

Project _____
Item No. _____
Quantity _____

DH-6000T WITH HEAT RECOVERY

DH-6000T

with Ventless Heat-Recovery and Condensate Removal

STANDARD FEATURES

- **Factory authorized startup**
- **Ventless Heat Recovery**
- **HMI – Operator Touch Screen Interface**
- **On-Board Service Diagnostics**
- **Field Convertible – single to three, or three to single phase**
- **Sleep Programable - All internal heaters shut off after selected time is reached**
- **Door Interlock – locks door closed during cycle**
- Auto delime with delime notification
- Built-in booster configured to ensure 180° rinse
- Field convertible from straight to corner operation
- Dual NSF listed as both a dishwasher and potwasher
- Rinse Sentry – ensures 180°F final rinse
- Cycle counter
- Auto start – starts unit when hood is closed
- Single or dual point electrical connection
- High efficiency 2 HP pump
- Self draining pump
- Automatic tank fill
- Automatic drain valve – drains wash tank when power is off
- PRV (Mounted Pressure Reducing Valve)
- 4 selectable cycles
- 27" [686mm] extended clearance

Ventless Heat Recovery Condensate Removal



Photo is for general visual representation only. Please refer to specifications for the latest detailed product information.

OPTIONS & ACCESSORIES

- ☐ ***NEW*** Built in detergent and rinse aid pumps
- ☐ Drain Water Tempering Kit (unmounted)
- ☐ Racks
  - ☐ Peg
  - ☐ Flat
- ☐ Corner operation splash baffle
- ☐ ***NEW*** Champion ION scale prevention system

SPECIFIER STATEMENT

Specified unit will be Champion model DH-6000T with Ventless Heat-Recovery and Condensate Removal, high temperature, high-hood type dishwashing machine. Features HMI controls, Rinse Sentry, Auto Start, up to 40 racks/hour, 0.73 US gals/rack [2.76 liters/rack, 0.61 imp. gals/rack].

1 year parts and labor warranty.

Champion Industries, Inc.
3765 Champion Blvd., Winston-Salem, NC 27105
Tel: 336/661-1556 Fax: 336/661-1979

2674 N. Service Road
Jordan Station, Ontario, Canada L0R 1S0
Tel: 800/263-5798 Fax: 905/562-4618

www.ChampionIndustries.com

(1M) 7/21 Printed in U.S.A.

DH-6000T WITH HEAT RECOVERY

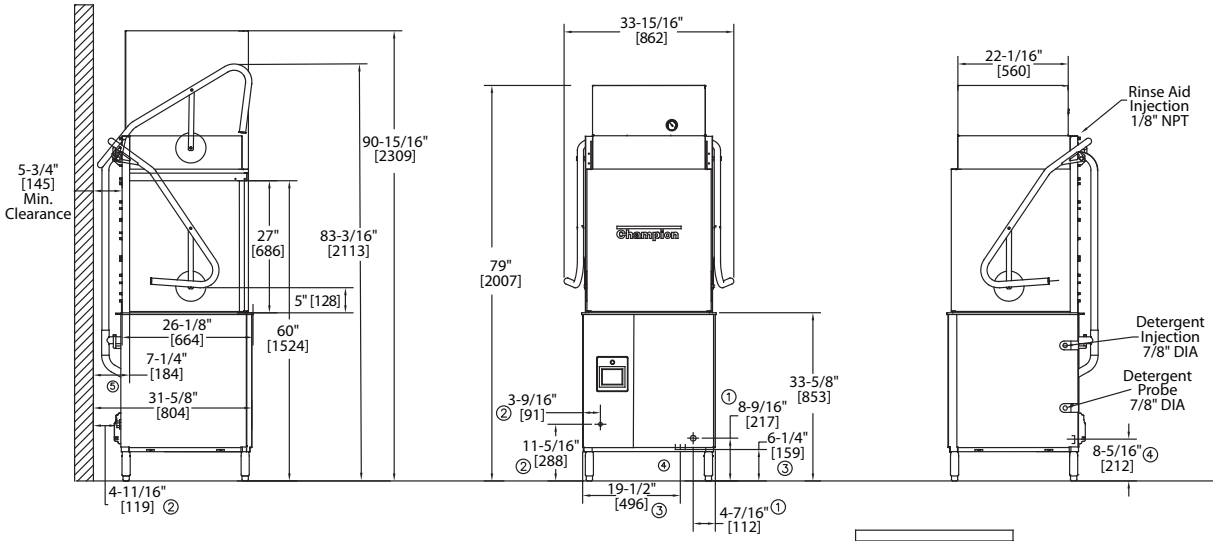
DH-6000T

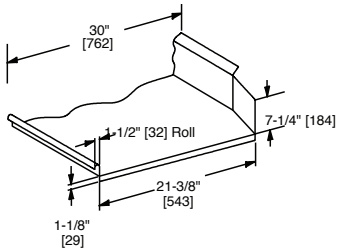
with Ventless Heat-Recovery
and Condensate Removal

Champion®
The Dishwashing Machine Specialists

Shipping weight crated: 350 lbs.

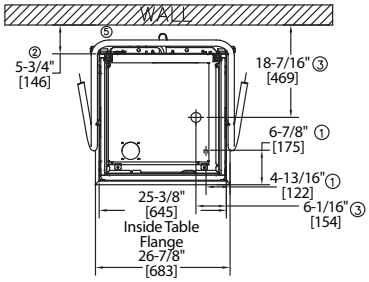
Dimensions shown in inches and [mm]

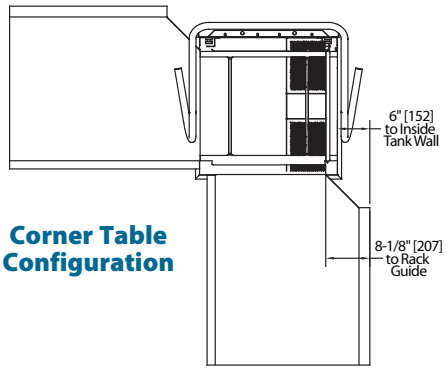




Typical Table Construction

Plan View





Corner Table Configuration

UTILITIES	
1	**Electrical** Machine Connection (See Electrical Box)
2	**Cold Water** 3/4" NPT Cold Water 50° - 75°F 45 PSI dynamic min. incoming Final rinse 18 PSI
3	**Drain** 1" NPT Connection Gravity flow, 15 GPM max flow
4	**Drain Water Tempering** 1/2" Cold water line with customer supplied cut-off valve (optional)
5	**Integrated Detergent System** Detergent bottle supply connections (optional)

Warning: Plumbing, electrical connections should be made by qualified personnel who will observe all the applicable plumbing, sanitary and safety codes and the National Electrical Code.

Note: Optional Drain Tempering: 1/2" NPT cold water connection required. 1/2" NPT drain connection from back flow preventer to house drain. (FIELD INSTALLED and PLUMBED).

Due to an ongoing value analysis program at Champion, specifications contained in this catalog are subject to change without notice.

Champion Industries, Inc.,
3765 Champion Blvd., NC 27105
336/661-1556 • Fax: 336/661-1979
ChampionIndustries.com

Machine & Built-in Booster (Standard)

Voltage	Rated Amps	Minimum Supply Circuit Ampacity	Maximum Overcurrent Protective Device
208-240/60/1	77-68	100	100
208-240/60/3	46-41	60	60
480/60/3	20	30	30

Machine Only
(two point electrical connection or no built-in booster)

Voltage	Rated Amps	Minimum Supply Circuit Ampacity	Maximum Overcurrent Protective Device
208-240/60/1	38-34	50	50
208-240/60/3	25-23	30	30
480/60/3	11	15	15

Booster Only (two point electrical connection)

Voltage	Rated Amps	Minimum Supply Circuit Ampacity	Maximum Overcurrent Protective Device
208-240/60/1	39-34	50	50
208-240/60/3	21-18	25	25
480/60/3	9	15	15

Note: Water Hammer Arrestor (meeting ASSE-1010 standard or equivalent) to be supplied (by others) in common water supply line at service connection.

SPECIFICATIONS

Capacities
- Racks per hr. (NSF rated) 40
- Wash tank (gal.) 10

Motor horsepower 2 HP

Water consumption
- Gal. per hr. 29
- Gal. per rack 0.73

Temperature °F
- Wash 150
- Rinse 180

Heating
- Tank heat, electric 5.2 kW
- Electric Booster 7.5 kW

	Dish-washer Mode	Pot & Pan Mode		
Selectable cycle times in minutes	1	2	4	6
Time cycles in seconds				
Wash	36	94	214	334
Rinse	8	10	10	10
Sanitary Dwell	16	16	16	16
Vent Fan	30	30	30	30
Total	**90**	**150**	**270**	**390**

an Ali Group Company
The Spirit of Excellence

John BOOS Since 1887

ITEM #: _____ QTY: _____

MODEL #: _____

PROJECT NAME: _____

073118

3601 S. Banker St. Effingham, IL 62401 • P.O. BOX 609 • Ph: (888) 431-2667 • Fax: (800) 433-2667

"CDT-S" CLEAN STRAIGHT DISHTABLES PRO-BOWL

FEATURES:

- TYPE 300 STAINLESS STEEL WITH # 4 POLISH, SATIN FINISH
- FULL LENGTH **10" HIGH BOXED BACKSPLASH,** WITH 2" RETURN TO WALL AT 45 DEGREE AND 1/2" TURNED DOWN REAR LIP
- ALL OUTSIDE CORNERS OF ASSEMBLY ARE BULLNOSED TO PROVIDE SAFE, CLEAN, AND POLISHED EDGE
- STANDARD 1-5/8" DIAMETER LEGS



CONSTRUCTION:

- TOP: STAINLESS STEEL TOPS ARE TIG WELDED, EXPOSED WELDS ARE POLISHED TO MATCH ADJACENT SURFACE.

MATERIAL:

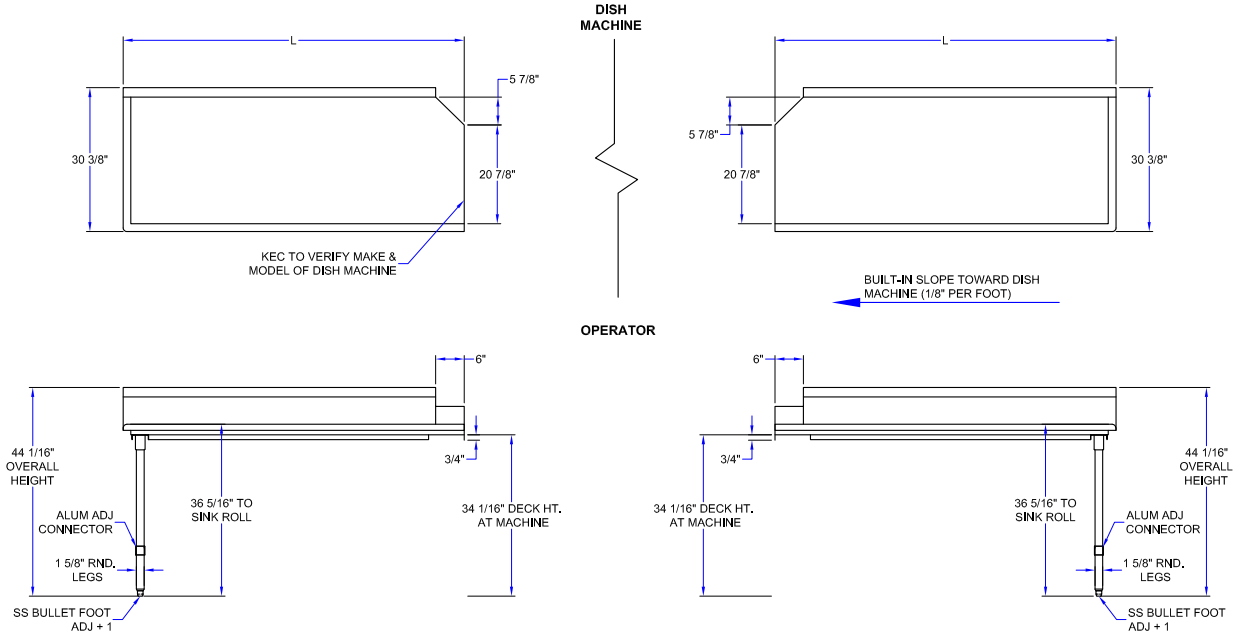
- TOP: STAINLESS STEEL TYPE 300 STAINLESS STEEL WITH #4 POLISH, SATIN FINISH
- FEET: 1" ADJUSTABLE STAINLESS STEEL BULLET FEET

14 GAUGE 304 16 GA. STAINLESS STEEL LEGS		16 GAUGE 304 16 GA. STAINLESS STEEL LEGS		16 GAUGE GALVANIZED LEGS	
PREMIUM	QTY	STANDARD	QTY	VALUE	QTY
CDT4-S24SBK-L OR R		CDT6-S24SBK-L OR R		CDT6-S24GBK-L OR R	
CDT4-S36SBK-L OR R		CDT6-S36SBK-L OR R		CDT6-S36GBK-L OR R	
CDT4-S48SBK-L OR R		CDT6-S48SBK-L OR R		CDT6-S48GBK-L OR R	
CDT4-S60SBK-L OR R		CDT6-S60SBK-L OR R		CDT6-S60GBK-L OR R	
CDT4-S72SBK-L OR R		CDT6-S72SBK-L OR R		CDT6-S72GBK-L OR R	
CDT4-S84SBK-L OR R		CDT6-S84SBK-L OR R		CDT6-S84GBK-L OR R	
CDT4-S96SBK-L OR R		CDT6-S96SBK-L OR R		CDT6-S96GBK-L OR R	
CDT4-S108SBK-L OR R		CDT6-S108SBK-L OR R		CDT6-S108GBK-L OR R	
CDT4-S120SBK-L OR R		CDT6-S120SBK-L OR R		CDT6-S120GBK-L OR R	
CDT4-S132SBK-L OR R		CDT6-S132SBK-L OR R		CDT6-S132GBK-L OR R	
CDT4-S144SBK-L OR R		CDT6-S144SBK-L OR R		CDT6-S144GBK-L OR R	

OPTIONAL ACCESSORIES

DESCRIPTION	MODEL #	QTY
OVER SHELF		
UNDER SHELF		

DETAILED SPECIFICATIONS



- UNITS 7 FT. AND LARGER ARE FURNISHED WITH SIX LEGS.

	14 GAUGE 304 16 GA. STAINLESS STEEL LEGS		16 GAUGE 304 16 GA. STAINLESS STEEL LEGS		16 GAUGE GALVANIZED LEGS	
LENGTH	PREMIUM	WT. (LBS)	STANDARD	WT. (LBS)	VALUE	WT. (LBS)
24"	CDT4-S24SBK-L OR R	46	CDT6-S24SBK-L OR R	37	CDT6-S24GBK-L OR R	37
36"	CDT4-S36SBK-L OR R	59	CDT6-S36SBK-L OR R	47	CDT6-S36GBK-L OR R	47
48"	CDT4-S48SBK-L OR R	78	CDT6-S48SBK-L OR R	62	CDT6-S48GBK-L OR R	62
60"	CDT4-S60SBK-L OR R	90	CDT6-S60SBK-L OR R	72	CDT6-S60GBK-L OR R	72
72"	CDT4-S72SBK-L OR R	109	CDT6-S72SBK-L OR R	87	CDT6-S72GBK-L OR R	87
84"	CDT4-S84SBK-L OR R	130	CDT6-S84SBK-L OR R	104	CDT6-S84GBK-L OR R	104
96"	CDT4-S96SBK-L OR R	143	CDT6-S96SBK-L OR R	113	CDT6-S96GBK-L OR R	114
108"	CDT4-S108SBK-L OR R	174	CDT6-S108SBK-L OR R	139	CDT6-S108GBK-L OR R	139
120"	CDT4-S120SBK-L OR R	205	CDT6-S120SBK-L OR R	164	CDT6-S120GBK-L OR R	164
132"	CDT4-S132SBK-L OR R	236	CDT6-S132SBK-L OR R	189	CDT6-S132GBK-L OR R	189
144"	CDT4-S144SBK-L OR R	268	CDT6-S144SBK-L OR R	214	CDT6-S144GBK-L OR R	214

MODEL # STRUCTURE

60 = TOTAL WIDTH OF DISHTABLE
S = STRAIGHT DISHTABLE
6 = 16GA WORK SURFACE
CDT = CLEAN DISHTABLE

SB = STAINLESS LEGS & BRACING
K = K.D. W/ ADJUSTABLE BRACING
L OR R = LEFT OR RIGHT DISHTABLE

CDT6-S60SBK-L

SOME UNITS SHIP UNASSEMBLED FOR REDUCED SHIPPING COST. ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500"
John Boos & Co. is constantly engaged in a program of improving products and therefore reserves the right to change specifications without prior notice.

SPEC SHEET

"BHS-TS" SORTING SHELVES

Tubular Construction, Wall Mount

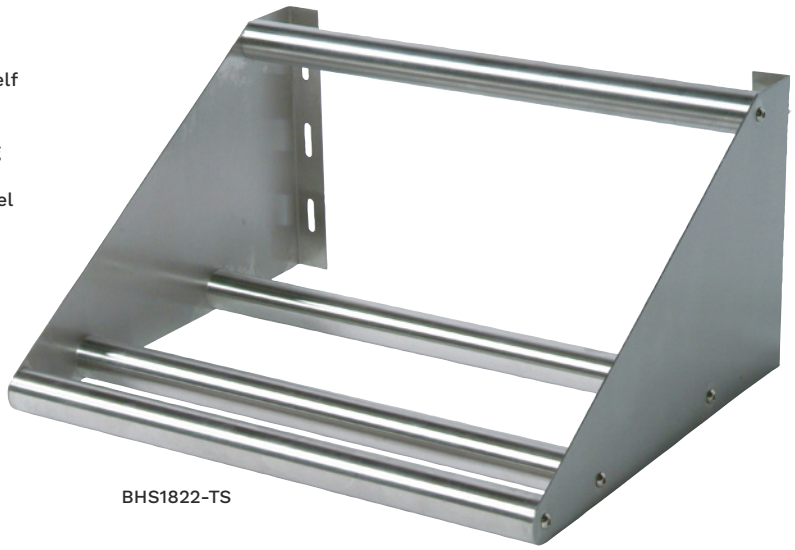
FEATURES:

- Dual Purpose Open Design, Wall Mounted Sorting Shelf

SPECIFICATIONS:

- Unit Is Shipped With Assembly Hardware, No Welding
- Brackets: 16GA Type 300 Stainless Steel
- Tubing: 1-5/8" Diameter 16GA Type 300 Stainless Steel

CERTIFICATIONS:



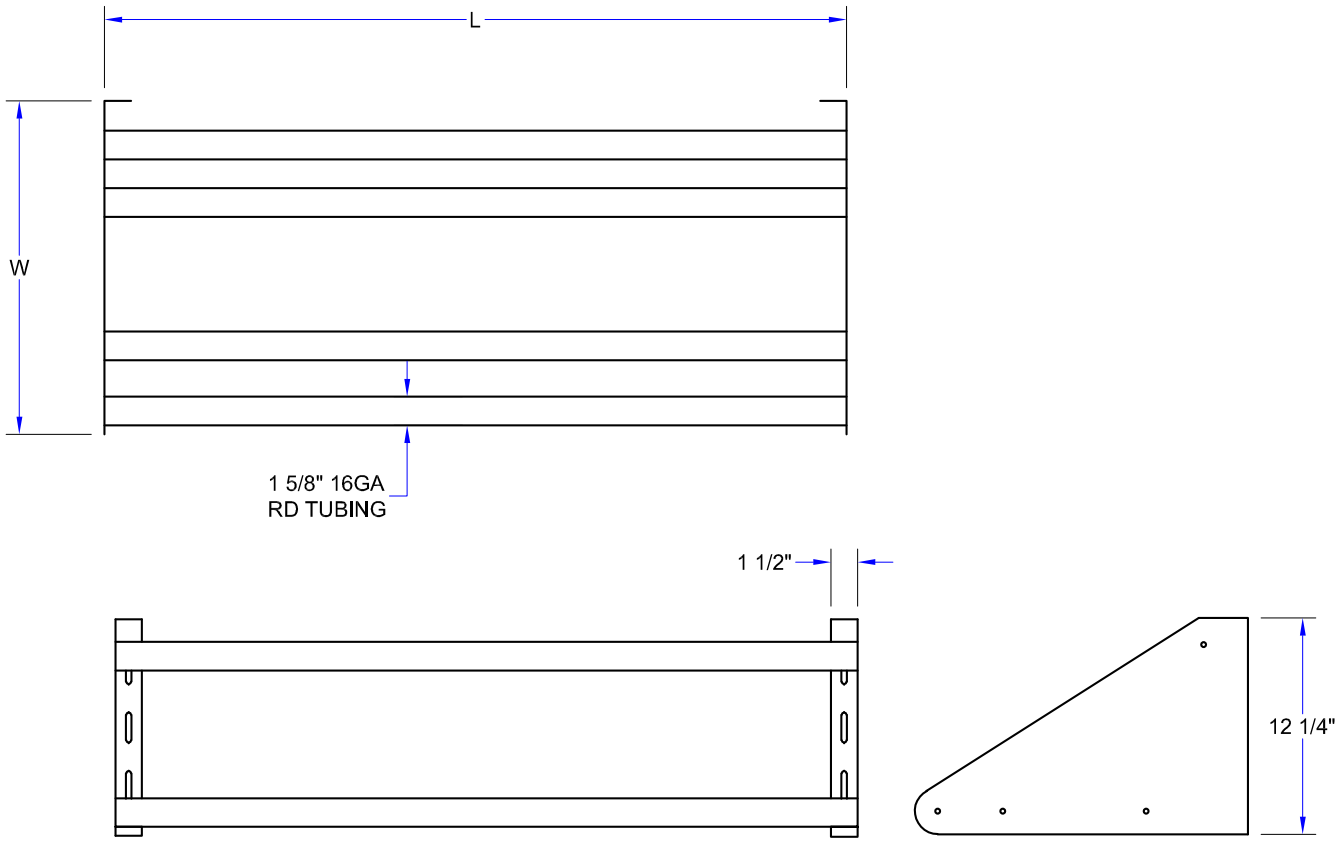
BHS1822-TS

"BHS-TS" SORTING SHELVES

MODEL	SIZE (L X W X H)	WEIGHT (LBS)
BHS1822-TS	22"x 18"x 12-1/4"	20
BHS1842-TS	42"x 18"x 12-1/4"	23
BHS1863-TS	63"x 18"x 12-1/4"	35
BHS1882-TS	82"x 18"x 12-1/4"	38

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

DETAILED SPECIFICATIONS



"BHS-TS" SORTING SHELVES

MODEL	SIZE (L X W X H)	WEIGHT (LBS)
BHS1822-TS	22"x 18"x 12-1/4"	20
BHS1842-TS	42"x 18"x 12-1/4"	23
BHS1863-TS	63"x 18"x 12-1/4"	35
BHS1882-TS	82"x 18"x 12-1/4"	38

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

SPEC SHEET

"PBHS-14-1" PRO-BOWL HAND SINKS

Wall Mount, (1) 14"x10"x5" Deep Bowl

FEATURES:

- One Piece Deep Drawn Bowl
- All Sink Bowls Have Large Liberal Radii Corners
- Includes Basket Drain
- Splash Mount - One Faucet Hole On-Center

SPECIFICATIONS:

- Bowl: Stainless Steel Tops Are TIG Welded, Exposed Welds Are Polished To Match Adjacent Surface
- Bowl: Type 300 Stainless Steel Polish, Satin Finish
- Bracket: Type 300 Stainless Steel Polish, Satin Finish
- Drain: 2" Drain Opening, With 1-1/2" NPS Outlet Connection

CERTIFICATIONS:



PBHS-W-1410-1

ACCESSORIES

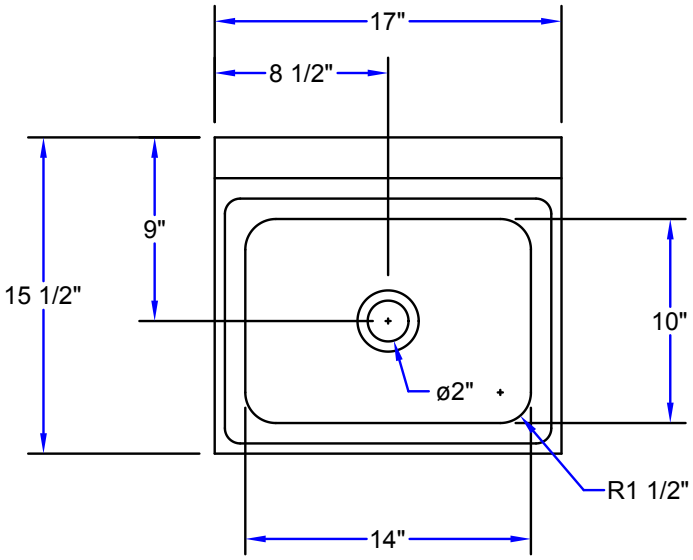
MODEL
Faucets
ADA Wrist Blades
Side Splashes
Towel Dispenser
Soap Dispenser
Lever Wastes
Over Flows
P-Traps

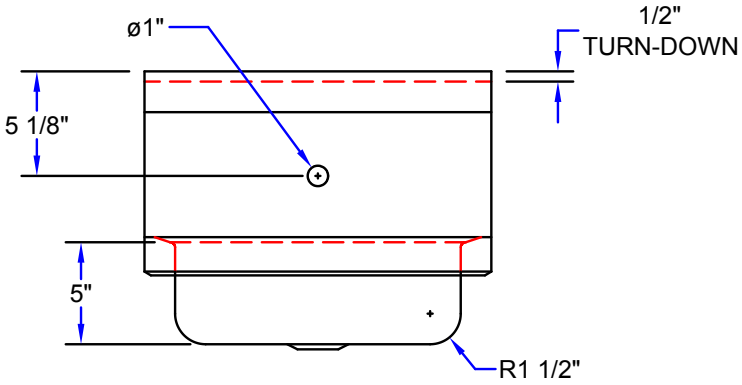
"PBHS-14-1" PRO-BOWL HAND SINKS

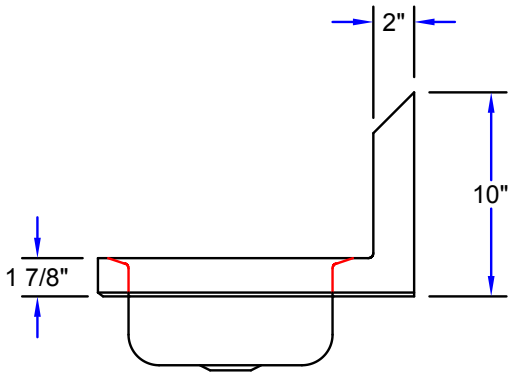
MODEL	BOWL SIZE (L X W X H)	OVERALL SINK SIZE (L X W X H)	WEIGHT (LBS)
PBHS-W-1410-1	14"x10"x5"	17"x15-1/2"x13-1/8"	8

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

DETAILED SPECIFICATIONS







"PBHS-14-1" PRO-BOWL HAND SINKS

MODEL	BOWL SIZE (L X W X H)	OVERALL SINK SIZE (L X W X H)	WEIGHT (LBS)
PBHS-W-1410-1	14"x10"x5"	17"x15-1/2"x13-1/8"	8

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

QUANTUM FOODSERVICE

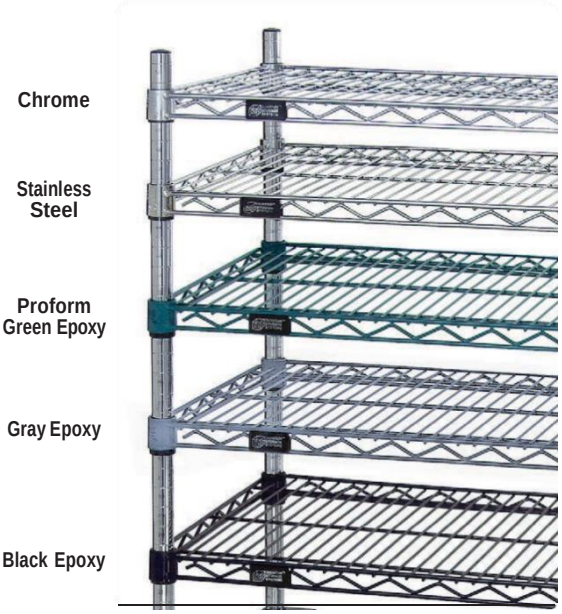
WIRE SHELVING

DESIGN: The open wire design of these shelves minimizes dust accumulation and allows free circulation of air, greater visibility of stored items and greater light penetration.

CONSTRUCTION: All welded wire shelves and posts are constructed of heavy-gauge carbon steel or Type 304 stainless steel.

CHOICE OF FINISHES:

- ***Chrome*** *- is a plating process which deposits hard chrome OVER a copper, nickel surface. This process is VERY durable and allows product to be used in any application in a dry storage ENVIRONMENT. 1 year limited warranty to not rust or corrode when used in dry and non-humid ENVIRONMENTS.*
- ***Stainless Steel*** *- 304 Stainless with an electro-polish finish represents the highest industry standard in the PREVENTION of corrosion. This finish is highly EFFECTIVE for CORROSIVE, high humidity or clean room ENVIRONMENTS. Lifetime warranty for 304 stainless steel electro-polish finish.*
- ***Proform Green, Gray and Black Epoxy*** *- are an ideal solution for high humidity, wet, or walk-in-cooler applications. The carbon steel is treated with an iron phosphate and the powder coated epoxy is electrostatically applied, baked and cured to a hard surface. All three colors are antimicrobial. 15 year limited warranty for antimicrobial finish to not rust or corrode.*



ADAPTABLE: Wire shelving can adapt to your changing needs. By using various accessories, hundreds of shelving configurations become possible.

QUICK, EASY ASSEMBLY: Posts have a double groove visual guide feature every 8", circular grooves at 1" increments, and are numbered at 1" intervals. Tapered split sleeve snaps together around each post. Tapered openings in the shelf corners slide over the tapered split sleeves providing a positive lock. Shelf is assembled in minutes without the use of any special tools.

ADJUSTABLE: Shelves can be adjusted at 1" intervals along length of the post.

WIRE TRUSSES: Architectural wire trusses increase shelf capacity.

TOP MAT WIRES: Run front to back to slide items easily off and on the shelf.

SHELF ACCESSIBILITY: Shelves can be loaded/unloaded easily from all sides. This open construction allows maximum use of storage cube.

ADJUSTABLE FOOT: 3/8-16 leveling bolt compensate for irregular floor surfaces.



NSF

Note: *Stainless stationary posts are equipped with stainless steel LEVELING feet.*

Highest Quality, Lowest Price Guaranteed!

QUANTUM FOOD SERVICE
15800 NW 15TH AVENUE, MIAMI, FLORIDA 33169 **TOLL-FREE: (888) 993-3370 FAX:** (954) 369-2512
E-MAIL: *SALES@QUANTUMFOODSERVICE.COM* WWW.**QUANTUMFOODSERVICE**.COM

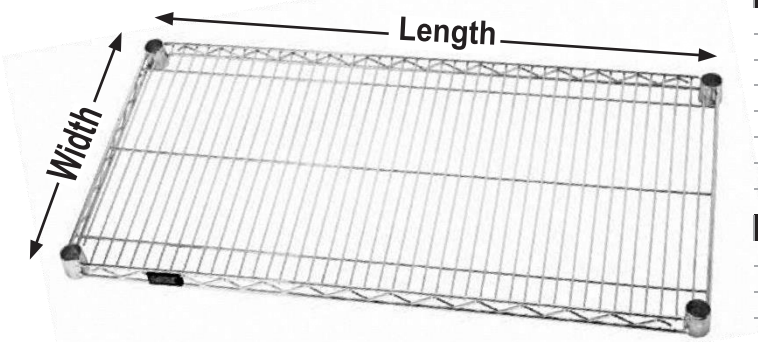
QUANTUM FOODSERVICE

WIRE SHELVING

WIRE SHELVES

- ***Plastic Split Sleeves*** *- are included with each shelf*
  Replacements are available:
  Model No: **WR-SS** *(4 Pairs)*
- ***Plastic Conductive Split Sleeves*** *- are available for conductive applications*
  Model No: **WR-SSCO** *(4 Pairs)*
- ***Aluminum Split Sleeves*** *- are recommended for extreme mobile applications and conductive applications*
  Model No: **ESD-SS** *(4 Pairs)*
- *Load capacity* ***(evenly distributed)*** *per shelf*

Widths: 12" to 36"
Lengths: **800 lbs.** for 18" to 48"
600 lbs. for 54" or longer except heavy-duty
1,000 lbs. for 60" or 72" on chrome heavy-duty



- *All welded construction with additional wire trussing for high strength characteristics*
- *Top mat wires run front to back* ***(except on 12" x 36" size)*** *for ease of loading and unloading*
- *Numbered grooved posts on 1" increments for quick assembly*
- *Wire allows air to circulate and light to penetrate for increased product visibility*
- *Minimal dirt accumulation*
- *Adjustable foot levelers*
- *No tools required for assembly*
- *Durable finishes*
- *Aesthetically pleasing*
- *National Sanitation Foundation* ***(NSF)*** *Approved*
- *Shipped KD Class 70*


Split Sleeve


Aluminum Split Sleeve

SHELF W" x L"	SHIP WGT	CHROME MODEL NO.	STAINLESS STEEL MODEL NO.	EPOXY PROFORM GREEN MODEL NO.	EPOXY GRAY MODEL NO.	EPOXY BLACK MODEL NO.
12" Deep - Wire Shelves						
12" x 24"	6 lbs	1224C	-	1224P	1224GY	1224BK
12" x 30"	6 lbs	1230C	-	1230P	1230GY	1230BK
12" x 36"	7 lbs	1236C	1236S	1236P	1236GY	1236BK
12" x 42"	8 lbs	1242C	-	1242P	1242GY	1242BK
12" x 48"	9 lbs	1248C	1248S	1248P	1248GY	1248BK
12" x 60"	14 lbs	1260C	1260S	1260P	1260GY	1260BK
12" x 72"	17 lbs	1272C	1272S	1272P	1272GY	1272BK
14" Deep - Wire Shelves						
14" x 24"	6 lbs	1424C	-	1424P	1424GY	1424BK
14" x 30"	7 lbs	1430C	1430S	1430P	1430GY	1430BK
14" x 36"	8 lbs	1436C	1436S	1436P	1436GY	1436BK
14" x 42"	10 lbs	1442C	1442S	1442P	1442GY	1442BK
14" x 48"	11 lbs	1448C	1448S	1448P	1448GY	1448BK
14" x 54"	12 lbs	1454C	1454S	1454P	1454GY	1454BK
14" x 60"	14 lbs	1460C	1460S	1460P	1460GY	1460BK
14" x 72"	17 lbs	1472C	1472S	1472P	1472GY	1472BK
18" Deep - Wire Shelves						
18" x 24"	7 lbs	1824C	1824S	1824P	1824GY	1824BK
18" x 30"	8 lbs	1830C	1830S	1830P	1830GY	1830BK
18" x 36"	10 lbs	1836C	1836S	1836P	1836GY	1836BK
18" x 42"	11 lbs	1842C	1842S	1842P	1842GY	1842BK
18" x 48"	14 lbs	1848C	1848S	1848P	1848GY	1848BK
18" x 54"	15 lbs	1854C	1854S	1854P	1854GY	1854BK
18" x 60"	17 lbs	1860C	1860S	1860P	1860GY	1860BK
18" x 72"	20 lbs	1872C	1872S	1872P	1872GY	1872BK
21" Deep - Wire Shelves						
21" x 24"	8 lbs	2124C	2124S	2124P	2124GY	2124BK
21" x 30"	9 lbs	2130C	2130S	2130P	2130GY	2130BK
21" x 36"	11 lbs	2136C	2136S	2136P	2136GY	2136BK
21" x 42"	12 lbs	2142C	2142S	2142P	2142GY	2142BK
21" x 48"	14 lbs	2148C	2148S	2148P	2148GY	2148BK
21" x 54"	16 lbs	2154C	2154S	2154P	2154GY	2154BK
21" x 60"	18 lbs	2160C	2160S	2160P	2160GY	2160BK
21" x 72"	24 lbs	2172C	2172S	2172P	2172GY	2172BK
24" Deep - Wire Shelves						
24" x 24"	9 lbs	2424C	2424S	2424P	2424GY	2424BK
24" x 30"	11 lbs	2430C	2430S	2430P	2430GY	2430BK
24" x 36"	13 lbs	2436C	2436S	2436P	2436GY	2436BK
24" x 42"	15 lbs	2442C	2442S	2442P	2442GY	2442BK
24" x 48"	16 lbs	2448C	2448S	2448P	2448GY	2448BK
24" x 54"	18 lbs	2454C	2454S	2454P	2454GY	2454BK
24" x 60"	21 lbs	2460C	2460S	2460P	2460GY	2460BK
24" x 66"	23 lbs	2466C	-	2466P	2466GY	-
24" x 72"	26 lbs	2472C	2472S	2472P	2472GY	2472BK
24" Deep Heavy-Duty - Wire Shelves *(1,000 lb. capacity)*						
24" x 60"	25 lbs	2460CHD	-	-	-	-
24" x 72"	30 lbs	2472CHD	-	-	-	-
30" Deep - Wire Shelves						
30" x 36"	15 lbs	3036C	3036S	3036P	3036GY	3036BK
30" x 42"	18 lbs	3042C	3042S	3042P	3042GY	3042BK
30" x 48"	21 lbs	3048C	3048S	3048P	3048GY	3048BK
30" x 60"	27 lbs	3060C	3060S	3060P	3060GY	3060BK
30" x 72"	31 lbs	3072C	3072S	3072P	3072GY	3072BK
36" Deep - Wire Shelves						
36" x 36"	18 lbs	3636C	3636S	3636P	3636GY	3636BK
36" x 48"	23 lbs	3648C	3648S	3648P	3648GY	3648BK
36" x 60"	29 lbs	3660C	3660S	3660P	3660GY	3660BK
36" x 72"	35 lbs	3672C	3672S	3672P	3672GY	3672BK

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QUANTUM FOODSERVICE

WIRE SHELVING

POSTS

All posts are fabricated from 16 gauge carbon steel with locating grooves on 1" increments and printed numbers between the grooves. Post also have doubled grooves every 8" for fast identification. Leveling legs are enclosed with all posts. Leveling legs cannot be used in conjunction with stem casters. Custom post heights are available.

STATIONARY POSTS ARE EQUIPPED WITH:

- ***Post Leveler Insert & Leveling Bolt*** *- use to account for uneven floors, it adjusts up or down allowing height flexibility*
  Replacements are available:
  Insert
  Model No: **W-PLI**
  Leveling Bolt
  Model No: **W-PLB**

- ***Foot Plates*** *- triangular plate allows additional surface to disperse weight. It may be ordered separately and installed in place of leveling foot*
  Model No: **FP**

- ***Floor Guides*** *- Serves as protection to prevent marring of floors*
  Model No: **FG** *(Pack of 4)*

- ***Fully Threaded Stud Connector*** *- can be utilized to connect two posts enabling any post height to be achieved*
  Model No: **W-PC-STUD**

- ***Post Cap*** *- Plastic caps are included with each post*
  Replacements are available:
  Model No: **W-PC** *(Pack of 4)*

- ***Shelf Collar Plug*** *- Shelf Collar Plug covers shelf collar when post is not being used*
  Model No: **WR-SP** *(Pack of 4)*

- ***S-Hook*** *- For continuous runs of shelving. Two hooks should be placed per shelf where two posts are not utilized.*
  Model No: **S-HOOK** *(Pack of 8)*

















FINISHES:
Chrome, Stainless Steel, Proform and Epoxy Green, Gray, Black

		CHROME	STAINLESS STEEL	EPOXY		
				PROFORM GREEN	GRAY	BLACK
DESCRIPTION	SHIP WGT	MODEL NO.	MODEL NO.	MODEL NO.	MODEL NO.	MODEL NO.
6"H Post	1 lb	P6C	P6S	P6P	P6GY	P6BK
14"H Post	1 lb	P14C	P14S	P14P	P14GY	P14BK
34"H Post	2 lbs	P34C	P34S	P34P	P34GY	P34BK
36"H Post	2 lbs	P36C	-	-	-	-
39"H Post	2 lbs	P39C	-	-	-	P39BK
42"H Post	2 lbs	-	P42S	-	-	-
54"H Post	3 lbs	P54C	P54S	P54P	P54GY	P54BK
63"H Post	4 lbs	P63C*	P63S	P63P*	P63GY*	P63BK*
74"H Post	4 lbs	P74C*	P74S	P74P*	P74GY*	P74BK*
86"H Post	5 lbs	P86C*	P86S	P86P*	P86GY*	P86BK*
96"H Post	6 lbs	P96C	P96S	P96P	P96GY	P96BK

*For easy installation, 63", 74" and 86" posts are available with pre-inserted leveler and bolt by adding an **X** to the Model No. **P74CX**

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QUANTUM FOODSERVICE

WIRE SHELVING

SHELVING UNITS

Heavy-duty shelving units allows up to 800 lb. shelf capacity. Starter kits come complete with 4 posts and 4 shelves. Additional shelves may be purchased separately.

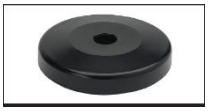
Additional Add-On kits allows you to expand your starter kit by sharing a set of posts. Configuration options include side to side, back to back and right angles *(L-Shape)*. Add-On kits come complete with 2 posts, 4 shelves and 8 S-Hooks. Additional shelves and posts may be purchased separately. Units with Add-on kits cannot be made mobile.

ADD SUFFIX TO THE END OF EACH MODEL NO. WHEN REFERENCING TO PART FINISHES

EPOXY: CHROME C, STAINLESS S, GREEN P, GRAY GY, BLACK BK







DB
Donut Bumper
Non-marking donut bumper used to protect walls and help cushion impact. Sold individually. Measures 3" diameter



WR-00HS
Polyurethane Stainless Steel Casters w/ Zerk Grease Fittings
Sold as a set of 4 casters, 2 with brake. Measures 5" x 1-1/4"



WR-00H
Polyurethane Casters
Sold as a set of 4 casters, 2 with brake. Measures 5" x 1-1/4"

63"H STARTER KIT UNITS			63"H ADD-ON KIT UNITS		
DIMENSIONS	SHIP WGT	MODEL NO.	DIMENSIONS	SHIP WGT	MODEL NO.
12" x 36" x 63"	44	WR63-1236	12" x 36" x 63"	37	AD63-1236C
12" x 42" x 63"	48	WR63-1242	12" x 42" x 63"	41	AD63-1242C
12" x 48" x 63"	52	WR63-1248	12" x 48" x 63"	45	AD63-1248C
12" x 60" x 63"	60	WR63-1260	12" x 60" x 63"	53	AD63-1260C
12" x 72" x 63"	68	WR63-1272	12" x 72" x 63"	61	AD63-1272C
14" x 24" x 63"	40	WR63-1424	14" x 24" x 63"	33	AD63-1424C
14" x 30" x 63"	44	WR63-1430	14" x 30" x 63"	37	AD63-1430C
14" x 36" x 63"	48	WR63-1436	14" x 36" x 63"	41	AD63-1436C
14" x 42" x 63"	56	WR63-1442	14" x 42" x 63"	49	AD63-1442C
14" x 48" x 63"	60	WR63-1448	14" x 48" x 63"	53	AD63-1448C
14" x 54" x 63"	64	WR63-1454	14" x 54" x 63"	57	AD63-1454C
14" x 60" x 63"	72	WR63-1460	14" x 60" x 63"	65	AD63-1460C
14" x 72" x 63"	84	WR63-1472	14" x 72" x 63"	77	AD63-1472C
18" x 24" x 63"	44	WR63-1824	18" x 24" x 63"	37	AD63-1824C
18" x 30" x 63"	48	WR63-1830	18" x 30" x 63"	41	AD63-1830C
18" x 36" x 63"	54	WR63-1836	18" x 36" x 63"	49	AD63-1836C
18" x 42" x 63"	58	WR63-1842	18" x 42" x 63"	53	AD63-1842C
18" x 48" x 63"	62	WR63-1848	18" x 48" x 63"	57	AD63-1848C
18" x 54" x 63"	74	WR63-1854	18" x 54" x 63"	69	AD63-1854C
18" x 60" x 63"	82	WR63-1860	18" x 60" x 63"	77	AD63-1860C
18" x 72" x 63"	94	WR63-1872	18" x 72" x 63"	89	AD63-1872C
21" x 24" x 63"	46	WR63-2124	21" x 24" x 63"	41	AD63-2124C
21" x 30" x 63"	50	WR63-2130	21" x 30" x 63"	45	AD63-2130C
21" x 36" x 63"	58	WR63-2136	21" x 36" x 63"	53	AD63-2136C
21" x 42" x 63"	62	WR63-2142	21" x 42" x 63"	57	AD63-2142C
21" x 48" x 63"	70	WR63-2148	21" x 48" x 63"	65	AD63-2148C
21" x 54" x 63"	78	WR63-2154	21" x 54" x 63"	73	AD63-2154C
21" x 60" x 63"	86	WR63-2160	21" x 60" x 63"	81	AD63-2160C
21" x 72" x 63"	110	WR63-2172	21" x 72" x 63"	105	AD63-2172C
24" x 24" x 63"	50	WR63-2424	24" x 24" x 63"	45	AD63-2424C
24" x 30" x 63"	58	WR63-2430	24" x 30" x 63"	53	AD63-2430C
24" x 36" x 63"	66	WR63-2436	24" x 36" x 63"	61	AD63-2436C
24" x 42" x 63"	74	WR63-2442	24" x 42" x 63"	69	AD63-2442C
24" x 48" x 63"	78	WR63-2448	24" x 48" x 63"	73	AD63-2448C
24" x 54" x 63"	86	WR63-2454	24" x 54" x 63"	81	AD63-2454C
24" x 60" x 63"	98	WR63-2460	24" x 60" x 63"	93	AD63-2460C
24" x 72" x 63"	118	WR63-2472	24" x 72" x 63"	113	AD63-2472C
30" x 36" x 63"	74	WR63-3036	30" x 36" x 63"	69	AD63-3036C
30" x 42" x 63"	86	WR63-3042	30" x 42" x 63"	81	AD63-3042C
30" x 48" x 63"	98	WR63-3048	30" x 48" x 63"	93	AD63-3048C
30" x 60" x 63"	122	WR63-3060	30" x 60" x 63"	117	AD63-3060C
30" x 72" x 63"	138	WR63-3072	30" x 72" x 63"	133	AD63-3072C
36" x 36" x 63"	86	WR63-3636	36" x 36" x 63"	81	AD63-3636C
36" x 48" x 63"	106	WR63-3648	36" x 48" x 63"	101	AD63-3648C
36" x 60" x 63"	130	WR63-3660	36" x 60" x 63"	125	AD63-3660C
36" x 72" x 63"	138	WR63-3672	36" x 72" x 63"	133	AD63-3672C

74" H STARTER KIT UNITS			74" H ADD-ON KIT UNITS		
DIMENSIONS	SHIP WGT	MODEL NO.	DIMENSIONS	SHIP WGT	MODEL NO.
12" x 36" x 74"	44	WR74-1236	12" x 36" x 74"	38	AD74-1236
12" x 42" x 74"	48	WR74-1242	12" x 42" x 74"	42	AD74-1242
12" x 48" x 74"	52	WR74-1248	12" x 48" x 74"	46	AD74-1248
12" x 60" x 74"	60	WR74-1260	12" x 60" x 74"	54	AD74-1260
12" x 72" x 74"	68	WR74-1272	12" x 72" x 74"	62	AD74-1272
14" x 24" x 74"	40	WR74-1424	14" x 24" x 74"	34	AD74-1424
14" x 30" x 74"	44	WR74-1430	14" x 30" x 74"	38	AD74-1430
14" x 36" x 74"	48	WR74-1436	14" x 36" x 74"	42	AD74-1436
14" x 42" x 74"	56	WR74-1442	14" x 42" x 74"	50	AD74-1442
14" x 48" x 74"	60	WR74-1448	14" x 48" x 74"	54	AD74-1448
14" x 54" x 74"	64	WR74-1454	14" x 54" x 74"	58	AD74-1454
14" x 60" x 74"	72	WR74-1460	14" x 60" x 74"	66	AD74-1460
14" x 72" x 74"	84	WR74-1472	14" x 72" x 74"	78	AD74-1472
18" x 24" x 74"	44	WR74-1824	18" x 24" x 74"	38	AD74-1824
18" x 30" x 74"	48	WR74-1830	18" x 30" x 74"	42	AD74-1830
18" x 36" x 74"	56	WR74-1836	18" x 36" x 74"	50	AD74-1836
18" x 42" x 74"	60	WR74-1842	18" x 42" x 74"	54	AD74-1842
18" x 48" x 74"	64	WR74-1848	18" x 48" x 74"	58	AD74-1848
18" x 54" x 74"	76	WR74-1854	18" x 54" x 74"	70	AD74-1854
18" x 60" x 74"	84	WR74-1860	18" x 60" x 74"	78	AD74-1860
18" x 72" x 74"	96	WR74-1872	18" x 72" x 74"	90	AD74-1872
21" x 24" x 74"	48	WR74-2124	21" x 24" x 74"	42	AD74-2124
21" x 30" x 74"	52	WR74-2130	21" x 30" x 74"	46	AD74-2130
21" x 36" x 74"	60	WR74-2136	21" x 36" x 74"	54	AD74-2136
21" x 42" x 74"	64	WR74-2142	21" x 42" x 74"	58	AD74-2142
21" x 48" x 74"	72	WR74-2148	21" x 48" x 74"	66	AD74-2148
21" x 54" x 74"	80	WR74-2154	21" x 54" x 74"	74	AD74-2154
21" x 60" x 74"	88	WR74-2160	21" x 60" x 74"	82	AD74-2160
21" x 72" x 74"	112	WR74-2172	21" x 72" x 74"	106	AD74-2172
24" x 24" x 74"	52	WR74-2424	24" x 24" x 74"	46	AD74-2424
24" x 30" x 74"	60	WR74-2430	24" x 30" x 74"	54	AD74-2430
24" x 36" x 74"	68	WR74-2436	24" x 36" x 74"	62	AD74-2436
24" x 42" x 74"	76	WR74-2442	24" x 42" x 74"	70	AD74-2442
24" x 48" x 74"	80	WR74-2448	24" x 48" x 74"	74	AD74-2448
24" x 54" x 74"	88	WR74-2454	24" x 54" x 74"	82	AD74-2454
24" x 60" x 74"	100	WR74-2460	24" x 60" x 74"	94	AD74-2460
24" x 72" x 74"	120	WR74-2472	24" x 72" x 74"	114	AD74-2472
30" x 36" x 74"	76	WR74-3036	30" x 36" x 74"	70	AD74-3036
30" x 42" x 74"	88	WR74-3042	30" x 42" x 74"	82	AD74-3042
30" x 48" x 74"	100	WR74-3048	30" x 48" x 74"	94	AD74-3048
30" x 60" x 74"	124	WR74-3060	30" x 60" x 74"	118	AD74-3060
30" x 72" x 74"	140	WR74-3072	30" x 72" x 74"	134	AD74-3072
36" x 36" x 74"	88	WR74-3636	36" x 36" x 74"	82	AD74-3636
36" x 48" x 74"	108	WR74-3648	36" x 48" x 74"	102	AD74-3648
36" x 60" x 74"	132	WR74-3660	36" x 60" x 74"	126	AD74-3660
36" x 72" x 74"	140	WR74-3672	36" x 72" x 74"	134	AD74-3672

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ADD YOUR CASTER KIT TO YOUR UNIT FOR MOBILITY

1,200-3,200 lb.
MOBILE LOAD CAPACITY



Donut Bumper

Non-marking, 3" diameter plastic bumper used to protect walls and help cushion impact.

MODEL NO.	DESCRIPTION	SHIP WGT
DB	One 3" Diameter Donut Bumper	1 lb

Casters

MODEL NO.	DESCRIPTION	LOAD CAPACITY PER CASTER	SHIP WGT
	Stem Casters		
WR-00H	Four Swivel 5" x 1-1/4" Thermoplastic Resin Casters, 2 with brake	300 lbs	10 lbs
WR-00HS	Four Swivel 5" x 1-1/4" Thermoplastic Resin Stainless Steel Casters with Zerk Grease Fittings, 2 with brake	300 lbs	12 lbs
WR-00CO	Four Swivel ESD/Conductive 5" x 1-1/4" Casters, 2 with brake	300 lbs	12 lbs
WR-SB2R2*	Two Swivel 5" x 1-1/4" Thermoplastic Resin Caster with brake, 2 Rigid	300 lbs	12 lbs
WR-3	Four Swivel 3" Polyurethane Casters, all with brake	200 lbs	8 lbs
WR-RG*	One Rigid 5" x 1-1/4" Thermoplastic Resin Caster	300 lbs	3 lbs
WR-PS	One Swivel 8" x 2-1/2" Pneumatic Caster	325 lbs	4 lbs
	Plate Casters		
PT-PS	One Swivel 5" x 1-1/4" Thermoplastic Resin Caster	300 lbs	3 lbs
PT-PR	One Rigid 5" x 1-1/4" Thermoplastic Resin Caster	300 lbs	3 lbs
PT-PSB	One Swivel 5" x 1-1/4" Thermoplastic Resin Caster with brake	300 lbs	3 lbs
PT-PS-S	One Swivel 5" x 1-1/4" Polyurethane Stainless Steel Caster with Zerk Grease Fittings	300 lbs	3 lbs
PT-PR-S	One Rigid 5" x 1-1/4" Polyurethane Stainless Steel Caster with Zerk Grease Fittings	300 lbs	3 lbs
PT-PSB-S	One Swivel 5" x 1-1/4" Polyurethane Stainless Steel Caster with brake with Zerk Grease Fittings	300 lbs	3 lbs
PT-PS6	One Swivel 6" x 2" Polyurethane Caster	800 lbs	5 lbs
PT-PR6	One Rigid 6" x 2" Polyurethane Caster	800 lbs	5 lbs
PT-PSB6	One Swivel 6" x 2" Polyurethane Caster with brake	800 lbs	5 lbs
PT-NS	One Swivel 8" x 2-1/2" Pneumatic Caster	325 lbs	4 lbs
PT-NR	One Rigid 8" x 2-1/2" Pneumatic Caster	325 lbs	4 lbs

*Requires Tie Bars for rigid alignment *(See pg. 147)*



WR-00H
Shown with and without brake
Sold as a set of 4 casters, 2 with brake



WR-00CO
Shown with and without brake
Sold as a set of 4 casters, 2 with brake



WR-00HS
Shown with and without brake
Sold as a set of 4 casters, 2 with brake



PT-PR



PT-PS



PT-PSB



PT-PR6



PT-PS6



PT-PSB6



WR-3
Sold as a set of
4 casters, all with brake



WR-PS



PT-NR



PT-NS



WR-RG
Requires Tie Bar
(See chart pg. 147)

ADD YOUR CASTER KIT TO YOUR UNIT FOR MOBILITY

1,200-3,200 lb.
MOBILE LOAD CAPACITY



Donut Bumper

Non-marking, 3" diameter plastic bumper used to protect walls and help cushion impact.

MODEL NO.	DESCRIPTION	SHIP WGT
DB	One 3" Diameter Donut Bumper	1 lb

Casters

MODEL NO.	DESCRIPTION	LOAD CAPACITY PER CASTER	SHIP WGT
	Stem Casters		
WR-00H	Four Swivel 5" x 1-1/4" Thermoplastic Resin Casters, 2 with brake	300 lbs	10 lbs
WR-00HS	Four Swivel 5" x 1-1/4" Thermoplastic Resin Stainless Steel Casters with Zerk Grease Fittings, 2 with brake	300 lbs	12 lbs
WR-00CO	Four Swivel ESD/Conductive 5" x 1-1/4" Casters, 2 with brake	300 lbs	12 lbs
WR-SB2R2*	Two Swivel 5" x 1-1/4" Thermoplastic Resin Caster with brake, 2 Rigid	300 lbs	12 lbs
WR-3	Four Swivel 3" Polyurethane Casters, all with brake	200 lbs	8 lbs
WR-RG*	One Rigid 5" x 1-1/4" Thermoplastic Resin Caster	300 lbs	3 lbs
WR-PS	One Swivel 8" x 2-1/2" Pneumatic Caster	325 lbs	4 lbs
	Plate Casters		
PT-PS	One Swivel 5" x 1-1/4" Thermoplastic Resin Caster	300 lbs	3 lbs
PT-PR	One Rigid 5" x 1-1/4" Thermoplastic Resin Caster	300 lbs	3 lbs
PT-PSB	One Swivel 5" x 1-1/4" Thermoplastic Resin Caster with brake	300 lbs	3 lbs
PT-PS-S	One Swivel 5" x 1-1/4" Polyurethane Stainless Steel Caster with Zerk Grease Fittings	300 lbs	3 lbs
PT-PR-S	One Rigid 5" x 1-1/4" Polyurethane Stainless Steel Caster with Zerk Grease Fittings	300 lbs	3 lbs
PT-PSB-S	One Swivel 5" x 1-1/4" Polyurethane Stainless Steel Caster with brake with Zerk Grease Fittings	300 lbs	3 lbs
PT-PS6	One Swivel 6" x 2" Polyurethane Caster	800 lbs	5 lbs
PT-PR6	One Rigid 6" x 2" Polyurethane Caster	800 lbs	5 lbs
PT-PSB6	One Swivel 6" x 2" Polyurethane Caster with brake	800 lbs	5 lbs
PT-NS	One Swivel 8" x 2-1/2" Pneumatic Caster	325 lbs	4 lbs
PT-NR	One Rigid 8" x 2-1/2" Pneumatic Caster	325 lbs	4 lbs

*Requires Tie Bars for rigid alignment *(See pg. 147)*



WR-00H
Shown with and without brake
Sold as a set of 4 casters, 2 with brake



WR-00CO
Shown with and without brake
Sold as a set of 4 casters, 2 with brake



WR-00HS
Shown with and without brake
Sold as a set of 4 casters, 2 with brake



PT-PR



PT-PS



PT-PSB



PT-PR6



PT-PS6



PT-PSB6



WR-3
Sold as a set of
4 casters, all with brake



WR-PS



PT-NR



PT-NS



WR-RG
Requires Tie Bar
(See chart pg. 147)

SPEC SHEET

"PBJC-48" JANITOR CABINET

16GA Sink Bowl



FEATURES:

- 18 GA Type 300 Stainless Steel With #4 Polish Satin Finish
- (2) Vented Swing Doors With Lock Handles
- Available In Left Side or Right Side Configuration
- MOP SINK Compartment Side Includes:
  - (1) Oversized Mop Sink 20"x16"x12" with 3-1/2" Drain
  - (1) Overhead Storage Shelf With Panel Backing
  - (2) Mop/Broom Holders With Locking Cam On Front Shelf
  - Panel-Less Back
- Storage Compartment Side Includes:
  - (3) Storage Shelves
  - Bottom Storage Area
- Includes (1) Heavy Duty Service Faucet (PBF-SS-6-X)
- Includes (1) 10' Service Faucet Hose (PB-HOSE-120-X)

SPECIFICATIONS:

- Cabinet: Stainless Steel Cabinets TIG Welded, Exposed Edges Are Polished To Match Adjacent Surface
- Cabinet: 18GA Type 300 Stainless Steel With #4 Polish, Satin Finish
- 18GA Type 300 Cabinet
- 16GA Type 300 Sink Bowl And Deck

CERTIFICATIONS:





PBF-SS-6



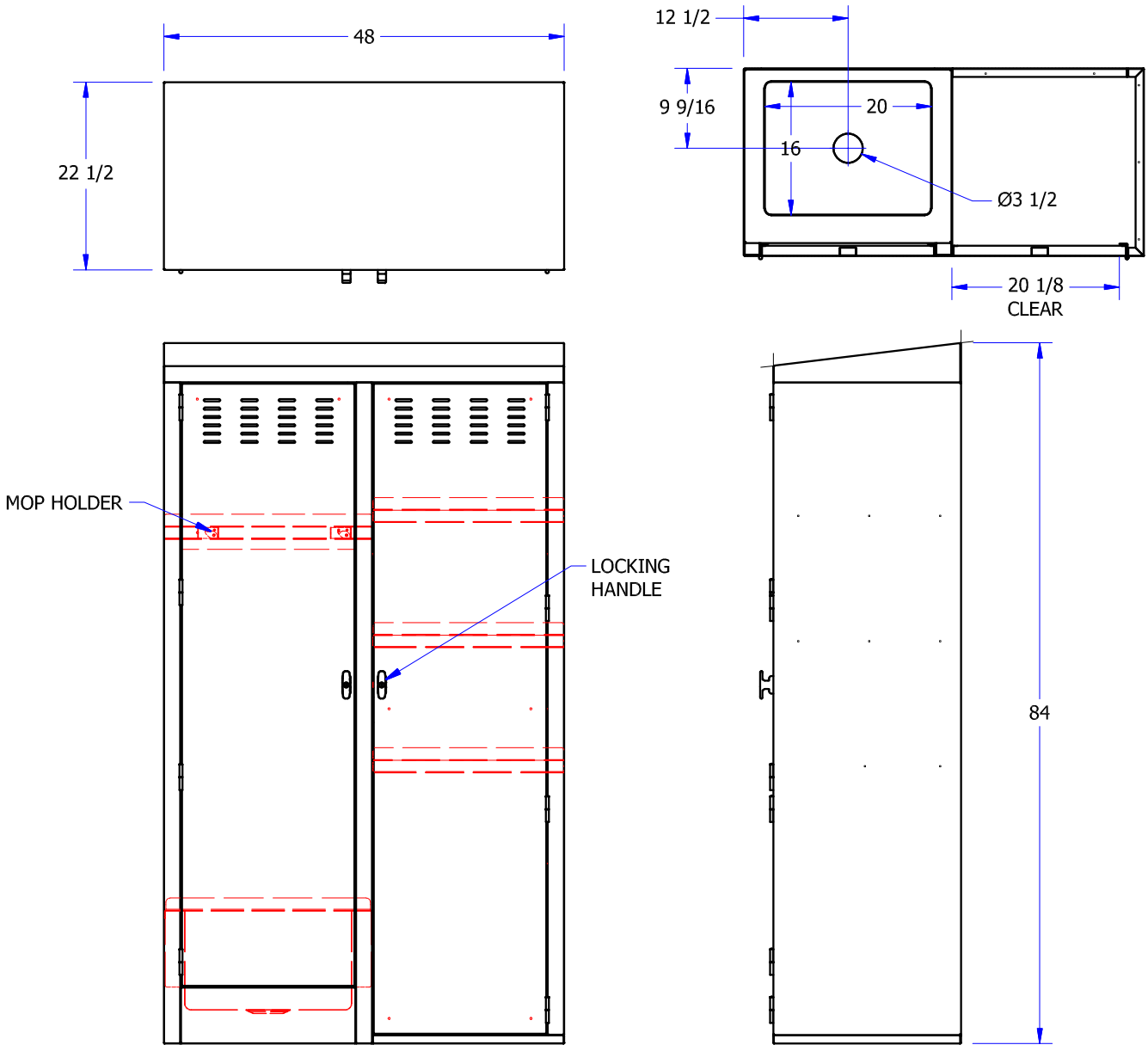
PB-HOSE-120

"PBJC-48" JANITOR CABINET

MODEL	DESCRIPTION	OVERALL SIZE (L X W X H)	MOP SINK SIZE	WEIGHT (LBS)
PBJC-224884-L	Left Hand	48"x22"x84"	20"x16"x12"	292
PBJC-224884-R	Right Hand	48"x22"x84"	20"x16"x12"	292

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

DETAILED SPECIFICATIONS



"PBJC-48" JANITOR CABINET

MODEL	DESCRIPTION	OVERALL SIZE (L X W X H)	MOP SINK SIZE	WEIGHT (LBS)
PBJC-224884-L	Left Hand	48"x22"x84"	20"x16"x12"	292
PBJC-224884-R	Right Hand	48"x22"x84"	20"x16"x12"	292

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

CHANNEL MANUFACTURING, INC.

Item No. _____

Quantity _____

Job Name _____

Spec No. _____

UTILITY CARTS

UTILITY/BUSSING CARTS

STAINLESS CONSTRUCTION



US1827-3

Model	Shelves	H	W	D	Weight
US1524-3	3	34"	27-1/4"	16"	39
US1827-3	3	34"	30-3/4"	18"	42
US2135-3	3	37-1/4"	39-1/2"	22"	68

SPECIFICATIONS:

- Designed as a mobile multi-purpose all-welded 18 gauge, 304 Series stainless steel cart.
- 500 lb. distributed weight capacity.
- Standard 5" full swivel non-marking casters. Casters are securely bolted to frame to facilitate replacements
- Fully assembled and ready for use. Includes corner bumpers.

MADE IN THE USA NSF

Notes

55 Channel Drive • Port Washington, NY11050-2216
8891 NW 102nd Street • Medley, FL 33178
Tel: 516-944-6271 • Fax: 516-944-0625
Toll Free: 866-712-7283
www.channelmfg.com • Email: sales@channelmfg.com

CHANNEL MANUFACTURING, INC.

Item No. _____

Quantity _____

Job Name _____

Spec No. _____



UTR-12

BUN PAN RACKS

BUN PAN / STEAMTABLE PAN RACKS

ALUMINUM CONSTRUCTION

Custom Sizes Available

Model	Spacing/Capacity	H	W	D	Weight
UTR-20	3"/20 Pans	70"	20½"	26"	54
UTR-15	4"/15 Pans	70"	20½"	26"	50
UTR-12	5"/12 Pans	70"	20½"	26"	44
UTR-10	6"/10 Pans	70"	20½"	26"	41
UTR-18	3"/18 Pans	64"	20½"	26"	50
UTR-11	5"/11 Pans	64"	20½"	26"	37
UTR-9	3"/9 Pans	36"	20½"	26"	29
UTR-5	5"/5 Pans	36"	20½"	26"	26

Options:

- ❑ /011 Caster Brakes (2)
- ❑ /052 5x2 Caster upgrade
- ❑ /5B HD Caster Brakes (2)
- ❑ /CC Card Clip Aluminum
- ❑ /022 Corner Bumpers (2)
- ❑ /024 Corner Bumpers (4)
- ❑ /PB Perimeter Bumper
- ❑ /VB Vertical Bumpers
- ❑ /009 Pan Stop Aluminum
- ❑ /BA Solid Bottom Aluminum
- ❑ /A Solid Top Aluminum
- ❑ /008 X Bracing

APPLICATIONS: Mobile multi-purpose racks for holding, storing and transporting of 18" X 26" bun pans and 12" X 20" steamtable pans.

CONSTRUCTION: Heavy duty, high tensile extruded aluminum. Type 6063-T5 alloy. Lifetime guarantee against rust.

TRAY SLIDES: 3-1/4" wide pan slides to accommodate 18" X 26" tray and 12" X 20" steamtable pans.

FRAME AND CROSS SUPPORTS: Vertical and horizontal frame sections are extruded 1" square tubular aluminum.

CASTERS: Standard 5" full swivel non-marking casters. Casters are securely bolted to frame to facilitate replacements.

MADE IN THE USA NSF

Notes

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Parts Dept. (800)424-TRUE • Parts Dept. Fax# (636)272-9471 • www.truemfg.com

Project Name: _____
Location: _____
Item #: _____ Qty: _____
Model #: _____

AIA #
SIS #

Model:
TH-23G~FGD01

TH Series:
Reach-In Glass Swing Door Heated Cabinet~Framed Glass Door Version 01



TH-23G~FGD01

- Provides cabinet holding temperature of 80°F to 180°F (26.6°C to 82.2°C).
- Internal fan provides low velocity, forced-air heat distribution to assure even temperatures throughout the cabinet.
- Stainless steel, tube heating element for uniform generation of electric heat. Cabinet comes with a total of 850 watts. Heating element sheathed for corrosion resistance.
- Exterior - stainless steel front and door. Anodized quality aluminum ends. Corrosion resistant GalFan coated steel back.
- Interior - Stainless steel interior liner and floor.
- Energy efficient, triple pane, thermal insulated glass door.
- Cabinet comes standard with three (3), adjustable, heavy duty chrome plated wire shelves.
- entire cabinet structure is foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).

ROUGH-IN DATA

Specifications subject to change without notice.
Chart dimensions rounded up to the nearest ⅛" (millimeters rounded up to next whole number).

Model	Doors	Cabinet Dimensions (inches) (mm) L	D†	H*	Watts	Voltage	Amps	NEMA Config.	Cord Length (total ft.) (total m)	Crated Weight (lbs.) (kg)
TH-23G~FGD01	1	27 686	29¾ 756	78⅜ 1991	850	115/60/1	7.8 N/A	5-15P	9 2.74	290 132

* Height does not include 5" (127 mm) for castors or 6" (153 mm) for optional legs.
* Height does not include 1" (26 mm) for ventilator cap.
† Depth does not include 1⅜" (35 mm) for door handle.

MADE WITH INNOVATION IN THE USA

6/18-A Printed in U.S.A.

APPROVALS:

AVAILABLE AT:

Model:
TH-23G~FGD01

TH Series:
Reach-In Glass Swing Door Heated Cabinet
~Framed Glass Door Version 01

STANDARD FEATURES

DESIGN
- True's solid door reach-in heated cabinets are designed with enduring quality that protects your long term investment.

HEATER SYSTEM
- Cabinet is designed to provide holding temperatures of 80°F to 180°F (26.6°C to 82.2°C). Heating system controlled by exterior on/off switch and temperature control dial.
- Stainless steel, tube heating element for uniform generation of electric heat. Cabinet comes with a total of 850 watts. Heating element sheathed for corrosion resistance.
- Low-velocity fans to assure even temperature distribution throughout the cabinet.
- Manually controlled vent located on top of the cabinet for positive humidity control.
- Exterior dial thermometer; accurate, direct reading of internal cabinet temperature.

CABINET CONSTRUCTION
- Exterior - Stainless steel front. Anodized quality aluminum ends. Corrosion resistant GalFan coated steel back.
- Interior- Stainless steel interior liner and floor.
- Insulation - entire cabinet structure is foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- Welded, heavy duty steel frame rail, black powder coated for corrosion protection.
- Frame rail fitted with 4" diameter stem castors - locks provided on front set.

DOOR
- Energy efficient, triple pane, thermal insulated glass door assembly with extruded aluminum frame.
- Door fitted with 12" (305 mm) extruded aluminum handle.
- Positive seal self-closing door. Lifetime guaranteed door hinges and torsion type closure system.
- Magnetic door gasket of one piece construction, removable without tools for ease of cleaning.

SHELVING
- Three (3) adjustable, heavy duty chrome plated wire shelves 21 7/16"L x 23 1/4"D (545 mm x 591 mm). Four (4) chrome plated shelf clips included per shelf.
- Anodized aluminum shelf support pilasters. Shelves are adjustable on ½" (13 mm) increments.

LIGHTING
- Incandescent Interior lighting; safety shielded.

MODEL FEATURES
- 12"L x 20"W x 1"D (305 mm x 508 mm x 26 mm) humidity pan standard for contents requiring high humidity.
- True heated cabinets are designed to hold warm baked or cooked food. Cabinets are not designed to heat ambient or cold products.
- NSF/ANSI Standard 4 compliant for open food product.

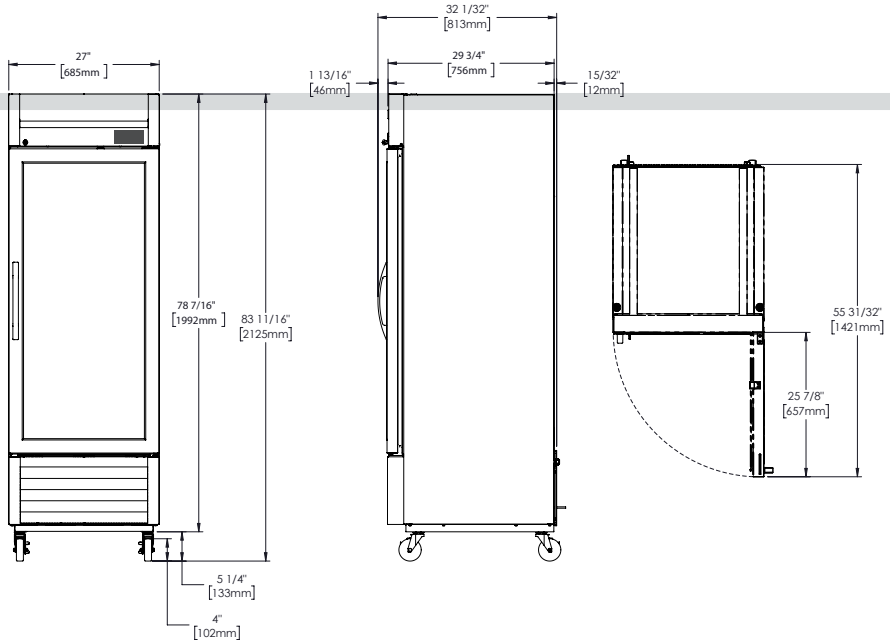
ELECTRICAL
- True requires that a sole use circuit be dedicated for the unit.
- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.



115/60/1
NEMA-5-15R

OPTIONAL FEATURES/ACCESSORIES
Upcharge and lead times may apply.
- ❑ 6" (153 mm) standard legs.
- ❑ 6" (153 mm) seismic/flanged legs.
- ❑ 2½" (64mm) castors.
- ❑ Alternate door hinging (factory installed).
- ❑ Additional shelves.

PLAN VIEW



WARRANTY
Three year warranty on all parts and labor. (U.S.A. only)

METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Model	Elevation	Right	Plan	3D	Back
TH-23G~FGD01					

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Project Name: _____
Location: _____
Item #: _____ Qty: _____
Model #: _____

AIA #
SIS #

Model:
T-35G-HC~FGD01

T-Series:
Reach-In Glass Swing Door Refrigerator with Hydrocarbon Refrigerant~Framed Glass Door Version 01



T-35G-HC~FGD01

- True's glass door reach-in's are designed with enduring quality that protects your long term investment.
- Designed using the highest quality materials and components to provide the user with colder product temperatures, lower utility costs, exceptional food safety and the best value in today's food service marketplace.
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydro carbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C) for the best in food preservation.
- Stainless steel front. The finest stainless available with higher tensile strength for fewer dents and scratches.
- Energy efficient, "Low-E", double pane thermal glass doors.
- LED interior lighting provides more even lighting throughout the cabinet. Safety shielded.
- Adjustable, heavy duty PVC coated shelves.
- Positive seal self-closing doors. Lifetime guaranteed door hinges and torsion type closure system.

Bottom mounted units feature:

- "No stoop" lower shelf.
- Storage on top of cabinet.
- Compressor performs in coolest, most grease free area of kitchen.
- Easily accessible condenser coil for cleaning.

ROUGH-IN DATA

Specifications subject to change without notice.
Chart dimensions rounded up to the nearest ⅛" (millimeters rounded up to next whole number).

Model	Doors	Shelves	Cabinet Dimensions (inches) (mm) W	D†	H*	HP	Voltage	Amps	NEMA Config.	Cord Length (total ft.) (total m)	Crated Weight (lbs.) (kg)
T-35G-HC~FGD01	2	6	39⅝ 1007	29⅞ 759	78⅜ 1991	⅓ N/A	115/60/1	5.6 N/A	5-15P	9 2.74	415 189

† Depth does not include 1⅜" (35 mm) for door handle. Depth does not include ½" (13mm) for rear mechanical components.
* Height does not include 5" (127 mm) for castors or 6" (153 mm) for optional legs.

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5/20 Printed in U.S.A.

APPROVALS:

AVAILABLE AT:

Model:
T-35G-HC~FGD01

T-Series:
Reach-In Glass Swing Door Refrigerator with Hydrocarbon Refrigerant~Framed Glass Door Version 01

STANDARD FEATURES

DESIGN
- True's commitment to using the highest quality materials and oversized refrigeration systems provides the user with colder product temperatures, lower utility costs, exceptional food safety and the best value in today's food service marketplace.

REFRIGERATION SYSTEM
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydro carbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C) for the best in food preservation.
- State of the art, electronically commutated evaporator and condenser fan motors. ECM motors operate at higher peak efficiencies and move a more consistent volume of air which produces less heat, reduces energy consumption and provides greater motor reliability.
- Bottom mounted condensing unit positioned for easy maintenance. Compressor runs in coolest and most grease free area of the kitchen. Allows for storage area on top of unit.

CABINET CONSTRUCTION
- Exterior - Stainless steel front. Anodized quality aluminum ends. Corrosion resistant GalFan coated steel back.
- Interior - attractive, NSF approved, clear aluminum liner. Stainless steel floor with coved corners.
- Insulation - entire cabinet structure is foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- Welded, heavy duty steel frame rail, black powder coated for corrosion protection.
- Frame rail fitted with 4" (102 mm) diameter stem castors - locks provided on front set.

DOORS
- "Low-E", double pane thermal glass assemblies with extruded aluminum frames. Door lock standard.
- Each door fitted with 15" (381 mm) long extruded aluminum handle.
- Positive seal self-closing doors. Lifetime guaranteed door hinges and torsion type closure system.
- Magnetic door gaskets of one piece construction, removable without tools for ease of cleaning.

SHELVING
- Six (6) adjustable, heavy duty PVC coated wire shelves 17½"L x 22⅜"D (445 mm x 569 mm). Four (4) chrome plated shelf clips included per shelf.
- Shelf support pilasters made of same material as cabinet interior; shelves are adjustable on ½" (13 mm) increments.

LIGHTING
- LED interior lighting provides more even lighting throughout the cabinet. Safety shielded.

MODEL FEATURES
- Exterior temperature display.
- Evaporator is epoxy coated to eliminate the potential of corrosion.
- NSF/ANSI Standard 7 compliant for open food product.

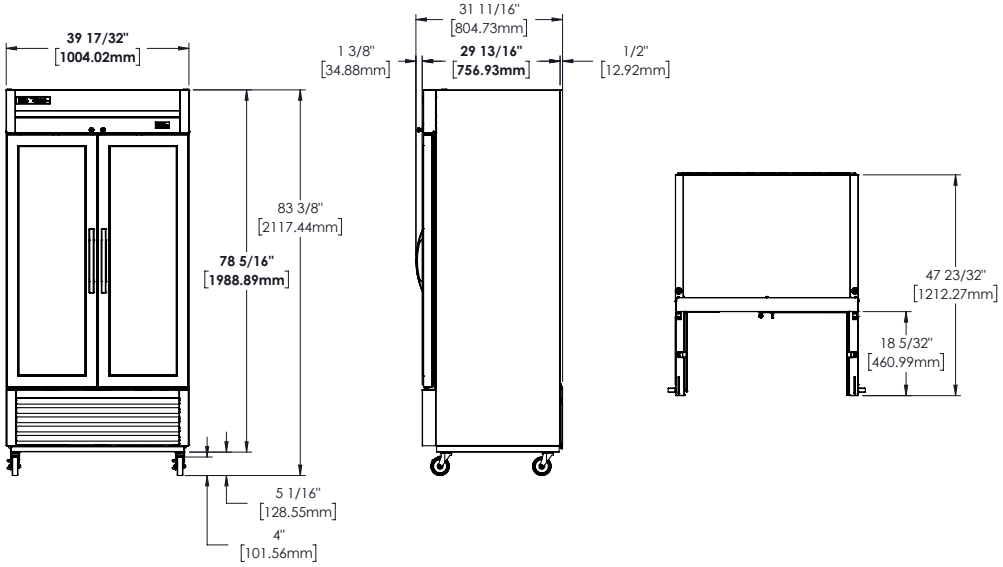
ELECTRICAL
- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.



115/60/1
NEMA-5-15R

OPTIONAL FEATURES/ACCESSORIES
Upcharge and lead times may apply.
- ❑ 6" (153 mm) standard legs.
- ❑ 6" (153 mm) seismic/flanged legs.
- ❑ Alternate Door Hinging (Factory Installed).
- ❑ Additional shelves.

PLAN VIEW



3 YEAR PARTS + LABOR 7 YEAR COMPRESSOR
WARRANTY
(U.S.A. only)

METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Model	Elevation	Right	Plan	3D	Back
T-35G-HC~FGD01					

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Project Name	*Location*	
Item #	*Qty*	*AIA #*
Model #		*SIS #*

Models TGM-DZ-59-SC/SC-B-W TGM-DZ-59-SC/SC-W-W TGM-DZ-59-SC/SC-S-W TGM-DZ-59-SC/SC-S-S

True Glass Merchandiser — Curved Glass, Solid Colored End Dual Zone



TGMDZ-59-SC/SC-B-W

FEATURES

- True's dual zone glass merchandisers combine efficient, high volume merchandising and exceptional refrigeration with an elegant curved glass front for sophisticated presentation of high end desserts and pastries.
- Refrigerated section features factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydro carbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- Refrigerated section features high capacity, factory balanced refrigeration system. Standard temperature range maintains cabinet temperatures of 33°F to 41°F (.5°C to 5°C), ideally suited for refrigerated bakery and cold deli products.
- Two (2) rear sliding glass doors for back access.
- Exterior - powder coated FDA black rounded front and back, solid wood sides with aluminum cover and front panels. Color options available (upcharge may apply) - white or stainless.
- Interior - powder coated FDA white over CRS material. Color options available (upcharge may apply) - black or stainless.
- Three (3) tiered levels of adjustable wire cantilever shelves that match cabinet interior color. Chrome plated wire shelves standard on stainless units.
- Curved glass front is single pane tempered glass with extra large viewing area to maximize product presentation.
- LED interior lighting provides more even lighting throughout the cabinet. Safety shielded.

STANDARD OPTIONS

Exterior Color	Black, White, or Stainless Steel
Interior Color	Black, White, or Stainless Steel
Solid Mirrored End (SM)	Solid Exterior Sides & Mirrored interior sides
Shelving	White, Black, Chrome, or Mezzanine

ROUGH-IN DATA

Specifications subject to change without notice.
Chart dimensions rounded up to the nearest ⅛" (millimeters rounded up to next whole number).

Model	Rear Doors	Shelves	Cabinet Dimensions (inches) (mm) W	D	H	HP	Voltage	Amps	NEMA Config.	Cord Length (total ft.) (total m)	Crated Weight White/Black Model (lbs.) (kg)	Crated Weight Stainless Model (lbs.) (kg)
TGM-DZ-59-SC/SC-Δ-Δ	2	6	59¼ 1505	39 990	49⅛ 1247	¼	115/60/1	10.0	5-15P	9 2.74	770 350	TBD TBD

Δ Represents Exterior/Interior (B-black, W-White, S-Stainless)

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10/18 Printed in U.S.A.

APPROVALS:

AVAILABLE AT:

Models:	
TGM-DZ-59-SC/SC-B-W	TGM-DZ-59-SC/SC-W-W
TGM-DZ-59-SC/SC-S-W	TGM-DZ-59-SC/SC-S-S

True Glass Merchandiser:
Curved Glass, Solid Colored End Dual Zone

STANDARD FEATURES

DESIGN
- True's combination "refrigerated" and "dry" display case glass merchandiser combines efficient, high volume merchandising and exceptional refrigeration with an elegant curved glass front for sophisticated presentation of high end end deli, desserts and pastries.
- Please note: If units are banked together, because of side panel, a 1/2" (13mm) gap will remain between units.

REFRIGERATION SYSTEM
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydrocarbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- Exclusive reversing condenser fan motors. Fan motors reverse during defrost off cycles to help keep condenser coil free from dirt, dust and debris. Keeping coils clean optimizes the unit's performance providing colder holding temperatures and increased energy efficiency. Regularly scheduled thorough cleaning of coils still recommended.
- High capacity, factory balanced refrigeration system that has two (2) temperature range options. Standard temperature range maintains cabinet temperatures of 33°F to 41°F (.5°C to 5°C), ideally suited for refrigerated bakery and cold deli products. Optional temperature range maintains cabinet temperatures of 42°F to 65°F (5.5°C to 18.3°C), ideally suited for chocolate & wine options.
- Pull Out Condensing unit slides out for easy cleaning and maintenance.

CABINET CONSTRUCTION
- Exterior - powder coated FDA black rounded front and back, solid wood sides with aluminum cover and front panels. Color options available (upcharge may apply) - white or stainless.
- Curved glass front and side glass panels.
- Interior - powder coated FDA white over CRS material. Color options available (upcharge may apply) - black or stainless.
- Insulation - entire cabinet structure is foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- Welded, heavy duty steel frame rail, black powder coated for corrosion protection.
- Frame rail fitted with leg levelers.

CURVED FRONT DISPLAY GLASS
- Curved glass front is single pane tempered glass with extra large viewing area to maximize product presentation.

REAR DOORS
- Two (2) rear sliding glass doors for back access.
- Each door fitted with 12" (305 mm) long aluminum handle.
- Sliding doors ride on stainless steel V-channel with stainless steel bearings. Doors fit within plastic channel frame.

SHELVING
- Six (6) adjustable heavy duty PVC coated wire shelves standard.
- Each shelf supports a maximum weight of 150 lbs. (69 kg).

PAN CAPACITY
- Cabinet holds six (6) 18"L x 26"D (458 mm x 661 mm) display pans and eight (8) 12"L x 18"D (305 mm x 458 mm) display pans. Pans supplied by others.

LIGHTING
- LED interior lighting, two (2) clips underneath shelf to keep wires in place. Safety shielded.

MODEL FEATURES
- Evaporator is epoxy coated to eliminate the potential of corrosion.
- Pull out condensing unit slides out for easy cleaning and maintenance.
- Electronic temperature control.
- NSF/ANSI Standard 7 compliant for open food product. Tested and certified for performance at NSF Type II: 80°F (27°C) and 55% relative humidity.

ELECTRICAL
- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.



115/60/1
NEMA-5-15R

STANDARD OPTIONS

Upcharge and lead times may apply.
- ❑ Black exterior
- ❑ White exterior
- ❑ Stainless steel exterior
- ❑ White interior
- ❑ Black interior
- ❑ Stainless steel interior
- ❑ Solid Colored Exterior Sides with color matching interior (SC)
- ❑ Solid Colored Exterior Sides with Mirrored interior ends (SM)
- ❑ White wire shelves
- ❑ Black wire shelves
- ❑ Chrome plated wire shelves
- ❑ Stainless steel mezzanine shelves

OPTIONAL FEATURES/ACCESSORIES

Upcharge and lead times may apply.
- ❑ Custom exterior colors (contact factory for details)
- ❑ Chocolate/Wine model available
- ❑ Glass shelves
- ❑ Frosted glass shelves
- ❑ Ratchet lock
- ❑ Electrical Receptacle
- ❑ Exterior top scale shelf
- ❑ Exterior small top service shelf
- ❑ Exterior medium top service shelf
- ❑ Exterior large top service shelf
- ❑ External front shelf kit (only available in black)
- ❑ External rear service shelf shelf kit (only available in black)
- ❑ 4" (102mm) Castors
- ❑ 2 1/2" (64mm) castors
- ❑ 6" (153mm) legs

TGM MODEL NUMBER NOMENCLATURE SYSTEM

True Glass Merchandiser

Size: (36, 48, 59, 77)

END TYPE: Left Position / Right Position

COLOR: Exterior / Interior

TGM - R - 59 - SC / SC - B - W

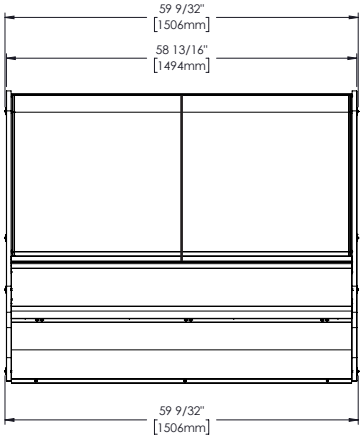
Note: Dual Zone models Not Available in 36 size models.

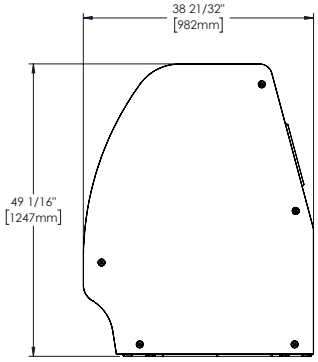
Type:
R - Refrigerator
DZ - Dual Zone
DC - Dry Case
CW - Chocolate/Wine

Side Type:
SC - Solid Colored End
SM - Solid Mirrored End

Color:
B - Black
W - White
S - Stainless Steel

PLAN VIEW





WARRANTY
Three year warranty on all parts and labor and an additional 2 year warranty on compressor. (U.S.A. only)

METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

KCL	Elevation	Right	Plan	3D	Back

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EVERSYS

Enigma

Datasheet & Installation

1. Machine configuration and overall dimensions



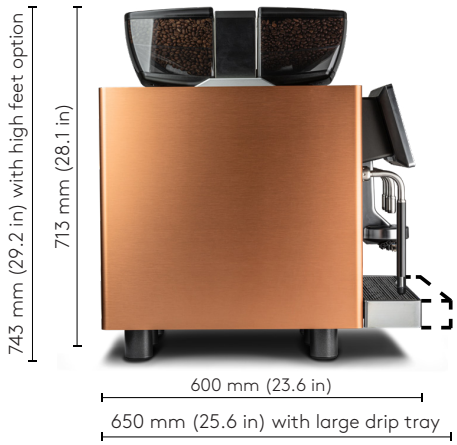
E'4m x-wide/Classic

Technical data	
Brew chamber	2 x 24 g
Grinder	2 x Ceramic burrs - 64 mm
User Interface	2 x Touch screen 256 mm (10.1")
Bean hopper	2 x 1.5 kg
Coffee outlet height*	190 mm max.
Hot water outlet height*	160 mm max. or 215 mm max. (option)
Interface	2 x USB, 1 x Ethernet, 1 x CCI/CSI/API
Cup heater surface	Up to 128 espresso cups
Coffee boiler size	2 x 1.5 L
Steam boiler size	5.4 L
Grounds drawer	1 x 700 g
Drip tray	Standard or Large with pitcher rinser (option) or Large without pitcher rinser (option)
Water Connection	
Water hose	Inox braided pipe G3/8" female x 2 m
Drain hose	Ø 22 mm x Ø 16 mm x 2 m

*measured from the drip tray

Classic	E'4s x-wide	E'4m x-wide
Weight	115 kg	119 kg
Performance (up to)		
Espresso/h (23 s)	350	
Hot water/h (200 ml)	170	
Cappuccino/h (23 s)	-	350
Adjustable hot water temperature (Manual)	Yes	
Adjustable hot water temperature (Automatic)	Option	
e'Foam Micro Air Dosing (MAD) system (controlled electronically)	Yes	
Milk system with EMT (Electronic Milk Texturing)	-	Yes
Voltage/Power		
North America		
2/PE, 208 V~, 60 Hz, 30A - US/CA	4600 W	
NEMA L6-30 (30Amp) Circuit Required		
Frequency	50/60 Hz	
Power consumption (machine on)	Up to 10200 W	
Power consumption (standby mode)	Less than 2 W	
Water pressure and flow		
2.5 - 4 bars (36.3 - 58 psi) If the pressure exceeds 4.5 bars (65.3 psi), it is necessary to install a pressure valve reducer.		
If the main flow rate is under 200 L/h, there is a risk of damaging the water pump.		





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SUPER TRADITIONAL

EVERSYS

Enigma

Datasheet & Installation

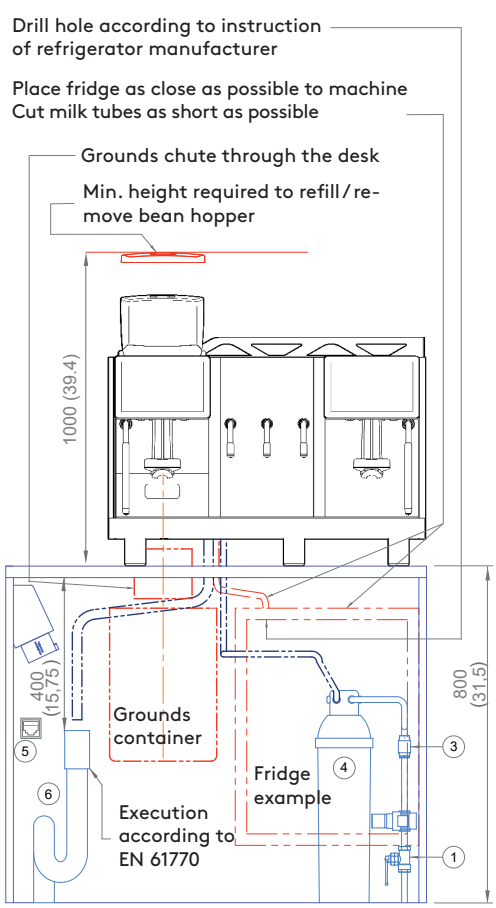
2. Prior to the installation READ SAFETY INSTRUCTIONS

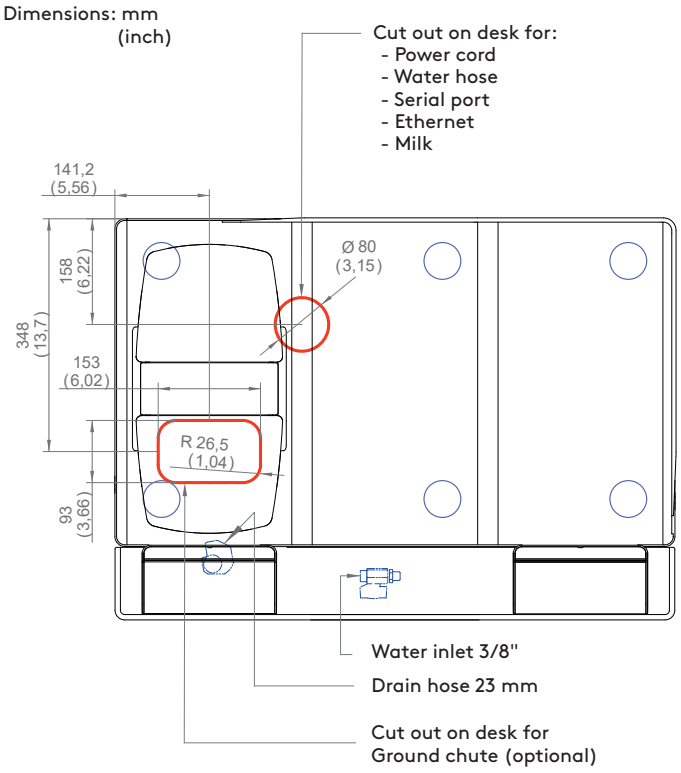
- Check water quality and pressure
- Define filter type and size and check space inside counter
- If no descaling cartridge is used, install carbon filter as minimum
- Check that the machine is on flat and stable surface
- Check counter cut out
- Check water supply installation
- Check that power supply conforms to local standards
- Check that power supply conforms to the machine settings
- Check that the machine is the only device on this power line
- Check all with customer on site
- Make sure original coffee is available
- Make sure cold milk is available (option)
- Check drink recipes and cup sizes
- Check that a milk pitcher is available.

3. After installation

- Explain cleaning and instruct staff using Quick Reference Card
- Fill in and sign the installation form and send it back to Eversys -> orders@eversys.com

4. Desk preparation and countertop cut out dimensions





1. Main water inlet
2. Pressure reducer output 3 bar (43,5 psi)
3. Check valve
4. Descaling cartridge or carbon filter as minimum
5. Electrical socket according to local regulation and RJ-45 connection (e'Connect)
6. Drain with syphon, top end min. 56 mm diameter

Water quality recommendation

Total hardness: 5 - 8° dGH (89-142 ppm)

Carbonate hardness: Max. 6° dKH (107 ppm)

pH value: ideal 7.0 - 7.2

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Project Name: _____ AIA #

Location: _____ SIS #

Item #: _____ Qty: _____

Model #: _____

Model: **TSSU-36-12M-B-HC**

Food Prep Table:
Mega-Top Solid Door Sandwich/Salad Unit with Hydrocarbon Refrigerant



TSSU-36-12M-B-HC

- True's salad/sandwich units are designed with enduring quality that protects your long term investment.
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydro carbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- Patented forced-air design holds 33°F to 41°F (.5°C to 5°C) product temperature in food pans and cabinet interior.
- Complies with and listed under ANSI/NSF-7.
- Exterior - stainless steel front, top and ends. Corrosion resistant GalFan coated steel back.
- Stainless steel, patented, foam insulated lid and hood keep pan temperatures colder, lock in freshness and minimize condensation. Removable for easy cleaning.
- Interior - attractive, NSF approved, clear coated aluminum liner. Stainless steel floor with coved corners.
- 8⅞" (226 mm) deep, ½" (13 mm) thick, full length removable cutting board included. Sanitary, high density, NSF approved white polyethylene provides tough preparation surface.
- Heavy duty PVC coated wire shelves.
- Foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).

ROUGH-IN DATA

Specifications subject to change without notice.
Chart dimensions rounded up to the nearest ⅛" (millimeters rounded up to next whole number).

Model	Doors	Shelves	Pans (top)	Cabinet Dimensions (inches) (mm) W	D†	H*	HP	Voltage	Amps	NEMA Config.	Cord Length (total ft.) (total m)	Crated Weight (lbs.) (kg)
TSSU-36-12M-B-HC	2	4	12	36⅜ 924	34⅛ 867	40⅜ 1026	¼ N/A	115/60/1	4.5 N/A	5-15P	7 2.13	255 116

† Depth does not include 1" (26 mm) for rear bumpers.
* Height does not include 6¼" (159 mm) for castors or 6" (153 mm) for optional legs.

MADE WITH INNOVATION IN THE USA · 5 YEAR COMPRESSOR WARRANTY USA · c UL us · CLASSIFIED UL EPH · natural refrigerant.

9/18 Printed in U.S.A.

APPROVALS:

AVAILABLE AT:

Model:
TSSU-36-12M-B-HC

Food Prep Table:
Mega-Top Solid Door Sandwich/Salad Unit with Hydrocarbon Refrigerant

STANDARD FEATURES

DESIGN
- True's commitment to using the highest quality materials and oversized refrigeration systems provides the user with colder product temperatures, lower utility costs, exceptional food safety and the best value in today's food service marketplace.

REFRIGERATION SYSTEM
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydrocarbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- Energy efficient, factory balanced refrigeration system with guided airflow to provide uniform temperature in food pans and cabinet interior.
- Patented forced-air design holds 33°F to 41°F (.5°C to 5°C) product temperature in food pans and cabinet interior. Complies with ANSI/NSF-7.
- Sealed, self-lubricating evaporator fan motor and larger fan blades give True sandwich/salad units a more efficient, low velocity, high volume airflow design.
- Condensing unit access in back of cabinet, slides out for easy maintenance.

CABINET CONSTRUCTION
- Exterior - stainless steel front, top and ends. Corrosion resistant GalFan coated steel back.
- Interior - attractive, NSF approved, clear coated aluminum liner. Stainless steel floor with coved corners.
- Insulation - entire cabinet structure and solid doors are foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- 5" (127 mm) diameter stem castors - locks provided on front set. 36" (915 mm) work surface height.

DOORS
- Stainless steel exterior with clear aluminum liner to match cabinet interior.
- Each door fitted with 12" (305 mm) long recessed handle that is foamed-in-place with a sheet metal interlock to ensure permanent attachment.
- Positive seal self-closing doors with 90° stay open feature. Doors swing within cabinet dimensions.
- Magnetic door gaskets of one piece construction, removable without tools for ease of cleaning.

SHELVING
- Four (4) adjustable, heavy duty PVC coated wire shelves 15 9/16"L x 16"D (396 mm x 407 mm). Four (4) chrome plated shelf clips included per shelf.
- Shelf support pilasters made of same material as cabinet interior; shelves are adjustable on ½" (13 mm) increments.

MODEL FEATURES
- Evaporator is epoxy coated to eliminate the potential of corrosion.
- 8 7/8" (226 mm) deep, ½" (13 mm) thick, full length removable cutting board. Sanitary, high-density, NSF approved white polyethylene provides tough preparation surface.
- Stainless steel, patented, foam insulated lid and hood keep pan temperatures colder, lock in freshness and minimize condensation. Removable for easy cleaning.
- Comes standard with 12 (⅙ size) 6 7/8"L x 6 ¼"W x 4"D (175 mm x 159 mm x 102 mm) clear polycarbonate, NSF approved, food pans in countertop prep area. Also accommodates 6" (153 mm) deep food pans (supplied by others).
- Countertop pan opening designed to fit varying size pan configurations with available pan divider bars. Varying size pans supplied by others.
- NSF/ANSI Standard 7 compliant for open food product.

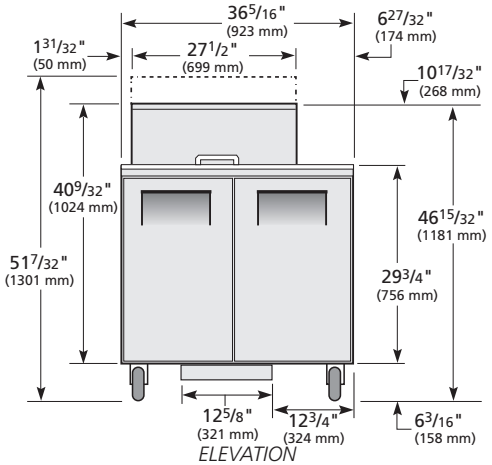
ELECTRICAL
- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.



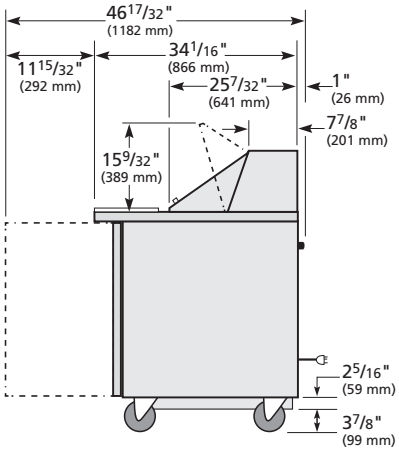
115/60/1
NEMA-5-15R

OPTIONAL FEATURES/ACCESSORIES
Upcharge and lead times may apply.
- ❑ 6" (153 mm) standard legs.
- ❑ 6" (153 mm) seismic/flanged legs.
- ❑ 2 ½" (64 mm) diameter castors.
- ❑ Barrel locks (factory installed). Requires one per door.
- ❑ Additional shelves.
- ❑ Single overshelf.
- ❑ Double overshelf.
- ❑ Flat lid.
- ❑ Sneezeguard.
- ❑ 8 7/8" (226 mm) deep, ½" (13 mm) thick, composite cutting board.
- ❑ Crumb catcher. Requires crumb catcher cutting board for proper installation.
- ❑ Pan dividers.
- ❑ Exterior rectangular digital temperature display (factory installed).
- ❑ ADA compliant model with 34" (864 mm) work surface height.

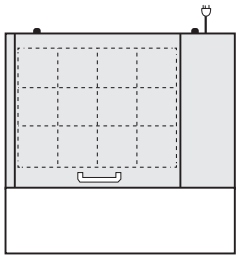
PLAN VIEW



ELEVATION



RIGHT VIEW


PAN LAYOUT

WARRANTY
Three year warranty on all parts and labor and an additional 2 year warranty on compressor. (U.S.A. only)

METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Model	Elevation	Right	Plan	3D	Back
TSSU-36-12M-B-HC					

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PRÁTICA

Project _____
Item No. _____
Quantity _____

Rocket Express
Speed Oven



PERFORMANCE

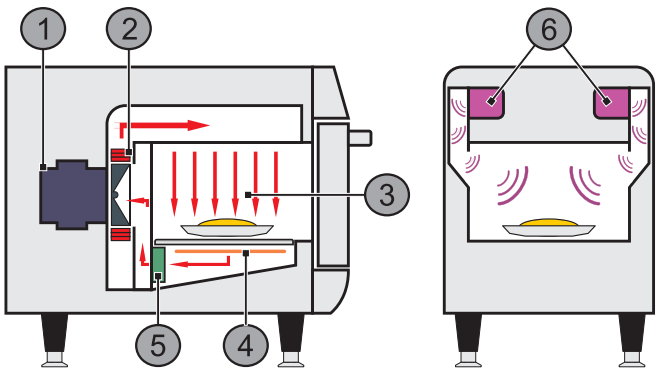
- The Rocket Express rapid cook oven utilizes a combination of convection heat, high speed impinged air, bottom infrared, and precision microwave to reduce cook times by more than 80% with chef-quality results. Rocket Express ovens are equipped with a removable catalytic converter, which break down grease-laden vapors allowing for ventless operation.

FEATURES

- Up to 80 recipes with 6 steps each
- USB port to upload/download recipes
- Easy to clean
- Adjustable temperature from 86F (30C) to 530F (276C)
- User Friendly Interface
- Cool to the touch exterior
- Certified ventless with easy removable catalytic converter
- Variable-speed impingement airflow
- Independently controlled top and bottom heaters
- Ventless side panels allow for zero side clearance installation
- Allows the use of metal pans
- Constructed from AISI430 (exterior) and AISI304 (interior) Stainless Steel
- Manual mode for on-the-fly cooking
- Warranty – 1 year parts and labor

STANDARD ACCESSORIES

- Panini Style Grill Plate
- Ceramic Baking Stone
- Solid PTFE Basket
- Perforated PTFE Basket
- Prática Oven Cleaner
- Prática Oven Protector
- Nylon Scrub Pad
- Aluminum Paddle
- Cleaning Towels
- USB Drive



1. Blower Motor
2. Impingement Heater
3. Impinged Air
4. IR heater
5. Catalytic Converter
6. Magnetrons

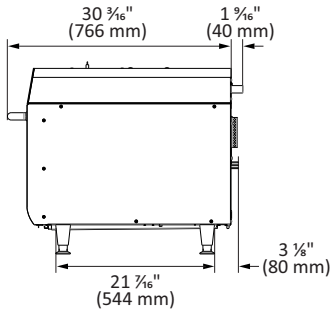
Prática Klimaquip Ind. e Com. S.A. - Brasil
Rodovia BR 459, km 101 S/N
37.556-140, Pouso Alegre-MG
Tel: +55 35 3449 1200
pratica@praticabr.com

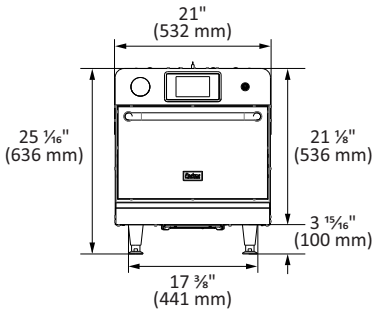
Prática Products, Inc - USA
424 E. Church Street
Lewisville, TX 75057
Phone: +1.214.584.6269
info@praticausa.com

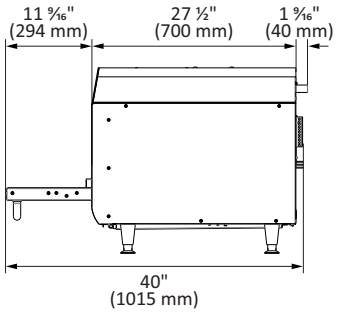
PRÁTICA

Rocket Express
Speed Oven

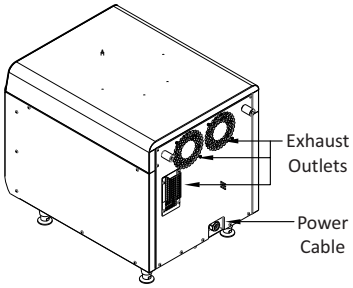
PRODUCT DIMENSIONS

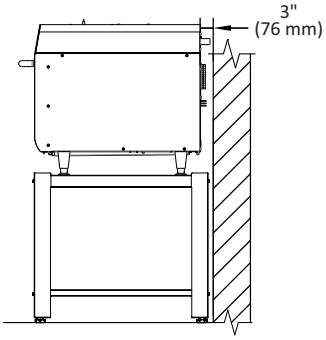


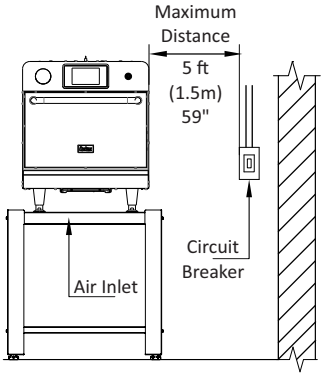




INSTALLATION







ELECTRICAL SPECIFICATIONS

Ensure that the electrical characteristics of the building network are in accordance with the technical specifications located on the data badge located on rear panel of the unit. The outlet should be located no more than 5ft / 1.5m away from the unit.

This plug must be connected to a properly installed and grounded outlet. In the event of an electrical short, properly grounding the unit reduces the risk of electrical shock by grounding the electrical current.

The building electrical is the customer's responsibility.

Region	Voltage (V)	Phases	Freq. (Hz)	Power (kW)	Circuit Breaker (A)	Cable	Socket	
USA	208	Single	60	6.2	30	3x10AWG	NEMA 6-30	
	240			7.2				
Europe	230	Single	50	6.9	32	3x4mm²	32A (2P+T)	
	230	Multi	50	6.9	32	3x4mm²	32A (2P+T)	

GENERAL INSTRUCTIONS

The oven must be installed on a base or counter that supports the weight of the unit (approximately 194 lbs. / 88 kg)

For proper ventilation, a minimum space of 3" (76mm) between the rear of the oven and the wall is required.

Do not block the air inlets and exhaust outlets located on the bottom and rear of the oven.

It is not recommended for the unit to be positioned near stoves, deep fryers, hot plates and other equipment that releases fat, fumes and heat.

The oven must be installed at a leveled and ventilated location.

Improper installation may void the equipment warranty.

DIMENSIONS

	Product Dimensions				Boxed Product Dimensions			
Rocket Express	Height	Width	Depth	Weight	Height	Width	Depth	Weight
	25 1/16" 636mm	21" 532mm	31 3/4" 806mm	194lbs 88kg	31 1/2" 800mm	22" 560mm	33 7/8" 860mm	242lb 110kg

Chamber Dimensions	Capacity	Height	Width	Depth
	0.74 cu.ft 21L	5 3/4" 146mm	15 1/2" 394mm	14 1/4" 362mm

Wall Clearance	Left Side	Back	Right Side
	0" 0mm	3" 76mm	0" 0mm

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Parts Dept. (800)424-TRUE • Parts Dept. Fax# (636)272-9471 • www.truemfg.com

Project Name: _____
Location: _____
Item #: _____ Qty: _____
Model #: _____

AIA #
SIS #

Model:
TUC-24-HC

Undercounter:
Solid Door Refrigerator with Hydrocarbon Refrigerant



TUC-24-HC

- True's undercounter units are designed with enduring quality that protects your long term investment.
- Designed using the highest quality materials and components to provide the user with colder product temperatures, lower utility costs, exceptional food safety and the best value in today's food service marketplace.
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C) for the best in food preservation.
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydro carbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- All stainless steel front, top and ends. Corrosion resistant GalFan coated steel back.
- Interior - attractive, NSF approved, clear coated aluminum liner. Stainless steel floor with coved corners.
- Heavy duty PVC coated wire shelves.
- Foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).

ROUGH-IN DATA

Specifications subject to change without notice.
Chart dimensions rounded up to the nearest ⅛" (millimeters rounded up to next whole number).

Model	Doors	Shelves	Cabinet Dimensions (inches) (mm) W	D†	H	HP	Voltage	Amps	NEMA Config.	Cord Length (total ft.) (total m)	Crated Weight (lbs.) (kg)
TUC-24-HC	1	2	24 610	24¾ 627	31⅝ 802	⅙ ⅙	115/60/1 230-240/50/1	2.0 1.03	5-15P ▲	7 2.13	155 71

† Depth does not include 1" (26 mm) for rear bumpers.

▲Plug type varies by country.

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APPROVALS:

AVAILABLE AT:

Model:
TUC-24-HC

Undercounter:
Solid Door Refrigerator with Hydrocarbon Refrigerant

STANDARD FEATURES

DESIGN
- True's commitment to using the highest quality materials and oversized refrigeration systems provides the user with colder product temperatures, lower utility costs, exceptional food safety and the best value in today's food service marketplace.

REFRIGERATION SYSTEM
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydro carbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C) for the best in food preservation.
- State of the art, electronically commutated evaporator and condenser fan motors. ECM motors operate at higher peak efficiencies and move a more consistent volume of air which produces less heat, reduces energy consumption and provides greater motor reliability.
- Condensing unit access in back of cabinet, slides out for easy maintenance.

CABINET CONSTRUCTION
- Exterior - stainless steel front, top and ends. Corrosion resistant GalFan coated steel back.
- Interior - attractive, NSF approved, clear coated aluminum liner. Stainless steel floor with coved corners.
- Insulation - entire cabinet structure and solid door are foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- Four (4) stationary castors. 31 5/8" (804 mm) work surface height. Two (2) front leg levelers included with unit for alternate use.

DOOR
- Stainless steel exterior with clear coated aluminum liner to match cabinet interior.
- Door fitted with 12" (305 mm) long recessed handle that is foamed-in-place with a sheet metal interlock to ensure permanent attachment.
- Positive seal self-closing door with 90° stay open feature. Door swings within cabinet dimensions.
- Magnetic door gasket of one piece construction, removable without tools for ease of cleaning.

SHELVING
- Two (2) adjustable, heavy duty PVC coated gray wire shelves 20"L x 13 7/8"D (508 mm x 353 mm). Four (4) chrome plated shelf clips included per shelf.
- Shelf support pilasters made of same material as cabinet interior; shelves are adjustable on ½" (13 mm) increments.

MODEL FEATURES
- Evaporator is epoxy coated to eliminate the potential of corrosion.
- Self-contained condensate pan. No need for external drain.
- NSF/ANSI Standard 7 compliant for open food product.

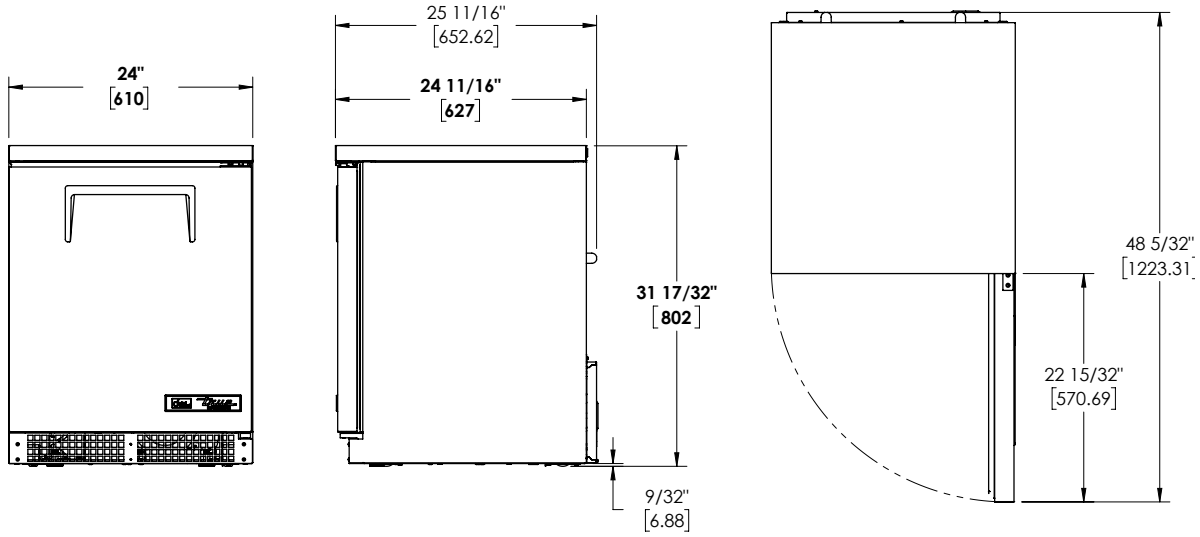
ELECTRICAL
- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.



115/60/1
NEMA-5-15R

OPTIONAL FEATURES/ACCESSORIES
Upcharge and lead times may apply.
- ❑ 230 - 240V / 50 Hz.
- ❑ Digital temperature display (mounted in front edge of countertop)
- ❑ Left hinge available
- ❑ Door lock
- ❑ SPEC3 package

PLAN VIEW



FRONT VIEW *SIDE VIEW* *TOP VIEW*

3 YEAR PARTS + LABOR 7 YEAR COMPRESSOR
WARRANTY
(U.S.A. only)

METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Model	Elevation	Right	Plan	3D	Back
TUC-24-HC	TFPY142E	TFPY142S	TFPY142P	TFPY1423	

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2001 East Terra Lane • O'Fallon, Missouri 63366-4434 • (636)240-2400 • Fax (636)272-2408 • Toll Free (800)325-6152 • Intl. Fax# (001)636-272-7546 • www.truemfg.com

TRUE MANUFACTURING CO., INC.
U.S.A. FOODSERVICE DIVISION
2001 East Terra Lane • O'Fallon, Missouri 63366-4434 • (636)240-2400
Fax (636)272-2408 • Toll Free (800)325-6152 • Intl Fax# (001)636-272-7546
Parts Dept. (800)424-TRUE • Parts Dept. Fax# (636)272-9471 • www.truemfg.com

Project Name: _____ AIA #

Location: _____ SIS #

Item #: _____ Qty: _____

Model #: _____

Model:
TDD-1-S-HC

Underbar Refrigeration:

Solid Swing Door Stainless Steel Direct Draw Beer Dispenser with Hydrocarbon Refrigerant



TDD-1-S-HC

- True's direct draw beer dispensers are designed with enduring quality and value. Our commitment to using the highest quality materials and oversized refrigeration assures colder product temperatures and years of trouble free service.
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C).
- Exterior - stainless steel doors, front and sides. Matching aluminum back. All stainless steel counter top.
- Interior - Stainless steel floor with ½" (13 mm) reinforced lip and heavy gauge galvanized steel walls. NSF/ANSI Standard 7 compliant for packaged or bottled product.
- One (1) 3" (77 mm) diameter stainless steel insulated beer column. Cold air is directed into beer column to reduce foaming and maximize draft beer profits.
- Anodized aluminum glass rail provides convenient storage for glasses on top.
- Entire cabinet structure and solid door are foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).

ROUGH-IN DATA

Specifications subject to change without notice.
Chart dimensions rounded up to the nearest ⅛" (millimeters rounded up to next whole number).

Model	Doors	Capacity ½ Barrels	Cabinet Dimensions (inches) (mm) W	D	H*	HP	Voltage	Amps	NEMA Config.	Cord Length (total ft.) (total m)	Crated Weight (lbs.) (kg)
TDD-1-S-HC	1	1	23½ 597	31¼ 794	39¾ 1010	⅒ N/A	115/60/1	1.4 N/A	5-15P	7 2.13	210 96

* Height does not include 14¾" (375 mm) for draft arm.

MADE WITH INNOVATION IN THE USA · 5 YEAR COMPRESSOR WARRANTY USA · ENERGY STAR · c UL us · CLASSIFIED · natural refrigerant.

8/19 Printed in U.S.A.

APPROVALS:

AVAILABLE AT:

Model:
TDD-1-S-HC

Underbar Refrigeration:
Solid Swing Door Stainless Steel Direct Draw Beer Dispenser with Hydrocarbon Refrigerant

STANDARD FEATURES

DESIGN
- True's direct draw beer dispensers are designed with enduring quality and value. Our commitment to using the highest quality materials and oversized refrigeration assures colder product temperatures and years of trouble free service.

REFRIGERATION SYSTEM
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydrocarbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C).
- State of the art, electronically commutated evaporator and condenser fan motors. ECM motors operate at higher peak efficiencies and move a more consistent volume of air which produces less heat, reduces energy consumption and provides greater motor reliability.
- Condensing unit accessed from rear of unit for easy cleaning and maintenance.

CABINET CONSTRUCTION
- Exterior - stainless steel doors, front and sides. Matching aluminum back. All stainless steel counter top.
- Interior - Stainless steel floor with ½" (13 mm) reinforced lip and heavy gauge galvanized steel walls.
- Door threshold protector prevents damage to cabinet from routine loading of product.
- Insulation - entire cabinet structure and solid door are foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- Cabinet fitted with 4" (102 mm) diameter castors (legs not available).
- One (1) 3" (77 mm) diameter stainless steel insulated beer column. Cold air is directed into beer column(s) to reduce foaming and maximize draft beer profits.
- Anodized aluminum glass rail.

DOOR
- Stainless steel exterior with heavy gauge galvanized steel liner.
- Each door fitted with 12" (305 mm) long recessed handle that is foamed-in-place with a sheet metal interlock to ensure permanent attachment.
- Positive seal doors.
- Magnetic door gasket of one piece construction, removable without tools for ease of cleaning.
- Door lock standard.

MODEL FEATURES
- Evaporator is epoxy coated to eliminate the potential of corrosion.
- Designed to accommodate all types of beer kegs.
- Listed under NSF/ANSI Standard 7 for the storage and/or display of packaged or bottled product.

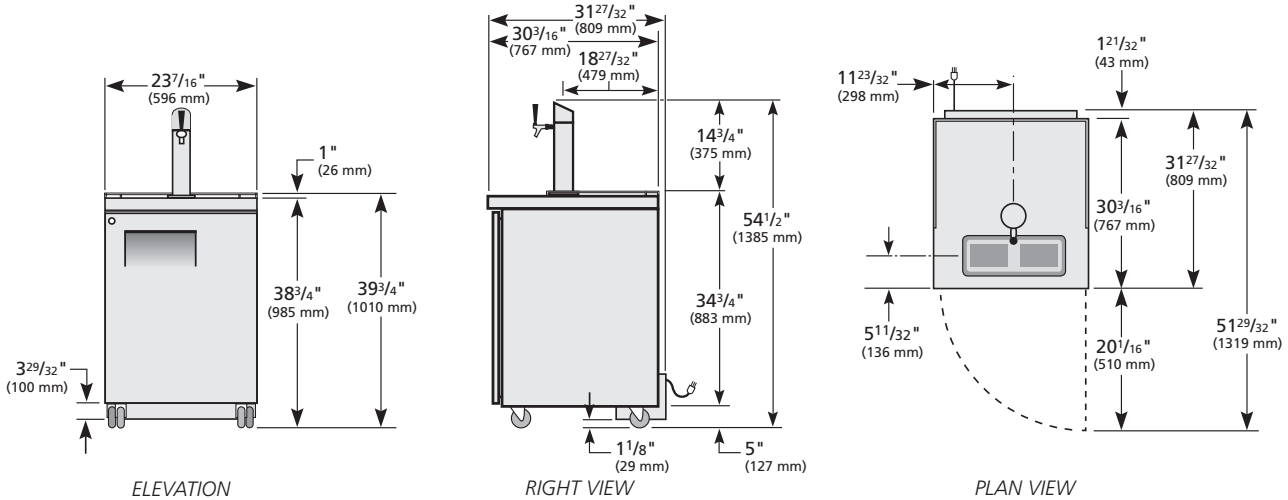
ELECTRICAL
- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.



115/60/1
NEMA-5-15R

OPTIONAL FEATURES/ACCESSORIES
Upcharge and lead times may apply.
- ❑ Double headed draft column.
- ❑ Triple headed draft column.
- ❑ Two-way tapper manifold.
- ❑ Draft cap.

PLAN VIEW



ELEVATION *RIGHT VIEW* *PLAN VIEW*

WARRANTY
Three year warranty on all parts and labor and an additional 2 year warranty on compressor. (U.S.A. only)

METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Model	Elevation	Right	Plan	3D	Back
TDD-1-S-HC	TFHY04E	TFHY04S	TFHY04P	TFHY043	

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BK RESOURCES

Mobile Ice Bins

Stainless Steel Ice Bins

Use your smart phone to scan the above QR code to visit our website: www.bk-resources.com



BK-MIB-2422



BK-MIB-2411

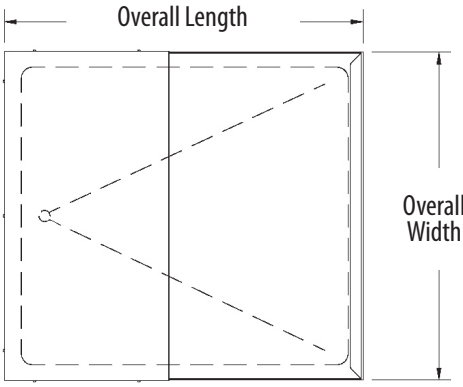
Features:

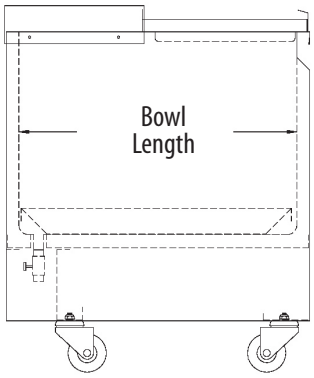
- 3″ Casters With Toe Activated Brake
- Removable Bottom Tray
- Ball Valve Drain In Rear of Unit

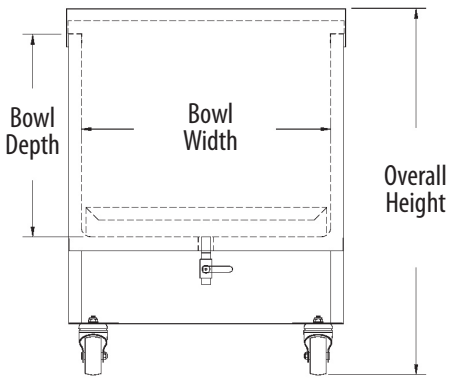
Material:

- T-304 18 ga Stainless Steel

Part Number	Unit Size (l x w x h)	Ice Bin Dim. (l x w x d)	Ice Bin Capacity
BK-MIB-2422	24" x 22" x 29″	$21^{7/8}$″ x $19^{11/16}$″ x $15^{15/16}$″	117 lbs.
BK-MIB-2411	24" x 11" x 29″	$21^{7/8}$″ x $8^{11/16}$″ x $15^{15/16}$″	53 lbs.







PRODUCT DATA SHEET

BK RESOURCES

SILVERKING®

Undercounters

27” Undercounter Freezer

SKF27A-EDUS1

Specification Sheet



Features

Eco-Friendly Refrigerant

R290 refrigerant with a global warming potential (GWP) of 3

High-Strength, Full-Extension Drawers

Premium slide and framework construction promotes lateral stability while offering high dynamic load capacities and a stay-shut feature

Stainless Steel Exterior

Galvanized back and bottom to reduce the risk of corrosion

Easy to Clean

Aluminum interior, coved corners, finished edges, plus full-extension and easy lift out drawers

Heavy-Duty Soft Casters

Secured to a 12 gauge steel base to ensure years of worry-free operation

High-Efficiency Refrigeration System

Forced air circulation provides uniform temperature throughout the cabinet while automatic defrost self-manages ice buildup and evaporates moisture

Drawer Capacity

Each drawer accommodates one (1) full-size 12” W x 20” H x 6” D hotel pan — additional adapters are available for fractional pans

Long-Lasting, Removable Gaskets

Santoprene™ gaskets last four times longer than standard gaskets

High-Density Insulation

Foamed-in-place, CFC-free polyurethane insulation for maximum strength, rigidity, and insulation

MARMON Foodservice Technologies
A BERKSHIRE HATHAWAY COMPANY

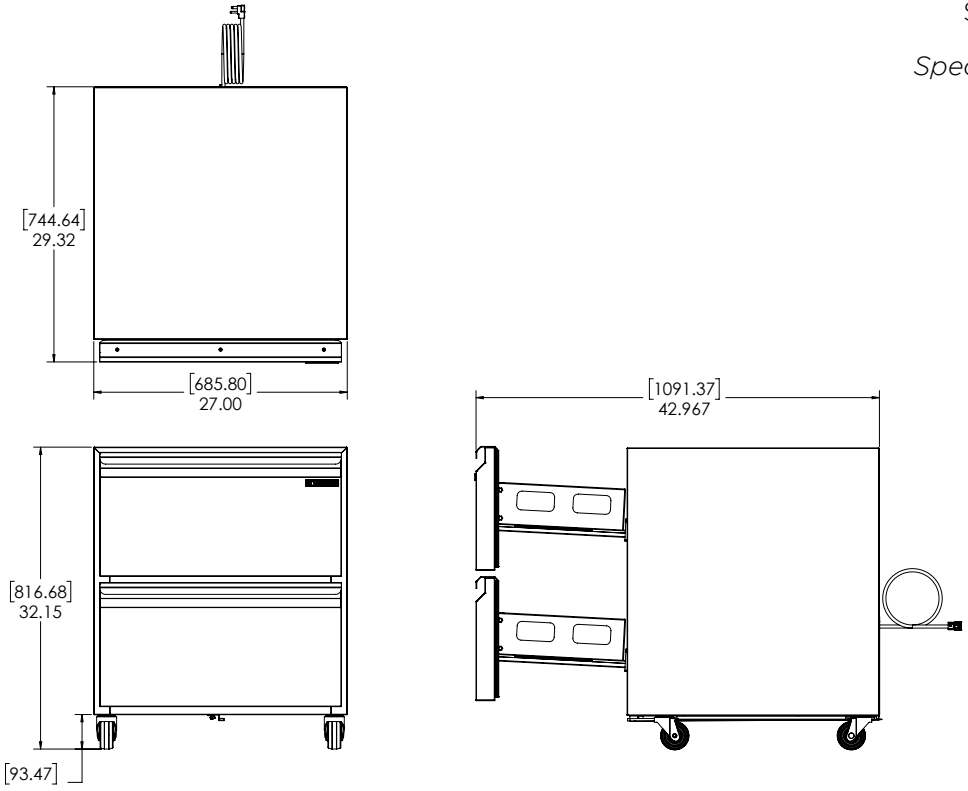
SILVERKING®

Undercounters

27” Undercounter Freezer

SKF27A-EDUS1

Specification Sheet



Technical Specifications

Electrical Requirements	115v/60hz/1ph/2A/NEMA 5-15P Plug
Product Dimensions	27”W x 32.15”H x 29.32”D (68.58cm x 81.66cm x 74.47cm)
Product Weight	190lbs (86.18kg)
Shipping Dimensions	32”W x 40”H x 37”D (81.28cm x 101.60cm x 93.98cm)
Shipping Weight	205lbs (92.99kg)
Shipping Cubic Dimensions	27.41ft^3 (0.78m^3)
Temperature Range	-5 to 5 (-20.6 to -15°C)
Refrigerant	R290

Insulation	Foamed-in-place, CFC-free polyurethane
Exterior Construction	Stainless steel exterior with galvanized back and bottom
Interior Construction	Aluminum interior with coved corners and finished edges
Drawers	Two (2) high-strength, full-extension drawers
Drawer Capacity	Accommodates two (2) full-size 12” W x 20” H x 6” D hotel pans
Door/Drawer Gasket	Santoprene™ gasket
Casters	Four (4) 3” heavy-duty soft casters (two locking)
Certifications	ETL Safety, ETL Sanitation
Warranty	1-year parts and labor, 5-year compressor (part only)

Model Number	Description
SKF27-EDUS1	Undercounter Freezer 27”, 115v/60hz/1ph, 2 drawer, 3” heavy-duty soft casters (two locking), NEMA 5-15P

Accessories	Description
25567	Adapter Bars for Fractional Pans
43581	Pan 1/6 Size, 4” Deep Plastic
43643	Pan 1/6 Size, 6” Deep Plastic
27066	Pan 1/3 Size, 4” Deep Plastic
26415	Pan 1/3 Size, 6” Deep Plastic

To learn more about **Silver King Undercounter Freezer**, visit silverking.com

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SPEC SHEET

"PB-DISINK0911-TD" PRO-BOWL HAND SINKS

Drop-In, (1) 11½"x9¼"x6" Deep Bowl w/Optional Soap Dispenser

FEATURES:

- Fabricated Bowl
- Includes Drain With Basket (PBDR-2)
- Suffix "-STD" Includes Deck Mount Soap Dispenser (PB-SD-DM)
- Integrated Towel Dispenser

SPECIFICATIONS:

- Top: Stainless Steel Tops Are TIG Welded, Exposed Welds Polished To Match Adjacent Surface
- 16GA 300 Series Stainless Steel Deck
- 18GA 300 Series Stainless Steel Base
- Drain: 2" Drain Opening, With 1-1/2" NPS Outlet Connection



PB-DISINK091106-TD



PB-DISINK091106-STD



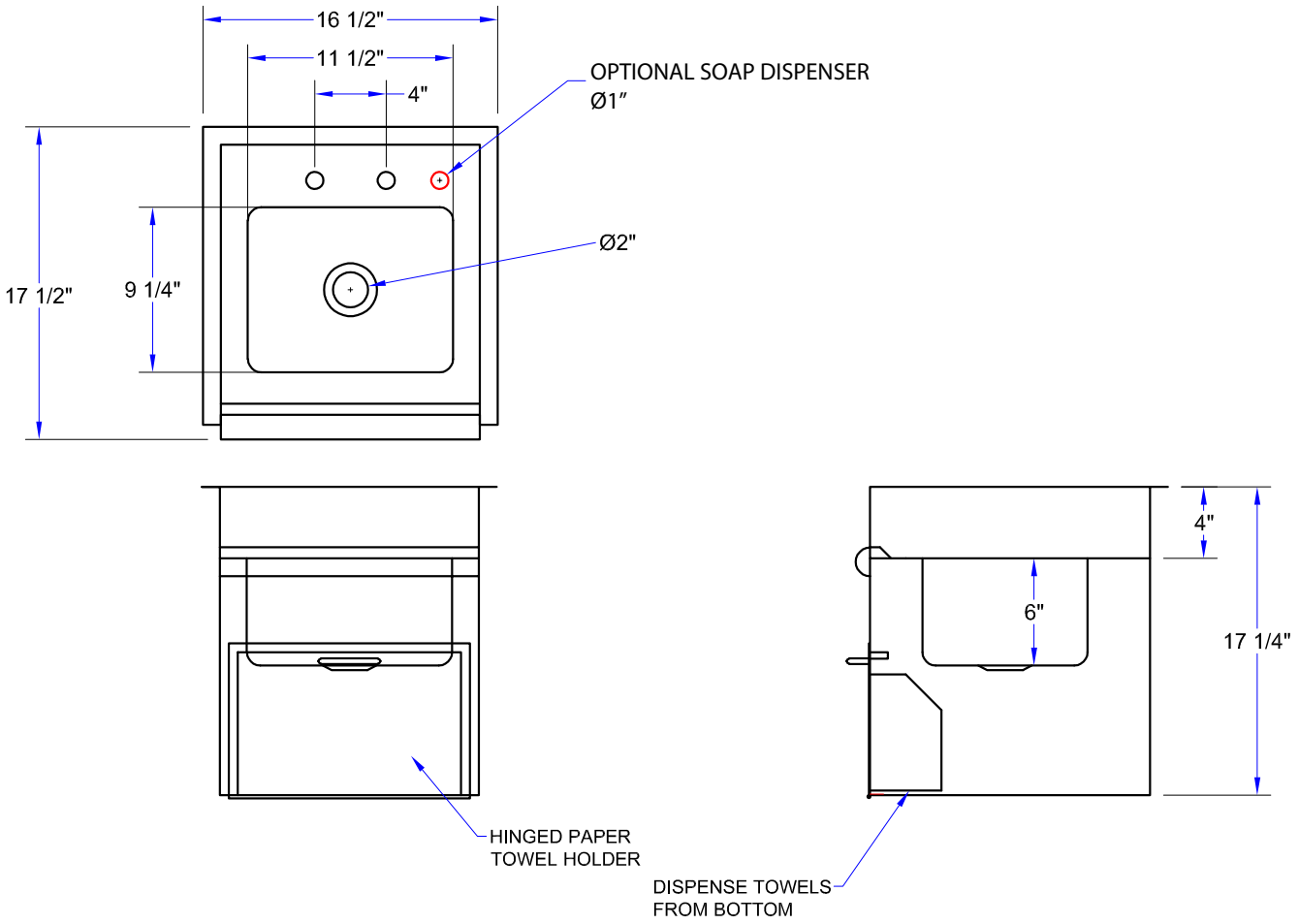
PB-SD-DM

"PB-DISINK0911-TD" PRO-BOWL HAND SINKS

MODEL	BOWL SIZE (L X W X H)	OVERALL SINK SIZE (L X W X H)	SOAP DISPENSER	WEIGHT (LBS)
PB-DISINK091106-TD	11-1/2"x9-1/4"x6"	16-1/2"x17-1/2"x17-1/4"	N/A	27
PB-DISINK091106-STD	11-1/2"x9-1/4"x6"	16-1/2"x17-1/2"x17-1/4"	PB-SD-DM	30

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

DETAILED SPECIFICATIONS



"PB-DISINK0911-TD" PRO-BOWL HAND SINKS

MODEL	BOWL SIZE (L X W X H)	OVERALL SINK SIZE (L X W X H)	SOAP DISPENSER	WEIGHT (LBS)
PB-DISINK091106-TD	11-1/2"x9-1/4"x6"	16-1/2"x17-1/2"x17-1/4"	N/A	27
PB-DISINK091106-STD	11-1/2"x9-1/4"x6"	16-1/2"x17-1/2"x17-1/4"	PB-SD-DM	30

ALL DIMENSIONS ARE TYPICAL. TOLERANCE +/- .500". JOHN BOOS & CO. RESERVES THE RIGHT TO CHANGE SPECIFICATIONS WITHOUT NOTICE.

ADVANCE TABCO
SMART FABRICATION™

STAINLESS STEEL

DROP-IN SINKS

Smart Series™ Single & Double Bowl Drop-Ins



Item #: _____ Qty #: _____

Model #: _____

Project #: _____

NOTE: Multi-Compartment Drop-In Sinks ARE NSF Approved when used in Mobile Food Carts and Kiosks only.

FEATURES:

One piece seamless **Deep Drawn** stainless steel bowls.
Self rimming design.
Flat deck allowing for more faucet options.
All bowls are sound deadened.
Units feature Advance Tabco's **Smart Finish™**.
Stainless Steel 1-1/2 IPS basket drain.

MATERIALS:

Stainless Steel Type 304 18 Gauge

DESIGN:

Self-Rim Design. Mounting clips provided accommodates all thicknesses of counter. (Quantity supplied varies based on drop in sink ordered).

8" O.C. Faucet Holes: Unit punched with 1-1/2" Diameter for the hot & cold water supply lines. Center hole punched with 1" Diameter.

SINGLE BOWL DROP-IN SINKS

MODEL #	OVERALL VIEW	BOWL SIZE L X W	BOWL DEPTH* (D)	CUTOUT (1 1/4" RADIUS CORNERS)	APPROX. WT.
SS-1-1319-10	13" x 19"	10" x 14"	10"	12 1/4" x 18 1/4"	14 lbs.
SS-1-1715-7	17" x 15"	14" x 10"	7-1/2"	16 1/4" x 14 1/4"	12 lbs.
SS-1-1715-10	17" x 15"	14" x 10"	10"	16 1/4" x 14 1/4"	14 lbs.
SS-1-1719-7	17" x 19"	14" x 14"	7-1/2"	16 1/4" x 18 1/4"	16 lbs.
SS-1-1719-10	17" x 19"	14" x 14"	10"	16 1/4" x 18 1/4"	18 lbs.
SS-1-1919-7	19" x 19"	16" x 14"	7-1/2"	18 1/4" x 18 1/4"	16 lbs.
SS-1-1919-10	19" x 19"	16" x 14"	10"	18 1/4" x 18 1/4"	18 lbs.
SS-1-1919-12	19" x 19"	16" x 14"	12"	18 1/4" x 18 1/4"	20 lbs.
SS-1-2321-7	23" x 21"	20" x 16"	7-1/2"	22 1/4" x 20 1/4"	20 lbs.
SS-1-2321-10	23" x 21"	20" x 16"	10"	22 1/4" x 20 1/4"	22 lbs.
SS-1-2321-12	23"x 21"	20" x 16"	12"	22 1/4" x 20 1/4"	24 lbs.
SS-1-3125-12	31"x 25"	28" x 20"	12"	30 1/4" x 24 1/4"	39 lbs.
DOUBLE BOWL DROP-IN SINKS					
SS-2-3321-7	33 1/2" x 21"	14" x 16"	7-1/2"	32 3/4" x 20 1/4"	33 lbs.
SS-2-3321-10	33 1/2" x 21"	14" x 16"	10"	32 3/4" x 20 1/4"	35 lbs.
SS-2-3321-12	33 1/2" x 21"	14" x 16"	12"	32 3/4" x 20 1/4"	37 lbs.
SS-2-4521-7	45 1/2" x 21"	20" x 16"	7-1/2"	44 3/4" x 20 1/4"	38 lbs.
SS-2-4521-10	45 1/2" x 21"	20" x 16"	10"	44 3/4" x 20 1/4"	39 lbs.
SS-2-4521-12	45 1/2" x 21"	20" x 16"	12"	44 3/4" x 20 1/4"	40 lbs.

Length is Left to Right. Width is Front to Back



INCLUDES STANDARD MOUNTING CLIPS
For countertops over 7/8" and up to 2" thick.
Replacement # K-28 (Per Sink)



K-132
8" O.C.



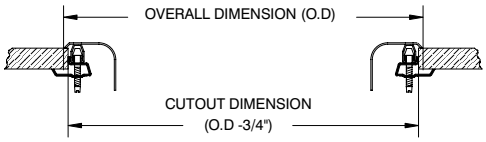
K-133
8" O.C.

Available Faucets & Accessories	Model #	Qty.
Deck Mounted Swing w/Spray. 8" O.C.	K-58	
Deck Mounted 5 1/2" Gooseneck. 8" O.C.	K-132	
Deck Mounted 9" Swing Spout. 8" O.C.	K-133	
Mounting Clips (Bag of 4)	K-28	



K-58
8" O.C.

TYPICAL INSTALLATION



Cut-Out Size = L to R x F to B

Standard Faucets conform to NSF 61 Standard 9.
Faucets Are AB1953 Lead Free Compliant.

⚠ **WARNING:** Faucets on this page may expose you to chemicals, including lead, that are known to the State of California to cause cancer or birth defects or other reproductive harm. For more Info.,visit www.p65warnings.ca.gov.

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SMART FABRICATION™
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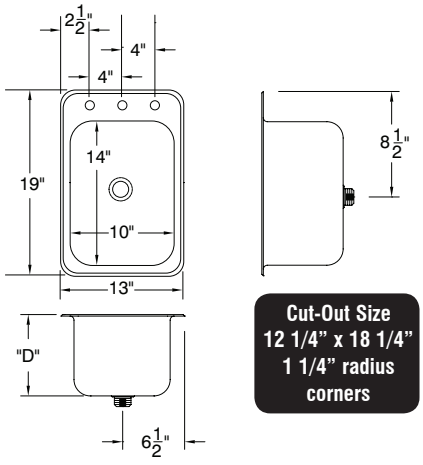
For Smart Fabrication™ Quotes:
Email: smartfab@advancetabco.com or **Fax:** 631-586-2933

DIMENSIONS and SPECIFICATIONS

TOL ± .125”

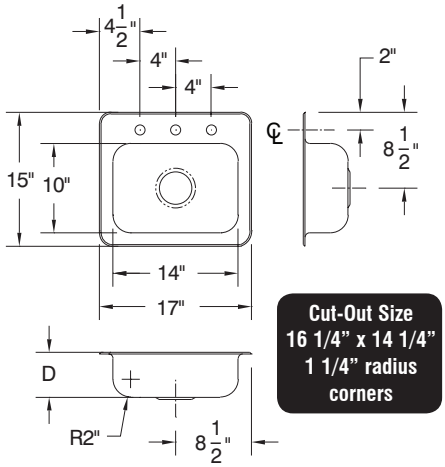
ALL DIMENSIONS ARE TYPICAL

SS-1-1319 Series



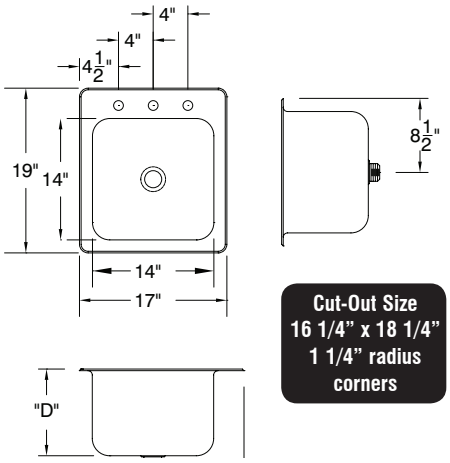
Cut-Out Size
12 1/4” x 18 1/4”
1 1/4” radius corners

SS-1-1715 Series



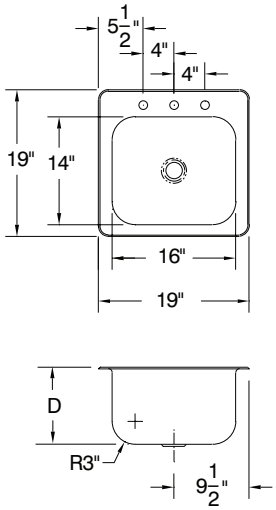
Cut-Out Size
16 1/4” x 14 1/4”
1 1/4” radius corners

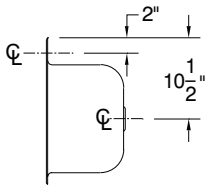
SS-1-1719 Series



Cut-Out Size
16 1/4” x 18 1/4”
1 1/4” radius corners

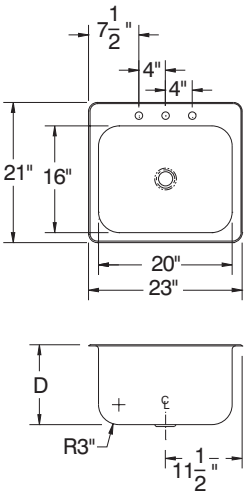
SS-1-1919 Series

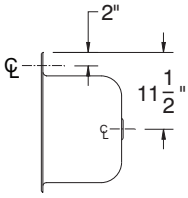




Cut-Out Size
18 1/4” x 18 1/4”
1 1/4” radius corners

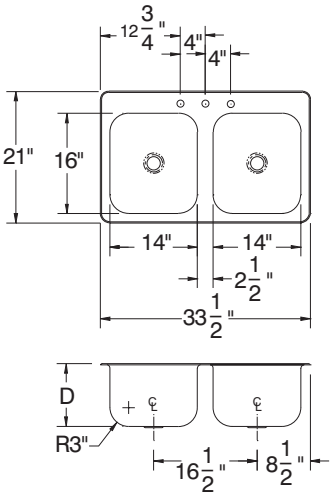
SS-1-2321 Series

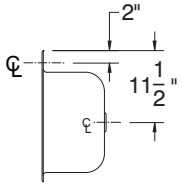




Cut-Out Size
22 1/4” x 20 1/4”
1 1/4” radius corners

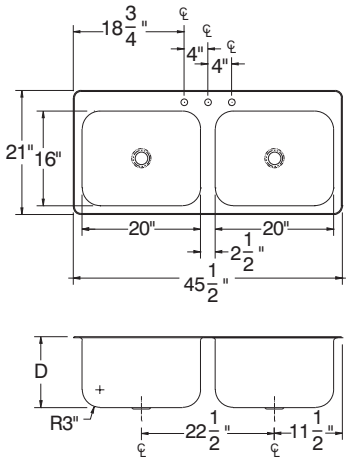
SS-2-3321 Series

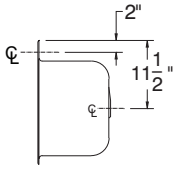




Cut-Out Size
32 3/4” x 20 1/4”
1 1/4” radius corners

SS-2-4521 Series





Cut-Out Size
44 3/4” x 20 1/4”
1 1/4” radius corners

ADVANCE TABCO
SMART FABRICATION™

ADVANCE TABCO is constantly engaged in a program of improving our products. Therefore, we reserve the right to change specifications without prior notice.

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TRUE MANUFACTURING CO., INC.
U.S.A. FOODSERVICE DIVISION
2001 East Terra Lane • O'Fallon, Missouri 63366-4434 • (636)240-2400
Fax (636)272-2408 • Toll Free (800)325-6152 • Intl Fax# (001)636-272-7546
Parts Dept. (800)424-TRUE • Parts Dept. Fax# (636)272-9471 • www.truemfg.com

Project Name: _____
Location: _____
Item #: _____ Qty: _____
Model #: _____

AIA #
SIS #

Model:
TUC-36-HC

Undercounter:
Solid Door Refrigerator with Hydrocarbon Refrigerant



TUC-36-HC

- True's undercounter units are designed with enduring quality that protects your long term investment.
- Designed using the highest quality materials and components to provide the user with colder product temperatures, lower utility costs, exceptional food safety and the best value in today's food service marketplace.
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydro carbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C) for the best in food preservation.
- All stainless steel front, top and ends. Corrosion resistant GalFan coated steel back.
- Interior - attractive, NSF approved, clear coated aluminum liner with stainless steel floor.
- Front breathing.
- Heavy duty PVC coated wire shelves.
- Foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).

ROUGH-IN DATA

Specifications subject to change without notice.
Chart dimensions rounded up to the nearest ⅛" (millimeters rounded up to next whole number).

Model	Doors	Shelves	Cabinet Dimensions (inches) (mm) L	D†	H*	HP	Voltage	Amps	NEMA Config.	Cord Length (total ft.) (total m)	Crated Weight (lbs.) (kg)
TUC-36-HC	2	4	36⅜ 924	30⅛ 766	29¾ 756	⅙ N/A	115/60/1	2.0 N/A	5-15P	11 3.35	235 107

† Depth does not include 1" (26 mm) for rear bumpers.
* Height does not include 6¼" (159 mm) for castors or 6" (153 mm) for optional legs.

MADE WITH INNOVATION IN THE USA · 5 YEAR COMPRESSOR WARRANTY USA · c UL us · CLASSIFIED UL EPR · natural refrigerant.

6/18-A Printed in U.S.A.

APPROVALS:

AVAILABLE AT:

Model:
TUC-36-HC

Undercounter:
Solid Door Refrigerator with Hydrocarbon Refrigerant

STANDARD FEATURES

DESIGN
- True's commitment to using the highest quality materials and oversized refrigeration systems provides the user with colder product temperatures, lower utility costs, exceptional food safety and the best value in today's food service marketplace.

REFRIGERATION SYSTEM
- Factory engineered, self-contained, capillary tube system using environmentally friendly R290 hydro carbon refrigerant that has zero (0) ozone depletion potential (ODP), & three (3) global warming potential (GWP).
- Energy efficient, factory balanced refrigeration system with guided airflow to provide uniform product temperatures.
- High capacity, factory balanced refrigeration system that maintains cabinet temperatures of 33°F to 38°F (.5°C to 3.3°C) for the best in food preservation.
- State of the art, electronically commutated evaporator and condenser fan motors. ECM motors operate at higher peak efficiencies and move a more consistent volume of air which produces less heat, reduces energy consumption and provides greater motor reliability.
- Condensing unit access in back of cabinet, slides out for easy maintenance.

CABINET CONSTRUCTION
- Exterior - stainless steel front, top and ends. Corrosion resistant GalFan coated steel back.
- Interior - attractive, NSF approved, clear coated aluminum liner. Stainless steel floor with coved corners.
- Insulation - entire cabinet structure and solid doors are foamed-in-place using a high density, polyurethane insulation that has zero ozone depletion potential (ODP) and zero global warming potential (GWP).
- 5" (127 mm) diameter stem castors - locks provided on front set. 36" (915 mm) work surface height.

DOORS
- Stainless steel exterior with clear aluminum liner to match cabinet interior.
- Each door fitted with 12" (305 mm) long recessed handle that is foamed-in-place with a sheet metal interlock to ensure permanent attachment.
- Positive seal self-closing doors with 90° stay open feature. Doors swing within cabinet dimensions.
- Magnetic door gaskets of one piece construction, removable without tools for ease of cleaning.

SHELVING
- Four (4) adjustable, heavy duty PVC coated wire shelves. Two (2) top shelves are 15 9⁄16"L x 20 1⁄4"D (396 mm x 515 mm), Two (2) bottom shelves are 15 9⁄16"L x 13 3⁄4"D (396 mm x 350 mm). Four (4) chrome plated shelf clips included per shelf.
- Shelf support pilasters made of same material as cabinet interior; shelves are adjustable on 1⁄2" (13 mm) increments.

MODEL FEATURES
- Evaporator is epoxy coated to eliminate the potential of corrosion.
- NSF/ANSI Standard 7 compliant for open food product.

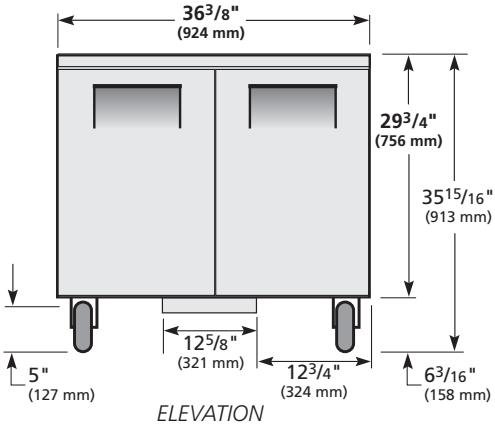
ELECTRICAL
- Unit completely pre-wired at factory and ready for final connection to a 115/60/1 phase, 15 amp dedicated outlet. Cord and plug set included.



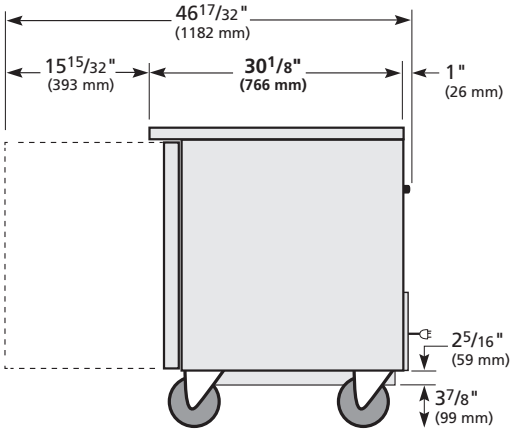
115/60/1
NEMA-5-15R

OPTIONAL FEATURES/ACCESSORIES
Upcharge and lead times may apply.
- ❑ 6" (153 mm) standard legs.
- ❑ 6" (153 mm) seismic/flanged legs.
- ❑ 2 1⁄2" (64 mm) diameter castors.
- ❑ Barrel locks (factory installed). Requires one per door.
- ❑ Single overshelf.
- ❑ Double overshelf.
- ❑ 30" (762 mm) deep, 1⁄2" (13 mm) thick, white polyethylene cutting board. Requires "L" brackets.
- ❑ 30" (762 mm) deep, 1⁄2" (13 mm) thick, composite cutting board. Requires "L" brackets.
- ❑ Exterior rectangular digital temperature display (factory installed).
- ❑ ADA compliant models with 34" (864 mm) work surface height.
- ❑ Low profile models with 31 7⁄8" (810 mm) work surface height.
- ❑ SPEC1 package

PLAN VIEW



ELEVATION



RIGHT VIEW

WARRANTY
Three year warranty on all parts and labor and an additional 2 year warranty on compressor. (U.S.A. only)

METRIC DIMENSIONS ROUNDED UP TO THE NEAREST WHOLE MILLIMETER

SPECIFICATIONS SUBJECT TO CHANGE WITHOUT NOTICE

Model	Elevation	Right	Plan	3D	Back
TUC-36-HC	TFPY25E	TFPY25S	TFPY25P	TFPY253	

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DUAL TF DBC BLK 120/240V w/Fnl Locks

35.7" x 20.2" x 21.8"
(90.7cm x 51.3cm x 55.4cm)



Servers and airpots sold separately

- Brews 16.3 to 18.9gal (61.7 to 71.5L) of perfect coffee per hour
- Coffee extraction controlled with pre-infusion and pulse brew, digital temperature control, and large sprayhead; coffee strength controlled with variable by-pass.
- Create coffee recipe cards with custom recipes, ad cards with messages that display on the brewer LCD, and dedicated funnels for special coffees with the BrewWISE Recipe Writer using your PC (Windows® compatible).
- Easy pulse interface allows automatic programming of pulse routine
- Preventive maintenance kit: 39641.0000
- Stores individual coffee recipes so operator can easily brew many varieties
- ThermoFresh® servers are vacuum insulated to keep coffee hot for hours.
- SplashGard® funnels deflect hot liquids away from the hand
- Energy saver mode reduces tank temperature during idle periods
- Operate any combination of BrewWISE equipment error-free with wireless brewer-grinder interface through Smart Funnel with SplashGard®
- Funnel locks help improve safety

Agency:

UL LISTED NSF

Specifications

Product #: 34600.0001
Water Access: Plumbed
Interface: Wireless
Finish: Black
Funnel: Smart Funnel
Faucet: Lower

Additional Features

BUNNLINK Compatible
BrewWISE

Electrical & Capacity

Volts	Amps	Watts	Cord Attached	Plug Type	8oz cups/hr 236ml cups/hr	Input H²O Temp.	Phase	# Wires plus Ground	Hertz
120/240	27.5	6600	No	-	309	60°F (15.5°C)	1	3	60

Plumbing Requirements

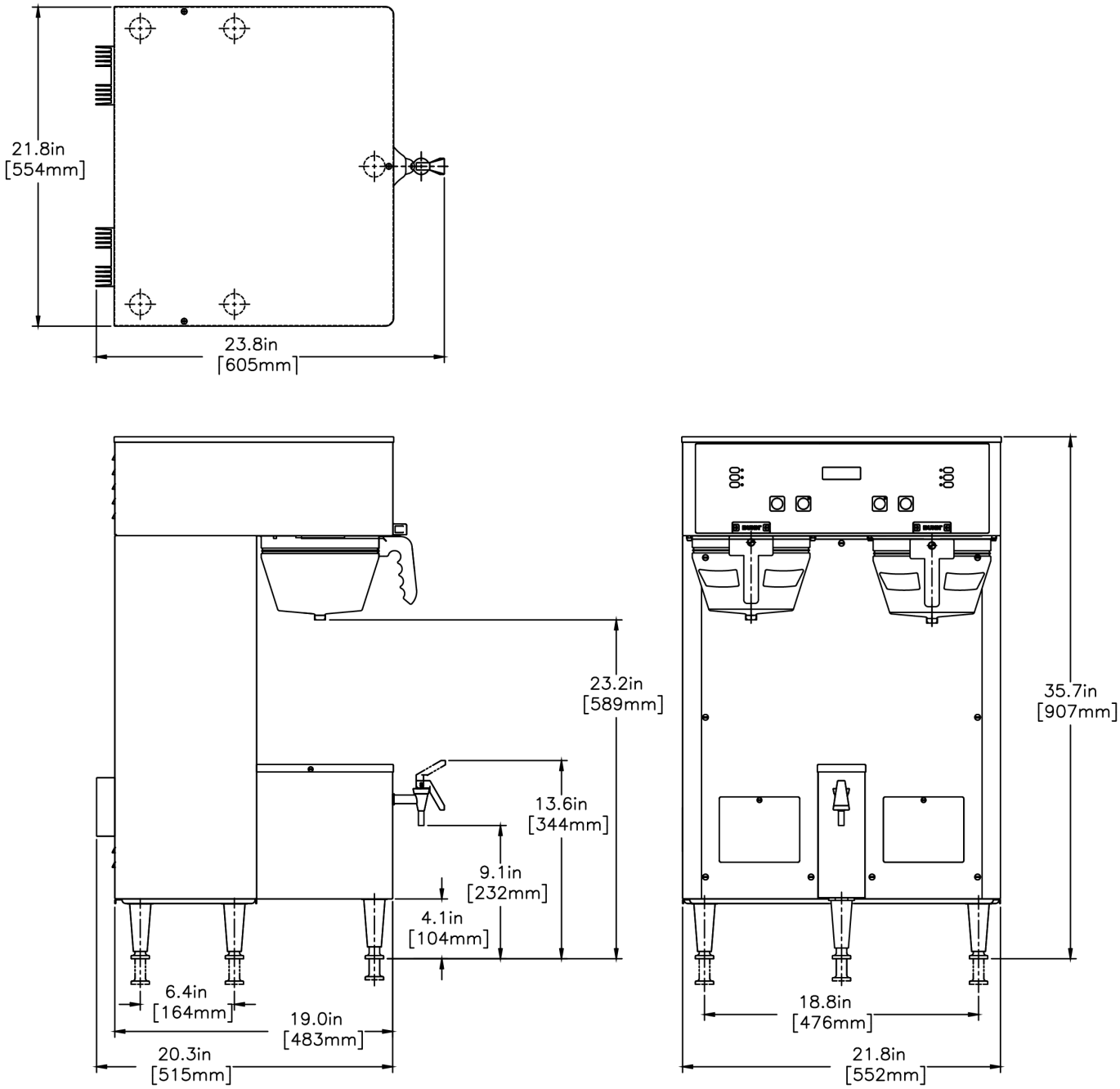
PSI	kPa	Fitting Supplied	Water Flow Required (GPM)
20-90	138-621	3/8" Male Flare Fitting	-

CAD Drawings

2D	Revit	KLC
●		

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For most current specifications and other info visit bunn.com.

Created on: 09/13/2017



Unit				Shipping				
	Width	**Height**	**Depth**	**Width**	**Height**	**Depth**	**Weight**	**Volume**
English	21.8 in.	35.7 in.	20.2 in.	-	-	-	92.500 lbs	13.180 ft³
Metric	55.4 cm	90.7 cm	51.3 cm	-	-	-	41.958 kgs	0.373 m³

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Created on: 09/13/2017

Related Products & Accessories: DUAL TF DBC BLK 120/240V w/Fnl Locks(34600.0001)



FILTERS,GOURMET 504 252/2 36/CL

Product #: 20138.0000



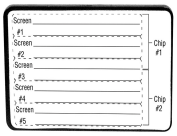
BREWWISE RECIPE WRITER

Product #: 34444.0000



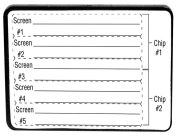
CARD ASSY,RECIPE TRANSFER(BRW)

Product #: 34447.0000



CARD ASSY, TRANSFER-AD (BRW)

Product #: 34448.0000



TARJETA

Product #: 34448.0000



MHG, 120V BLK

Product #: 35600.0022



WATER FILTER, EQHP-25L

Product #: 39000.0002



WATER FILTER, EQHP-25

Product #: 39000.0005

KIT, PM-DUAL TF

Product #: 39641.0000

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Created on: 09/13/2017

Serving & Holding Options: DUAL TF DBC BLK 120/240V w/Fnl Locks(34600.0001)



TF SERVER, DSG2 1G/3.8L

Product #:42700.0000



TERMO

Product #:42700.0000



TF SERVER, DSG2 1G/3.8L BLK

Product #:42700.0001



TF SERVER, DSG2 1G CD

Product #:42700.0003



TF SERVER, DSG2 1G BLK CD

Product #:42700.0004



TF SERVER, DSG2 1.5G SST

Product #:42750.0000



TF SERVER, DSG2 1.5G BLK

Product #:42750.0001



TERMO

Product #:42750.0001



TF SERVER, DSG2 1.5G CD

Product #:42750.0003



TF SERVER, DSG2 1.5G BLK CD

Product #:42750.0010



TF SERVER, 1G/3.8L MECH

Product #:44000.0000



TERMO

Product #:44000.0000



TF SERVER, 1G/3.8L MECH BLK

Product #:44000.0001



TERMO

Product #:44000.0001



TF SERVER, 1.5G/5.7L MECH

Product #:44050.0000



TERMO

Product #:44050.0000



TF SERVER, 1.5G/5.7L MECH BLK

Product #:44050.0001



TERMO

Product #:44050.0001

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Created on: 09/13/2017

1.5Gal(5.7L) TF Srvr w/ Base, MSG GEN3

22.7" x 12.9" x 9.1"
(57.7cm x 32.8cm x 23.1cm)



- Vacuum insulated to keep coffee hot for hours
- Ideal for use with Twin or Single Infusion Series Brewers
- Brew-through design with flip lid cover
- Soft-grip bail handle for easy transportation
- Self-locking stand allows for multiple brewing and serving options
- Large cup clearance allows for dispensing into cups, decanters and thermal carafes
- Integrated sight gauge assembly allows for easy cleaning
- Sturdy aluminum faucet guard keeps faucet area clean and protected
- Drip tray is easily removed for cleaning or to provide extra clearance for dispensing into pitchers
- Fast flow faucet

Agency:

NSF

Specifications

Product #: 44050.0200

Handle: Bail Handle

Liner: Stainless Steel

Dispense: Lever Action

Lid Color: Black

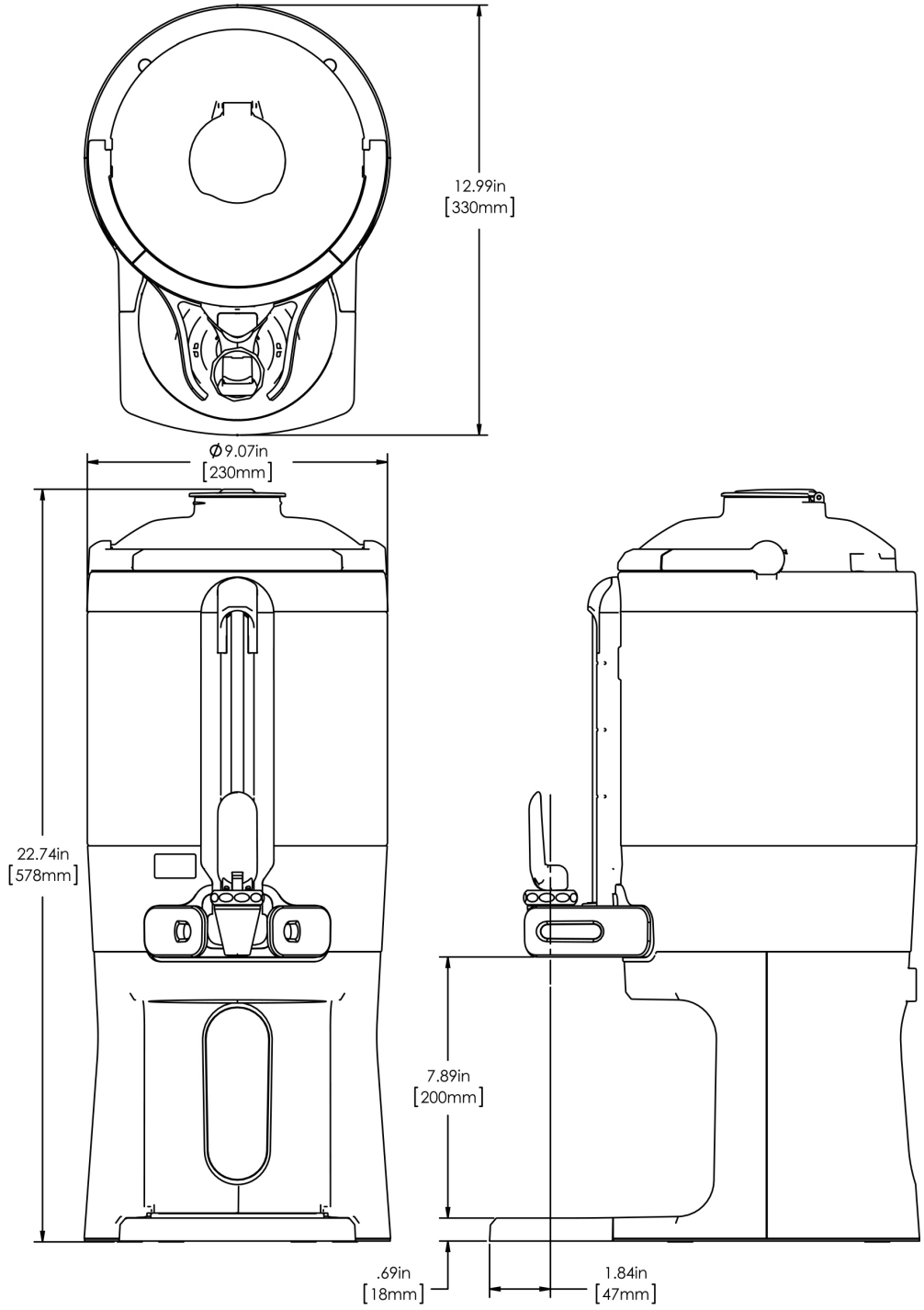
Additional Features

Holding Capacity

English	Metric
192 oz.	5.7 L

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Created on: 01/25/2019



	Unit			Shipping				
	Width	**Height**	**Depth**	**Width**	**Height**	**Depth**	**Weight**	**Volume**
English	9.1 in.	22.7 in.	12.9 in.	12.3 in.	26.5 in.	15.3 in.	14.300 lbs	2.865 ft³
Metric	23.1 cm	57.7 cm	32.8 cm	31.1 cm	67.3 cm	38.7 cm	6.486 kgs	0.081 m³

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Created on: 01/25/2019

Related Products & Accessories: 1.5Gal(5.7L) TF Srvr w/Base, MSG GEN3(44050.0200)



STAND ASSY, TF SERVER GEN3

Product #: 39795.0200

STAND ASSY, TF SERVER

Product #: 54473.0000

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Created on: 01/25/2019

Model Compatibility: 1.5Gal(5.7L) TF Srvr w/Base, MSG GEN3(44050.0200)

Serving and Holding selections are currently unavailable. Please contact your sales representative to find out more information.

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By Owner

SECTION 11 4000
FOODSERVICE EQUIPMENT
END OF SECTION

SECTION 12 2400
WINDOW SHADES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Interior motorized roller shades.

B. Motor controls.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. NFPA 70 - National Electrical Code; Most Recent Edition Adopted by Authority Having Jurisdiction, Including All Applicable Amendments and Supplements.

B. UL 325 - Standard for Door, Drapery, Gate, Louver, and Window Operators and Systems; Current Edition, Including All Revisions.

1.04 ADMINISTRATIVE REQUIREMENTS

1.05 SUBMITTALS

1.06 QUALITY ASSURANCE

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver shades in manufacturer's unopened packaging, labeled to identify each shade for each opening.

B. Handle and store shades in accordance with manufacturer's recommendations.

1.08 FIELD CONDITIONS

1.09 WARRANTY

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Interior Motorized Roller Shades, Motors and Motor Controls:
   1. MechoShade Systems LLC; UrbanShade Single Roller - Motorized: www.mechoshade.com/#sle.
   2. Substitutions: See Section 01 6000 - Product Requirements.

2.02 ROLLER SHADES

A. General:
   1. Provide shade system components that are easy to remove or adjust without removal of mounted shade brackets.
   2. Provide shade system that operates smoothly when shades are raised or lowered.
   3. Motorized Shades: Motor system housed inside roller tube, controlling shade movement via motor controls indicated; listed or recognized to UL 325.
      a. Comply with NFPA 70.
      b. Electrical Components: Listed, classified, and labeled as suitable for the purpose intended. Where applicable, system components to be FCC compliant.
      c. Motors: Size and configuration as recommended by manufacturer for the type, size, and arrangement of shades to be operated; integrated into shade operating components and concealed from view; fully compatible with controls to be installed.

B. Roller Shades Type _____:
   1. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
   2. Roller Tubes: As required for type of shade operation.
   3. Hembars: Designed to maintain bottom of shade straight and flat.

C. Roller Shades Type _____ - Basis of Design: MechoShade Systems LLC; ElectroShade with iQ2-AC EDU, line voltage, 120 VAC: www.mechoshade.com/#sle.

1. Description: Single roller, motor-operated fabric window shade system complete with mounting brackets, roller tubes, hembars, hardware, and accessories.
   a. Drop Position: Regular roll.
   b. Mounting: Ceiling mounted.
   c. Size: As indicated on drawings.
   d. Fabric: As indicated under Shade Fabric article.
2. Brackets and Mounting Hardware: As recommended by manufacturer for mounting indicated and to accommodate shade fabric roll-up size and weight.
   a. Double Roller Brackets: Configured for light-filtering and room-darkening shades in one opening.
      1) Light-Filtering Fabric: Room-side of opening.
3. Roller Tubes:
   a. Material: Extruded aluminum.
   b. Size: As recommended by manufacturer; selected for suitability for installation conditions, span, and weight of shades.
   c. Fabric Attachment: Utilize extruded channel in tube to accept vinyl spline welded to fabric edge. Shade band to be removable and replaceable without removing roller tube from brackets or inserting spline from the side of the roller tube.
4. Hembars: Designed to maintain bottom of shade straight and flat.
   a. Style: Full wrap fabric covered bottom bar, flat profile with heat sealed closed ends.
5. Intelligent Encoded Electronic Drive System:
   a. Line-Voltage EDU, 120 VAC:
      1) Audible Noise: 46 dBA or less measured 3 feet from motor unit, depending on motor torque.
   b. Modes of Operation:
      1) Uniform Mode: Shades move only to defined intermediate stop positions to maintain aesthetic uniformity.
      2) Normal Mode: Shades move to defined intermediate stop positions plus any position between defined upper and lower limits.
      3) Maintenance Mode: Prevent shade from moving to newly commanded positions via dry contact or network control commands until EDU has been serviced or Maintenance Mode has been cleared or disabled.
   c. Control Methods:
      1) Local isolated dry contact inputs support local switch control and third-party system integration without separate interface.
      2) Bidirectional network communication enables commanding operation of large groups of shades over common backbone.
      3) Provide minimum of three customizable preset positions accessible over network connection and local dry contact control inputs.
      4) Provide minimum of 32 customizable preset positions, including three local switch presets, accessible via network commands.
6. Accessories:
   a. Ceiling Pockets with Prewired Raceway: UL 325 listed, extruded aluminum shade pocket with removable closure panel and ceiling tile support, for recess mounting in acoustical tile or drywall ceilings; size and configuration as indicated on drawings.
      1) Designed to accommodate installation of motor control and wiring accessories within pocket.
      2) Product: MechoShade Systems LLC; ElectroPocket; Model _____; www.mechoshade.com/#sle.

2.03 SHADE FABRIC

A. Fabric - Type _____: Nonflammable, color-fast, impervious to heat and moisture, and able to retain its shape under normal operation.

2.04 ROLLER SHADE FABRICATION

A. Field measure finished openings prior to ordering or fabrication.

B. Dimensional Tolerances: Fabricate shades to fit openings within specified tolerances.
   1. Vertical Dimensions: Fill openings from head to sill with 1/2 inch (13 mm) space between bottom bar and window stool.
   2. Horizontal Dimensions - Inside Mounting: Provide symmetrical light gaps on both sides of shade not to exceed 3/4 inch (19.05 mm) total.

C. At openings requiring continuous multiple shade units with separate rollers, locate roller joints at window mullion centers; butt rollers end-to-end.

PART 3 EXECUTION

3.01 EXAMINATION

A. Examine finished openings for deficiencies that may preclude satisfactory installation.

B. Start of installation shall be considered acceptance of substrates.

3.02 PREPARATION

A. Prepare surfaces using methods recommended by manufacturer for achieving best result for substrate under the project conditions.

B. Coordinate with window installation and placement of concealed blocking to support shades.

3.03 INSTALLATION

A. Install in accordance with manufacturer's instructions and approved shop drawings, using mounting devices as indicated.

B. Adjust level, projection, and shade centering from mounting bracket. Verify there is no telescoping of shade fabric. Ensure smooth shade operation.

3.04 SYSTEM STARTUP

A. Motorized Shade System: Provide services of a manufacturer's authorized representative to perform system startup.

3.05 CLEANING

A. Clean soiled shades and exposed components as recommended by manufacturer.

B. Replace shades that cannot be cleaned to "like new" condition.

3.06 CLOSEOUT ACTIVITIES

A. See Section 01 7800 - Closeout Submittals, for closeout submittals.

B. See Section 01 7900 - Demonstration and Training, for additional requirements.

C. Demonstration: Demonstrate operation and maintenance of window shade system to Owner's personnel.

D. Training: Train Owner's personnel on operation and maintenance of system.
   1. Use operation and maintenance manual as training reference, supplemented with additional training materials as required.
   2. Provide minimum of two hours training by manufacturer's authorized personnel at location designated by the Owner.

3.07 PROTECTION

A. Protect installed products from subsequent construction operations.

B. Touch-up, repair, or replace damaged products before Substantial Completion.

3.08 MAINTENANCE

A. See Section 01 7000 - Execution and Closeout Requirements, for additional requirements relating to maintenance service.

END OF SECTION

SECTION 12 3600
COUNTERTOPS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Countertops for architectural cabinet work.

B. Countertops for manufactured casework.

C. Wall-hung counters and vanity tops.

D. Sinks molded into countertops.

1.02 RELATED REQUIREMENTS

A. Section 06 4100 - Architectural Wood Casework.

B. Section 22 4000 - Plumbing Fixtures: Sinks.

1.03 REFERENCE STANDARDS

A. ASTM B211/B211M - Standard Specification for Aluminum and Aluminum-Alloy Rolled or Cold Finished Bar, Rod, and Wire; 2019.

B. ASTM E84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2023.

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards, 2nd Edition; 2014, with Errata (2016).

D. AWMAC/WI (NAAWS) - North American Architectural Woodwork Standards; 2021, with Errata.

E. IAPMO Z124 - Plastic Plumbing Fixtures; 2022.

F. ISFA 2-01 - Classification and Standards for Solid Surfacing Material; 2013.

G. ISFA 3-01 - Classification and Standards for Quartz Surfacing Material; 2013.

H. NEMA LD 3 - High-Pressure Decorative Laminates; 2005.

I. NSI (DSDM) - Dimensional Stone Design Manual, Version VIII; 2016.

1.04 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements for submittal procedures.

B. Product Data: Manufacturer's data sheets on each product to be used, including:
   1. Preparation instructions and recommendations.
   2. Storage and handling requirements and recommendations.
   3. Specimen warranty.

C. Shop Drawings: Complete details of materials and installation; combine with shop drawings of cabinets and casework specified in other sections.

D. Verification Samples: For each finish product specified, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

E. Test Reports: Chemical resistance testing, showing compliance with specified requirements.

F. Maintenance Data: Manufacturer's instructions and recommendations for maintenance and repair of countertop surfaces.

1.05 QUALITY ASSURANCE

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened packaging until ready for installation.

B. Store and dispose of solvent-based materials, and materials used with solvent-based materials, in accordance with requirements of local authorities having jurisdiction.

1.07 FIELD 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.

PART 2 PRODUCTS

2.01 COUNTERTOPS

A. Solid Surfacing Countertops: Solid surfacing sheet or plastic resin casting over continuous substrate.
   1. Flat Sheet Thickness: 0.79 inch (2 mm), minimum.
   2. Solid Surfacing Sheet and Plastic Resin Castings: Complying with ISFA 2-01 and NEMA LD 3; up to 93 percent quartz aggregare polyester resin, unfilled,and pigments; homogenous, non-porous and capable of being worked and repaired using standard woodworking tools; no surface coating; color and pattern consistent throughout thickness.
      a. Manufacturers:
         1) Wilsonart; _____: www.wilsonart.com/#sle.
            (a) As indicated on Finish Legend..
         2) Substitutions: Not permitted.
      b. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
      c. NSF approved for food contact.
      d. Sinks and Bowls: Integral castings; minimum 3/4 inch (19 mm) wall thickness; comply with IAPMO Z124.
      e. Finish on Exposed Surfaces: Matte, gloss rating of 5 to 20.
      f. Color and Pattern: As indicated on Finish Legend.
   3. Other Components Thickness: As indicated on drawings. 1/2 inch (12 mm), minimum.
   4. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.
   5. Skirts: As indicated on drawings.
   6. Fabricate in accordance with manufacturer's standard requirements.

B. Natural Quartz and Resin Composite Countertops: Sheet or slab of natural quartz and plastic resin over continuous substrate.
   1. Flat Sheet Thickness: 1-1/4 inch (32 mm), minimum.
   2. Natural Quartz and Resin Composite Sheets, Slabs and Castings: Complying with ISFA 3-01 and NEMA LD 3; orthophthalic polyester resin, mineral filler, and pigments; homogenous, non-porous and capable of being worked and repaired using standard stone fabrication tools; no surface coating; color and pattern consistent throughout thickness.
      a. Manufacturers:
         1) Corian.
            (a) As indicated on Finish Legend.
         2) Substitutions: Not permitted.
      b. Factory fabricate components to the greatest extent practical in sizes and shapes indicated; comply with NSI (DSDM).
      c. Surface Burning Characteristics: Flame spread index of 25, maximum; smoke developed index of 450, maximum; when tested in accordance with ASTM E84.
      d. NSF approved for food contact.
      e. Finish on Exposed Surfaces: Polished.
   3. Other Components Thickness: As indicated on drawings. 3/4 inch (19 mm), minimum.
   4. Back and End Splashes: Same sheet material, square top; minimum 4 inches (102 mm) high.
   5. Skirts: As indicated on drawings.
   6. Fabricate in accordance with manufacturer's standard requirements.

2.02 MATERIALS

A. Extruded Aluminum: ASTM B211/B211M, 6463 alloy, T5 temper.

B. Adhesives: Chemical resistant waterproof adhesive as recommended by manufacturer of materials being joined.

C. Joint Sealant: Mildew-resistant silicone sealant, clear.

2.03 ACCESSORIES

A. Support Brackets as indicated on drawings.

2.04 FABRICATION

A. Fabricate tops and splashes in the largest sections practicable, with top surface of joints flush.
   1. Join lengths of tops using best method recommended by manufacturer.
   2. Fabricate to overhang fronts and ends of cabinets 1 inch (25 mm) except where top butts against cabinet or wall.
   3. Prepare all cutouts accurately to size; replace tops having improperly dimensioned or unnecessary cutouts or fixture holes.

B. Provide back/end splash wherever counter edge abuts vertical surface unless otherwise indicated.
   1. Secure to countertop with concealed fasteners and with contact surfaces set in waterproof glue.
   2. Height: 4 inches (102 mm), unless otherwise indicated.

C. Solid Surfacing: Fabricate tops and wall panels up to 144 inches (3,657 mm) long in one piece; join pieces with adhesive sealant in accordance with manufacturer's recommendations and instructions.

D. Wall-Mounted Counters: Provide skirts, aprons, brackets, and braces as indicated on drawings, finished to match.

PART 3 EXECUTION

3.01 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

C. Verify that wall surfaces have been finished and mechanical and electrical services and outlets are installed in proper locations.

3.02 PREPARATION

A. Clean surfaces thoroughly prior to installation.

B. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.

3.03 INSTALLATION

A. Securely attach countertops to cabinets using concealed fasteners. Make flat surfaces level; shim where required.

B. Attach plastic laminate countertops using screws with minimum penetration into substrate board of 5/8 inch (16 mm).

C. Seal joint between back/end splashes and vertical surfaces.

3.04 TOLERANCES

A. Variation From Horizontal: 1/8 inch in 10 feet (3 mm in 3 m), maximum.

B. Offset From Wall, Countertops: 1/8 inch (3 mm) maximum; 1/16 inch (1.5 mm) minimum.

C. Field Joints: 1/8 inch (3 mm) wide, maximum.

3.05 CLEANING

3.06 PROTECTION

A. Protect installed products until completion of project.

B. Touch-up, repair or replace damaged products before Date of Substantial Completion.

3.07 SCHEDULES

A. As indicated on Finish Legend and drawings.

END OF SECTION

SECTION 12 4813
ENTRANCE FLOOR MATS AND FRAMES

PART 1 GENERAL

1.01 RELATED REQUIREMENTS

A. 03 3000 Cast-in-Place Concrete: Instalation coordination.

1.02 SUBMITTALS

A. See Section 01 3000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating properties of walk-off surface, component dimensions and recessed frame characteristics.

C. Shop Drawings: Indicate dimensions and details for recessed frame.
   1. For recessed frames located within a dimensionally restricted area, show dimensions of space within which the frame will be installed.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Entrance Floor Grilles and Gratings:

2.02 ENTRANCE FLOOR GRILLES AND GRATINGS

A. Entrance Floor Gratings: Recessed stainless steel bar grating with longitudinal bars running perpendicular to traffic flow and perimeter frame forming sides of recess; grating hinged for access to recess.
   1. Basis-Of-Design: Construction Specialties: GridLine G6, 5/8" Hidden Lockdowns: www.c-sgroup.com.
   2. Grating: Longitudinal bars 0.09 inch (2.3 mm), nominal, in width, spaced at less than twice the bar width apart; cross bars set below for pronounced linear appearance.
   3. Grating Depth: 5/8 inches (____ mm), nominal.
   4. Recess Depth Below Bottom of Grating: 1 inches (25 mm).
   5. Length in Direction of Traffic Flow: 72 inches (1830 mm).
   6. Width Perpendicular to Traffic Flow: Full width of entrance door opening.
   7. Frame: Anodized aluminum for embedding in concrete; minimal exposed trim; stud or hook concrete anchors.

B. Mounting: Top of non-resilient members level with adjacent floor.

C. Structural Capacity: Capable of supporting a rolling load of 1000 pounds (453.6 kg) without permanent deformation or noticeable deflection.

D. Vibration Resistant Fabrication: All members welded, riveted, or bolted; no snap or friction connections.

2.03 FABRICATION

A. Fabricate mats in single unit sizes; fabricate multiple mats where indicated on drawings.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that floor opening for mats are ready to receive work.

3.02 PREPARATION

A. Vacuum clean floor recess.

3.03 INSTALLATION

A. Install walk-off surface in floor recess flush with finish floor after cleaning of finish flooring.

END OF SECTION