

New DQ Grill & Chill[®]
to be located in:

Brandenburg KY

American Dairy Queen
Minneapolis, MN – USA

Issue Date: 09/03/21

OUTLINE SPECIFICATIONS

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BID FORMS

1. Submission of Bids: Submit bids in compliance with Document 00 21 00 - Instructions to Bidders. Fill in blanks. The Owner reserves the right to reject incomplete bid forms.
2. Bidding Documents: This Bidding document is not part of the Contract Documents, unless specifically referenced in the Owner/Contractor Agreement.

Project Name: Dairy Queen Brandenburg KY

Name of Bidder: _____

3. Base Bid: The Bidder proposes to perform all of the Work required by the Contract Documents for the amount of: (Fill in amount in words and numbers.)

\$ _____ . ____ \$ _____

4. Time: The Bidder proposes the following dates (Fill in):

Proposed Starting Date: _____

Proposed Date of Substantial Completion (not later than):

5. Submission of Bid Form: By submitting this Bid Form, the Bidder certifies that Bidder has visited the project site, is aware of existing conditions which affect the work, and has reviewed the Contract Documents
6. Bid Qualifications: Submit bid qualifications and reasons for qualifications with this Bid Form at the end of the Bid Form. Include impact of bid qualifications on time, cost or quality. Bid qualifications may include: Cash flow requirements, assumptions for access to the work, assumptions for staging the work, assumptions for protecting existing and abutting work, proposed modifications to General and Supplementary Conditions, proposed modifications to drawings and specifications.
7. Signature: Signed and sealed (Enter date, Bidder's signature, title, name of firm, legal business address, phone and fax numbers, email address):

Signature: _____

Name and Title: _____

Firm: _____

Address: _____

City, State, ZIP: _____

Telephone: _____

Fax: _____

Email: _____

8. Project Manager: Bidder's Project Manager To Be Assigned to the Project (name and brief summary of experience):

9. Subcontractors: Bidder's List of Proposed Major Subcontractors (list):

10. Bid Qualifications: List of Bid Qualifications by Bidder (If any):

END OF DOCUMENT

DOCUMENT 00 52 00

AGREEMENT FORMS

1. Owner-Contractor Agreement Form: AIA A101, Owner-Contractor Agreement Form - Stipulated Sum.
2. Owner-Contractor Agreement Form: AIA A105, Owner-Contractor Agreement Form - Small Projects and A 205 General Conditions for Small Project,
3. Owner-Contractor Agreement Form: AIA A107, Owner-Contractor Agreement Form - Stipulated Sum - For Construction Projects of Limited Scope.
4. Owner-Contractor Agreement Form: AIA A111, Owner-Contractor Agreement Form - Cost of the Work Plus a Fee With a Negotiated Guaranteed Maximum Price (GMP).
5. Owner-Contractor Agreement Form: AIA A114, Owner-Contractor Agreement Form - Cost of the Work Plus a Fee Without a Guaranteed Maximum Price (GMP.)
6. Owner-Contractor Agreement Form: AIA A171, Owner-Contractor Agreement Form - Stipulated Sum - For Furniture, Furnishings and Equipment.
7. Owner-Contractor Agreement Form: AIA A177 Abbreviated Owner-Contractor Agreement Form - Stipulated Sum - For Furniture, Furnishings and Equipment.
8. Agreement Forms: Agreement forms are available from the American Institute of Architects, Washington, D.C., 202-626-7300. Agreement Forms will be prepared and approved for use on the project by the Owner in consultation with an attorney.

END OF DOCUMENT

DOCUMENT 00 72 00

GENERAL CONDITIONS

1. General Conditions: AIA A201, General Conditions of the Contract for Construction shall apply to any contract given under these specifications and shall be binding upon general contractor and every subcontractor.
2. General Conditions Forms: General Conditions are available from the American Institute of Architects, Washington, D.C., 202-626-7300. General Conditions will be prepared and approved for use on the project by the Owner in consultation with an attorney.

END OF DOCUMENT

SECTION 01 10 00

SUMMARY

PART 1 GENERAL

1.1 SUMMARY

- A. Project Identification: Dairy Queen Brandenburg KY
- B. Project Summary: The project consists of a freestanding American Dairy Queen Grill & Chill building.
- C. Owner-purchased, Contractor-installed items: The Owner will provide equipment, furniture, and decor, items as indicated in the Construction Documents. The Contractor's Work includes providing support systems to receive, Owner's items, and mechanical and electrical connections.

The owner will arrange and pay for delivery of Owner-furnished items in accordance with the Contractors Construction Schedule, and inspect deliveries for damage.

If the Owner-furnished items are damaged, defective or missing, the Owner will arrange for replacement. The Contractor is responsible for designating the delivery dates of Owner-furnished items in the Construction Schedule and for receiving, unloading and handling the items at site. Handling includes uncrating, assembly and installation. The Contractor is responsible for protecting Owner-furnished items from damage, including damage from exposure to the elements, and to repair or replace items damaged as a result of his operations.

- D. The general contractor shall provide a construction schedule at the time of mobilization and update any changes bi-weekly, construction schedules will be adhered to. The general contractor shall also produce and email a daily job log, weekly reports and digital photographs as requested.
- E. A qualified/competent job superintendent must be on the job site at all times during the course of contraction and completion of the final punch list. The owner has the right to refuse a general contractors superintendent.
- F. Permits and Fees: Apply for, obtain, and pay for permits, fees, and utility company back charges required to perform the work. Submit copies to Architect.
- G. Codes: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communications to Architect.
- H. Dimensions: Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.
- I. Existing Conditions: Notify Architect of existing conditions differing from those indicated on the drawings. Do not remove or alter structural components without prior written approval.
- J. Coordination:
 - 1. Coordinate the work of all trades.
 - 2. Prepare coordination drawings for areas above ceilings where close tolerances are required between building elements and mechanical and electrical work.
 - 3. Verify location of utilities and existing conditions.
- K. Installation Requirements, General:

1. Inspect substrates and report unsatisfactory conditions in writing.
 2. Do not proceed until unsatisfactory conditions have been corrected.
 3. Take field measurements prior to fabrication where practical. Form to required shapes and sizes with true edges, lines and angles. Provide inserts and templates as needed for work of other trades.
 4. Install materials in exact accordance with manufacturer's instructions and approved submittals.
 5. Install materials in proper relation with adjacent construction and with proper appearance.
 6. Restore units damaged during installation. Replace units which cannot be restored at no additional expense to the Owner.
 7. Refer to additional installation requirements and tolerances specified under individual specification sections.
- L. Limit of Use: Limit use of work as indicated. Keep driveways and entrances clear.
- M. Existing Construction: Maintain existing building in a weather tight condition. Repair damage caused by construction operations. Protect building and its occupants.
- N. Definitions:
1. Provide: Furnish and install, complete with all necessary accessories, ready for intended use. Pay for all related costs.
 2. Approved: Acceptance of item submitted for approval. Not a limitation or release for compliance with the Contract Documents or regulatory requirements. Refer to limitations of 'Approved' in General and Supplementary Conditions.
 3. Match Existing: Match existing as acceptable to the Owner.
- O. Intent: Drawings and specifications are intended to provide the basis for proper completion of the work suitable for the intended use of the Owner. Anything not expressly set forth but which is reasonable implied or necessary for proper performance of the project shall be included.
- P. Writing Style: Specifications are written in the imperative mode. Except where specifically intended otherwise, the subject of all imperative statements is the Contractor. For example, 'Provide tile' means 'Contractor shall provide tile.'

PART 2 PRODUCTS - Not Applicable To This Section

PART 3 EXECUTION - Not Applicable To This Section

END OF SECTION

SECTION 01 50 00

TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. This section includes requirements for temporary utilities, support facilities, and security and protection facilities.
- B. Use charges: Cost or use charges for temporary facilities shall be included in the Contract Sum. Allow other entities to use temporary services and facilities without cost, including, but not limited to, Owners Representative, testing agencies, and authorities having jurisdiction.
- C. Quality Assurance:
 - 1. Electric Service: Comply with NECA, NEMA, and UL standards and regulations for temporary electric service. Install service to comply with NFPA 70
 - 2. Tests and Inspections: Arrange for authorities having jurisdiction to test and inspect each temporary utility before use. Obtain required certifications and permits.
- D. Temporary Use of Permanent Facilities: Installer of each permanent service shall assume responsibility for operation, maintenance, and protection of each permanent service during its use as a construction facility before Owner's acceptance, regardless of previously assigned responsibilities

PART 2 PRODUCTS

2.1 TEMPORARY FACILITIES

- A. Field Offices, General: Prefabricated or mobile units with serviceable finishes, temperature controls, and foundations adequate for normal loading.

2.2 EQUIPMENT

- A. Fire Extinguishers: Portable, UL rated; with class and extinguishing agent as required by locations and classes of fire exposures.
- B. HVAC equipment: unless owner authorizes use of permanent HVAC system; provide vented, self-contained, liquid-propane-gas or fuel-oil heaters with individual space thermostatic control.
 - 1. Use of gasoline burning space heaters, open flame heaters, or salamander type heating units is prohibited.
 - 2. Heating units: Listed and labeled for type of fuel being consumed, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
 - 3. Permanent HVAC system: If Owner authorizes use of permanent HVAC system for temporary use during construction, provide filter at each return air grille in system and remove at end of construction.

PART 3 EXECUTION

3.1 GENERAL INSTALLATION

- A. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate and modify facilities as required by progress of the Work.

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- B. Provide each facility ready for use when needed to avoid delay. Do not remove until facilities are no longer needed or are replaced by authorized use of completed permanent facilities.

3.2 TEMPORARY UTILITY INSTALLATION

- A. General: Install temporary service or connect to existing service.
 - 1. Arrange with utility company, Owner, and existing users for time when service can be interrupted, if necessary, to make connections for temporary services.
- B. Sewers and Drainage: Provide temporary utilities to remove effluent lawfully.
 - 1. Connect temporary sewers to municipal system as directed by authorities having jurisdiction.
- C. Water Service: Install water service in size and pressure adequate for construction.
- D. Sanitary Facilities: Provide temporary toilets, wash facilities, and drinking water for use of construction personnel. Comply with authorities having jurisdiction for type, number, location, operation, and maintenance of fixtures and facilities
- E. Heating: Provide temporary heating required by construction activities for curing or drying of completed installations or for protecting installed construction from adverse effects of low temperatures or high humidity. Select equipment that will not have a harmful effect on completed installations or elements being installed
- F. Electric Power Service: Provide electric power service and distribution system of sufficient size, capacity, and power characteristics required for construction operations
- G. Lighting: Provide temporary lighting with local switching that provides adequate illumination for construction operations, observations, inspections, and traffic conditions
- H. Telephone Service: Provide temporary telephone service in common-use facilities for use by all construction personnel

3.3 SUPPORT FACILITY INSTALLATION

- A. General: comply with the following.
 - 1. Maintain support facilities until near Substantial Completion. Remove before Substantial Completion. Personnel remaining after Substantial Completion will be permitted to use permanent facilities, under conditions acceptable to Owner.
- B. Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Maintain Project site, excavations, and construction free of water.
- C. Project Identification and Temporary Signs: Temporary Project identification sign (See bid packet for template/design. Identification of Contractor is to be on a separate sign.
- D. Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction.
- E. Lifts and Hoists: Provide facilities necessary for hoisting materials and personnel.
 - 1. Truck cranes and similar devices used for hoisting materials are considered "tools and equipment" and not temporary facilities.

3.4 SECURITY AND PROTECTION FACILITIES INSTALLATION

- A. Environmental Protection: Provide protection, operate temporary facilities, and conduct construction in ways and by methods that comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.
- B. Temporary Erosion and Sedimentation Control: Provide measures to prevent soil erosion and discharge of soil-bearing water runoff and airborne dust to adjacent properties and walkways, according to requirements of authorities having jurisdiction
- C. Storm Water Control: Comply with authorities having jurisdiction. Provide barriers in and around excavations and sub grade construction to prevent flooding by runoff of storm water from heavy rains.
- D. Tree and Plant Protection: Install temporary fencing located as indicated or outside the drip line of trees to protect vegetation from damage from construction operations. Protect tree root systems from damage, flooding, and erosion
- E. Pest Control: Engage pest-control service to recommend practices to minimize attraction and harboring of rodents, roaches, and other pests and to perform extermination and control procedures at regular intervals so Project will be free of pests and their residues at Substantial Completion. Obtain extended warranty for Owner. Perform control operations lawfully, using environmentally safe materials
- F. Site Enclosure Fence: Furnish and install site enclosure fence in a manner that will prevent people and animals from easily entering site except by entrance gates
- G. Barricades, Warning Signs, and Lights: Comply with requirements of authorities having jurisdiction for erecting structurally adequate barricades, including warning signs and lighting
- H. Temporary Enclosures: Provide temporary enclosures for protection of construction, in progress and completed, from exposure, foul weather, other construction operations, and similar activities. Provide temporary weather tight enclosure for building exterior

3.5 OPERATION, TERMINATION, AND REMOVAL

- A. Supervision: Enforce strict discipline in use of temporary facilities. To minimize waste and abuse, limit availability of temporary facilities to essential and intended uses.
- B. Maintenance: Maintain facilities in good operating condition until removal
- C. Temporary Facility Changeover: Do not change over from using temporary security and protection facilities to permanent facilities until Substantial Completion
- D. Termination and Removal: Remove each temporary facility when need for its service has ended, when it has been replaced by authorized use of a permanent facility, or no later than Substantial Completion. Complete or, if necessary, restore permanent construction that may have been delayed because of interference with temporary facility. Repair damaged Work, clean exposed surfaces, and replace construction that cannot be satisfactorily repaired
 - 1. Owner reserves right to take possession of Project identification signs

END OF SECTION

SECTION 01 60 00

PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for selection of products for use in Project; product delivery, storage, and handling; manufacturers' standard warranties on products; special warranties; product substitutions; and comparable products

1.2 DEFINITIONS

- A. Products: Items purchased for incorporating into the Work, whether purchased for Project or taken from previously purchased stock. The term "product" includes the terms "material," "equipment," "system," and terms of similar intent.
 - 1. Named Products: Items identified by manufacturer's product name, including make or model number or other designation shown or listed in manufacturer's published product literature, that is current as of date of the Contract Documents
 - 2. New Products: Items that have not previously been incorporated into another project or facility. Products salvaged or recycled from other projects are not considered new products
 - 3. Comparable Products: Product that is demonstrated and approved through submittal process, or where indicated as a product substitution, to have the indicated qualities related to type, function, dimension, in-service performance, physical properties, appearance, and other characteristics that equal or exceed those of specified product
- B. Substitutions: Changes in products, materials, equipment, and methods of construction from those required by the Contract Documents and proposed by Contractor

1.3 SUBSTITUTIONS

- A. Request for substitution must be in writing. Conditions for substitution include:
 - 1. An 'or equal' phrase in the specifications.
 - 2. Specified material cannot be coordinated with other work.
 - 3. Specified material is not acceptable to authorities having jurisdiction.
 - 4. Substantial advantage is offered to the Owner in terms of cost, time, or other valuable consideration.
- B. Substitution Requests: Submit three copies of each request for consideration. Identify product or fabrication or installation method to be replaced. Include Specification Section number and title and Drawing numbers and titles. All substitutions shall have written approval from the Owner and Dairy Queen Corporation

1.4 ALTERNATES

- A. Coordination: Modify or adjust affected adjacent work as necessary to completely integrate work of the alternate into Project:
 - 1. Include as part of each alternate, miscellaneous devices, accessory objects, and similar items incidental to or required for a complete installation whether or not indicated as part of alternate.
- B. Notification: Immediately following award of the Contract, notify each party involved, in writing, of the status of each alternate. Indicate if alternates have been accepted, rejected, or deferred for later consideration. Include a complete description of negotiated modifications to alternates

- C. Execute accepted alternates under the same conditions as other work of the Contract

1.5 QUALITY ASSURANCE

- A. Compatibility of Options: If Contractor is given option of selecting between two or more products for use on Project, product selected shall be compatible with products previously selected, even if previously selected products were also options

1.6 PRODUCT DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft. Comply with manufacturers written instructions
- B. Delivery and Handling:
 - 1. Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces
 - 2. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses
 - 3. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing
 - 4. Inspect products on delivery to ensure compliance with the Contract Documents and to ensure that products are undamaged and properly protected
- C. Storage:
 - 1. Store products to allow for inspection and measurement of quantity or counting of units.
 - 2. Store materials in a manner that will not endanger Project structure.
 - 3. Store products that are subject to damage by the elements, under cover in a weather tight enclosure above ground, with ventilation adequate to prevent condensation.
 - 4. Store cementitious products and materials on elevated platforms.
 - 5. Store foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment.
 - 6. Comply with product manufacturers written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage.
 - 7. Protect stored products from damage and liquids from freezing.

1.7 PRODUCT WARRANTIES

- A. Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents
 - 1. Manufacturer's Warranty: Preprinted written warranty published by individual manufacturer for a particular product and specifically endorsed by manufacturer to Owner
 - 2. Special Warranty: Written warranty required by or incorporated into the Contract Documents, either to extend time limit provided by manufacturer's warranty or to provide more rights for Owner

PART 2 PRODUCTS

2.1 PRODUCT SELECTION PROCEDURES

- A. General Product Requirements: Provide products that comply with the Contract Documents, that are undamaged and, unless otherwise indicated, that are new at time of installation

1. Provide products complete with accessories, trim, finish, fasteners, and other items needed for a complete installation and indicated use and effect
 2. Standard Products: If available, and unless custom products or nonstandard options are specified, provide standard products of types that have been produced and used successfully in similar situations on other projects
 3. Owner reserves the right to limit selection to products with warranties not in conflict with requirements of the Contract Documents
- B. Product Selection Procedures:
1. Product: Where Construction Documents name a single product and manufacturer, provide the named product that complies with requirements
 2. Manufacturer/Source: Where Construction Documents name a single manufacturer or source, provide a product by the named manufacturer or source that complies with requirements

2.2 PRODUCT SUBSTITUTIONS

- A. Timing: Owner will consider requests for substitution if received prior to commencement of work.
- B. Conditions: Owner will consider Contractor's request for substitution when the following conditions are satisfied. If the following conditions are not satisfied, Architect will return requests without action, except to record noncompliance with these requirements.
1. Requested substitution offers Owner a substantial advantage in cost, time, energy conservation, or other considerations, after deducting additional responsibilities Owner must assume. Owner's additional responsibilities may include compensation to Architect for redesign and evaluation services, increased cost of other construction by Owner, and similar considerations
 2. Requested substitution does not require extensive revisions to the Contract Documents
 3. Requested substitution is consistent with the Contract Documents and will produce indicated results
 4. Substitution request is fully documented and properly submitted
 5. Requested substitution will not adversely affect Contractor's Construction Schedule
 6. Requested substitution has received necessary approvals of authorities having jurisdiction
 7. Requested substitution is compatible with other portions of the Work
 8. Requested substitution has been coordinated with other portions of the work
 9. Requested substitution provides specified warranty

2.3 COMPARABLE PRODUCTS

- A. Conditions: Owner will consider Contractor's request for comparable product when the following conditions are satisfied:
1. Evidence that the proposed product does not require extensive revisions to the Contract Documents, that it is consistent with the Contract Documents and will produce the indicated results, and that it is compatible with other portions of the Work
 2. Detailed comparison of significant qualities of proposed product with those named in the Specifications. Significant qualities include attributes such as performance, weight, size, durability, visual effect, and specific features and requirements indicated
 3. Evidence that proposed product provides specified warranty
 4. List of similar installations for completed projects with project names and addresses and names and addresses of architects and owners, if requested
 5. Samples, if requested

PART 3 EXECUTION - Not Applicable To This Section

END OF SECTION

SECTION 01 70 00

EXECUTION AND CLOSEOUT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. This Section includes administrative and procedural requirements for contract closeout, including, but not limited to, the following:
 - 1. Inspection Procedures.
 - 2. Warranties.
 - 3. Final cleaning.

1.2 SUBSTANTIAL COMPLETION

- A. Preliminary Procedures: Before requesting inspection for determining date of Substantial Completion, complete the following. List items below that are incomplete in request.
 - 1. Prepare a list of items to be completed and corrected (punch list), the value of items on the list, and reasons why the Work is not complete.
 - 2. Advise Owner of pending insurance changeover requirements.
 - 3. Submit specific warranties, workmanship bonds, maintenance service agreements, final certifications, and similar documents.
 - 4. Obtain and submit releases permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
 - 5. Prepare and submit Project Record Documents, operation and maintenance manuals, damage or settlement surveys, property surveys, and similar final record information.
 - 6. Deliver tools, spare parts, extra materials, and similar items to location designated by Owner. Label with manufacturer's name and model number where applicable.
 - 7. Make final changeover of permanent locks and deliver keys to Owner. Advise Owner's personnel of changeover in security provisions.
 - 8. Complete startup testing of systems.
 - 9. Submit test/adjust/balance records.
 - 10. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
 - 11. Advise Owner of changeover in heat and other utilities.
 - 12. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
 - 13. Complete final cleaning requirements, including touchup painting.
 - 14. Touch up and otherwise repair and restore marred exposed finishes to eliminate visual defects.
- B. Inspection: Submit a written request for Substantial Completion. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements. Owner will notify Contractor of items, either on Contractor's list or additional items identified by Owner that must be completed or corrected before submittal completion is accepted.
 - 1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected. .
 - 2. Results of completed inspection will form the basis of requirements for Final Completion

1.3 FINAL COMPLETION

- A. Preliminary Procedures: Before requesting final inspection for determining date of final

completion, complete the following.

1. Submit a final Application for Payment.
 2. Submit inspection list of items to be completed or corrected (punch list). The list shall state that each item has been completed or otherwise resolved for acceptance.
 3. Submit evidence of final, continuing insurance coverage complying with insurance requirements.
 4. Instruct Owner's personnel in operation, adjustment, and maintenance of products, equipment, and systems.
- B. Inspection: Submit a written request for final inspection for acceptance. On receipt of request, Owner will either proceed with inspection or notify Contractor of unfulfilled requirements.
1. Re-inspection: Request re-inspection when the Work identified in previous inspections as incomplete is completed or corrected.

1.4 LIST OF INCOMPLETE ITEMS (PUNCH LIST)

- A. Preparation: Submit copies of list. Include name and identification of each space and area affected by construction operations for incomplete items and items needing correction including, if necessary, areas distributed by Contractor that are outside the limits of construction.

1.5 WARRANTIES

- A. Submittal Time: Submit written warranties on request of the Owner for designated portions of the Work where commencement of warranties other than date of Substantial Completion is indicated.
- B. Organize warranty documents into an orderly sequence based on the table of contents of the Project Manual.
- C. Provide additional copies of each warranty to include in operation and maintenance manuals.
- D. Warranty Review
1. Dairy Queen will perform a warranty inspection 10 months from the date of substantial completion. It is recommended that the General Contractor attend this inspection, but not required.
 2. All items discovered in need of warranty service and/or repair must be completed within 30 days of notification.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cleaning Agents: Use cleaning materials and agents recommended by manufacturer or Fabricator of the surface to be cleaned. Do not use cleaning agents that are potentially Hazardous to health or property or that might damage finished surfaces.

PART 3 EXECUTION

3.1 FINAL CLEANING

- A. General: Provide final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations.

- B. Cleaning: Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average commercial building cleaning and maintenance program. Comply with manufacturers written instructions.
1. Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a portion of Project:
 - a. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
 - b. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
 - c. Rake grounds that are neither planted nor paved to a smooth, even-textured surface.
 - d. Remove tools, construction equipment, machinery, and surplus material from Project site.
 - e. Remove snow and ice to provide safe access to building.
 - f. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
 - g. Remove debris and surface dust from limited access spaces, including roofs, plenums, shafts, trenches, equipment vaults, manholes, attics, and similar spaces.
 - h. Sweep concrete floors broom clean in unoccupied spaces.
 - i. Clean transparent materials, including mirrors and glass in doors and windows. Remove glazing compounds and other noticeable, vision-obscuring materials. Replace chipped or broken glass and other damaged transparent materials. Polish mirrors and glass, taking care not to scratch surfaces.
 - j. Remove labels that are not permanent.
 - k. Touch up and otherwise repair and restore marred, exposed finishes and surfaces. Replace finishes and surfaces that cannot be satisfactorily repaired or restored or that already show evidence of repair or restoration. Do not paint over "UL" and similar labels, including mechanical and electrical nameplates.
 - l. Wipe surfaces of mechanical and electrical equipment and similar equipment. Remove excess lubrication, paint and mortar droppings, and other foreign substances.
 - m. Replace parts subject to unusual operating conditions.
 - n. Clean plumbing fixtures to a sanitary condition, free of stains, including stains resulting from water exposure.
 - o. Replace disposable air filters and clean permanent air filters. Clean exposed surfaces of diffusers, registers, and grills.
 - p. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency. Replace burned-out bulbs, and those noticeably dimmed by hours of use, and defective and noisy starters in fluorescent and mercury vapor fixtures to comply with requirements for new fixtures.
 - q. Leave Project clean and ready for occupancy.
- C. Comply with safety standards for cleaning. Do not burn waste materials. Do not bury debris or excess materials on Owner's property. Do not discharge volatile, harmful, or dangerous materials into drainage systems. Remove waste materials from Project site and dispose of lawfully.

END OF SECTION

SECTION 02 41 00

DEMOLITION

GENERAL

1.1 SUMMARY

- A. Provide demolition activities.

1.2 SUBMITTALS

- A. Schedule: Submit for approval selective demolition schedule, including schedule and methods for capping utilities to be abandoned and maintaining existing utility service.

1.3 QUALITY ASSURANCE

- A. Codes and Regulations: Comply with governing codes and regulations. Use experienced workers.

1.4 PROJECT CONDITIONS

- A. Occupancy: Immediate areas of work will not be occupied during selective demolition. The public, including children, may occupy adjacent areas.
- B. Existing Conditions: No responsibility for buildings and structures to be demolished will be assumed by the Owner

PART 2 PRODUCTS

2.1 DEMOLITION APPLICATIONS

- A. Selective Site Demolition:
 - 1. Application: Demolition of designated building structures.
 - 2. Application: Demolition of designated improvements including paving, curbing, site walls, and utility structures.
 - 3. Application: Demolition of below-grade foundations and site improvements to depth to avoid conflict with new construction or site work.
 - 4. Application: Removal of hollow items or items which could collapse.
 - 5. Application: Salvage of designated items.
 - 6. Application: Protection of site work and adjacent structures.
 - 7. Application: Disconnection, capping, and removal of utilities.
 - 8. Application: Pollution control during building demolition, including noise control.
 - 9. Application: Removal and legal disposal of materials.
 - 10. Protection: Designated site improvements and adjacent construction.
 - 11. Salvage: Designated items.
 - 12. Utilities: Interruption, capping or removal as applicable.
- B. Hazardous Materials: Not present
- C. Selective Building Demolition:
 - 1. Application: Selective demolition of interior partitions, systems, and building components designated to be removed.
 - 2. Application: Selective demolition of exterior facade, structures, and components designated to be removed.
 - 3. Application: Protection of portions of building adjacent to or affected by selective

- demolition.
- 4. Application: Removal of abandoned utilities and wiring systems.
- 5. Application: Notification to Owner of schedule of shut-off of utilities which serve occupied spaces.
- 6. Application: Pollution control during selective demolition, including noise control.
- 7. Application: Removal and legal disposal of materials.
- 8. Protection: Designated site improvements and adjacent construction.
- 9. Salvage: Designated items.
- 10. Utilities: Interruption, capping or removal as applicable.
- 11. Hazardous Materials: Not present.

PART 3 EXECUTION

3.1 SELECTIVE DEMOLITION

- A. Demolition Operations: Do not damage building elements and improvements indicated to remain. Items of salvage value, not included on schedule of salvage items to be returned to Owner, shall be removed from structure. Storage or sale of items at project site is prohibited.
- B. Utilities: Locate, identify, disconnect, and seal or cap off utilities in buildings to be demolished.
- C. Shoring and Bracing: Provide and maintain interior and exterior shoring and bracing.
- D. Occupied Spaces: Do not close or obstruct streets, walks, drives or other occupied or used spaces or facilities without the written permission of the Owner and the authorities having jurisdiction. Do not interrupt utilities serving occupied or used facilities without the written permission of the Owner and authorities having jurisdiction. If necessary, provide temporary utilities.
- E. Operations: Cease operations if public safety or remaining structures are endangered. Perform temporary corrective measures until operations can be continued properly.
- F. Security: Provide adequate protection against accidental trespassing. Secure project after work hours.
- G. Restoration: Restore finishes of patched areas.

END OF SECTION

SECTION 03 30 00

CAST-IN-PLACE-CONCRETE

PART 1 GENERAL

1.1 SUMMARY

- A. Provide cast-in-place concrete, reinforcing and accessories.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings:
 - 1. Submit shop drawings for steel reinforcement
- C. Mix Design: Submit for approval mix design proposed for use.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Testing: Employ an independent testing agency acceptable to Owner to design concrete mixes and to perform material evaluation tests. Provide 7 and 28 day cylinder tests. Comply with ASTM C 143, C 173, C 31 and C 39.
- C. Standards:
 - 1. ACI 301, Specifications for structural Concrete for Buildings.
 - 2. ACI 318, Building Code Requirements for Reinforced Concrete, and CRSI Manual of Standard Practice.
- D. Floor Flatness and Levelness Tolerances:
 - 1. Subfloors Under Materials Such as Concrete Toppings, Ceramic Tile, and Sand Bed Terrazzo: ACI 302.1R and ASTM E 1155, floor flatness (Ff) of 15, floor levelness (Fl) of 13.
 - 2. Subfloors Under Materials Such As Vinyl Tile, Epoxy Toppings, Paint, and Carpet: ACI 302.1R and ASTM E 1155, floor flatness (Ff) of 20, floor levelness (Fl) of 17.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cast-In-Place Concrete:
 - 1. Application: Foundations and footings
 - 2. Application: Slabs on grade.
 - 3. Cast-In-Place Concrete Reinforcing and Accessories:
 - a. Concrete Design Mixes: ASTM C 94, 28 day compressive strength suitable for project requirements and site conditions.
 - b. Formwork: Plywood or metal panel formwork sufficient for structural and visual requirements.
 - c. Reinforcing Bars: ASTM A615 - Grade 60
 - d. Steel Wire: ASTM A 82.

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- e. Steel Wire Fabric: ASTM A 497, welded, deformed.
- f. Concrete Materials: ASTM C 150, Type I, Portland cement; potable water.
- g. Concrete Admixtures: Containing less than 0.1 percent chloride ions.
- h. Reglets: Galvanized sheet steel reglets, minimum 26 gauge (.018 inch).
- i. Waterstops: Rubber, PVC or self expanding butyl/bentonite waterstops.
- j. Vapor Retarder: ASTM D 4397 polyethylene sheet, 10 mils.
- k. Liquid Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class A.
- l. Underlayment Compound: Free-flowing, self-leveling cement-based compound.
- m. Bonding Compound: Polyvinyl acetate or acrylic base.
- n. Epoxy Adhesive: ASTM C 881, two-component material.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with ASTM C 94. Do not change mix design without approval. Calcium chloride admixtures are not permitted.
- B. Tolerance: Plus 1/8" in 10" for grade, alignment, and straightness.
- C. Construction Joints: Use keyways, continue reinforcement through joint.
- D. Expansion Joints: Provide smooth dowels across joint which permit 1" horizontal movement and no vertical shear movement.
- E. Isolation Joints: Provide between slabs and vertical elements such as columns and structural walls.
- F. Control Joints: Provide sawn or tooled joints or removable insert strips; depth equal to 1/4 slab thickness. Spacing as required and approved.
- G. Cure and protect work. Report defective work in writing.

END OF SECTION

SECTION 04 20 00

UNIT MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. Provide unit masonry construction.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Fire Performance for Fire-Rated Brick and Concrete Block Assemblies: ASTM E 119.
- B. Testing: Independent Testing Laboratory.
- C. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Concrete Masonry Units:
 - 1. Application: Concrete masonry bearing walls.
 - 2. Concrete Masonry Units: ASTM C 90, 1500 f'm compressive strength:
 - 3. Size: Face dimension of 7-5/8 inches high by 15-5/8 inches long by width required for application.
 - 4. Special Shapes: As required by building configuration.
 - 5. Bond Pattern: Running Bond.
 - 6. Integral Water Repellent: Liquid polymeric admixture.
- B. Masonry Accessories:
 - 1. Cavity Drainage Material
 - 2. Loose-Granular Fill Insulation.
 - 3. Nonmetallic expansion joint strips.
 - 4. Preformed control joint gaskets.
 - 5. Bond breaker strips.

2.2 MORTAR AND GROUT MIXES

- A. General: Do not use admixtures, unless otherwise indicated
 - 1. Do not use Calcium Chloride in mortar or grout.
 - 2. Limit cementitious materials in mortar for exterior and reinforced masonry to Portland cement and lime
 - 3. Add cold weather admixture (if used) at same rate for all mortar that will be exposed to view, regardless of weather conditions, to ensure that mortar color is consistent.
- B. Mortar for Unit Masonry: Comply with ASTM C 270, proportion specification.
 - 1. For masonry below grade or in contact with earth, use type M.
 - 2. For exterior, above grade, load bearing and non load bearing partitions; and for other

applications where another type is not indicated, use type N.

- C. Grout for Unit Masonry: Comply with ASTM C 476.
 - 1. Use grout of type indicated, or if not otherwise indicated, of type (fine or coarse) that will comply with Table 1.15.1 in ACI 530.1/ASCE 6/TMS 602 for dimensions of grout spaces and pour height.
 - 2. Provide grout with a slump of 8 to 10 inches as measured according to ASTM C 143/C 143M.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Installation of Masonry Assemblies:
 - 1. Comply with PCA Recommended Practices for Laying Concrete Block, Brick Institute of America BIA Tech Notes, and NCMA TEK Bulletins.
 - 2. Comply with cold weather and warm weather protection procedures as recommended in BIA Tech Notes.
 - 3. Provide fire-rated assemblies complying with ASTM E 119.
 - 4. Sawcut units when required. Maintain uniform joint width. Provide full bed, head and collar joints except at weepholes.
 - 5. Coordinate installation of flashings.
 - 6. Comply with applicable codes and regulations for spacing of ties and horizontal reinforcing.
 - 7. Provide expansion and control joints in accordance with BIA and NCMA recommendations.
 - 8. Remove and replace damaged units.
 - 9. Clean concrete masonry by dry brushing, NCMA TEK No. 28.

END OF SECTION

SECTION 04 72 00

CAST STONE MASONRY

PART 1 GENERAL

1.1 SUMMARY

- A. Provide cast stone fabrications.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: 12"x12" Panel containing full size samples of specified cast stone masonry showing full range of colors and textures complete with mortar.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standard: Manufacturer is a producing member of the Cast Stone Institute or has on file and follows a written quality-control plan that includes all elements of the Cast Stone Institute's "Quality Control Procedures Required for Plant Inspection."
- C. Testing: Independent testing laboratory.
- D. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cast Stone Applications:
 - 1. Manufacturers: Specified on construction documents
 - 2. Product: Texture and color as indicated on drawings
 - 3. Application: Stone Veneer.
 - 4. Metal Lath: 2.5lb galvanized expanded metal lath
 - 5. Fasteners:
 - a. Into wood studs: minimum 1/8" shank diameter galvanized nails or minimum 3/4" crown staples of sufficient length to penetrate 1" minimum into the stud
 - b. Into steel studs: minimum 7/16" head diameter, corrosion resistant, self-tapping, pancake head screws of sufficient length to penetrate 3/8" minimum into the stud
 - 6. Mortar and Grout: Mortar Mix: ASTM C 270, Type N, for above-grade load bearing and non-load bearing walls and parapet walls.
 - 7. Weep screed as required for installation over framed construction.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved

submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.

- B. Protect finished work from rain during and for 48 hours following installation.
- C. Clean in accordance with manufacturer's installation instructions.
- D. Replace damaged units. Clean and protect work from damage.

END OF SECTION

SECTION 05 40 00

COLD-FORMED METAL FRAMING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide cold-formed metal framing.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards: AISI, Specification for Design of Cold-Formed Steel Structural Members.
- C. Deflection Criteria for Exterior Masonry Veneer: L/600.
- D. Fabrication Tolerances: 1/8 inch in 10 feet.
- E. Erection Tolerances: 1/16 inch from true position.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cold-Formed Metal Framing:
 - 1. Application: Interior steel-stud walls.
 - 2. Wall Framing: C-shaped steel studs.
 - 3. Units 16 gauge (.0598 inch) and heavier: ASTM A 653, yield point 50,000.
 - 4. Units 18 gauge (.0358 inch): ASTM A 653, yield point 37,000 psi.
 - 5. Units 20 gauge (.0329 inch): ASTM A 653, yield point 33,000 psi.
 - 6. Finish: Galvanized, ASTM A 653, G60.
 - 7. Framing Accessories:
 - a. Supplementary framing.
 - b. Bracing, bridging, and blocking.
 - c. Deflection track and vertical side clips.
 - d. Anchors, clips, and fasteners.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.
- B. Comply with requirements of ASTM C 1007 for installation of steel studs and accessories and Metal Lath/Steel Framing Association Lightweight Steel Framing Systems Manual.
- C. Restore damaged components. Protect work from damage.

END OF SECTION

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Provide rough carpentry. Submit manufacturer's product data and installation instructions for each material and product used.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data for each process.
 - 1. Include data for wood preservative treatment from chemical treatment manufacturer and certification by treating plant that treated materials comply with requirements.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
 - 1. Open web truss roof framing drawings showing layout and details necessary for determining fit and placement in the building.
 - 2. Laminated Veneer Lumber drawings showing layout and details necessary for determining fit and placement in the building.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Lumber Standards and Grade Stamps: DOC PS 20, American Softwood Lumber Standard and inspection agency grade stamps.
- C. Construction Panel Standards: DOC PS 1, U.S. Product Standard for Construction and Industrial Plywood; APA PRP-108.
- D. Wood Framing Standards: NFPA Framing Manual.
 - 1. Exterior Wall Framing: 2x6, 2x8, 2x10 nominal studs, 16 inches (40 cm) on center.
 - 2. Interior Wall Framing: 2x4, 2x6 nominal studs, 16 inches (40 cm) on center.
- E. Preservative Treatment: AWPAC C2 for lumber and AWPAC C9 for plywood; waterborne pressure treatment. Provide for wood in contact with soil, concrete, masonry, roofing, flashing, dampproofing and waterproofing.
- F. Fire-Retardant Treatment: AWPAC C20 for lumber and AWPAC C27 for plywood; noncorrosive type. Provide at building interior where required by code.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Rough Carpentry Applications:
 - 1. Manufacturers, Dimensional Lumber:
 - 2. Manufacturers, Pressure-Treated Wood Products:
 - 3. Manufacturers, Fire-Retardant Treated Wood Products:
 - 4. Manufacturers, Structural Panels:

5. Manufacturers, Sheathing:
6. Manufacturers, Open Web Trusses
7. Manufacturers, Laminated Veneer Lumber
8. Application: Framing with dimension lumber.
9. Application: Framing with engineered wood products.
10. Application: Framing with timbers.
11. Application: Rooftop equipment bases and support curbs.
12. Application: Wood grounds, nailers, and blocking.
13. Application: Wood furring.
14. Application: Backing panels.
15. Application: Sheathing.
16. Dimension Lumber:
 - a. Light Framing: Stud, No. 3 or Standard grade.
 - b. Structural Framing: No. 1 grade.
 - c. Species: Any species of grade indicated.
 - d. Exposed Framing: Appearance grade.
17. Engineered Wood Products:
 - a. Laminated-Veneer Lumber: A composite of wood veneers with grain primarily parallel to member lengths, manufactured with an exterior-type adhesive complying with ASTM D 2559.
 - b. Prefabricated Open Web Trusses: Provide engineers shop drawings of open web trusses to Architect prior to fabrication and installation.
18. Construction Panels:
 - a. Plywood Wall Sheathing: Exposure 1, Structural I sheathing.
 - b. Oriented-Strand-Board Wall Sheathing: Exposure 1, Structural sheathing.
 - c. Plywood Roof Sheathing: Exposure 1, Structural I. Sheathing.
 - d. Oriented-Strand-Board Roof Sheathing: Exposure 1, Structural I sheathing.
 - e. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated.
19. Sill Sealer Gaskets:
 - a. Material: Glass fiber strip resilient insulation.
20. Framing Anchors and Fasteners:
 - a. Material: Non-corrosive, suitable for load and exposure. Drywall screws are not acceptable.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Securely attach rough carpentry work to substrate by anchoring and fastening as indicated,
- B. Plywood: Comply with applicable recommendations contained in APA Form No. E30K, "APA Design/Construction Guide: Residential & Commercial"
- C. Provide nailers, blocking and grounds where required. Set work plumb, level and accurately cut.
- D. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with other work.
- E. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials.
- F. Restore damaged components. Protect work from damage.

END OF SECTION

SECTION 06 17 53

SHOP-FABRICATED WOOD TRUSSES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide prefabricated and pre-engineered open web wood trusses.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Show fabrication and installation details for trusses.
 - 1. Shop drawings shall be prepared and stamped by a qualified engineer licensed in the jurisdiction of the project.
 - 2. Show location, pitch, span, camber, configuration, and spacing for each type of truss required.
 - 3. Indicate sizes, stress grades, and species of lumber.
 - 4. Indicate locations of permanent bracing required to prevent buckling of individual truss members due to design loads.
 - 5. Indicate type, size, material, finish, design values, orientation, and location of metal connector plates.
 - 6. Show splice details and bearing details.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards: TPI 1, "National Design Standard for Metal Plate Connected Wood Truss Construction." and fabricate wood trusses within manufacturing tolerances in TPI 1
- C. Design Engineering: Registered engineer required to design trusses.
- D. Fire-Retardant Treatment: AWPA C20 for lumber; noncorrosive type.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wood Trusses:
 - 1. Manufacturers: Local to jobsite region
 - 2. Lumber Standard: PS 20 American Softwood Lumber Standard.
 - 3. Chord members, Connecting pins, and Bearing hardware: shall be of a material and size as required by design
 - 4. Species: Softwood species of specified grade.
 - 5. Moisture Content: Seasoned, 15 percent maximum.
 - 6. Moisture Content: Seasoned, 19 percent maximum.
 - 7. Connectors, Fasteners, and Metal Framing Anchors:
 - a. Nails, Wire, Brads, and Staples: FS FF-N-105.
 - b. Power Driven Fasteners: CABO NER-272.
 - c. Wood Screws: ASME B18.6.1.

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- d. Lag Bolts: ASME B18.2.1.
- e. Truss Tie-Downs: Bent strap tie for fastening roof trusses to wall studs below; Stainless-Steel Sheet, ASTM A 666, Type 304.

PART 3

PART 4 EXECUTION

4.1 INSTALLATION

- A. Install wood trusses only after supporting construction is in place and is braced and secured.
- B. Install and brace trusses according to TPI recommendations and within installation tolerances in TPI 1.
- C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.
- D. Hoist trusses in place by lifting equipment suited to sizes and types of trusses required, exercising care not to damage truss members or joints by out of plane bending or other causes.
- E. Anchor trusses securely at bearing points with metal tie downs. Install fasteners through each fastener hole in truss accessories according to manufacturers fastening schedules and written instructions.
- F. Install and fasten permanent bracing during truss erection and before construction loads are applied. Anchor ends or permanent bracing where terminating at walls or beams.
- G. Do not cut or remove truss members.
- H. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- I. Restore damaged components. Clean and protect work from damage.

END OF SECTION

SECTION 06 40 00

ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SUMMARY

- A. Provide interior finish carpentry, architectural woodwork, and wainscot.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards: Architectural Woodwork Institute (AWI) 'Architectural Woodwork Standards.'

PART 2 PRODUCTS

2.1 MATERIALS

- A. Interior Standing and Running Trim and Rails:
 - 1. Species: Clear Maple.
 - 2. Grade: Premium.
 - 3. Finish: refer to section 09-93-23
- B. Interior Wainscot:
 - 1. Manufacturer: Marmoleum wall panel system.
 - 2. Color: per construction documents
 - 3. Core: 1/4" MDF
 - 4. Panel Size: 38"x96"

PART 2 EXECUTION

2.1 INSTALLATION

- A. Provide trim work to sizes, shapes, and profiles indicated. Install work to comply with quality standards referenced. Back prime work and install plumb, level, and straight with tight joints, scribe work to fit.
- B. Quality Standard: Install woodwork to comply with AWI standards for the same grade specified for type of woodwork involved. Install Marmoleum wall panels per manufacturers written instructions and construction documents.
- C. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections. Substrate should be sound, relatively smooth, clean, flat, and permanently dry.
- D. Always store materials flat. Materials should be acclimated to site conditions a minimum 48 hours prior to installation.
- E. Repair minor damage, clean and protect.

- F. Areas to receive Marmoleum wall panels shall be clean, fully enclosed and weather tight with the permanent HVAC in operation.

END OF SECTION

SECTION 07 21 00

THERMAL INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide thermal insulation

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. R Value: Meet or exceed regional wall, floor, and roof R Values per ASHRAE 90.1 2010.
- B. Blanket/Batt Insulation:
 - 1. Application: Thermal insulation in studs in exterior walls.
 - 2. Unfaced or Faced glass-fiber blanket insulation: ASTM C 665, Type I (blankets without membrane facing); with maximum flame spread index of 25 and smoke developed index of 50; passing ASTM E 136 for combustion characteristics

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections. Provide full height and thickness over entire area, tightly fitting around penetrations.
- B. Water Piping Coordination: If water piping is located within exterior walls, coordinate location or piping to ensure that it is placed on the warm side of insulation, and insulation encapsulates piping.

END OF SECTION

SECTION 07 21 13

BOARD INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide foam board insulation for below grade building foundation wall perimeter insulation.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. R Value: Meet or exceed regional below grade wall and slab on grade R Values per ASHRAE 90.1 2010.
- B. Materials shall meet the property requirements of one or more of the following specifications as applicable to the specific product of end use:
 - 1. ASTM C 578: Standard specification for rigid cellular polystyrene thermal insulation.
 - 2. ASTM C 518: Thermal resistance value (R).
 - 3. ASTM D 1621: Compressive strength, select appropriate type and thickness for application.
- C. Extruded polystyrene (XPS) rigid board insulation:
 - 1. Application: below grade foundation wall insulation.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials in accordance with manufacturer's written instructions. Provide full height and thickness over entire area. Cut insulation to fit snugly and continuously around any and all projections and irregularities on wall surface.
- B. Verify that all masonry joints are struck flush and that other conditions are satisfactory for proper installation. Remove concrete fins and mortar projections that interfere with placement of insulation boards.
- C. Protect installed insulation from damage and exposure to sun.

END OF SECTION

SECTION 07 24 00

EXTERIOR INSULATION AND FINISH SYSTEMS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide Weather Barrier and Exterior Insulation and Finish Systems with cavity drainage system.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- C. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 10 years.

1.3 QUALITY ASSURANCE

- A. Installer qualifications: Certified in writing by EIFS manufacturer to install manufacturers system using trained workers
- B. Source Limitations: Obtain EIFS through one source from a single EIFS manufacturer and from sources approved by EIFS manufacturer as compatible with system components.
- C. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 PRODUCTS

2.1 MATERIALS

- A. EIFS: STO Therm Essence Next system
 - 1. Manufacturers: Sto Corp.
 - 2. Type: EIMA Class PB.
 - 3. Finish Coat: Sto Essence DPR finish – acrylic based textured wall coating with graded marble aggregate and dirt pick-up resistance technology.
 - 4. Base Coat: Sto Primer/Adhesive B - one component polymere modified cement based factory blended base coat.
 - 5. Reinforcing Mesh:
 - a. Standard Reinforcing Mesh: Sto Mesh - nominal 4.5 oz./yd², symmetrical, interlaced open-weave glass fiber fabric made with alkaline resistant coating for compatibility with EIFS materials.
 - b. High-Impact Mesh: Sto Armor Mat--nominal 15 oz./yd², ultra-high impact, double strand, interwoven, open-weave glass fiber fabric with alkaline resistant coating for compatibility with EIFS materials.
 - 6. Insulation Board: Nominal 1.0 lb/ft³ Expanded Polystyrene (EPS) insulation board in compliance with ASTM E 2430 and ASTM C 578 Type I requirements.
 - 7. Adhesive/Drainage Layer: Sto Primer/Adhesive-B - one component polymer modified cement based, factory blend adhesive. Vertically oriented adhesive ribbons.
 - 8. Trim Accessories: Starter Track – rigid PVC plastic track Part No. STDE as furnished by Plastic Components Inc., 9051 NW 97th Terrace, Miami FL 33179 (800-327-7077)

PART 3 EXECUTION

3.1 INSTALLATION

- A. Inspect substrate and report unsatisfactory conditions in writing; beginning work means acceptance of substrate.
- B. Comply with ASTM C 1397 and EIFS manufacturers written instructions for installation of EIFS as applicable to each type of substrate indicated.
- C. Comply with system manufacturer's instructions and recommendations; admixtures shall not be used. Provide reinforced base and finish coats to provide a uniform appearance. Completely cover all insulation board including edges. Provide soft joints at all changes of substrate and at intervals suggested by manufacturers and at approved locations. Install areas of special patterns where indicated on drawings. Clean and protect work.

END OF SECTION

SECTION 07 27 26

FLUID APPLIED MEMBRANE AIR BARRIERS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide fluid applied air and moisture barriers.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Manufacturers requirements:
 - 1. Manufacturer of exterior wall waterproof air barrier materials for a minimum of 30 years in North America
 - 2. ISO 9001:2000 certified quality system and ISO 14001:2004 certified environmental management system.
- C. Warranty: Provide manufacturers standard warranty.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Primary Air Barrier Material: StoGuard with Sto Gold Coat - ready-mixed flexible spray or roller applied waterproof air barrier membrane material
- B. Joint Treatments:
 - 1. Sto Gold Fill[®] with StoGuard Mesh: ready mixed flexible trowel or spray applied air barrier material
 - 2. StoGuard[®] Rapid Seal[™] with StoGuard Mesh: moisture cure elastomeric waterproof air barrier material
 - 3. Sto Gold Coat with StoGuard Fabric: flexible waterproof air barrier membrane material
- C. Joint Reinforcements:
 - 1. StoGuard Mesh: nominal 4.2 oz/yd² (142 g/m²) self-adhesive, flexible, symmetrical, interlaced glass fiber reinforcing mesh, with alkaline resistant coating for compatibility with Sto materials
 - 2. StoGuard Fabric: non-woven integrally reinforced cloth reinforcement
 - 3. StoGuard RediCorner[™]: non-woven integrally reinforced pre-formed cloth
- D. Transition Membranes:
 - 1. Sto Gold Fill with StoGuard Mesh: ready mixed flexible trowel or spray applied air barrier material with treated glass fiber reinforcing mesh
 - 2. StoGuard RapidSeal or StoGuard RapidSeal with StoGuard Mesh: moisture cure elastomeric waterproof air barrier material with treated glass fiber reinforcing mesh (where applicable)
 - 3. Sto VaporSeal with StoGuard Fabric: flexible waterproof air barrier membrane material with non-woven integrally reinforced cloth

4. StoGuard Tape: self adhering rubberized asphalt tape with polyester fabric facing
- E. Primers:
 1. StoGuard Primer: rubber resin emulsion primer for use with StoGuard Tape to enhance adhesion and allow installation down to 35 degrees F (1.7 degrees C).

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Provide full height and thickness over entire area, tightly fitting around penetrations.
- B. Coordinate work with other trades to ensure air barrier continuity with connections at foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line.
- C. Rough opening protection: Install transition membrane into and around rough opening. Refer to STO details and applicable product bulletins.
- D. Sheathing Joints: Install joint treatment material with applicable reinforcement over sheathing joints. Refer to Sto detail 20.00a and applicable Sto product bulletins
- E. Transitions: install air barrier accessory materials (with reinforcement where applicable), or auxiliary material at transition areas: foundation, floor lines, flashings, lintels and shelf angles, openings and penetrations such as pipes, vents, windows and doors, masonry anchors, rafters or beams, joints in construction, projections such as decks and balconies, and roof line. Refer to Sto Tech Hotline No. 0211-BSc and applicable Sto product bulletins.
- F. Install cladding within 180 days of waterproof air barrier installation.
- G. Protect installed air and moisture barriers.

END OF SECTION

SECTION 07 42 13

METAL WALL PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide manufactured metal wall panels.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Warranty: Submit manufacturers standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 10 year finish IAW AAMA – 2605.
 - 2. Warranty Period: 10 year panel.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Metal Wall Panels:
 - 1. Material Manufacturer: Alpolic Materials by Mitsubishi Plastics Composites America, Inc.
 - a. 3mm Alpolic prefinished panels.
 - 2. Supplier/Fabricator: NuLook Exteriors
 - 3. Concealed fasteners.
 - 4. Translucent Panels: Polyester plastic.
 - a. Standard: ASTM D 3841, Type CC1, limited flammability type.
 - 5. Panel Supports and Anchorage:
 - a. Wall Girts: C or Z shaped sections, 16 gauge (.0598 inch) steel, shop painted.
 - b. Flange and Sag Bracing: 16 gauge (.0598 inch) steel, shop-painted.
 - c. Base and Sill Angles: 14 gauge (.0747 inch) galvanized steel.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged components and finishes. Clean and protect work from damage.

END OF SECTION

SECTION 07 54 00

PVC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide PVC membrane roofing, flashings, and rigid roof deck insulation.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Warranty: Submit manufacturers standard warranty with no dollar limit, in which manufacturer agrees to repair or replace components of membrane roofing system that fail in material or workmanship within specified warranty period. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 15 years, issued direct from manufacturer.
 - 2. No exclusions for damage caused by ponding of water, biological growth, and for incidental or consequential damage.
 - 3. Transferable for the full term of the warranty.
 - 4. No additional charge for the warranty.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Listing: UL Class A external fire exposure:
- C. Listing: FM Class I construction.

PART 2 PRODUCTS

2.1 MATERIALS

- A. PVC Membrane Roofing:
 - 1. Manufacturers: Duro-Last Roofing, Inc.
 - 2. Type: Mechanically attached.
 - 3. Membrane: PVC, 50 mils.
 - a. Standard: ASTM D 4434 Type III, fabric reinforced.
 - 4. Color: White
- B. Flashings & Accessory Materials: Provide all necessary flashings and accessory materials as required for completion of roof to water tight conditions.
 - 1. Manufacturers: Duro-Last Roofing, Inc.
 - 2. Color: White
 - 3. Sheet Flashing: Duro-Last white 50-mil reinforced PVC Duro-Last Parapet Flashing membrane with 28" tabs
 - 4. Prefabricated Flashing: Prefabricated stack flashings for pipes, wind screen support

5. Prefabricated inside and outside corner of Duro-Last white 40-mil reinforced PVC sheet membrane
 6. Sealants and Adhesives: Duro-Caulk Plus, pitch pocket filler, Sure Bond 240 mastic as supplied by Duro-Last Roofing Inc.
 7. Slip Sheet and Cover Boards: Slip sheet or cover boards, of type required by roof membrane manufacturer for the application.
 8. Termination Bars: Standard rigid exterior vinyl bar, 1.5 inches (38 mm) wide with slotted holes 6 inches (152 mm) on center.
 9. Scupper Flashing: Prefabricated Duro-Last® Vinyl-Coated Metal Flange Scuppers with single skirt.
 10. Dome Strainer: Blue dome strainer should be used with roof drains 6" in diameter or less. Proper sized drain boot should also be installed using Duro-Caulk Plus and CDR ring.
 11. Edge Detail: Fascia bar and cover, prefabricated Drip Edge, prefabricated Gravel Stop, 2-Piece Compression Metal Edge.
 12. Vinyl Coated Metal: 24 gauge, hot-dipped galvanized, grade 90 metal with a minimum of 17 mil of Duro-Last membrane laminated to one side.
 13. Fasteners: #14 Heavy-Duty factory-coated steel fasteners and metal and plastic plates meeting corrosion-resistance provisions in FMG 4470, designed for fastening membrane to substrate.
 14. Roof Trac III walkway pads- 60 "x 60 " Roof Trac III walkway pads to be installed on service side of all mechanical equipment, roof hatch and roof ladder.
- C. Insulation Board:
1. Polyisocyanurate Insulation: ASTM C 1289, Type II.
 2. Provide preformed saddles, crickets, tapered edge strips, and other insulation shapes where indicated for proper slope to drain.
 3. R Value: Meet or exceed regional roof R Value per ASHRAE 90.1 2010.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Inspect substrate and report unsatisfactory conditions in writing. Beginning work means acceptance of substrate.
- B. Comply with roof system manufacturer's instructions and recommendations; clean, prime and prepare substrate.
- C. Install insulation with tightly butted joints and neatly fitted around penetrations.
- D. Minimize seams and shingle overlaps to shed water.
- E. Final roof inspection: Arrange for Duro-Lasts technical representative to inspect roofing installation on completion.
 1. Deficiencies: any deficiencies identified during the inspection will be corrected and make ready for re-inspection within five (5) working days. Such corrections will be made at no expense to the owner.
 2. Warranty: Upon receipt of the required materials, certifying inspection and acceptance of the installation by Duro-Last, the warranty shall be duly executed and issued to the owner.
- F. Install walkway protection over an additional layer of membrane at locations indicated and

where required to provide access to roof mounted equipment.

- G. Restore or replace damaged components. Protect work from damage.

END OF SECTION

SECTION 07 62 00

ALUMINUM FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

- A. Provide aluminum flashing, trim, and eyebrows.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Flashing and Sheet Metal:
 - 1. Manufacturers: NuLook Exteriors Inc.
 - 2. Application: Exposed metal flashings.
 - 3. Application: Exposed metal trim and eyebrow units.
 - 4. Application: Eyebrow rain screens.
 - 5. Metal: Aluminum.
 - a. Standard: ASTM B 209, alloy 3003, prefinished 2-coat 70% fluoropolymer, .040 aluminum (.05000 inch).
 - b. Refer to construction documents for color.
- B. Auxiliary Materials:
 - 1. Exposed fasteners: Heads matching color of sheet metal.
 - 2. Blind fasteners: High strength aluminum or stainless steel rivets.
 - 3. Fastener for flashing or trim: Blind fasteners or gasketed self drilling screws.
 - 4. Elastomeric sealant: ASTM C 920, elastomeric polyurethane, polysulfide or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim to remain water tight.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Follow recommendations of SMACNA Sheet Metal Manual. Allow for expansion. Isolate dissimilar materials.

- B. Fabricate sheet metal flashing and trim without excessive oil canning, buckling, and tool marks and true to line and levels indicated, with exposed edges folded back to form hems.
- C. Sealed joints: form no expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- D. Expansion Provision: where lapped or bayonet type expansion provisions in the work cannot be used, form expansion joints of intermeshing hooked flanges, not less than one inch deep, filled with sealant concealed within joint.
- E. Conceal fasteners and expansion provisions where possible on exposed to view sheet metal flashing and trim.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, non corrosive metal, and in thickness not less than that of metal being secured.
- G. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- H. Restore damaged components and finishes. Clean and protect work from damage.

END OF SECTION

SECTION 07 71 13

MANUFACTURED COPINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide manufactured scuppers, downspouts, and copings.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Scupper and Downspout Systems:
 - 1. Material Manufacturer: Una-Clad
 - 2. Manufacturer: Roofing contractor
 - 3. Thickness: 24 gauge Steel
 - 4. Color: refer to construction documents.
- B. Copings,
 - 1. Material Manufacturer: Una-Clad
 - 2. Supplier/Fabricator: NuLook Exteriors
 - 3. Interlocking multi-part coping system, 24 gauge sheet metal.
 - 4. Color: refer to construction documents.
- C. Auxiliary Materials:
 - 1. Exposed fasteners: Heads matching color of sheet metal.
 - 2. Blind fasteners: High strength aluminum or stainless steel rivets.
 - 3. Fastener for flashing or trim: Blind fasteners or gasketed self drilling screws.
 - 4. Elastomeric sealant: ASTM C 920, elastomeric polyurethane, polysulfide or silicone polymer sealant; of type, grade, class, and use classifications required to seal joints in sheet metal flashing and trim to remain water tight.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Follow recommendations of SMACNA Sheet Metal Manual. Allow for expansion. Isolate dissimilar materials.
- B. Fabricate coping without excessive oil canning, buckling, and tool marks and true to line and

levels indicated, with exposed edges folded back to form hems.

- C. Sealed joints: form no expansion but movable joints in metal to accommodate elastomeric sealant to comply with SMACNA recommendations.
- D. Expansion Provision: where lapped or bayonet type expansion provisions in the work cannot be used, form expansion joints of intermeshing hooked flanges, not less than one inch deep, filled with sealant concealed within joint.
- E. Conceal fasteners and expansion provisions where possible on exposed to view sheet metal flashing and trim.
- F. Fabricate cleats and attachment devices from same material as accessory being anchored or from compatible, non corrosive metal, and in thickness not less than that of metal being secured.
- G. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- H. Restore damaged components and finishes. Clean and protect work from damage.

END OF SECTION

SECTION 07 92 00

JOINT SEALANTS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide joint sealers and fillers.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
 - 1. Include manufacturers full range of color and finish options if additional selection is required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Exterior Joints in Vertical Surfaces, Silicone:
 - 1. Materials: Two component silicone sealant.
- B. Exterior Joints in Vertical Surfaces, Urethane:
 - 1. Materials: Two-component urethane sealant.
- C. Exterior Joints in Horizontal Surfaces, Urethane:
 - 1. Materials: Self-leveling urethane sealant, ASTM C 920.
- D. Exterior Paving Joint Fillers, Bituminous:
 - 1. Materials: Bituminous fiber.
- E. Interior Joints, Limited Movement, Acrylic:
 - 1. Materials: Acrylic-emulsion, ASTM C 834.
- F. Interior Joints, Sanitary Silicone:
 - 1. Materials: One-part mildew-resistant silicone sealant, ASTM C 920.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Examine substrate; report unsatisfactory conditions in writing. Beginning work means acceptance of substrates.
- B. Provide sealants in colors as selected from manufacturer's standards.

- C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Clean and prime joints, and install bond breakers, backer rods and sealant as recommended by manufacturers.
- D. Depth shall equal width up to 1/2 inch wide; depth shall equal 1/2 width for joints over 1/2 inch wide.
- E. Cure and protect sealants as directed by manufacturers. Replace or restore damaged sealants. Clean adjacent surfaces to remove spillage.

END OF SECTION

SECTION 08 11 13

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide steel doors and frames.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards: ANSI/SDI-100, Recommended Specifications for Standard Steel Doors and Frames.
- C. Performance Standards:
 - 1. Fire-Rated Assemblies: NFPA 80, and acceptable testing agency listing.
 - 2. Thermal-Rated Assemblies at Exterior: ASTM C 236 or ASTM C 976.
 - 3. Sound-Rated Assemblies at Mechanical Rooms: ASTM E 1408, and ASTM E 413.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Interior Steel Frames:
 - 1. Material: Minimum 16 gauge steel sheet.
 - 2. Corners: Mitered or coped.
 - 3. Type: KD afterset drywall.
 - 4. Finish: Factory primed complying with ANSI A250.10 and field painted.
 - 5. Jamb Anchors: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c.
- B. Exterior Steel Doors:
 - 1. Material: Minimum 18 gauge galvanized steel sheet.
 - 2. Door Thickness: 1-3/4 inches, thermally insulated.
 - 3. Finish: Factory primed and field painted.
- C. Exterior Steel Frames:
 - 1. Material: Minimum 16 gauge galvanized steel sheet.
 - 2. Corners: Mitered or coped.
 - 3. Type: Welded.
 - 4. Finish: Factory primed complying with ANSI A250.10 and field painted.
 - 5. Jamb Anchors: Locate anchors not more than 18 inches from top and bottom of frame. Space anchors not more than 32 inches o.c.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Fabricate work to be rigid, neat and free from seams, defects, dents, warp, buckle, and exposed fasteners. Install doors and frames in compliance with SDI-100, NFPA 80, and requirements of authorities having jurisdiction.
- B. Provide thermally improved doors with maximum U-value of 0.24 BTU/hr./sq. ft. degree F (ASTM C 236) for all exterior doors and elsewhere as noted.
- C. Hardware: Prepare doors and frames to receive hardware on final schedule. Provide for 3 silencers on single doorframes; 2 on double doorframes.
- D. Final Adjustments: Check and readjust operating hardware items immediately before final inspection. Leave work in complete and proper operating condition. Remove and replace defective work, including steel doors and frames that are warped, bowed, or otherwise unacceptable.
- E. Shop Finish: Clean, treat and prime paint all work with rust-inhibiting primer comparable with finish paint specified in Division 9 section. Provide asphalt emulsion sound deadening coating on concealed frame interiors.
- F. Touch-up damaged coatings ready to receive finish painting.

END OF SECTION

SECTION 08 14 00

WOOD DOORS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide wood doors.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- C. Warranty: Submit manufacturers standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Solid-Core Interior Doors: Life of installation.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Quality Standards for Stile and Rail Doors: NWWDA I.S. 6.
- C. Quality Standards: [NWWDA I.S.1-A, 'Architectural Wood Flush Doors.'] [AWI's 'Architectural Woodwork Quality Standards Illustrated.'].]
- D. Quality Standards: [NWWDA I.S.1-A, 'Architectural Wood Flush Doors.'] [WIC's 'Manual of Millwork.'].]
- E. Fire Rated Wood Doors: Meet NFPA 80 requirements.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Interior Flush Wood Doors:
 - 1. Manufacturers:
 - 2. Type: Lumber core.
 - 3. Thickness: 1-3/4 inches thick.
 - 4. Face: Plastic Laminate as scheduled.
 - 5. Finish Application: Factory finished.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with NWMA I.S. 1A and specified quality standard.
- B. Prefit doors to frames. Premachine doors for hardware listed on final schedules. Factory bevel doors.

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- C. Install doors with not more than 1/8 inch clearance at top and sides, 1/4 inch at bottom. Comply with NFPA 80 for rated assemblies.
- D. Adjust, clean, and protect.

END OF SECTION

SECTION 08 31 00

ACCESS DOORS AND PANELS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide access doors and panels for walls and ceilings.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Access Doors:
 - 1. Manufacturers:
 - 2. Frames: 16-gauge (.0598 inch) sheet steel with flange.
 - 3. Frames: 16-gauge (.0598 inch) stainless steel, AISI No. 4 satin finish with flange.
 - 4. Doors: 14-gauge (.0625 inch) sheet steel.
 - 5. Doors: 14-gauge (.0625 inch) stainless steel, AISI No. 4 satin finish.
 - 6. Door Type: Flush panel.
 - 7. Door Type: Recessed panel.
 - 8. Locking Devices: Cylinder locks.
 - 9. Fire Rating: NFPA 80.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Install assemblies complete with all hardware, anchors, inserts, supports and accessories. Test and adjust operation.
- B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 08 41 13

ENTRANCES AND STOREFRONTS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide entrances and storefront.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish.
- D. Product Test Reports: for each material used.
- E. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Assembly Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials. Two years from substantial completion.
 - 2. Finish Warranty: 20 Years from date of substantial completion.
- F. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Provide systems including anchorage capable of withstanding, without failure, the effects of the following:
 - 1. Structural Loads.
 - 2. Thermal Movements.
 - 3. Movements of supporting structure indicated on construction documents
 - 4. Temperature Change (range): Systems accommodate 120 degrees F, ambient; 180 degrees F, material surfaces.
 - 5. Air infiltration: Maximum air leakage through fixed glazing and framing areas of systems of 0.06 cfm/sf when tested according to ASTM E 283 at a minimum static air pressure difference of 6.24 lbf/sf.
 - 6. Water Penetration Under Static Pressure: Systems do not evidence water penetration through fixed glazing and framing areas tested under ASTM E 331 at a minimum static air pressure difference of 20% of positive wind load design pressure, but not less than 6.24 lbs/sf
 - 7. Condensation Resistance: Fixed glazing and framings areas of systems have condensation resistance factor (CRF) of not less than 53 tested according to AAMA 1503.

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8. Average Thermal Conductance: Fixed glazing and framings areas of systems have average U-factor of not more than 0.69 btu/sf x h x degrees F when tested according to AAMA 1503.

- C. Aluminum Members: ASTM B 209, ASTM

PART 2 PRODUCTS

2.1 MATERIALS

- A. Aluminum Entrances and Storefront:
 1. Manufacturers: YKK AP
 2. Aluminum Members: ASTM B 209, ASTM B 221, ASTM B 429.
 3. Steel Reinforcement: ASTM A 36, ASTM A 1008, and ASTM A 1011.
 4. Door Style: Medium stile and rail doors.
 5. Storefront Style: Aluminum framed.
 6. Glass and Glazing: Insulating glazing, tempered.
 7. Glazing Color: Clear with Low-e coating.
 8. Door Hanging Devices: Ball bearing butts.
 9. Closers: Concealed mounted.
 10. Closers: Surface mounted.
 11. Closer Operation: Single acting closers.
 12. Aluminum Finish: Specified on construction documents.
 13. Auxiliary Materials:
 - a. Aluminum infill panels.
 - b. Push/pulls, doorstops, overhead holders, and deadlocks.
 - c. Weather stripping and thresholds.
 - d. Exit devices.
 - e. Electric-strike release.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Take field measurements before fabrication where possible; do not delay job progress.
- B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- C. Anchor securely in place; install plumb, level and in true alignment. Isolate dissimilar materials to prevent corrosion.
- D. Install components to weep water from condensation occurring within framing members and moisture migrating within the system to the exterior.
- E. Set continuous sill members and flashing in full sealant bed and install perimeter joint sealants to produce a weather tight closure.
- F. Entrance: Install to produce smooth operation and tight fit at contact points.
 1. Exterior entrances: Install to produce tight fit at weather stripping and weather tight closure
 2. Field installed hardware: Install surface mounted hardware according to hardware manufacturer's written instruction using concealed fasteners to greatest extent possible.
- G. Coordinate with glass and glazing work; install hardware and adjust for smooth, proper

operation.

- H. Clean and protect completed system; repair damage.

END OF SECTION

SECTION 08 71 00

DOOR HARDWARE

PART 1 GENERAL

1.1 SUMMARY

- A. Provide door hardware.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Submit for approval hardware schedule proposed for use based on Owner's requirements.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Hardware for Fire-Rated Openings: NFPA 80, and local requirements.
- C. Materials and Application: ANSI A156 series standards.
- D. Warranty: Manufacturers standard form in which manufacturer agrees to repair or replace components that fail in materials or workmanship within specified warranty period.
 - 1. Typical Warranty: Three years from date of substantial completion.
 - 2. Manual closers: Ten year warranty from date of substantial completion.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Scheduled Hardware: Provide door hardware for each door to comply with requirements in this section and door hardware sets indicated in door and frame schedule on construction documents.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Follow guidelines of DHI 'Recommended Locations for Builder's Hardware and hardware manufacturers' instructions.
- B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- C. Keying: All cylinders to be keyed per owners requirements.
- D. Adjust operation, clean and protect.

END OF SECTION

SECTION 08 80 00

GLAZING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide glass and glazing.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Insulating Glass: Manufacturer's 10-year warranty.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Glazing for Fire-Rated Assemblies: Glazing for assemblies that comply with NFPA 80
- C. Safety Glazing Products: Comply with testing requirements in 16 CFR 1201 and, for wired glass, ANSI Z97.1.
- D. Glazing Publications:
 - 1. GANA Publications: GANA's 'Glazing Manual.' and 'Laminated Glass Design Guide.'
 - 2. AAMA Publications: AAMA GDSG-1, 'Glass Design for Sloped Glazing,' and AAMA TIR-A7, 'Sloped Glazing Guidelines.'
 - 3. IGMA Publication for Sloped Glazing: IGMA TB-3001, 'Sloped Glazing Guidelines.'
 - 4. IGMA Publication for Insulating Glass: SIGMA TM-3000, 'Glazing Guidelines for Sealed Insulating Glass Units.'

PART 2 PRODUCTS

2.1 MATERIALS

- A. Glass and Glazing:
 - 1. Type: High-performance insulating glass units with low-e coating, tempered at locations as required by code.
 - 2. Auxiliary Materials:
 - a. Compression gaskets.
 - b. Elastomeric glazing sealants.
 - c. Preformed glazing tapes.
 - d. Glazing gaskets.
 - e. Setting blocks, spacers, and compressible filler rods.

PART 3 EXECUTION

3.1 INSTALLATION

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- A. Inspect framing and report unsatisfactory conditions in writing.
- B. Comply with GANA "Glazing Manual" and manufacturers instructions and recommendations. Use manufacturer's recommended spacers, blocks, primers, sealers, gaskets and accessories.
- C. Install glass with uniformity of pattern, draw, bow and roller marks.
- D. Install sealants to provide complete wetting and bond and to create a substantial wash away from glass.
- E. Remove and replace damaged glass and glazing. Wash, polish and protect all glass supplied under this section.

END OF SECTION

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide gypsum board assemblies.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Tolerances: Not more than 1/16-inch difference in true plane at joints between adjacent boards before finishing. After finishing, joints shall be not be visible. Not more than 1/8 inch in 10 feet deviation from true plane, plumb, level and proper relation to adjacent surfaces in finished work.
- C. Fire Resistance for Fire-Rated Assemblies: ASTM E 119.
- D. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Gypsum Board:
 - 1. Application: Interior walls, partitions, and ceilings with tape and joint compound finish.
 - 2. Application: Cementitious backer units for application of tile.
 - 3. Application: Installation of access panels in gypsum board assemblies.
 - 4. Material Standard: ASTM C1396.
 - 5. Type: Board for tape and joint compound finish.
 - a. Type: Regular, moisture-resistant and fire-rated types as required.
 - b. Typical Thickness: 5/8 inch.
 - 6. Type: Water-resistant gypsum backing board.
 - a. Type: Regular and fire-rated types as required:
 - b. Typical Thickness: 5/8 inch.
 - 7. Joint Treatment: ASTM C474 and ASTM C840, 3-coat system, paper or fiberglass tape.
 - 8. Auxiliary Materials:
 - a. Cornerbead, edge trim and control joints.
 - b. Extruded aluminum reveals and channels.
 - c. Gypsum board screws, ASTM C 1002.
 - d. Fastening adhesive.
 - e. Concealed acoustical sealant.
 - f. Mineral fiber sound attenuation blankets.
 - g. Polyethylene vapor retarder, 6 mils.
 - h. Acoustical finish.

- B. Glass-Mat Water-Resistant Gypsum Backing Board:
 - 1. Material Standard: ASTM C1178.
 - 2. Type: Regular and fire-resistant as required.
 - a. Typical Thickness: 5/8 inch.
- C. Cementitious Backer Units:
 - 1. Material Standard: ANSI A118.9.
 - 2. Type: Cement-coated Portland cement panels.
 - a. Thickness: 1/2 inch nominal.
- D. Steel Framing for Walls and Partitions:
 - 1. Material Standard: ASTM C645.
 - 2. Stud Thickness: 20 gauge (.0329 inch).
 - 3. Stud Thickness: 22 gauge (.0276 inch).
 - 4. Stud Thickness: 25 gauge (.0179 inch).
 - 5. Stud Depth, Typical: 6 inches.
 - 6. Auxiliary Framing Components: Furring brackets, resilient furring channels, Z-furring members, and non-corrosive fasteners.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Steel Framing: Install steel framing in compliance with ASTM C 754. Install with tolerances necessary to produce substrate for gypsum board assemblies with tolerances specified. Include blocking for items such as railings, grab bars, casework, toilet accessories, window treatment and similar items.
- B. Wood Framing: Install wood framing in compliance with Section 06100 - Rough Carpentry. Install with tolerances necessary to produce substrate for gypsum board assemblies with tolerances specified. Include blocking for items such as railings, grab bars, casework, toilet accessories, window treatment and similar items.
- C. Tape and Joint Compound: Install gypsum board for tape and 3-coat joint compound finish in compliance with ASTM C 840 and GA 216, Level 4 finish. Install gypsum board assemblies true, plumb, level and in proper relation to adjacent surfaces.
- D. Provide fire-rated systems where indicated and where required by authorities having jurisdiction.
- E. Install boards vertically. Do not allow butt-to-butt joints and joints that do not fall over framing members.
- F. Where new partitions meet existing construction, remove existing cornerbeads to provide a smooth transition.
- G. Provide insulation full height and thickness in partitions at conference rooms, toilet rooms, between different occupancies, and where required.
- H. Provide acoustical sealant at both faces at top and bottom runner tracks, wall perimeters, openings, expansion and control joints.
- I. Install trim in strict compliance with manufacturer's instructions and recommendations.
- J. Repair surface defects. Leave ready for finish painting or wall treatment.

END OF SECTION

SECTION 09 30 00

TILING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide tile.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Tile manufacturer (single source responsibility): Company specializing in ceramic tile, mosaics, pavers, trim units and/or thresholds with three (3) years minimum experience. Obtain tile from single source with resources to provide products of consistent quality in appearance and physical properties. ANSI A 137.1
- B. Installation system manufacturer (single source responsibility): Laticrete International, Inc. Obtain installation materials from single source supplier to insure consistent quality and full compatibility. ANSI A 118 series standard specifications.
- C. Installer qualifications: Company specializing in installation of ceramic tile, mosaics, pavers, trim units and thresholds with documented experience with installations of similar scope, materials and design. ANSI 108 series standard specifications and Tile Council of America, Handbook for Ceramic Tile Installation.
- D. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- E. Pre installation job site meeting or conference call: At least three weeks prior to commencing the work contractor to set up a meeting to discuss conformance with requirements of specification and job site conditions. Representatives of owner, architect, general contractor, tile subcontractor, Tile Manufacturer, Installation System Manufacturer and any other parties who are involved in the scope of this installation must attend the meeting.
- F. The contractor warrants the work of this Section to be in accordance with the Contract Documents and free from faults and defects in materials and workmanship for a period of one (1) year. Laticrete International, Inc. shall provide a written twenty five (25) year system warranty, which covers materials and labor - reference Manufacturer Warranty Data Sheet for complete details and requirements. For exterior facades over steel or wood framing, Laticrete International, Inc. shall provide a written ten (10) year warranty, which covers replacement of Manufacturer products only – reference Warranty Data Sheet for complete details and requirements.
- G. Extra Stock: Submit extra stock equal to 2% of amount installed.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Tile:
 - 1. Manufacturers: Specified on construction documents.

ADQ PROJECT MANUAL

2. Application: Interior wall tile over gypsum wallboard.
 3. Application: Interior wall tile over tile backer board at wet areas.
 4. Application: Interior floor tile over concrete slab.
 5. Type: Ceramic mosaic tile.
 6. Type: Porcelain tile.
 7. Type: Quarry tile.
 8. Type: Glass Tile.
 9. Type: Slate Tile.
- B. Setting Materials: Laticrete International, Inc.
1. Thin-set mortar.
 - a. 254 Platinum, slurry bond coat
 - b. Glass Tile Adhesive
 - c. 255 Multimax, thin bed / adhesive method
 - d. Latapoxy300, Chemical resistant epoxy adhesive
 2. Grout: specified on construction documents.
 - a. Permacolor Select, grout with sealer.
 - b. Spectralock 2000 IG. Chemical-resistant epoxy grout.
 3. Edge Protection: specified on construction documents.
 - a. Application: corner protection.
 - b. Finish: polished chrome anodized aluminum.
 - c. Height: as required.
 4. Waterproofing membrane under tile.
 - a. Hydro Ban. ANSI A 118.10.
 5. Crack suppression membrane under tile.
 - a. Hydro Ban. ANSI A 118.10.
 6. Elastomeric sealants.
 - a. Latasil 100% silicone.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with Tile Council of America and ANSI Standard Specifications for Installation for substrate and installation required. Comply with manufacturer's instructions and recommendations.
- B. Install waterproof membrane in accordance with manufacturer's instructions and recommendations.
- C. Lay tile in grid pattern with alignment grids. Layout tile to provide uniform joint widths and to minimize cutting; do not use less than 1/2 tile units.
- D. Provide sealant joints where recommended by TCA and approved by Architect.
- E. Install edge protection profiles with accessories per manufacturers written instructions.
- F. Grout and cure, clean and protect.

END OF SECTION

SECTION 09 51 00

ACOUSTICAL CEILINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide acoustical ceilings and suspension systems.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities. Acoustical performance based on project requirements.
- C. Extra Stock: Submit extra stock equal to 2 percent of amount installed.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Mineral Fiber Acoustical Ceilings:
 - 1. Manufacturers: Specified on construction documents.
 - 2. Panel Size: 24"x48" and 24"x24"
 - 3. Panel Edge: As selected.
 - 4. Grid: Exposed flush grid.
 - 5. Suspension System: Intermediate duty.
 - 6. Auxiliary Materials:
 - a. Edge molding and trim.
 - b. Hold-down clips and impact clips.
 - c. Concealed acoustical sealant.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and suspension systems in accordance with manufacturer's instructions and recommendations, and ASTM C 636. Coordinate installation with location of mechanical and electrical work to ensure proper locations and anchorage.
- B. Level ceiling to within 1/8 inch in 10 feet in both directions. Scribe and cut panels to fit accurately. Measure and layout to avoid less than half panel units.
- C. Removal and reinstallation at existing ceilings: Remove and store materials for reuse when allowed. Handle with white gloves and avoid damaging corners and edges. Clean tiles and grid system, which have been removed. Provide additional materials to complete the work and to replace damaged existing materials. New materials shall match existing materials as approved.

ADQ PROJECT MANUAL

- D. Adjust, clean, and touch-up all system components.

END OF SECTION

SECTION 09 70 00

WALL FINISHES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide wall coverings and surface preparation.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Performance: Fire performance meeting requirements of building code and local authorities.
- C. Extra Stock: Submit extra stock equal to 2 unopened rolls of each type of wall covering used.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Vinyl Wall Covering:
 - 1. Manufacturers: Specified on construction documents.
 - 2. Stain Resistance: Factory applied polyvinyl fluoride or polymer coating.
 - 3. Serviceability: ASTM F 793 for peelable or strippable wall coverings.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Acclimatize materials; prime and seal substrates; test substrates for moisture content and prepare surfaces in compliance with manufacturer's recommendations.
- B. Install in accordance with manufacturer's instructions. Apply adhesive and install with seams plumb and overlapped and double-cut to ensure tight closure except where pattern would not match. Do not place seams within 6" of corners.
- C. Remove air bubbles, blisters, wrinkles and other defects; horizontal seams are not permitted. Remove excess adhesive immediately; clean walls and protect surfaces.

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide painting and surface preparation.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Regulations: Compliance with VOC and environmental regulations.
- C. Extra Stock: Submit 2 unopened gallons of each paint and color used in the project.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Painting:
 - 1. Manufacturers: Benjamin Moore & Co.
Benjamin Moore's national account customer care specification assurance program
Hours: 8am – 7pm EST Phone: 877-623-8484 Fax: 630-784-7639
bmnaaccountercare@benjaminmoore.com
 - 2. Application: Interior unfinished surfaces, specified on construction documents.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Inspect surfaces, report unsatisfactory conditions in writing; beginning work means acceptance of substrate.
- B. Comply with manufacturer's instructions and recommendations for preparation, priming and coating work. Coordinate with work of other sections.
- C. At existing areas to be repainted, remove blistered or peeling paint to sound substrates. Remove chalk deposits and mildew and wash all surfaces with mild detergent. Perform related minor preparation including caulk and glazing compounds. Spot prime bare areas before priming and painting as specified.
- D. Re-coat or remove and replace work which does not match or shows loss of adhesion. Clean up, touch up and protect work.

END OF SECTION

SECTION 09 93 23

INTERIOR STAINING AND FINISHING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide staining and transparent finishing and surface preparation.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Regulations: Compliance with VOC and environmental regulations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Staining and Transparent Finishes:
 - 1. Manufacturers: Lenmar MegaVar-WB premium water based polyurethane finish.
 - 2. Application: Interior unfinished surfaces.
 - 3. Primary Coating Type: Water based finishes.
 - 4. Finish: 1WB-504 Satin.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Inspect surfaces, report unsatisfactory conditions in writing; beginning work means acceptance of substrate.
- B. Comply with manufacturer's instructions and recommendations for preparation, priming and coating work. Coordinate with work of other sections.
- C. Re-coat or remove and replace work which does not match or shows loss of adhesion. Clean up, touch up and protect work.

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 GENERAL

1.1 SUMMARY

- A. Provide Interior and Exterior signage.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
 - 1. Exterior Pylon Signs footings and foundations shop drawings to be prepared and signed by a qualified engineer licensed in the jurisdiction of the project.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Facilities Signage: Provided as part of Equipment Package, Installed by General Contractor.
 - 1. Supplier: The Wasserstrom Company (TWC)
 - 2. Manufacturers: Joliet.
- B. Interior Menu Boards: Provided as part of Equipment Package, Installed by General Contractor.
 - 1. Manufacturers: LSI Industries.
 - 2. Frame: Extruded aluminum
 - 3. Copy: Insert.
 - 4. Illumination: Internal.
- C. Exterior Building Signage: Provided as part of Equipment Package, Installed by General Contractor.
 - 1. Manufacturers: Allen Industries. Custom Designed Sign to meet Ft Wright ordinances
- D. Traffic Signage: Provided as part of Equipment Package, Installed by General Contractor.
 - 1. Manufacturers: Allen Industries.
 - 2. Panel Faces: Polycarbonate
 - 3. Frame: Extruded aluminum
 - 4. Copy: Raised lettering.
 - 5. Illumination: Internal.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 10 21 13

TOILET COMPARTMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide toilet partitions and screens.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Toilet Compartments:
 - 1. Manufacturers: Specified on construction documents.
 - 2. Compartments: Floor-anchored, overhead braced.
 - 3. Style: Standard privacy style.
 - 4. Material: Metal with baked enamel finish.
 - a. ASTM A 591, electrolytically zinc-coated or ASTM A 653 hot-dip galvanized or galvanized, with powder coated or baked enamel finish.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Limit openings between panels, doors and pilasters to less than 1/2".
- C. Adjust hardware, clean, and protect work.

END OF SECTION

SECTION 10 26 00

WALL PROTECTION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide wall corner protection systems.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Performance: Fire performance meeting code requirements.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Corner Guards:
 - 1. Manufacturers: Specified on construction documents.
 - 2. Type: Resilient plastic corner guards, surface mounted.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 10 28 13

TOILET ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide toilet, bath and laundry accessories.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Toilet and Bath Accessories: See schedule for items by owner / contractor
 1. Manufacturers: Specified on construction documents
 2. Accessory: Paper towel dispensers.
 3. Accessory: Toilet tissue dispensers, single roll.
 4. Accessory: Toilet tissue dispensers, double roll.
 5. Accessory: Waste receptacles.
 6. Accessory: Combination towel dispenser/waste receptacle units.
 7. Accessory: Grab bars.
 8. Accessory: Sanitary napkin disposal units.
 9. Accessory: Soap dispensers, wall mounted.
 10. Accessory: Mop and broom holders.
 11. Accessory: Coat hooks.
 12. Accessory: Baby changing stations.
 13. Accessory: Undercounter lavatory pipe guards.
 14. Finish: Stainless steel.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 10 44 00

FIRE PROTECTION SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide fire extinguishers, cabinets and accessories.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards: UL and FM listed products, NFPA 10.
- C. Regulations: ADAAG.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fire Extinguishers:
 - 1. Type: Multipurpose dry chemical type.
 - 2. Type: Stored-pressure water type.
 - 3. Rating: Sized for project requirements.
 - 4. Public Area Mounting: Cabinet mounted.
 - 5. Service Area Mounting: Metal brackets.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Install fire extinguishers in mechanical and service areas with wall-hung brackets at locations and heights indicated and acceptable to authorities having jurisdiction.
- C. Install fire extinguishers in cabinets in public areas plumb and level at heights acceptable to authorities having jurisdiction.
- D. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 10 73 13

AWNINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide awnings and support framework.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Exterior Awnings:
 - 1. Manufacturers: Specified on construction documents
 - 2. Type: Fixed fabric.
 - 3. Frame: Aluminum.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Take field measurements prior to fabrication, where possible. Form to required shapes and sizes with true, straight edges, lines and angles.
- B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.
- C. Test for proper operation. Restore damaged finishes and protect work.

END OF SECTION

SECTION 11 40 00

FOOD SERVICE EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Food service equipment is supplied by the Owner (Franchisee). See equipment schedule and drawings for exact listing of Owner supplied equipment.
- B. Provide commercial stainless steel food service equipment as specified on construction documents.
- C. Provide interior finish carpentry including:
 - 1. Interior Trim
 - 2. Interior frames and jambs
 - 3. Plastic laminate cabinets. Provided as part of equipment package installed by general contractor.
 - 4. Plastic laminate counter tops. Provided as part of equipment package installed by general contractor.
 - 5. Solid surface counter tops. Provided as part of equipment package installed by general contractor.
- D. Provide aluminum pass through window unit. Provided in equipment package, installed by General Contractor
- E. Food service equipment is supplied by the Owner (Franchisee). See equipment schedule and drawings for exact listing of Owner supplied equipment.
- F. The Contractor shall submit to the owner a construction schedule for the coordination and timing of delivery of the owner furnished items.
- G. The contractor shall store all pieces of equipment in secure, weather protected areas in their original packaging.
- H. The contractor is required to receive and unload the owner supplied equipment. The owner shall arrange and pay for delivery of the equipment to the site. The contractor and/or subcontractors shall uncrate, install, and hook up equipment.
- I. Provide cold storage rooms.
- J. Provide exhaust hood and ansul system.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- D. Coordinate foodservice equipment layout and installation with other work, including lighting, HVAC, fire suppression, and utility service connections.

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- E. Operation and Maintenance Data for exhaust hood and ansul system: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Codes and Standards:
 - 1. NSF Seal of Approval.
 - 2. Underwriters' Laboratories Label.
 - 3. ASHRAE 15, 'Safety Code for Mechanical Refrigeration.'
 - 4. NFPA 54, 'National Fuel Gas Code.'
 - 5. NFPA 70, 'National Electrical Code.'
 - 6. NFPA 96, 'Ventilation Control, and Fire Protection of Commercial Cooking Operations.'
 - 7. ASME Boiler and Pressure Vessel Code.
 - 8. AWI Architectural Woodwork Institute Architectural Woodwork Quality Standards
 - 9. WIC Woodwork Institute of California Manual of Millwork
- C. Preservative Treatment: Nonpressure method, exterior type, AWPAC N1
- D. Fire-Retardant Treatment:
 - 1. Lumber: AWPAC C20, non-corrosive type.
 - 2. Plywood: AWPAC C27, non-corrosive type.
 - 3. Particleboard: ASTM E 84, flame spread 20 or less.
- E. Wood Products: Comply with the following:
 - 1. Hardboard: AHA A135.4.
 - 2. Medium-Density Fiberboard: ANSI A208.2, Grade MD-Exterior Glue.
 - 3. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
 - 4. Softwood Plywood: DOC PS 1, Medium Density Overlay.
 - 5. Hardwood Plywood and Face Veneers: HPVA HP-1.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Installation Accessories: NSF certified for end use application indicated.
- B. Sealant: ASTM C 920; Type S (single component), Grade NS (nonsag), Class 25, use NT (nontraffic) related to exposure, and use M, G, A, or O as applicable.
 - 1. Public Health and Safety Requirements:
 - a. Washed and cured sealant complies with FDA's regulations for use in areas that come in contact with food.
 - 2. Backer Rod: ASTM C 1330, Type C, closed cell polyethylene, in diameter larger than joint width.
- C. Interior Standing and Running Trim and Rails:
 - 1. Species for Transparent Finish: Maple.
 - 2. Grade: Premium.
- D. Interior Plastic Laminate Clad Cabinets:
 - 1. Laminate: High pressure decorative laminate, NEMA LD-3.

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2. Core: Plywood.
 3. Edge: Laminate.
- E. Interior Plastic Laminate Clad Countertops:
1. Laminate: High pressure decorative laminate, NEMA LD-3.
 2. Core: Plywood.
 3. Edge: Laminate.
- F. Interior Solid Surfacing Material Countertops:
1. Manufacturers: Corian.
 2. Type: Homogeneous solid sheets ANSI Z124.3, for Type 5 or Type 6, without a precoated finish.
 3. Edge: 1/2" radius.
- G. Pass-Through Windows:
1. Manufacturers: Quikserv Corp.
 2. Type: In-line side-sliding manual open/close window.
 3. Anchors, Clips, and Window Accessories: Aluminum, nonmagnetic stainless steel, or galvanized steel.
 4. Glazing: Insulating glass.
 5. Finish: Clear anodized.
- H. Walk-in Freezer/cooler:
1. Manufacturers: Norlake
 2. Panels: Insulated metal wall and ceiling panels.
 3. Insulated Doors: Suitable for service.
 4. Mechanical Units: roof mounted
- I. Exhaust Hood and Fire Suppression Systems:
1. Manufacturers: Unison Comfort Technologies
 2. Application: Exhaust hood and ansul system.
 3. Components: Suitable for service.
 - a. Fixtures.
 - b. Piping, fittings, and joints.
 - c. Pumps.
 - d. Expansion fittings and loops.
 - e. Sleeves and escutcheons.
 - f. Flow and tamper alarm switches.
 - g. Meters and gages.
 - h. Gate valves, check valves, and drain valves.
 - i. Pipe hangers and supports.
 - j. Heat tracing.
 - k. Vibration and seismic controls.
 - l. Identification devices.
 - m. Piping insulation.

PART 3 FABRICATION

3.1 FABRICATION

- A. General: Complete fabrications in shop to maximum extent possible before shipment to project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting
1. Interior woodwork grade: as indicated on construction documents

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2. Shop cut openings to maximum extent possible: sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops per manufacturers requirements.
- B. Interior Trim:
 1. For transparent finished trim items wider than available lumber, used veneered construction. Do not glue for width.
 2. Back out or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
- C. Plastic Laminate cabinets:
 1. AWI type of cabinet construction as indicated on construction documents.
- D. Plastic laminate counter tops:
 1. High pressure decorative laminate as indicated on construction documents.
 2. Joint: Provide a spline joint with draw-tight hardware.
- E. Solid surface counter tops:
 1. Solid surface material as indicated on construction documents.
 2. Provide product in the largest pieces available.
 3. Form field joints using manufacturers recommended adhesive, with joints inconspicuous in finished work.
- F. Cabinet Hardware and Accessories:
 1. Door Pulls: Wire, 4" center to center, Polished Chrome
 2. Hinges: Concealed Heavy Duty, 120 degree swing

3.2 SHOP FINISHING

- A. Finish architectural cabinetry at fabrication shop. Defer only final touchup, cleaning, and polishing until after installation.
- B. Transparent finish as indicated on construction documents

PART 4 EXECUTION

4.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. As a guideline for prompt and efficient equipment installation, the contractor shall have carpentry, plumbing, electrical, and refrigeration trades on site and available from the second day of equipment installation until all equipment is installed and hooked up.
- C. The contractor shall dispose of all crating and packaging materials. Provide the owner with all product literature and warranty information. The owner is responsible for checking the equipment shipment for shortages and damage.
- D. Install foodservice equipment level and plumb, according to manufacturers written instructions.
 1. Connect equipment to utilities.
 2. Provide cutouts in equipment, neatly formed, where required to run service lines through equipment to make final connections.
- E. Complete stainless steel equipment assembly where field assembly is required.

1. Provide closed butt and contact joints that do not require filler.
 2. Grind field welds on stainless steel equipment smooth and polish to match adjacent finish.
- F. Install equipment with access and maintenance clearances that comply with manufacturers written instructions and requirements of authorities having jurisdiction.
- G. Install closure trim strips and similar items requiring fasteners in a bed of sealant.
- H. Install joint sealant in joints between equipment and abutting surfaces with continuous joint backing, where required. Produce airtight, watertight, vermin proof, and sanitary joints.
- I. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and back-priming
- J. Provide wood work to sizes, shapes, and profiles indicated. Install work to comply with quality standards referenced. Back prime work and install plumb, level and straight with tight joints; scribe work to fit.
- K. Quality Standard: Install woodwork to comply with [AWI Section 1700] [WIC Section 26] for the same grade specified for type of woodwork involved.
- L. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials
- M. Fabricate windows to conform to AAMA standards and to accept glass specified.
- N. Take field measurements for walk-in freezer/cooler prior to fabrication, where possible. Form to required shapes and sizes with true, straight edges, lines and angles.
- O. Test for walk-in freezer/cooler for proper operation. Restore damaged finishes and protect work.
- P. Instruct Owner's personnel in proper operation of Exhaust hood and ansul systems. Clearly label all valves and components.

4.2 CLEANING AND PROTECTING

- A. Restore damaged finishes and test for proper operation. Clean and protect work from damage.
- B. Clean and adjust equipment as required to produce ready for use condition.
- C. Protect equipment from damage during remainder of construction period.

END OF SECTION

SECTION 12 20 00

WINDOW TREATMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide window treatments.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Window Shade:
 - 1. Manufacturers: specified on construction documents.
 - 2. Operation: Lifting mechanisms.
 - 3. Mount: Window head frame
 - 4. Snap on Fascia:
 - 5. Anodized cassette:
 - 6. Fabric: specified on construction documents.
 - 7. Color: specified on construction documents.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Restore damaged finishes and test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 13 21 26

COLD STORAGE ROOMS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide cold storage rooms.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Cold Storage Rooms:
 - 1. Manufacturers: Manitowoc
 - 2. Panels: Insulated metal wall and ceiling panels.
 - 3. Insulated Doors: Suitable for service.
 - 4. Mechanical Units: roof mounted

PART 3 EXECUTION

3.1 INSTALLATION

- A. Take field measurements prior to fabrication, where possible. Form to required shapes and sizes with true, straight edges, lines and angles.
- B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.
- C. Test for proper operation. Restore damaged finishes and protect work.

END OF SECTION

SECTION 22 00 00

PLUMBING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide plumbing systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Coordinate with Owner's room uses to provide adequate system for all contract areas.
- C. Coordinate location of plumbing systems to avoid interference with location of structure and other building systems. Notify Owner prior to construction of conflicts, which cannot be resolved.
- D. All workmanship and materials shall be of the highest quality in every respect. All materials and equipment shall be new, of the latest design, and free of defects. All materials and equipment shall conform to the latest amended edition of all applicable standards, including but not limited to, SMACNA, UL, and NEMA standards.
- E. Design all piping to present a neat and orderly appearance. Run all lines parallel with building wall and construction. Keep piping free from contact with structure or equipment to prevent noise transmission, allowing clearance for expansion and contraction. Provide access doors or panels for all valves, cleanouts, etc.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Plumbing fixtures: specified on construction documents.
- B. Water supply piping:
 - 1. Above ground:
 - a. Type L hard temper copper complying with ASTM B 88.
 - b. Copper fittings: wrought copper complying with USASI B16.18 and B16.18A.
 - c. Crosslinked Polyethylene (PEX) complying with ASTM F 876 and F 877.
 - 2. Below ground:
 - a. PEX
 - b. Type K copper.
- C. Soil, Waste, and Vent piping:

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1. Above ground:
 - a. No hub cast iron sanitary system complying with CISPI #301-69T.
 - b. PVC
 2. Below ground:
 - a. PVC
- D. Refrigerant piping: installed between condensing unit and associated equipment.
1. Piping: ACR type L hard drawn copper
 2. Wrought copper fittings with lead free soldered joints:
- E. Pipe Hangers and Supports:
1. Spacing: 3/4" – 2"
 - a. 3/4" diameter to 2" diameter = 10'-0"
 - b. 2" diameter or larger = 6'-0".
- F. Water meter: Hersey Products model 562, or equal
- G. Valves: contractor shall furnish and install valves as necessary for proper system operations and component isolation.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and building code requirements.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Install shutoff valves on each piece of equipment on both hot and cold water supply.
- D. Clearly label all valves and components.
- E. Sterilize water distribution system. Flush and test all systems for proper operation. Adjust system to prevent water hammer.
- F. Insulation applied to pipes only after they have been tested, inspected, and all surfaces are thoroughly cleaned of all moisture, foreign materials, grease, and rust. Insulation shall be continuous through walls, floors, and sleeves.
- G. Restore damaged finishes. Clean and protect work from damage.
- H. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 22 05 00

COMMON WORK RESULTS FOR PLUMBING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide common work results for plumbing systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 PRODUCTS

- A. Common Work Results for Plumbing:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Pipes and Fittings:
 - a. Drawn Temper Copper Pipe and Tube Material: ASTM B 88, Type L.
 - b. Annealed Temper Copper Pipe and Tube Material ASTM B 88, Type K.
 - c. Steel Pipe: ASTM A 53, Schedule 10 black steel pipe.
 - d. Steel Pipe: ASTM A 53, Schedule 40 black steel pipe.
 - e. Plastic Pipe: ASTM D 2846 CPVC pipe.
 - f. PEX: ASTM F 876, F877 and AWWA C904.
 - g. Fittings: Suitable for piping type and service class.
 - h. Joints: Solder, gaskets, grooved mechanical joints, press-seal fittings.
 - 6. Valves: Gate, ball, plug, globe, butterfly, and check valves.
 - 7. Expansion Joints for Piping Systems: 200 percent absorption capacity.
 - 8. Meters and Gages: Temperature and indicator ranges for services required.
 - 9. Supports and Anchors: MSS SP-58.
 - 10. Motors: NEMA MG 1 motors with suitable phase, frequency rating, voltage rating.
 - 11. Mechanical Identification: ASME A13.1 as applicable, color coded.
 - 12. Vibration Control: Pads, isolators, hangers and flexible connectors.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform

appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.

- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 22 13 19

SANITARY WASTE PIPING SPECIALTIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide exterior grease interceptor.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards:
 - 1. Standard specifications for precast grease interceptor tanks: ASTM C 1613-06
 - 2. Standard for waste water structures: ASTM C 890-06.
 - 3. Standard for reinforced concrete: ASTM C 318-02.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Precast concrete grease interceptor:
 - 1. Manufacturer: certified NPCA
 - 2. 500 gallon capacity
 - 3. 24" diameter manhole covers spaced 8'-0" apart.
 - 4. Manholes provided with warning labels affixed or cast into covers.
 - 5. Provide cast iron frame and covers with gas tight bolted access lids.
 - 6. Inlet and outlet piping joints to be furnished with rubber boots meeting ASTM C 923

PART 3 EXECUTION

3.1 INSTALLATION

- A. Excavate for exterior grease interceptor, setting precast bases on granular compacted base of 6" stone or sand. Base material shall support weight of tank and back fill without settlement. Seal joints between base, top sections, risers, and castings per ASTM C 990. Back fill and compact soil around grease interceptor in 12" lifts. Backfill material to be dry and under 3" in size.
- B. Tank shall be vacuum tested after installation to ensure structure is water tight per ASTM 1663-06.
- C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Coordinate with work of other sections. Comply with applicable regulations and

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code requirements. Provide proper clearances for servicing.

- D. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 00 00

HEATING, VENTILATING, AND AIR CONDITIONING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide heating, ventilating, and air conditioning systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
 - 1. Shop drawings shall be prepared and stamped by a qualified engineer licensed in the jurisdiction of the project.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. The air distribution system shall be fabricated as recommended in the latest edition of the SMACNA low velocity duct manual and installed where shown on HVAC plan. Contractor shall be responsible for furnishing as required dampers, transitions, and connections to air terminals necessary for a complete operating system.
- B. Provide vibration isolation devices for all moving machinery. Provide flexible connections to all moving machinery.
- C. Design all ductwork to present a neat and orderly appearance. Run all lines parallel with building wall and construction. Keep ductwork free from contact with structure or equipment to prevent noise transmission, allowing clearance for expansion and contraction. Provide access doors or panels for all dampers, controls, devices, etc.
- D. The contractor shall order all equipment required within ten days upon receipt of contract in order to ensure timely receipt of material. Substitutions after this date due to lack or placement of order will not be approved.

1.4 SPACE TEMPERATURE CONTROL

- A. Mechanical contractor shall furnish and install thermostats, sensors, controllers, relays, contactors, and actuators. Along with any other materials necessary for a complete and properly operating temperature control system as specified below.
 - 1. Cooling Cycle – Occupied Space: upon rise in space temperature above the setting of the thermostat, the air conditioning unit shall be activated to provide the necessary cooling to the space. The supply air blower shall operate continuously and the refrigeration unit shall cycle as required to maintain the space temperature.
 - 2. Cooling Cycle – Unoccupied Space: upon a rise in space temperature above 80 degrees F setting of thermostat, the first stage only of the air conditioning unit shall be activated to provide the necessary cooling to the space. The supply air blower and the refrigeration unit shall cycle as required to maintain the space temperature.
 - 3. Heating Cycle – Occupied Space: upon a drop in space temperature below the 68 degree F setting of thermostat, the HVAC units shall operate as required to maintain

space temperature. The supply air blower shall operate continuously. When the thermostat is satisfied, the HVAC units shall be deactivated.

4. Heating Cycle – Unoccupied Space: upon a drop in space temperature below the 60 degree F setting of thermostat, the HVAC units shall operate as required to maintain space temperature. When the thermostat is satisfied, the HVAC units shall be deactivated.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Packaged rooftop air conditioning units: Carrier
 1. The contractor shall install package rooftop unit(s) as shown and scheduled on the construction documents. The unit(s) shall be installed in accordance with this specification and perform at the specified.
 2. General Unit Description:
 - a. Unit(s) shall be combination gas heating/electric cooling packaged rooftop(s) as scheduled on construction documents and specifications. Cooling capacity ratings shall be based on ARI standard 210. Units(s) shall consist of insulated weather tight casing with compressor(s), air cooled condenser coil, condenser fans, evaporator coil, return air filters, supply motors, units controls, and gas fired heating section.
 - b. Units shall be convertible airflow design as manufactured.
 3. Unit Casing:
 - a. Cabinet: galvanized steel, phosphatized, and finished with an air dry paint coating with removable access panels. Structural members shall be 18 gauge with access doors and removable panels on minimum 20 gauge.
 - b. Unit cabinet surface shall be tested 1000 hours in salt spray test in compliance with ASTM B 117.
 - c. Cabinet top cover shall be one piece construction or where seams exit, it shall be double hemmed and gasket sealed.
 - d. Access panels: water and air tight panels with handles shall provide access to filters, heating section, return air fan section, supply air fan section, evaporator coil section, and unit control section.
 - e. Units base pan shall have a raised 1 1/8 inch high lip around the supply and return openings for water integrity.
 - f. Insulation: provide 1/2 inch thick fiberglass insulation with foil face on all exterior panels in contact with the return and conditioned air stream. All edges must be captured so that there is no insulation exposed in the air stream.
 - g. Provide factory installed circuit breaker and 115V unpowered convenience outlet, per NEC requirements.
 - h. Provide openings through the base for power, control, condensate, and gas connections.
 4. Air Filters:
 - a. Air filters: factory installed filters shall mount integral within the unit and shall be accessible through access panels. One inch thick glass fiber disposable media filters shall be provided.
 5. Fans and Motors:
 - a. Provide evaporator fan section with forward curved, double width, double inlet, centrifugal type fan.
 - b. Provide self aligning, grease lubricated, ball or sleeve bearings with permanent lubrication fittings.
 - c. Provide units with belt driven, supply fans with adjustable motor sheaves.
 - d. Outdoor and indoor fan motors shall be permanently lubricated and have internal thermal overload protection.

- e. Outdoor fans shall be direct drive, statically and dynamically balanced, draw through in the vertical discharge position.
- f. Provide shafts constructed of solid hot rolled steel, ground and polished, with key way, and protectively coated with lubricating oil.
- 6. Gas Fired Heating:
 - a. Completely assembled and factory installed heating system shall be integral to unit, UL or CSA approved specifically for outdoor applications for use downstream from refrigerant cooling coils. Threaded connection with plug or cap provided. Provide capability for gas piping through the side of the units.
 - b. Induced draft combustion type with direct spark ignition system, redundant main gas valve, and two staged heat.
 - c. Gas burner safety controls: provide safety controls for the proving of combustion air prior to ignition, and continuous flame supervision.
 - d. Induced draft blower shall have combustion air proving switches and built-in thermal overload protection on fan motor.
 - e. Heat Exchanger: provide tubular section type constructed from 18 gauge stainless steel
 - f. Limit Controls: high temperature limit controls will shut off gas flow in the event of excessive temperatures resulting from restricted indoor airflow or loss of indoor airflow.
- 7. Evaporator Coil:
 - a. Provide configured aluminum fin surface mechanically bonded to copper tubing coil.
 - b. Provide an independent expansion device for each refrigeration circuit. Factory pressure tested at 450 psig and leak tested at 200 psig.
 - c. Provide a removable, reversible, cleanable double sloped drain pan for base evaporator coil constructed of PVC.
- 8. Condenser:
 - a. Provide internally finned seamless copper tube mechanically bonded to configured aluminum fins. Factory pressure test to 450 psig.
 - b. Provide vertical discharge, direct drive fans with aluminum blades. Fans shall be statically balanced. Motors shall be permanently lubricated, with integral thermal overload protection in weather tight casing.
- 9. Refrigeration Casing:
 - a. Compressors: provide scroll compressor with direct drive operating at 3600 rpm. Integral centrifugal oil pump. Provide suction gas cooled motor with winding temperature limits and compressor overloads.
 - b. Units shall have cooling capabilities down to 0 degrees F as standard.
 - c. Provide each unit with one refrigerant circuits factory supplied completely piped with liquid line filter drier, suction and liquid line pressure ports.
- 10. Outdoor Air:
 - a. Provide motorized outside air damper with 0% - 50% outside air operating, manually set.
 - b. Provide spring return motor for outside air damper closure during unit shutdown of power interruption.
- 11. Operating Control:
 - a. Provide microprocessor unit mounted DDC control which when used with an electric zone sensor provides proportional integral room control. This UCM shall perform all unit functions by making all heating, cooling, and ventilating decisions through resident software logic.
 - b. Provide factory installed indoor evaporator defrost control to prevent compressor slugging by interrupting compressor operation.
 - c. Provide anti-cycle timing and minimum on/off between stages timing in the microprocessor.
- 12. Building Management System:

- a. Rooftop units to have a factory installed communication card capable of communicating to a building management system.
- 13. Roof Curb:
 - a. Contractor shall install factory supplied roof curb, 16 gauge perimeter made of zinc coated steel with supply and return air gasketing and wood leveling nailer strips. Ship knocked down and provided with instructions for easy assembly.
 - b. Curb shall be manufactured in accordance with the National Roofing Contractors Association guidelines.
- B. Kitchen Downflow Airflow:
 - 1. General Downflow Airflow: units will be dedicated downflow airflow. Operating range will be between 155 degrees F and 0 degrees F cooling as standard from factory. Cooling performance will be rated in accordance with ARI testing procedures. The unit will be factory assembled, internally wired, fully charged with R-410A and 100% run tested before leaving the factory. Wiring internal to the unit will be colored and numbered for simplified identification. Units will be UL listed and label, classified in accordance to ANSI Z 21.47 for gas fired central furnaces and UL 1995/CAN/CSA No. 236-M90 for central cooling air conditioners.
 - 2. Casing Downflow Unit: unit casing is constructed of zinc coated, heavy gauge, and galvanized steel. All components are mounted in a weather resistant steel cabinet with a painted exterior. Units surface will be tested 500 hours in a salt spray test in compliance with ASTM B 117. Cabinet construction allows for all maintenance on one side of the unit. Service panels have lifting handles and are removed and reinstalled by removing one – three screws while providing a water and air tight material. The base pan has no penetrations within the perimeter of the curb other than the raised 1 1/8 inch high supply/return openings to provide an added water integrity precaution should the condensate drain back up. The base of the unit has provisions for forklift and crane lifting.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and building code requirements.
- B. Install ductwork in accordance with SMACNA recommendations. Seal duct seams with sealer. Provide splitters and balancing dampers. Provide fire dampers and automatic smoke and fire dampers where required. Provide flexible connectors and inlet and discharge connections. Clean before testing and balancing.
- C. Clearly label and tag all components.
- D. HVAC package system shall include a system balance of all rooftop units, and all exhaust fans, grills register, and diffusers. The mechanical contractor shall submit balance report to landlord.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 05 00

COMMON WORK RESULTS FOR HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. Provide common work results for HVAC systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 PRODUCTS

- A. Common Work Results for HVAC:
 - 1. Manufacturers: Carrier.
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning..
 - Pipes and Fittings:
 - a. Copper Pipe and Tube Material: ASTM B 88, Type K and Type L.
 - b. Steel Pipe: ASTM A 53, Schedule 10 black steel pipe.
 - c. Steel Pipe: ASTM A 53, Schedule 40 black steel pipe.
 - d. Plastic Pipe: ASTM D 2846 CPVC pipe.
 - e. Fittings: Suitable for piping type and service class.
 - f. Joints: Solder, gaskets, grooved mechanical joints, press-seal fittings.
 - 5. Valves:
 - a. Gate Valves, 2-Inch and Smaller: MSS SP-80.
 - b. Gate Valves, 2-1/2-Inch and Larger: MSS SP-70.
 - c. Ball Valves: Rated for 150 psi saturated steam pressure.
 - d. Plug Valves, 2-Inch and Smaller: Rated at 150 psi WOG.
 - e. Plug Valves, 2-1/2-Inch and Larger: MSS SP-78.
 - f. Globe Valves, 2-Inch and Smaller: MSS SP-80.
 - g. Globe Valves, 2-1/2-Inch and Larger: MSS SP-85.
 - h. Butterfly Valves: 2-1/2-Inch and Larger: MSS SP-67.
 - i. Swing Check Valves, 2-Inch and Smaller: MSS SP-80.
 - j. Swing Check Valves, 2-1/2 Inch and Larger: MSS SP-71.
 - k. Wafer Check Valves: Class 250.
 - l. Lift Check Valves, 2-Inch and Smaller: Class 125, threaded ends.
 - 6. Expansion Joints for Piping Systems:
 - a. Packless expansion joints.
 - b. Slip joints.
 - c. Flexible ball pipe joints.

- d. Mechanical grooved fittings.
- e. Fabricated expansion loops.
- 7. Meters and Gages:
 - a. Mercury-In-Glass Thermometers: Tube with magnifying lens.
 - b. Direct-Mount Filled-System Dial Thermometers: Vapor actuated.
 - c. Remote-Reading Filled-System Dial Thermometers: Vapor actuated.
 - d. Bimetal Dial Thermometers: Direct mounted, bimetal, universal angle type.
 - e. Dial-Type Insertion Thermometers: Bimetal, stainless steel case and stem.
 - f. Thermometer Wells: Brass or stainless steel, pressure rated.
 - g. Pressure Gages: General use, ASME B40.1, Grade A.
 - h. Pressure Gauge Accessories: Brass tubing straight coil syphon; brass snubber.
 - i. Wafer Orifice-Type Flood Elements: Differential-pressure type, cast-iron body.
 - j. Venturi-Type Flow Elements: Differential-pressure type, steel with brass fittings.
 - k. Pitot Tube-Type Flow Elements: Differential-pressure pitot tube-type design.
 - l. Window-Type Flow Meters: Integral self-closing valve with indicator valve.
 - m. BTU Meters: Turbine wheel flow meter, temperature sensors.
 - n. Test Plugs: Nickel-plated brass body, self-sealing valve-type core inserts.
- 8. Hangers and Support Components: MSS SP-58, pipe and equipment hangers.
- 9. Motors: NEMA MG 1 motors.
- 10. Mechanical Identification: ASME A13.1 as applicable, color coded.
- 11. Vibration Control: Pads, isolators and connectors.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 09 00

INSTRUMENTATION AND CONTROL FOR HVAC

PART 1 GENERAL

1.1 SUMMARY

- A. Provide instrumentation and control for HVAC.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Instrumentation and Control for HVAC:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Electric Control System Components:
 - a. Valves: Control valves, service valves, terminal unit control valves.
 - b. Dampers: Automatic control dampers, frames, and damper and valve motors.
 - c. Thermostats: Room remote-bulb fire protection low-temperature thermostats.
 - d. Sensors: Electronic temperature and relative humidity sensors.
 - e. Controllers: Step, electronic, fan speed, and electric heat current controllers.
 - f. Control Panels: Local control panels, central control panels.
 - 6. Pneumatic Control System Components:
 - a. Air Piping: ASTM B 88 seamless copper tubing.
 - b. Air Piping: ASTM D 2737 polyethylene non-metallic tubing.
 - c. Valves: Pneumatic control valves and service valves.
 - d. Dampers: Automatic control dampers and frames, and pneumatic operators.
 - e. Thermostats: Room and return air thermostats; fire protection thermostats.
 - f. Controllers: Temperature, humidity, static pressure and dew point controllers.
 - g. Sensors: Temperature sensors; humidity sensors; pressure sensors.
 - h. Air Supply Systems: Duplex air compressor.
 - i. Air Supply Systems: Single air compressor dryer system.
 - j. Air Supply Systems: Single air compressor refrigerator drier system.
 - k. Control Panels: Local control panels, central control panels.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 11 23

FACILITY NATURAL-GAS PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide facility natural gas piping within the building.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Standards:
 - 1. Materials, Products, and Installation: ASME B31.9.
 - 2. Plastic Piping Components: NSF 14.
- C. Compliance: NFPA 54.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Facility Natural Gas Piping:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Pipe, Fittings, and Specialties:
 - a. Steel Pipe and Tubes: ASTM A 53, Type S or Type E, Grade B, Schedule 40.
 - b. Copper Tube: ASTM B 88, Type L, water tube, drawn temper.
 - c. Plastic Pipe: ASTM D 2513, polyethylene (PE), DR 11 or DR 11.5.
 - d. Fittings and Valves: Suitable for piping type and service class.
 - e. Gas Meter and Pressure Regulator: Diaphragm type meter; pressure regulator.
 - f. Piping Specialties: Flexible connectors, strainers.
 - g. Protective Coating: Corrosion-resistant polyethylene.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.

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- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 21 23

HVAC PIPING AND PUMPS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide HVAC piping and pumps.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: ASME Code, ASME B 31.9.

PART 2 PRODUCTS

2.1 MATERIALS

- A. HVAC Piping and Pumps:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Pipes and Fittings:
 - a. Copper Pipe and Tube Material: ASTM B 88, Type L and Type K.
 - b. Steel Pipe: ASTM A 53, Schedule 10 black steel pipe.
 - c. Steel Pipe: ASTM A 53, Schedule 40 black steel pipe.
 - d. Plastic Pipe: ASTM D 2846 CPVC pipe.
 - e. Fittings: Suitable for piping type and service class.
 - f. Joints: Solder, gaskets, grooved mechanical joints, press-seal fittings.
 - 6. Valves:
 - a. General Duty Valves: Gate, globe, check, ball, and butterfly valves.
 - b. Special Duty Valves: Plug, pump discharge valves, safety valves.
 - 7. Specialties:
 - a. Manual Air Vents: Bronze body, nonferrous internal parts.
 - b. Automatic Air Vents: Float principle air vent, bronze body.
 - c. Compression Tanks: ASME pressure tested, air control tank fittings.
 - d. Diaphragm-Type Compression Tanks: ASME pressure tested.
 - e. Air Separator: Welded black steel.
 - f. Pump Suction Diffusers: Cast-iron body, threaded connections.
 - g. Chemical Feeder: Bypass type chemical feeder, welded steel construction.
 - h. Diverting Fittings: Cast iron body.
 - i. Y-Pattern and Basket Strainers: Cast iron body, ASTM A 126, Class B.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- D. Clearly label and tag all components.
- E. Test and balance all systems for proper operation.
- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 23 00

REFRIGERANT PIPING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide refrigerant piping.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced & R-410A certified installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: ASME Code, ASME B 31.5, ARI 760.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Refrigerant Piping:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Refrigerant: R-410A, ASHRAE 34.
 - 6. Pipes, Fittings, and Specialties:
 - a. Copper Tubing: ASTM B 280, Type ACR.
 - b. Fittings: Wrought-copper, ANSI B16.22.
 - c. Joining Materials: AWS A5.8, BAg-1 silver brazing filler metals.
 - d. Specialties: Moisture/liquid indicators, filter-driers, suction line filter-driers.
 - 7. Valves:
 - a. General Duty Valves: Globe, and check valves suitable for use.
 - b. Special Duty Valves: Solenoid, pressure regulating valves, expansion valves.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.

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- C. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- D. Clearly label and tag all components.
- E. Test and balance all systems for proper operation.
- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 30 00

HVAC AIR DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide HVAC air distribution systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. HVAC Air Distribution:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. HVLS (High Volume/Low Speed) Fans:
 - a. Industrial installations.
 - b. Commercial installations.
 - 6. Centrifugal Fans:
 - a. Centrifugal Fans for Indoor Installations: Belt-driven with housing.
 - b. Tubular Centrifugal Fans: Tubular inline, belt driven with housing.
 - c. Inline Centrifugal Fans: Inline, belt driven with housing.
 - 7. Axial Fans:
 - a. Propeller Axial Fans: Belt-driven or direct-drive propeller fan.
 - b. Vaneaxial Axial Fans: Belt-driven or direct drive, vaneaxial fan.
 - 8. Power Ventilators:
 - a. Centrifugal Roof Ventilators: Belt-driven or direct-drive types.
 - b. Axial Roof Ventilators: Belt-driven or direct-drive types, axial fans.
 - c. Centrifugal Wall Ventilators: Belt-driven or direct-drive, centrifugal fans.
 - d. Ceiling-Mounted Ventilators: Centrifugal fan.
 - e. Upblast Propeller Roof Exhaust Ventilators: Belt-driven or direct-driven fans.
 - f. Utility Set Centrifugal Ventilators: Belt-driven fans.
 - 9. Central Station Air-Handling Units:
 - a. Indoor Constant-Volume, Central-Station-Air Handling: ARI 430, NFPA 90A.
 - b. Components: Motors, coils, dampers, filters.
 - 10. Air Filters:
 - a. Air Filters: ASHRAE 52, ARI 850, NFPA 90A, 90B.
 - b. Replaceable (Throwaway) Panel Filters: Interlaced glass fiber media, frames.

- c. Cleanable (Washable) Panel Filters: Flat panels, galvanized steel frames.
- d. Extended Surface Disposable Panels Filters: Fibrous material media.
- e. Extended Surface Non-Supported-Media Filters: Fibrous material media.
- f. Automatic (Self-Renewing) Roll Filters: Automatic, with fibrous glass media.
- g. Activated Carbon Filters: Carbon trays with replaceable panel prefilter.
- h. High Efficiency Particulate Air (HEPA) Filters: UL 586 fibrous glass media.
- i. Electronic Air Cleaners: Electronic agglomerator and prefilters, ionizing wire.
- j. Front and Rear Access Filter Frames: Aluminum framing, prefilters, sealers.
- k. Side Service Housings: Galvanized steel side-service housings, prefilters.
- l. Filter Gages: Diaphragm type with suitable filter gauge range.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 63 00

REFRIGERANT CONDENSERS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide refrigerant condensers.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: ARI 360; ASHRAE 15; ASME Code.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Refrigerant Condensers:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Air-Cooled Condenser Units: Factory-assembled.
 - 6. Accessories: Suitable for ambient temperature.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- D. Clearly label and tag all components.
- E. Test and balance all systems for proper operation.

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- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 23 76 00

EVAPORATIVE AIR-COOLING EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Provide evaporative air-cooling equipment.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: ARI 210, 360; ASHRAE 15; ASME Code.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Evaporative Air-Cooling Equipment:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Condensing Units:
 - a. Water-cooled condensing units.
 - b. Air-cooled condensing units.
 - c. Residential air-cooled condensing units.
 - 6. Accessories:
 - a. Discharge line muffler.
 - b. Gauge panel.
 - c. Electric solenoid unloading.
 - d. Control circuit transformer.
 - e. Pumpdown relay package.
 - f. Crankcase coverplates with equalizer connections.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.

- B. Support piping properly. Pitch to drain points. Install with pipe expansion loops, mechanical expansion joints, and anchors.
- C. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- D. Clearly label and tag all components.
- E. Test and balance all systems for proper operation.
- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 26 00 00

ELECTRICAL

PART 1 GENERAL

1.1 SUMMARY

- A. Provide electrical systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings for fixtures and switchgear.
- C. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Arrangement of systems indicated on the drawings is diagrammatic, and indicates the minimum requirements for electrical work. Site conditions shall determine the actual arrangement of conduits, boxes, and similar items. Take field measurements before fabrication. Be responsible for accuracy of dimensions and layout.
- C. Comply with the National Electrical Code and applicable local regulations.
- D. Include primary service, transformers, distribution center, grounding, power and lighting panels, wiring, outlet boxes, receptacles, lighting fixtures, switches, conduits, and raceways and all accessories.
- E. Provide telephone and data outlets with cutout, box and pull string only.
- F. Modify and extend existing service to accommodate new work. Re-lamp existing fixtures consistent with building standards. Remove existing systems and wiring, which are abandoned.
- G. Maintain fire alarm system in operation during construction.
- H. Coordinate with Owner's room uses to provide adequate system for all contract areas.
- I. Coordinate location of ductwork and fire protection systems to avoid interference with location of designated lighting fixture locations. Notify Owner prior to construction of conflicts, which cannot be resolved.
- J. Coordinate schedule of telephone and data outlet completion with Owner's communications requirements and installer as applicable.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Electrical Systems:
 - 1. Manufacturers:
 - 2. Application: Interior lighting.
 - 3. Application: Emergency lighting.
 - 4. Application: Exit signs.
 - 5. Application: Special purpose lighting.
 - 6. Application: Exterior lighting.
 - 7. Application: Cathodic protection.
 - 8. Sustainable Design: Occupancy sensors.
 - 9. Sustainable Design: Perimeter daylighting controls.
 - 10. Sustainable Design: Energy efficient equipment and fixtures.
 - 11. Sustainable Design: Energy efficient bulbs.
 - 12. Sustainable Design: Commissioning.
 - 13. Type: Instrumentation and control for electrical systems.
 - a. Lighting control devices.
 - b. Photoelectric switches.
 - c. Occupancy sensors.
 - 14. Type: Wiring devices.
 - a. Receptacles.
 - b. Switches.
 - c. Finish plates.
 - 15. Type: Lighting.
 - a. Interior lighting fixtures, lamps, and ballasts.
 - b. Emergency lighting.
 - c. Exit signs.
 - d. Special purpose lighting.
 - e. Security lighting.
 - f. Display lighting.
 - g. Exterior lighting poles and standards.
 - h. Parking lighting.
 - i. Area lighting.
 - j. Site lighting.
 - k. Walkway lighting.
 - l. Flood lighting.
 - 16. Connected Loads: Suitable for service.
 - a. Public area lighting.
 - b. Internal operations lighting.
 - c. Site lighting.
 - d. Convenience power.
 - e. Mechanical cooling.
 - f. Mechanical and plumbing equipment.
 - 17. IEEE Illumination Levels: Suitable for service.
 - a. Public areas.
 - b. Circulation.
 - c. Kitchen.
 - d. Storage.
 - e. Mechanical.
 - f. Parking lots.
 - 18. Components: Suitable for service.
 - a. Cables, conduit, and tubing.
 - b. Grounding and bonding devices.
 - c. Hangers and supports.
 - d. Raceways, boxes, and cabinets.
 - e. Cable trays.
 - f. Vibration and seismic controls.

- g. Identification devices and warning labels.
- h. Service entrance components.
- i. Switchboards.
- j. Low-voltage power switchgear.
- k. Grounding components.
- l. Transformers.
- m. Motor controllers.
- n. Busways.
- o. Overcurrent protective devices.
- p. Panelboards.
- q. Fuses.
- 19. Electrical Standards.
 - a. Code: NFPA 70 National Electrical Code.
 - b. Fluorescent Fixtures: Fixtures, UL 1570; ballasts, UL 935, energy-saving.
 - c. HID Fixtures: UL 1572; ballasts, UL 1029; instant restrike device.
 - d. Incandescent Fixtures: UL 1571.
 - e. Fixtures for Hazardous Locations: UL 844.
 - f. Track Lighting Systems: UL 1574.
 - g. Exit Signs: UL 924.
 - h. Emergency Lighting Units: UL 924.
 - i. Emergency Fluorescent Power Supply: UL 924.
 - j. Lamps: ANSI Standards, C78 series.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and building code requirements.
- B. Comply with National Electrical Code and building code requirements. Maintain continuity of circuits required to supply new or existing equipment in service.
- C. Install light switches 48" above finished floor. Locate switches within rooms at strike side of door unless noted otherwise.
- D. Install thermostats and sensors at 60" above finished floor.
- E. Gang-mount multiple switching locations. Mount multiple types of controls as close together as possible and in-line with each other at a height of 48" above finished floor.
- F. Group multiple junction boxes, telephone and electrical outlets together on wall not more than 6" apart. Avoid back-to-back box locations.
- G. Mount electrical, data, and telephone outlets vertically, 18" above finished floor unless noted otherwise.
- H. Test all systems for proper operation. Restore damaged finishes. Clean and protect work from damage.
- I. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 26 05 00

COMMON WORK RESULTS FOR ELECTRICAL

PART 1 GENERAL

1.1 SUMMARY

- A. Provide common work results for electrical systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Common Work Results for Electrical:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Medium-Voltage Cables:
 - a. Single and Multiple Conductor Types: UL 1072.
 - b. Cable: Cross-linked polyethylene, XLP, insulated, NEMA WC 7.
 - c. Cable: Ethylene propylene rubber, EPR, insulated, NEMA WC 8.
 - d. Conductors: Class B stranded, annealed copper.
 - e. Conductors: Class B stranded, aluminum.
 - f. Cable Jacket: PVC.
 - g. Cable Jacket: PVC extruded over metal armor.
 - h. Cable Jacket: Cross-linked polyolefin.
 - i. Metallic Shielding: Copper shielding tape.
 - j. Metallic Shielding: Solid copper wires.
 - k. Cable Voltage Rating: 15 kV phase to phase.
 - l. Insulation Thickness: Corresponding to referenced standard.
 - m. Circuit Identification: Color-coded tape.
 - n. Three-Conductor Cable Assembly: Shield conductors with grounding conductor.
 - o. Type MC Cable Armor: Aluminum interlocked armor.
 - p. Type MC Cable Armor: Galvanized steel interlocked armor.
 - q. Splices, Terminations, Kits, Cable Seals, Junctions: Suitable for service.
 - r. Arc-Proofing Materials: UL fireproofing intumescent tape.
 - s. Fault Indicators: Manual reset fault indicator to clamp to cable sheath.
 - 6. Low-Voltage Cables:
 - a. Armored Cable: UL Types AC.

- b. Metal-Clad Cable in Cable Trays: UL Type MC.
- c. Nonmetallic-Sheathed Cable for Lighting Wiring: UL Type NM and NMC.
- d. Aboveground Service Entrance Cable: UL Type SE.
- e. Underground Service Entrance Cable: UL Type USE.
- f. Underground Feeder and Branch-Circuit Cable: UL Type UF.
- g. Portable Cord for Flexible Pendant Leads to Outlets and Equipment: UL Type S.
- h. Control/Signal Transmission Media: Single conductor coaxial type.
- i. Flat Cabling System for Power Under Carpet Tile: Factory-laminated assembly.
- j. Flat Cabling System for Tel/Data Transmission Under Carpet Tile: Flat cable.
- k. Fiber Optic Cables: Single channel low-loss glass type.
- l. 7.Wire Components:
- m. Conductors, No. 10 AWG and Smaller: Solid.
- n. Conductors, No. 8 AWG and Larger: Stranded.
- o. Insulation: THW, THHN/THWN or XHHW as applicable.
- p. Jackets: Factory-applied nylon or PVC.
- q. Conductor Material: Copper.
- r. Conductor Material: Copper-clad aluminum.
- s. Conductor Material: Aluminum.
- 7. Metal Conduit and Tubing:
 - a. Rigid Aluminum Conduit: ANSI C80.5.
 - b. Rigid Steel Conduit: ANSI C80.1.
 - c. Intermediate Steel Conduit: UL 1242.
 - d. PVC Coated Rigid Steel Conduit and Fittings: ANSI C80.1, NEMA RN 1.
 - e. Electrical Metallic Tubing (EMT) and Fittings: ANSI C80.3.
 - f. PVC Coated Electrical Metallic Tubing and Fittings: ANSI C80.3, NEMA RN 1.
 - g. Flexible Metal Conduit: UL 1 aluminum.
 - h. Flexible Metal Conduit: UL 1 zinc-coated steel.
 - i. Liquidtight Flexible Metal Conduit and Fittings: UL 360.
- 8. Nonmetallic Conduit and Ducts:
 - a. Electrical Nonmetallic Tubing (ENT): NEMA TC 13.
 - b. Rigid Nonmetallic Conduit (RNC): NEMA TC 2 and UL 651, PVC.
 - c. Underground PVC and ABS Plastic Utilities Duct: NEMA TC 6.
 - d. PVC and ABS Plastic Utilities Duct Fittings: NEMA TC 9.
 - e. Liquidtight Flexible Nonmetallic Conduit and Fittings: UL 1660.
- 9. Boxes and Fittings:
 - a. Cabinet Boxes: UL 50, sheet steel, NEMA 1.
 - b. Pull and Junction Boxes: UL 50, steel boxes.
 - c. Metal Outlet, Device and Small Wiring Boxes: UL 514A and OS 1.
 - d. Nonmetallic Outlet, Device and Small Wiring Boxes: NEMA OS 2.
- 10. Raceway Accessory Materials:
 - a. Conduit Bodies: NEC requirements.
 - b. Wireways: NEC requirements.
 - c. Surface Raceways, Metallic: Galvanized steel, with snap-on covers.
 - d. Surface Raceways, Nonmetallic: Rigid PVC, UL 94.
- 11. Cable Trays:
 - a. Materials: Mill galvanized steel.
 - b. Materials: Hot-dip galvanized steel.
 - c. Materials: PVC-coated steel.
 - d. Configuration: Ladder type, trough-type, solid-bottom type, channel type.
 - e. Covers: Solid type, louvered type, and ventilated-hat type.
- 12. Components: Suitable for service.
 - a. Cables, conduit, and tubing.
 - b. Grounding and bonding devices.

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- c. Hangers and supports.
- d. Raceways, boxes, and cabinets.
- e. Cable trays.
- f. Vibration and seismic controls.
- g. Identification devices and warning labels.
- h. Service entrance components.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Check rotation of all three phase equipment to ensure proper rotation.
- D. Clearly label and tag all components.
- E. Test and balance all systems for proper operation.
- F. Restore damaged finishes. Clean and protect work from damage.
- G. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 26 20 00

LOW-VOLTAGE ELECTRICAL DISTRIBUTION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide low-voltage electrical distribution.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used. List project-specific information, including incoming service characteristics, connection types, transformers, and distribution system characteristics if available.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Low-Voltage Electrical Distribution:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Low-Voltage Transformers:
 - a. Dry Type Transformers: NEMA ST 20, copper windings.
 - b. Drive Isolation Transformers: NEMA ST 1, UL 506, 2 winding dry type.
 - c. Buck-Boost Transformers: NEMA ST 1, UL 506, self-cooled dry type.
 - d. Control and Signal Transformers: NEMA ST 1, UL 506, self-cooled.
 - e. Voltage Regulating Transformers: ANSI/IEEE C57.15, ventilated, self-cooled.
 - f. Voltage Stabilizing Transformers: NEMA ST 1, UL 506, dry-type, self-cooled.
 - g. Induction Type Voltage Regulator: ANSI/IEEE C57.15, solid state type.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.

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- C. Test all systems for proper operation. Label circuits in electrical panels. Restore damaged finishes. Clean and protect work from damage.
- D. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 26 51 00

INTERIOR LIGHTING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide interior lighting.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: NFPA 70 "National Electrical Code."

PART 2 PRODUCTS

2.1 MATERIALS

- A. Interior Lighting:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Components: Suitable for service.
 - a. Fluorescent Fixtures: UL 1570; ballasts, UL 935, energy saving.
 - b. High Intensity Discharge (HID) Fixtures: UL 1572; ballasts, UL 1029.
 - c. Incandescent Fixtures: UL 1571.
 - d. Fixtures for Hazardous Locations: UL 844.
 - e. Track Lighting Systems: UL 1574.
 - f. Exit Signs: UL 924, self-powered battery type and luminous source type.
 - g. Emergency Lighting Units: UL 924.
 - h. Emergency Fluorescent Power Supply: UL 924.
 - i. Lamps: ANSI Standards, C78 series.
 - j. Suspended Fixture Support Components: Stem, rod, and hook hangers.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Provide proper clearances for servicing.

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- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Test all systems for proper operation. Label circuits in electrical panels.
- D. Restore damaged finishes. Clean and protect work from damage.
- E. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 26 56 00

EXTERIOR LIGHTING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide exterior lighting.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: NFPA 70 "National Electrical Code."

PART 2 PRODUCTS

2.1 MATERIALS

- A. Exterior Lighting:
 - 1. Manufacturers:
 - 2. Application: Locations indicated.
 - 3. Sustainable Design: Utility efficient equipment and fixtures.
 - 4. Sustainable Design: Commissioning.
 - 5. Exterior Lighting Components:
 - a. Fluorescent Fixtures: UL 1570; ballasts, UL 935, energy-saving.
 - b. High Intensity Discharge (HID) Fixtures: UL 1572; ballasts, UL 1029.
 - c. Incandescent Fixtures: UL 1571.
 - d. Lamps: ANSI Standards, C78 series.
 - 6. Fixture Support Poles, Mast Arms and Brackets:
 - a. Steel tubing.
 - b. Aluminum.
 - c. Fiberglass.
 - d. Laminated wood.
 - e. Pressure-treated wood.
 - f. Prestressed concrete.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.

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- B. Clearly label and tag all components.
- C. Test and balance all systems for proper operation.
- D. Restore damaged finishes. Clean and protect work from damage.
- E. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 27 00 00

COMMUNICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide communications systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: FCC regulations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Communications: Provided and installed by equipment vendor.
 - 1. Application: Headsets
 - 2. Application: Q-Timer
 - 3. Application: Order Confirmation Board
 - 4. Application: Music system
 - 5. Application: Loop Detection system
 - 6. Application: Electronic Point of Sale (EPOS) system.
 - a. Firewalls.
 - b. Routers.
 - c. Network management.
 - d. Wireless access points.
 - e. Modem

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- C. Clearly label and tag all components.

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- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 27 11 16

COMMUNICATIONS CABINETS, RACKS, FRAMES, AND ENCLOSURES

PART 1 GENERAL

1.1 SUMMARY

- A. Wall mounted equipment racks.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Manufacturers qualifications: ISO 9001:2000 registered company.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wall mount pivoting equipment rack: Installed by general contractor.
 - 1. Manufacturers: Middle Atlantic Products Inc.
 - 2. DWR series wall mount rack:
 - a. Model: EWR-16-22
 - b. Type: 19" wall mount rack
 - c. Compliance: EIA/TIA 310D
 - d. UL Listed: US and Canada
 - e. Overall dimensions: 22.3"deep x23.4"wide x35"high.
 - f. Rackspaces: 16
 - g. Weight capacity: 150pounds
 - h. Mounting: tool free "quick mount" system
 - i. Finish: Black textured
 - j. Keylock: Standard 1/4 turn
 - 3. Accessories
 - a. Locking Front Door
 - b. Rack mount outlet strip with surge protection
 - c. Cooling fan
 - d. Rack mount shelf
 - e. One (1) set LPB Lacing Bars

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install in accordance with manufacturer's instructions and approved submittals. Provide proper clearances for servicing.

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- B. Install wall mount pivoting equipment racks plumb, level, square, and secure.
- C. Mount racks for left-hand
- D. Test for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 27 30 00

VOICE COMMUNICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide voice communications systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Operation and Maintenance Data: Submit manufacturer's operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Compliance: FCC regulations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Voice Communications:
 - 1. Manufacturers:
 - 2. Application: Locations indicated by owner.
 - 3. Telephone System Components:
 - a. Telephone wiring, cabling, and jacks.
 - b. Control and signal transmission media.
 - c. Terminals.
 - d. Telephone handsets.
 - 4. Telephone Distribution System Components:
 - a. Terminal Blocks: Type 66 or 100, stand-off brackets.
 - b. Jack Assemblies: 8-position modular, latching, plug type.
 - c. Cable: 4 pair, No. 24 AWG, solid copper, ICEA S-80-576.
 - d. Cable Trays, Raceways, Boxes, Cabinets: Comply with project standards.
 - e. Backboard: Interior grade plywood, 3/4 inch (19 mm) thick.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials in proper relation with adjacent construction and with uniform appearance for exposed work. Coordinate with work of other sections. Comply with applicable regulations and code requirements. Provide proper clearances for servicing.
- B. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.

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- C. Clearly label and tag all components.
- D. Test and balance all systems for proper operation.
- E. Restore damaged finishes. Clean and protect work from damage.
- F. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 31 20 00

EARTH MOVING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide earthwork operations.

1.2 SUBMITTALS

- A. Test Reports: Submit for approval test reports, list of materials and gradations proposed for use.

1.3 QUALITY ASSURANCE

- A. Compaction:
 - 1. Under structures, building slabs, steps, pavements, and walkways, 95 percent maximum density, ASTM D 1557.
 - 2. Under lawns or unpaved areas, 90 percent maximum density, ASTM D 1557.
- B. Grading Tolerances Outside Building Lines:
 - 1. Lawns, unpaved areas, and walks, plus or minus 1 inch.
 - 2. Pavements, plus or minus 1/2 inch.
- C. Grading Tolerance for Fill Under Building Slabs: Plus or minus 1/2 inch measured with 10-foot straightedge.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Earthwork:
 - 1. Manufacturers:
 - 2. Application: Excavation, filling, compacting and grading operations both inside and outside building limits as required for below-grade improvements and to achieve grades and elevations indicated. Provide trenching and backfill for mechanical and electrical work and utilities.
 - 3. Application: Subbase materials, drainage fill, common fill, and structural fill materials for slabs, pavements, and improvements.
 - 4. Application: Suitable fill from off-site if on-site quantities are insufficient or unacceptable, and legal disposal of excess fill off-site.
 - 5. Application: Rock excavation without blasting unless blasting is specifically authorized.
 - 6. Subbase Material: Graded gravel or crushed stone.
 - 7. Bedding Course: Graded crushed gravel and sand.
 - 8. Borrow Soil: Off-site soil for fill or backfill.
 - 9. Drainage Fill: ashed gravel or crushed stone.
 - 10. Common Fill: Mineral soil free from unsuitable materials.
 - 11. Structural Fill: Graded gravel.
 - 12. Impervious Fill: Gravel and sand mixture.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Excavation is unclassified and includes excavation to subgrade regardless of materials encountered. Repair excavations beyond elevations and dimensions indicated as follows:
 - 1. At Structure: Concrete or compacted structural fill.
 - 2. Elsewhere: Backfill and compact as directed.
- B. Maintain stability of excavations; coordinate shoring and bracing as required by authorities having jurisdiction. Prevent surface and subsurface water from accumulating in excavations. Stockpile satisfactory materials for reuse, allow for proper drainage and do not stockpile materials within drip line of trees to remain.
- C. Compact materials at the optimum moisture content as determined by ASTM D 1557 by aeration or wetting to the following percentages of maximum dry density:
 - 1. Structure, Pavement, Walkways: Subgrade and each fill layer to 95% of maximum dry density to suitable depth.
 - 2. Unpaved Areas: Top 6" of subgrade and each fill layer to 90% maximum dry density.
- D. Place acceptable materials in layers not more than 8" loose depth for materials compacted by heavy equipment and not more than 4" loose depth for materials compacted by hand equipment to subgrades indicated as follows:
 - 1. Structural Fill: Use under foundations, slabs on grade in layers as indicated.
 - 2. Drainage Fill: Use under designated building slabs, at foundation drainage and elsewhere as indicated.
 - 3. Common Fill: Use under unpaved areas.
 - 4. Subbase Material: Use under pavement, walks, steps, piping and conduit.
- E. Grade to within 1/2" above or below required subgrade and within a tolerance of 1/2" in 10'.
- F. Protect newly graded areas from traffic and erosion. Recompact and regrade settled, disturbed and damaged areas as necessary to restore quality, appearance, and condition of work.
- G. Control erosion to prevent runoff into sewers or damage to sloped or surfaced areas.
- H. Control dust to prevent hazards to adjacent properties and vehicles. Immediately repair or remedy damage caused by dust including air filters in equipment and vehicles. Clean soiled surfaces.
- I. Dispose of waste and unsuitable materials off-site in a legal manner.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide erosion and sedimentation control.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used, including:
 - 1. Types of stone and sizes.
 - 2. Types of fabrics and erosion control matting.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Erosion and Sedimentation Control:
 - 1. Manufacturers:
 - 2. Application: Control of water erosion and sediment deposition.
 - 3. Type: High-density polypropylene reinforcing geogrids.
 - 4. Type: Turf reinforcement mat.
 - 5. Type: High-strength geotextiles.
 - 6. Type: Crushed stone bedding with filter fabric and stone riprap.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.

END OF SECTION

SECTION 32 12 16

ASPHALT PAVING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide hot-mixed asphalt paving.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Test Reports: Submit for approval test reports.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Construction Tolerances:
 - 1. Base Course Thickness: Within 1/2 inch.
 - 2. Surface Course Thickness: Within 1/4 inch.
 - 3. Base Course Surface Smoothness: Within 1/4 inch.
 - 4. Surface Course Surface Smoothness: Within 3/16 inch. No ponding acceptable.
 - 5. Crowned Surfaces: Within 1/4 inch from template.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Hot-Mixed Asphalt Paving:
 - 1. Manufacturers:
 - 2. Application: Roadways.
 - 3. Application: Sidewalks.
 - 4. Application: Base for pavers.
 - 5. Asphalt-Aggregate Mixture: Plant-mixed, hot-laid asphalt-aggregate mixture, ASTM D 3515, complying with local DOT and DPW regulations.
 - 6. Prime Coat: Cut-back asphalt, ASTM D 2027.
 - 7. Tack Coat: Emulsified asphalt, ASTM D 977.
 - 8. Herbicide Treatment: EPA registered chemical for weed control.
 - 9. Marking Paint: Alkyd-resin type, lead and chromate free, white or yellow.
 - 10. Wheel Stops: Precast, concrete.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Asphalt/Aggregate Mixture: Comply with local DOT or DPW Standard Specifications for Highways and Bridges. Class as required by loading and use.
- B. Remove loose material from compacted subbase. Proof roll and check for areas requiring additional compaction. Report unsatisfactory conditions in writing. Beginning of work means

acceptance of subbase.

- C. Apply prime coat to prepared subbase. Apply tack coat to previous laid work and adjacent in-place concrete surfaces.
- D. Place asphalt concrete at minimum temperature of 225 degrees F in strips not less than 10' wide overlapping previous strips. Complete entire base course before beginning surface course.
- E. Construct curbs to dimensions indicated or if not indicated to standard shapes. Provide tack coat between curb and pavement.
- F. Begin rolling when pavement can withstand weight of roller. Roll while still hot to obtain maximum density and to eliminate roller marks.
- G. Provide 4' lane and striping paint in uniform, straight lines. Provide wheel stops where indicated and securely dowel into pavement. Protect work from traffic and damage.
- H. Test in-place asphalt work for thickness and smoothness. Remove and replace defective work and patch to eliminate evidence of patching

END OF SECTION

SECTION 32 13 13

CONCRETE PAVING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide cast-in-place concrete paving.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Design Mixes: Submit for approval design mixes, including adjustments for variations in project conditions.
- C. Test Reports: Submit for approval test reports.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Construction Tolerance: 1/8" in 10' for grade and alignment of top of forms; 1/4" in 10' for vertical face on longitudinal axis.
- C. Testing: Independent testing laboratory.
- D. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Concrete Paving Materials:
 - 1. Manufacturer: Concrete Color Additives and Sealers: Increte Systems Inc.
 - 2. Manufacturer: Concrete Stamping and Accessories: Increte Systems Inc.
 - 3. Manufacturer: Tool Release agent: Increte Systems Inc.
 - 4. Application: Exterior site concrete pads.
 - 5. Application: [Colored] concrete patio - Submit color to sample to owner
 - 6. Application: Sidewalks.
 - 7. Application: Driveways
 - 8. Application: Roadways.
 - 9. Finish for Exterior Concrete Sidewalks, Steps, and Site Pads: Non-slip broom finish.
 - 10. Design Mix: 3000 psi, 28 day minimum compressive strength.
 - 11. Content: Portland cement; normal weight aggregates; potable water.
 - 12. Slump Limits: 8 inches minimum with superplasticizer, 3 inches otherwise.
 - 13. Air Content: 5 to 8 percent.
 - 14. Accessories:
 - a. Wire Mesh Reinforcement: Welded plain steel wire fabric, ASTM A 185.
 - b. Reinforcing Bars: Deformed steel bars, ASTM A 615, Grade 60.
 - c. Fabricated Bar Mats: Steel bar or rod mats, ASTM A 184, using ASTM A 615, Grade 60 steel bars.

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- d. Joint Dowel Bars: Plain steel bars, ASTM A 615, Grade 60.
- e. Hook Bolts: ASTM A 307, Grade A threaded bolts.
- f. Liquid-Membrane Forming and Sealing Curing Compound: ASTM C 309, Type I, Class A.
- g. Bonding Compound: Polyvinyl acetate or acrylic base.
- h. Color Pigment: ASTM C 979.
- i. Marking Paint: FS TT-P-1952 white or yellow.
- j. Epoxy Adhesive: ASTM C 881.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with ACI 301 for measuring, mixing, transporting, and placing concrete.
- B. Proof roll subbase and check for unstable areas. Report unsatisfactory conditions in writing. Beginning paving work means acceptance of subbase.
- C. Comply with concrete section for concrete mix, testing placement, joints, tolerances, curing, repairs and protection.
- D. Expansion Joints: For exterior work locate 30' o.c. at approved locations.
- E. Dispose of over-mixed concrete off-site in a legal manner.
- F. Protect concrete paving until weight of a person will not leave any impression. Remove and replace concrete paving, which shows impressions or other defects. Skim coating defects is not acceptable.
- G. Sweep and clean surface to eliminate loose material and dust and apply paint with mechanical equipment to produce pavement markings of dimensions indicated with uniform, straight edges. Apply at manufacturer's recommended rates to provide a minimum wet film thickness of 15 mils
- H. Patio: Install in accordance with manufacturers instructions.
 - 1. Color: 50% Sun Buff color hardener, 50% Sand Buff color hardener, Dark Grey release agent
 - 2. Stamp Pattern: Notched English
 - 3. Sealer: Apply minimum of one coat Increte Clear Seal in accordance with manufacturers instructions

END OF SECTION

SECTION 32 16 00

CURBS AND GUTTERS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide curbs and gutters.

1.2 SUBMITTALS

- A. No submittals required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Construction Tolerance: 1/8' in 10' for grade and alignment; 1/4' in 10' for vertical or sloped face on longitudinal axis.
- C. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Precast Concrete Curbs and Gutters:
 - 1. Manufacturers:
 - 2. Application: Roadway curbs and gutters.
 - 3. Concrete: Portland Cement; normal weight aggregates; potable water.
 - 4. Design Mix: 4000 psi, 28 day minimum compressive strength.
 - 5. Finish: Smooth form finish.
 - 6. Reinforcing Bars: Deformed steel bars.
 - 7. Joint Dowel Bars: Plain steel bars.
- B. Granite Curbs and Gutters:
 - 1. Manufacturers:
 - 2. Vertical Granite Curb: Sawed top and smooth quarry split face.
 - 3. Sloped Granite Curb: Smooth quarry split face.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide acceptable materials and install curbing in strict compliance with local DOT and DPW Standard Specifications for Highways and Bridges.
- B. Set curbs on compacted gravel subbase with joints between curb pieces from 1/8' to 3/4' wide. Point joints with mortar and tool concave; remove surplus mortar and clean curbs.

END OF SECTION

SECTION 32 80 00

IRRIGATION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide irrigation systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Warranty: Submit manufacturers standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 5 years.
- D. Operation and Maintenance Data: Submit manufacturers operation and maintenance data, including operating instructions, list of spare parts and maintenance schedule.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Water Coverage for Turf Areas: 100 percent.
- C. Water Coverage for Planting Areas: 100 percent.
- D. Testing: Hydrostatic test at 100 psi.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Irrigation System:
 - 1. Manufacturers:
 - 2. Application: Irrigation for site plantings.
 - 3. Application: Irrigation for lawns.
 - 4. Piping: Copper.
 - 5. Piping: PVC plastic.
 - 6. Valves: Cast bronze.
 - 7. Backflow Preventers: Cast bronze.
 - 8. Sprinkler Heads: Suitable for service.
 - 9. Automatic Control System: Interior location.
 - 10. Automatic Control System: Exterior location.

PART 3 EXECUTION

3.1 INSTALLATION

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- A. Protect existing landscaping from damage. Repair and repave cut paving to match paving in original condition.
- B. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.
- C. Restore damaged components and test for proper operation. Clean out system and protect work from damage.
- D. Instruct Owner's personnel in proper operation and maintenance procedures.

END OF SECTION

SECTION 32 90 00

PLANTING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide plantings.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. Shop Drawings: Submit shop drawings indicating material characteristics, details of construction, connections, and relationship with adjacent construction.
- C. Maintenance Data: Submit maintenance data, including maintenance schedule.
- D. Notices: Submit 48-hour written notice prior to turnover to Owner for watering and maintenance.
- E. Warranty: Warrant trees and shrubs for a period of one year after date of Substantial Completion, against defects including death and unsatisfactory growth and except for defects resulting from neglect by Owner, abuse by others, or natural phenomena. Replace unsatisfactory plant material at end of warranty period at no additional expense to the Owner. One replacement is required.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Balled and Burlapped Plants and Trees: Graded to American Standard for Nursery Stock, ANSI Z60.1.
- C. Testing: Laboratory testing for suitable soil amendments and fertilizer.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Planting:
 - 1. Manufacturers:
 - 2. Application: Trees, shrubs, plants, and ground cover.
 - 3. Application: Finish grading and lawns.
 - 4. Application: Topsoil and soil amendments.
 - 5. Application: Initial maintenance of landscape materials.
 - 6. Application: Pruning and relocation of existing plant materials.
 - 7. Application: Reconditioning existing lawns.
 - 8. Plant Materials: Deciduous trees and shrubs.
 - 9. Plant Materials: Coniferous trees and shrubs.
 - 10. Plant Materials: Ground cover and plants.
 - 11. Lawns: Seed, new crop seed mixture.

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12. Lawns: Sod, strongly rooted.
13. Topsoil: Site stockpile.
14. Topsoil: From offsite
15. Soil Amendments: Based on soil testing.
16. Accessories:
 - a. Gravel: Water-worn gravel.
 - b. Anti-Erosion Mulch: Seed-free salt hay or threshed straw.
 - c. Anti-Dessicant: Emulsion type, film-forming.
 - d. Plastic Sheet: Black polyethylene, 8 mils.
 - e. Filtration Fabric: Water permeable fiberglass or polypropylene fabric.
 - f. Wrapping: Tree-wrap tape.
 - g. Stakes and Guys: New hardwood, treated softwood, or redwood.
 - h. Metal Edging: Commercial steel edging.
 - i. Wood Headers and Edging: All heart redwood or pressure treated southern yellow pine.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials in accordance with approved submittals. Install landscape work in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- B. Prepare topsoil by mixing fertilizer with loam. Apply fertilizer at a rate of 2 pounds of actual nitrogen per 1000 sq. ft. for plant beds and 2 pounds per inch of trunk for tree pits.
- C. Install soil mix to a depth of 18' in plant beds.
- D. For seeded lawns, apply seed at rate of 5 pounds per 1000 square feet.
- E. For lawns with sod, place sod tightly, with grain in same direction.
- F. Excavate as required for trees and shrubs.
- G. Install plant material and backfill with soil mix. Stake and guy trees. Water thoroughly. Allow for soil settlement.
- H. Provide maintenance and watering until turnover to Owners for maintenance and watering. Replace damaged materials and dead or unhealthy plants prior to turnover to Owner.

END OF SECTION

SECTION 33 10 00

WATER UTILITIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide underground, exterior water service piping systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.
- B. Testing: Hydrostatic tests at minimum 2 times working pressure for 2 hours.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Water Service Piping Systems:
 - 1. Manufacturers:
 - 2. Application: Water service piping for buildings.
 - 3. Piping: Ductile iron.
 - 4. Piping: PVC.
 - 5. Piping: Fiberglass.
 - 6. Piping: Copper.
 - 7. Piping: Polybutylene.
 - 8. Piping: Polyethylene.
 - 9. Valves: Suitable for service.
 - 10. Anchorages: Suitable for service.
 - 11. Accessories:
 - a. Gray iron sleeve coupling assemblies.
 - b. Reinforced concrete valve pits with ladder and cast-iron manhole frame and cover.
 - c. Utility Company water meter.
 - d. Backflow preventers.
 - e. Vacuum breakers.
 - f. Free standing fire hydrants.
 - g. Free standing fire department connections.
 - h. Metallic-lined plastic underground identification tapes.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.

- B. Clean and disinfect system. Test for proper operation. Backfill and protect work from damage.

END OF SECTION

SECTION 33 30 00

SANITARY SEWERAGE UTILITIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide sanitary sewerage systems.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Sanitary Sewerage Systems:
 - 1. Manufacturers:
 - 2. Application: Sewerage piping and systems for building wastes.
 - 3. Pipe and Fittings: Hub-and-spigot cast-iron pipe.
 - 4. Pipe and Fittings: Hubless cast-iron pipe.
 - 5. Pipe and Fittings: PVC.
 - 6. Pipe and Fittings: Fiberglass.
 - 7. Pipe and Fittings: Non-reinforced concrete.
 - 8. Pipe and Fittings: Reinforced concrete.
 - 9. Sleeves, Couplings, Gaskets and Valves: Suitable for service.
 - 10. Manholes, Cleanouts and Catch Basins: Suitable for service.
 - 11. Accessories:
 - a. Outfalls.
 - b. Dry wells.
 - c. Trench drains.
 - d. Packaged pumping stations.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections.
- B. Where connections are made to existing systems, rout out old drainage lines.
- C. Test for proper operation. Clean and protect work from damage.

END OF SECTION

SECTION 33 40 00

STORM DRAINAGE UTILITIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide subdrainage systems for foundations and slabs.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.

1.3 QUALITY ASSURANCE

- A. Comply with governing codes and regulations. Provide products of acceptable manufacturers, which have been in satisfactory use in similar service for three years. Use experienced installers. Deliver, handle, and store materials in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Storm Drainage Systems:
 - 1. Manufacturers:
 - 2. Application: Water detention chambers and infiltration systems.
 - 3. Application: Geotextile membranes and geogrid.
 - 4. Application: Water retention cells.
 - 5. Application: Pond and reservoir liners.
 - 6. Pipe and Fittings: Perforated clay pipe.
 - 7. Pipe and Fittings: Perforated concrete pipe.
 - 8. Pipe and Fittings: Porous concrete pipe.
 - 9. Pipe and Fittings: Clay drain tile.
 - 10. Pipe and Fittings: Concrete drain tile.
 - 11. Pipe and Fittings: Cast-iron pipe.
 - 12. Pipe and Fittings: Polyethylene pipe.
 - 13. Pipe and Fittings: PVC pipe.
 - 14. Pipe and Fittings: Perforated PVC pipe.
 - 15. Pipe and Fittings: ABS plastic pipe.
 - 16. Geotextile: Nonwoven membrane.
 - 17. Water Storage Cells: Injection molded plastic panels.
 - 18. Accessories:
 - a. Open-joint screening, asphalt-or coal tar saturated roofing felt, copper mesh, or woven geotextile filter fabric.
 - b. Pipe couplings.
 - c. Cleanouts.
 - d. Sleeves.
 - e. Drainage conduits.
 - f. Prefabricated drainage panels with drainage core and filter fabric.
 - g. Composite drainage panels with insulating drainage core and filter fabric.
- B. Pond and Reservoir Liners Pipe and Fittings:
 - 1. Manufacturers: CertainTeed Corp Foundation and Pipe Products; Invisible Structures, Inc.; Reed & Graham Inc. Geosynthetics Division.

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2. Application: Geotextile membranes and geogrid.
3. Application: Water retention cells.
4. Pipe and Fittings: Perforated clay pipe.
5. Pipe and Fittings: Perforated concrete pipe.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Coordinate with work of other sections. Provide cleanouts.
- B. Connect to above-grade and below-grade drainage systems. Drain system to approved location. Test for proper operation. Clean system out and protect work from damage.

END OF SECTION