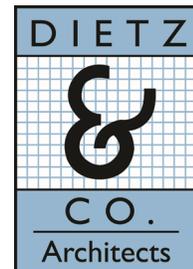

GREENFIELD SENIOR CENTER

35 PLEASANT STREET
GREENFIELD, MA

FOR THE
COUNCIL ON AGING
TOWN OF GREENFIELD, MA

PROJECT MANUAL



Dietz & Company Architects, Inc.
17 Hampden Street
Springfield, MA 01103

December 4, 2015

SCHEMATIC DESIGN

Architect's Project Number 21546

PROJECT MANUAL

GREENFIELD

SENIOR CENTER

Architect

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Civil Engineering/Landscape Architecture

The Berkshire Design Group, Inc.
4 Allen Place
Northampton, MA 01060

Structural Engineering

Barry Engineers & Constructors, Inc.
176 Churchill Street
Pittsfield, MA 01201

MEP/FP Engineering

Creative Environment Corporation
120 Maple Street
Springfield, MA 01105

Cost Estimating

A.M. Fogarty & Associates, Inc.
175 Derby Street – Suite 5
Hingham, MA 02043-4014

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AGREEMENT FORMS

- A. Owner-Contractor Agreement Form: AIA A101, Owner-Contractor Agreement Form - Stipulated Sum, as modified by the Town of Greenfield.
- B. 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 61 00

BOND FORMS

- A. Bid Bond: AIA A310, Bid Bond.
- B. Performance Bond and Payment Bond: AIA A312, Performance Bond and Payment Bond.
- C. Bond Forms: Bond forms are available from the American Institute of Architects, Washington, D.C., 202-626-7300. Bond 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

- A. General Conditions: AIA A201, General Conditions of the Contract for Construction.
- B. 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

DOCUMENT 00 73 00

SUPPLEMENTARY CONDITIONS

- A. Supplementary Conditions: Supplementary Conditions will be prepared and approved for use on the project by the Owner in consultation with an attorney.
- B. Supplementary Conditions Sample Language: Available from the American Institute of Architects, Washington, D.C., 202-626-7300. Supplementary 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: Greenfield Senior Center
35 Pleasant Street
Greenfield, MA
- B. Project Summary: New construction of a single story, wood-framed, slab-on-grade structure, approximately 12,000 gross square feet.
- C. Particular Project Requirements:
 - 1. Existing site conditions and restrictions: Existing former school building to remain. Remains of existing foundations of former structures may be encountered below grade.
 - 2. Requirements for sequencing, scheduling and completion date: Provide Substantial Completion within 10 months of the issuance of the Notice to Proceed.
 - 3. Prior or concurrent work by Owner or others: Demolition of the existing former school building sometime during the construction period.
 - 4. Prior hazardous waste or asbestos work by Owner or others: Oil tank removal behind existing former school.
- D. Energy Efficiency Standards: See Section 01 10 10 Energy Efficient Construction for special requirements.
- E. Permits and Fees: Apply for, obtain, and pay for permits, fees, and utility company backcharges required to perform the work. Submit copies to Architect.
- F. Codes: Comply with applicable codes and regulations of authorities having jurisdiction. Submit copies of inspection reports, notices and similar communications to Architect.
- G. Dimensions: Verify dimensions indicated on drawings with field dimensions before fabrication or ordering of materials. Do not scale drawings.
- H. 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.
- I. 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.
- J. 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.
- K. Limit of Use: Limit use of work as indicated. Keep driveways and entrances clear.
- L. 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.
- M. 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.
- N. 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 10 10

ENERGY EFFICIENT REQUIREMENTS

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 ENERGY EFFICIENCY STANDARDS

- A. General: Building has been oriented for both passive and active solar access and has insulation and air-tightness levels that are expected to exceed EnergyStar Tier III rating.
- B. Construction Requirements: The building is detailed to minimize air leakage through walls and around windows. This building as a whole shall meet an air tightness minimum of 1.2 air changes per hour at 50 pascals (1.2 ACH 50). This shall be proven by blower door testing at completion.
- C. Independent Commissioning: Qualified third party commissioning agents will be utilized to confirm energy efficiency levels and air tightness levels required by these specifications. The General Contractor shall bear all costs associated with air tightness testing beyond the final test, which will be paid by the Owner.

1.3 AIR SEALING REQUIREMENTS

- A. Overview and Location of the Air Barrier: This document provides guidance on how to create an effective pressure boundary around conditioned space. This guide is provided as recommendations and is not to be considered a requirement except that the building needs to meet a maximum air tightness of 1.2 ach at 50 pascals, as verified by testing to be provided by CET near the completion of the project. Building envelopes are to be air sealed at high and low pressure planes to best mitigate stack-effect driven infiltration.
 - 1. Roof and Walls: The air barrier at the top of the building is to be located at the top side of the 5/8" plywood roof sheathing that sits on top of the roof trusses or framing. The air barrier shall cover the entire roof and lap over the exterior walls over the 1/2" weather barrier sheathing.
 - 2. Penetrations: All penetrations between concrete floor slab and exterior shall be sealed to prevent air movement.
- B. Recessed Electrical Penetrations: Recessed electrical junction boxes in insulated ceilings should be both insulation contact ("IC") and air tight rated. The housing of the recessed box or fixture should also be sealed (with caulk or an effective gasket) to the ceiling gypsum board.
 - 1. Seal holes in and around electrical boxes with fire rated foam or caulk.
 - 2. Seal electrical wire and conduit penetrations through the attic plane; gaps should be sealed with fire rated foam or caulk. For gaps larger than 1/2", use backer material and foam.

3. For larger gaps/openings, use rigid air barrier board and fire rated foam or caulk. Cut the board to size accounting for any obstructions (wires, pipes, etc.), attach board to framing using screws/nails, and then seal the perimeter of the board using expandable foam or caulk.
4. Install insulation taking care to ensure insulation is fitted evenly and is in continuous contact with gypsum board and air barrier.

C. Exterior Wall at Sill Plate:

1. Seal between exterior wall/foundation and sill plate with caulk/expandable foam. For gaps larger than 1/2" use backer material and foam.
2. Seal between sill plate and slab with caulk/expandable foam. For gaps larger than 1/2" use backer material and foam.
3. For larger gaps/openings between the sill plate and slab, use rigid air barrier board and foam or caulk. Cut the board to size accounting for any obstructions (wires, pipes, etc.), attach board to framing using screws/nails, and then seal the perimeter of the board and pipe using expandable foam or caulk.

PART 2 - PRODUCTS (Not Used)

PART 3 - EXECUTION (Not Used)

END OF SECTION 01 10 10

SECTION 01 20 00

PRICE AND PAYMENT PROCEDURES

PART 1 GENERAL

1.1 SUMMARY

A. Price and Payment Procedures:

1. Alternates.
2. Allowances.

1.2 ALTERNATES

- A. Total Price: Provide total price for each alternate in Bid Form. Include cost of modifications to other work to accommodate alternate. Include related costs such as overhead and profit.
- B. Acceptance of Alternates: Owner will determine which alternates are selected for inclusion in the Contract.
- C. Coordination of Alternates: Modify or adjust affected adjacent work as necessary to integrate work of the alternate into Project. Coordinate alternates with related work to ensure that work affected by each selected alternate is properly accomplished.
- D. List of Alternates:
 1. ((Add alternates.))

1.3 ALLOWANCES

- A. Allowances: Unit cost allowances are listed below and as indicated on the Drawings. Amounts shall include all costs including overhead and profit except as specifically noted. Coordinate allowances with requirements for related and adjacent work.
- B. Notification of Owner: Notify Owner of date when final decision on allowance items is required to avoid delays in the work.
- C. Certification of Quantities: Furnish certification that quantities of products purchased are the actual quantities needed with reasonable allowance for cutting or installation losses, tolerances, mixing, waste, and similar margins.
- D. Invoices and Delivery Slips: Submit invoices or delivery slips to indicate actual quantities of materials delivered and costs. Indicate amounts of applicable trade discounts.
- E. Unit Cost Allowances: The following items will be selected at a later date and unit costs below are for materials only. Installation and all other costs are to be included in the base bid. Refer to the Drawings to determine quantities required, multiply by unit cost below, and include total within base bid.
 1. Unsuitable Soils Removal and Replacement: \$ _____ Per CY

PART 2 PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01 30 00

ADMINISTRATIVE REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Administration of Contract: Provide administrative requirements for the proper coordination and completion of work including the following:
 - 1. Supervisory personnel.
 - 2. Preconstruction conference.
 - 3. Project meetings, minimum of two per month; prepare and distribute minutes.
- B. Reports: Submit daily and special reports.
- C. Work Schedule: Submit progress schedule, updated monthly.
- D. Submittal Schedule: Prepare submittal schedule; coordinate with progress schedule.
- E. Schedule of Values: Submit schedule of values.
- F. Schedule of Tests: Submit schedule of required tests including payment and responsibility.
- G. Perform Surveys: Lay out the work and verifying locations during construction. Perform final site survey.
- H. Emergency Contacts: Submit and post a list of emergency telephone numbers and address for individuals to be contacted in case of emergency.
- I. Record Documents: Submit record drawings and specifications; to be maintained and annotated by Contractor as work progresses.

1.2 SUBMITTALS

- A. Types of Submittals: Provide types of submittals listed in individual sections and number of copies required below.
 - 1. Shop drawings, reviewed and annotated by the Contractor.
 - 2. Product data.
 - 3. Samples - 2, plus extra samples as required to indicate range of color, finish, and texture to be expected.
 - 4. Inspection and test reports.
 - 5. Warranties.
 - 6. Survey data.
 - 7. Closeout submittals.
- B. Submittal Procedures: Submittals shall be processed through Textura/Submittal Exchange. Comply with project format for submittals. Comply with submittal procedures established by Architect including Architect's submittal and shop drawing stamp. Provide required resubmittals if original submittals are not approved. Provide distribution of approved copies including modifications after submittals have been approved.
- C. Samples and Shop Drawings: Samples and shop drawings shall be prepared specifically for this project. Shop drawings shall include dimensions and details, including adjacent construction and related work. Note special coordination required. Note any deviations from requirements of the

Contract Documents.

- D. Warranties: Provide warranties as specified; warranties shall not limit length of time for remedy of damages Owner may have by legal statute. Contractor, supplier or installer responsible for performance of warranty shall sign warranties.

PART 2 PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01 40 00

QUALITY REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Quality Monitoring: Monitor quality control over suppliers, manufacturers, products, services, site conditions, and workmanship, to produce Work of specified quality. Perform quality control procedures and inspections during installation.
- B. Standards: Comply with specified standards as minimum quality for the Work except where more stringent tolerances, codes, or specified requirements indicate higher standards or more precise workmanship.
- C. Tolerances: Monitor fabrication and installation tolerance control of products to produce acceptable Work. Do not permit tolerances to accumulate. Comply with manufacturers' tolerances.
- D. Reference Standards: For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.
- E. Manufacturer's Field Services: When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to perform the following as applicable, and to initiate instructions when necessary.
 - 1. Observe site conditions.
 - 2. Conditions of surfaces and installation.
 - 3. Quality of workmanship.
 - 4. Start-up of equipment.
 - 5. Test, adjust and balance of equipment.
- F. Mock-Ups: Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes. Accepted mock-ups shall be a comparison standard for the remaining Work.
- G. Removal of Mock-Ups: Where mock-up has been accepted by Architect and no longer needed, remove mock-up and clear area when directed to do so.

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. Temporary Services: Provide temporary services and utilities, including payment of utility costs including the following.
 - 1. Water (potable and non-potable).
 - 2. Lighting and power.
 - 3. Metering.
 - 4. Telephone.
 - 5. Toilet facilities.
 - 6. Materials storage.

- B. Construction Facilities: Provide construction facilities, including payment of utility costs including the following.
 - 1. Construction equipment.
 - 2. Dewatering and pumping.
 - 3. Enclosures.
 - 4. Heating.
 - 5. Lighting.
 - 6. Access.
 - 7. Roads.

- C. Security and Protection: Provide security and protection requirements including the following.
 - 1. Fire extinguishers.
 - 2. Site enclosure fence, barricades, warning signs, and lights.
 - 3. Building enclosure and lock-up.
 - 4. Environmental protection.
 - 5. Pest control during and at the end of construction.
 - 6. Snow and ice removal if applicable.

- D. Personnel Support: Provide personnel support facilities including the following.
 - 1. Architect's field office with telephone, fax and data connection.
 - 2. Contractor's field office.
 - 3. Sanitary facilities.
 - 4. Drinking water.
 - 5. Project identification sign.
 - 6. Cleaning.

PART 2 PRODUCTS – NOT APPLICABLE TO THIS SECTION

PART 3 EXECUTION - NOT APPLICABLE TO THIS SECTION

END OF SECTION

SECTION 01 60 00
PRODUCT REQUIREMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Manufacturers: Provide products from one manufacturer for each type or kind as applicable. Provide secondary materials as acceptable to manufacturers of primary materials.
- B. Product Selection: Provide products selected or equal approved by Architect. Products submitted for substitution shall be submitted with complete documentation, and include construction costs of substitution including related work.
- C. Substitutions: 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.
- D. Substitution Requests: Substitutions shall be submitted prior to award of contract, unless otherwise acceptable. Approval of shop drawings, product data, or samples containing substitutions is not an approval of a substitution unless an item is clearly presented as a substitution at the time of submittal.

PART 2 PRODUCTS - NOT APPLICABLE TO THIS SECTION

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. Substantial Completion: The following are prerequisites to substantial completion. Provide the following:
1. Punch list prepared by Contractor and subcontractors as applicable.
 2. Supporting documentation.
 3. Warranties.
 4. Certifications.
 5. Occupancy permit.
 6. Start-up and testing of building systems.
 7. Changeover of locks.
 8. Meter readings.
 9. Commissioning documentation.
- B. Final Acceptance: Provide the following prerequisites to final acceptance:
1. Final payment request with supporting affidavits.
 2. Completed punch list.
- C. As-Built Drawings: Provide a marked-up set of drawings including changes, which occurred during construction.
- D. Project Closeout: Provide the following during project closeout:
1. Submission of record documents.
 2. Submission of maintenance manuals.
 3. Training and turnover to Owner's personnel.
 4. Final cleaning and touch-up.
 5. Removal of temporary facilities.

PART 2 PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 EXECUTION

3.1 CUTTING AND PATCHING

- A. Cutting and Patching: Provide cutting and patching work to properly complete the work of the project, complying with project requirements for:
1. Structural work.
 2. Mechanical/electrical systems.
 3. Visual requirements, including detailing and tolerances.
 4. Operational and safety limitations.
 5. Fire resistance ratings.
 6. Inspection, preparation, and performance.
 7. Cleaning.
- B. Means and Methods: Do not cut and patch in a manner that would result in a failure of the work to perform as intended, decrease energy performance, increase maintenance, decrease operational life, or decrease safety performance.

- C. Inspection: Inspect conditions prior to work to identify scope and type of work required. Protect adjacent work. Notify Owner of work requiring interruption to building services or Owner's operations.
- D. Performance of Operations: Perform work with workmen skilled in the trades involved. Prepare sample area of each type of work for approval.
- E. Cutting: Use cutting tools, not chopping tools. Make neat holes. Minimize damage to adjacent work. Inspect for concealed utilities and structure before cutting.
- F. Patching: Make patches, seams, and joints durable and inconspicuous. Comply with tolerances for new work.
- G. Cleaning: Clean work area and areas affected by cutting and patching operations.

END OF SECTION

SECTION 02 30 00

SUBSURFACE INVESTIGATION

PART 1 GENERAL

1.1 SUMMARY

- A. Geotechnical Report: A copy of the geotechnical report and boring logs are available from the Architect and Owner.
- B. Information Not Guaranteed: Information on the Drawings and in the Project Manual relating to subsurface conditions and existing utilities and structures is from information available from sources available to the Owner's engineering consultants. Such information is furnished only for the information and convenience of the Contractor, and the accuracy or completeness of this information is not guaranteed.

PART 2 PRODUCTS - NOT APPLICABLE TO THIS SECTION

PART 3 EXECUTION - NOT APPLICABLE TO THIS SECTION

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: 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. 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. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.
- E. 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. Manufacturers, Concrete Forming and Accessories: Ceme-Tube LLC; Newark Paperboard Products; Scott System, Inc.; Symons; Universal Building Products, Inc.; or approved equal.
 - 2. Manufacturers, Concrete Anchoring: Powers Fasteners.; or approved equal.
 - 3. Manufacturers, Concrete Curing, Sealing and Hardening: Armorlon, Division of Reef

- Industries, Inc.; Ashford Formula, By Curecrete.; or approved equal.
4. Manufacturers, Cement Grouts, Adhesives and Sealants: Five Star Products, Inc.; or approved equal.
 5. Manufacturers, Concrete Resurfacing and Rehabilitation: MAPEI Corp.; ProSpec (formerly Bonsal branded products); or approved equal.
 6. Application: Foundations and footings.
 7. Application: Slabs on grade.
 8. Application: Exterior site concrete and pads.
 9. Finish for Vertical Surfaces Exposed To View: Smooth rubbed finish.
 10. Finish for Vertical Surfaces Not Exposed To View: As-cast form finish.
 11. Finish for Horizontal Surfaces To Receive Concrete or Mortar Setting Bed: Scratch finish.
 12. Finish for Surfaces to be Exposed to View or Covered with Resilient Flooring, Carpet Tile or Other Thin Finish System: Trowel finish.
 13. Finish for Surfaces to Receive Thin-set Ceramic or Quarry Tile: Trowel and fine broom finish.
 14. Finish for Exterior Concrete Platforms, Steps, Ramps and Sloped Walls: Non-slip broom finish.
 15. 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 A 767, Class II, galvanized.
 - d. Steel Wire: ASTM A 82.
 - 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. Vapor Retarder: ASTM D 4397 polyethylene sheet, 10 mils.
 - i. Liquid Membrane-Forming Curing Compound: ASTM C 309, Type 1, Class A.
 - j. Underlayment Compound: Free-flowing, self-leveling cement-based compound.
 - k. Bonding Compound: Polyvinyl acetate or acrylic base.
 - l. 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. Chamfer exposed edges/corners to provide straight lines.
- C. Tolerance: Plus 1/8 inch in 10 inches for grade, alignment, and straightness.
- D. Construction Joints: Use keyways, continue reinforcement through joint.
- E. Expansion Joints: For exterior work locate 30 feet o.c. at approved locations. Provide smooth dowels across joint which permit 1 inch horizontal movement and no vertical shear movement.
- F. Isolation Joints: Provide between slabs and vertical elements such as columns and structural walls.
- G. Control Joints: Provide sawn or tooled joints or removable insert strips; depth equal to 1/4 slab thickness. Spacing as required and approved.
- H. Wall Finishes: As-cast and patched for concealed work; rubbed smooth, filled and cement paste coated for exposed work.

- I. Slab Finishes: Obtain sample approval before beginning work.
 - 1. Scratch: For surfaces to receive mortar setting beds or cementitious flooring materials.
 - 2. Trowel: Hard, smooth, uniform surface for areas to receive resilient flooring, carpet, or other thin finish material.
 - 3. Broom: After trowel finishing, roughen surface by fine brooming perpendicular to traffic direction for exposed exterior walks, steps and ramps.
 - 4. Non-Slip Aggregate: After trowel finishing, uniformly trowel 25-lbs./100 square feet of damp non-slip aggregate into surface. Cure, then rub lightly to expose aggregate. Use for interior exposed concrete stairs and ramps.
 - 5. Exposed Aggregate: Use chemical retarder or tamp aggregate into wet concrete and expose by brushing with water. Use where indicated.
 - 6. Hardener Finish: For exposed interior concrete floors. Follow manufacturer's directions.
- J. Cure and protect work. Report defective work in writing.

END OF SECTION

SECTION 05 12 00

STRUCTURAL STEEL FRAMING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide structural steel assemblies 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: 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. 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. Standards: AISC, Code of Standard Practice for Steel Buildings and Bridges, and applicable regulations.
- C. Architecturally Exposed Structural Steel: Comply with fabrication requirements, including tolerance limits, and installation tolerances of AISC's "Code of Standard Practice for Steel Buildings and Bridges" for structural steel identified as architecturally exposed structural steel.
- D. Testing: Independent testing laboratory.
- E. Erection Tolerances: AISC standards.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Structural Steel:
 - 1. Application: Building structure.
 - 2. Application: Architecturally exposed structural steel.
 - 3. Structural Steel Shapes, Plates, and Bars: ASTM A 572.
 - 4. Cold-Formed Steel Tubing: ASTM A 500, Grade B.
 - 5. Hot-Formed Steel Tubing: ASTM A 501.
 - 6. Steel Pipe: ASTM A 53, Type E or S, Grade B; or ASTM A 501.
 - 7. Steel Castings: ASTM A 27, Grade 65-35.
 - 8. Headed Stud-Type Shear Connectors: ASTM A 108, Grade 1015 or 1020.
 - 9. Anchor Bolts: ASTM A 307, nonheaded type.
 - 10. Unfinished Threaded Fasteners: ASTM A 307, Grade A.
 - 11. High-Strength Threaded Fasteners: ASTM A 325 or ASTM A 490, as applicable.

12. Auxiliary Materials:
 - a. Direct Tension Indicators: ASTM A 959.
 - b. Electrodes for Welding: AWS Code.
13. Structural Steel Primer Paint: SSPC - Paint 13, compatible with topcoats.
14. Cement Grout: Portland cement, sand.
15. Metallic Shrinkage-Resistant Grout: Premixed ferrous aggregate grouting compound ASTM C 1107.
16. Nonmetallic Shrinkage-Resistant Grout: Premixed nonmetallic grouting compound, ASTM C 1107.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with AISC codes and specifications, and with AWS "Structural Welding Code."
- B. Employ a registered engineer to check elevations and plumb and level tolerances; certify that installed work is within AISC Standards. Owner may engage testing/inspection agency to inspect welded and bolted connections.
- C. Architecturally exposed steel: Fabricate with special care using materials carefully selected for best appearance. Store materials off ground and keep clean. Cut, fit and assemble work with surfaces smooth, square and with complete contact at joints. Set all cambers up. Weld all work continuously; grind smooth and flush to make seams not visible after priming. Prepare surfaces to comply with SSPC-SP6; apply prime coat within 24 hours after cleaning.
- D. Touch up field welds and abraded areas with shop primer.

END OF SECTION

SECTION 05 50 00
METAL FABRICATIONS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide metal fabrications.

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. 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. Metal Fabrications:
 - 1. Manufacturers, Metal Fastenings: Kee Industrial Products, Inc.; or approved equal.
 - 2. Manufacturers, Metal Ladders: ACL Industries, Inc.; ALACO Ladder Co.; DeMuth Steel Products, Inc.; Jomy Products, Inc.; O'Keeffe's, Inc.; Precision Ladders, LLC; or approved equal.
 - 3. Application: Rough hardware.
 - 4. Application: Pipe railings at retaining wall.
 - 5. Application: Ship's ladders.
 - 6. Application: Loose bearing and leveling plates.
 - 7. Application: Loose steel lintels.
 - 8. Application: Shelf and relieving angles.
 - 9. Application: Miscellaneous framing and supports for overhead doors and grilles.
 - 10. Application: Miscellaneous framing and supports for suspended toilet partitions.
 - 11. Application: Miscellaneous framing and supports for suspended operable partitions.
 - 12. Application: Steel framing and supports for countertops.
 - 13. Application: Miscellaneous steel trim.
 - 14. Ferrous Materials:
 - a. Steel Plates, Shapes and Bars: ASTM A 36.
 - b. Rolled Steel Floor Plates: ASTM A 786.
 - c. Steel Tubing: ASTM A 500 or A 501.
 - d. Uncoated Structural Steel Sheet: ASTM A 611 or A 570.
 - e. Uncoated Steel Sheet: ASTM A 366 or A 569.

- f. Galvanized Steel Sheet: ASTM A 653, G90.
 - g. Steel Pipe, Black Finish: ASTM A 53.
 - h. Steel Pipe, Galvanized Finish: ASTM A 53.
 - i. Gray Iron Castings: ASTM A 48, Class 30.
 - j. Malleable Iron Castings: ASTM A 47, Grade 32510.
 - k. Reinforcing Bars: ASTM A 615, Grade 60.
 - l. Brackets, Flanges, and Anchors: Cast or formed metal.
 - m. Concrete Inserts: Threaded or wedge type.
 - n. Welding Rods and Bare Electrodes: AWS specifications.
 - o. Zinc-Coating: Hot-dip galvanized coating for materials in exterior assemblies or exterior walls.
15. Stainless Steel Materials:
- a. Bar Stock: ASTM A 276, Type 302 or 304.
 - b. Plate: ASTM A 666, Type 302 or 304.
 - c. Rolled-Steel Floor Plate: ASTM A 786.
16. Fasteners:
- a. Bolts and Nuts: Hexagon head type, ASTM A 307, Grade A.
 - b. Lag Bolts: Square head, FS FF-B-561.
 - c. Machine Screws: Cadmium plated steel, FS FF-S-92.
 - d. Wood Screws: Flat head carbon steel, FS FF-S-111.
 - e. Plain Washers: Round carbon steel, FS FF-W-92.
 - f. Drilled-In Expansion Anchors: FS FF-S-325.
 - g. Toggle Bolts: Tumble-wing type, FS FF-B-588.
 - h. Lock Washers: Spring type carbon steel, FS FF-W-84.
 - i. Zinc-Coating: Fasteners in exterior assemblies or exterior walls.
17. Auxiliary Materials:
- a. Nonshrink Metallic Grout: ASTM C 1107.
 - b. Nonshrink Nonmetallic Grout: ASTM C 1107.
 - c. Interior Anchoring Cement: Hydraulic expansion cement.
 - d. Exterior/Interior Anchoring Cement: Erosion-resistant hydraulic expansion cement.
 - e. Shop Primer: Fast curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79, compatible with topcoats.
 - f. Zinc-Rich Primer: Complying with SSPC-Paint 20 or SSPC-Paint 29 and compatible with topcoat.
 - g. Galvanizing Repair Paint: SSPC - Paint 20.
 - h. Bituminous Paint: Asphalt mastic, SSPC - Paint 12.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Take field measurements prior to preparation of shop drawings and fabrication. Do not delay job; allow for cutting and fitting if field measurement not practical.
- B. Form work true to line with sharp angles and edges. Weld continuously, grind flush and make smooth on exposed surfaces.
- C. Install work plumb and level with hairline joints and ground flush welds.
- D. Touch up damaged coatings with shop primer and galvanize repair paint.
- E. Paint items scheduled in accordance with painting section.

END OF SECTION

SECTION 05 52 00

METAL RAILINGS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide pipe and tube handrails and railing 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.

1.3 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. Handrail and Railing Structural Performance: In accordance with applicable Building Code.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Metal Railings:
 - 1. Manufacturers, Handrails and Railings: ACI Distribution - Vitro; AVCON; Couturier Iron Craft, Inc.; Hansen Architectural Systems; INKAN Ltd.; Joseph Blum & Co.; Kee Industrial Products, Inc.; Moultrie Manufacturing Company; Taco Metals, Inc.; UltraGuard, Division of Alside; or approved equal.
 - 2. Application: Interior metal railings.
 - 3. Stainless Steel Pipe and Tube Railing Systems:
 - a. Tubing: ASTM A 554, Grade TP 304 or TP 316.
 - b. Pipe: ASTM A 312, Grade TP 304 or TP 316.
 - c. Castings: ASTM A 743, Grade CF 8 or CF 20.
 - d. Plate: ASTM A 666, Type 304 or 316.
 - 4. Stainless Steel Finish: 180 grit, satin finished.

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. Provide light-tight, hairline joints.
- 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. Coordinate with work of other sections; provide inserts and templates as needed. Install work plumb and level with uniform appearance.

- D. Restore damaged finishes and protect work.

END OF SECTION



STRUCTURAL DESIGN NARRATIVE

December 3, 2015

Per your request I am writing to provide you with a description of proposed structural systems for the Greenfield Senior Center in Greenfield, Massachusetts. The building is a one story slab on grade building with some mechanical spaces for air handling units above ceilings throughout the building. Based on the current layout, I would recommend the following framing and foundation solutions:

Foundation & Slabs

1. The foundations will be 12" thick frost walls to 4' below grade reinforced with (2)#4 bars at top and bottom and #4 bars at 18" oc horizontally. The walls will be doweled to the footings with #4 bent dowels at 18" oc which should extend to the top of the wall.
2. The footing will be approximately 12" thick x 3'-0" wide and reinforced with (3) #4 bars continuous longitudinally.
3. The slab on grade should be a 4" thick slab with 6x6-w2.9/w2.9 wwf on 10 mil vapor barrier on 4" minimum of rigid insulation.
4. The slab should be placed on 8" minimum of compacted gravel over compacted sub-grade. All organics should be removed below the slab so that the depth of gravel will depend on the final grade of the building and the required amount of existing soils that will need to be removed.
5. Exterior slabs at accessible entrances should have frost walls around the perimeter of the building and have 4" of rigid insulation below them to prevent movement from frost.

Exterior Walls

1. Exterior walls can be 2x4's @ 16" o.c or 2x6's @ 24" o.c. at the 9' ceiling areas and will need to be sheathed with 1/2" plywood sheathing as required to resist horizontal shear forces.
2. Exterior walls at the gathering area gable end wall will need to be at least 2x6 studs (and possibly 2x8 studs) due to the longer length of the wall at the cathedral ceiling areas.

3. Interior bearing walls supporting mezzanines and roofs should be 2x6's @ 16" o.c so that drilling of studs can be done without impacting structural capacity.
4. Hold down anchors will be required at numerous locations to resist overturning forces at shear walls.
5. If double wall systems are used for the exterior walls, the exterior wall will be the bearing walls and the interior walls are only to provide additional space for insulation.

Mezzanine Framing

1. Wood framing of mezzanines will depend on the equipment loads on the mezzanine. With reasonable spans and loads, it is expected that the majority of these can be framed with 2x10's or 2x12's spaced at 16" o.c.
2. Wood sheathing at the mezzanines should be 3/4" tongue and groove structural #1 plywood or Advantec sheathing screwed and glued to the floor framing.

Roof Framing

1. Roof framing at the areas with 9' ceilings can be accomplished with wood roof trusses spaced at 16" or 24" o.c. Mechanical space trusses may be able to be incorporated into the design to provide for mechanical equipment.
2. Roof framing at the cathedral ceiling areas can either be done with scissors trusses or with slope parallel chord trusses to a structural ridge member. The scissors truss option is likely to be the most cost effective solution. Due to the long span, the layout of the trusses will need to be done to accommodate required shipping heights and trusses should be spaced at 16" o.c.
3. Roof sheathing should be a minimum of 5/8" plywood for framing spaced at 16" o.c. and 3/4" plywood for framing spaced at 24" o.c. As a result, if mixed spacings are used, the sheathing should be kept to 3/4" thick. OSB products are not recommended for roof sheathing.

William M. Barry, PE

SECTION 06 10 00

ROUGH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Provide rough carpentry.

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. 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 House Framing Manual.
 - 1. Exterior Wall Framing: 2 inch by 6-inch nominal (38 mm by 140 mm actual) studs, 16 and 24 inches on center, as noted on the drawings.
- E. Preservative Treatment: AWPA C2 for lumber and AWPA C9 for plywood; waterborne pressure treatment. Provide for wood in contact with soil, concrete, masonry, roofing, flashing, dampproofing and waterproofing.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Rough Carpentry Applications:
 - 1. Manufacturers, Dimensional Lumber: CertainTeed Corp., Boardwalk Composite Decking & Railing; or approved equal.
 - 2. Manufacturers, Structural Panels: Temple-Inland Forest Products Corp. - Engineered Wood Products; or approved equal.
 - 3. Manufacturers, Sheathing: Zip .
 - 4. Sustainable Design: Low-emitting materials, adhesives.
 - 5. Sustainable Design: Low-emitting materials, no added urea-formaldehyde.
 - 6. Application: Framing with dimension lumber.
 - 7. Application: Framing with engineered wood products.
 - 8. Application: Wood grounds, nailers, and blocking.
 - 9. Application: Wood furring.
 - 10. Application: Backing panels.
 - 11. Application: Sheathing.
 - 12. Application: Subflooring.
 - 13. 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.
14. Miscellaneous Lumber:
- a. Moisture Content: 19 percent.
 - b. Grade: Standard grade light framing.
15. 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. Parallel-Strand Lumber: A composite of wood strand elements with grain primarily parallel to member lengths, manufactured with an exterior-type adhesive complying with ASTM D 2559.
 - c. Prefabricated Wood I Joists: Stress-graded lumber bonded to APA performance rated panel with exterior type adhesive; design stresses for use intended.
 - d. Composite Joists and Headers: Laminated lumber veneers; design stresses for use intended.
16. Construction Panels:
- a. Combination Subfloor-Underlayment: Exposure 1, Structural I, Underlayment.
 - b. Oriented-Strand-Board Wall Sheathing: Exposure 1, Structural sheathing. Huber ZIP System Sheathing and Tape.
 - c. Oriented-Strand-Board Roof Sheathing: Exposure 1, Structural I sheathing. Huber ZIP System Sheathing and Tape.
 - d. Telephone and Electrical Equipment Backing Panels: DOC PS 1, Exposure 1, C-D Plugged, fire-retardant treated.
17. Sill Sealer Gaskets:
- a. Material: Glass fiber strip resilient insulation.
18. 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 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: 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.

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.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wood Trusses:
 - 1. Manufacturers, metal connector plates: Alpine Engineered Products, Inc.; Cherokee Metal Products, Inc.; CompuTrus, Inc.; or approved equal.
 - 2. Manufacturers, metal framing anchors: Cleveland Steel Specialty Co.; Harlen Metal Products, Inc.; KC Metals Products, Inc.; Simpson Strong-Tie Co., Inc., or approved equal.
 - 3. Lumber Standard: PS 20 American Softwood Lumber Standard.
 - 4. Dressing: Dressed four sides.
 - 5. Species: Softwood species of specified grade.
 - 6. Design Values: Modulus of elasticity at least 1,800,000 psi; extreme fiber stress in bending of at least 1800 psi.
 - 7. Moisture Content: Seasoned, 19 percent maximum.
 - 8. Grade for Chord Members: No. 1.
 - 9. Grade for Web Members: Same as chord grade.
 - 10. 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.
 - d. Lag Bolts: ASME B18.2.1.
 - e. Bolts: ASTM A 307, Grade A; ASTM A 563 for hex nuts and, where indicated, flat washers.

- f. Metal Framing Anchors: Hot-dip galvanized steel sheet, ASTM A 653, G60.
- g. Truss Tie-Downs: Bent strap tie for fastening roof trusses to wall studs below; Stainless-Steel Sheet, ASTM A 666, Type 304.
- h. Connectors: Stainless steel sheet, ASTM A 653; ASTM A 666, Type 304.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install and brace trusses according to TPI recommendations and within installation tolerances in TPI 1.
- 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. Install trusses plumb, square, and true to line and securely fasten to supporting construction.
- D. Restore damaged components. Clean and protect work from damage.

END OF SECTION

SECTION 06 20 13

EXTERIOR FINISH CARPENTRY

PART 1 GENERAL

1.1 SUMMARY

- A. Provide exterior finish carpentry.

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.
- B. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship of each type of finish carpentry.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Exterior Standing and Running Trim, Rails, Door Frames and Window Frames:
 - 1. Manufacturers: CertainTeed Corp.; Versatex; Fypon; Kleer, or approved equal.
 - 2. Material for trim: Cellular PVC.
 - 3. Sizes:
 - a. Rakes, Gable Ends, Fascias: 5/4 x 10" with 5/4 x 6" over top.
 - b. Corner Trim: 5/4 x 6"
 - c. Horizontal Trim: 5/4 x 6"
 - d. Window and Door Trim: 5/4 x 4" on jambs and casings
 - e. Window and Door Sill: Shaped and sloped 5/4 material
 - 4. Finish: Paint.
- B. Exterior Fasteners:
 - 1. Nails: Stainless steel siding nails.
 - 2. Screws and Anchors: Noncorrosive, type required for secure anchorage.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide 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. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Use non-corrosive fasteners for exterior work. Coordinate with work of other sections.
- C. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials.
- D. Repair minor damage, clean and protect.

END OF SECTION

SECTION 06 40 23

INTERIOR ARCHITECTURAL WOODWORK

PART 1 GENERAL

1.1 SUMMARY

A. Provide interior finish carpentry, as follows:

1. Benches
2. Open shelving
3. Closed cabinets
4. Handrails
5. Chair rails
6. Miscellaneous wood trim

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.
- B. Standards: Architectural Woodwork Institute (AWI) "Architectural Woodwork Quality Standards."
- C. Standards: Woodwork Institute (WI) "Manual of Millwork."
- D. 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.
- E. Sustainable Design:
 1. Low-emitting materials, adhesives.
 2. Low-emitting materials, field-applied paints and coatings.
 3. Low-emitting materials, no added urea-formaldehyde.
- F. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship of each type of finish carpentry.

PART 2 PRODUCTS

2.1 MATERIALS

A. Interior Standing and Running Trim and Rails:

1. Species for Transparent Finish: Hardwood.
2. Grade: Premium.
3. Site Finish: Transparent finish.

B. Interior Wood Casework:

1. Species for Transparent Finish: Hardwood.
2. Grade: Premium.
3. Face Style: Flush.
4. Frame Fabrication: Frameless.
5. Grain Matching: Vertical.
6. Veneer Matching of Leaves: Book.
7. Veneer Matching In Panel Face: Running.
8. Site Finish: Transparent finish.

C. Interior Casework Hardware and Auxiliary Materials:

1. Manufacturers: Accuride International, Inc.; Blum, Inc.; Grass America, Inc.; Hafele America Co.; Knappe & Vogt Mfg. Co.; or approved equal.
2. Hardware Standard: ANSI/BHMA A156.9.
3. Hardware Finish and Base Metal: Satin chromium plated steel.
4. Glass: Clear tempered glass, ASTM C 1048.

D. Interior Solid Surfacing Material Countertops and Interior Window Sills:

1. Manufacturers: Silestone by Consentino; Cambria; LG HiMacs; or approved equal.
2. Type: Quartz aggregate, polyester resin, and color pigments formed into flat slabs.
3. Edge: Square with eased edges.
4. Special Fabrication: Integral bowls, backsplashes.

E. Interior Frames and Jambs:

1. Species for Transparent Finish: Hardwood.
2. Grade: Premium.
3. Site Finish: Transparent finish.

F. Interior Shelving and Closet Specialties:

1. Shelving: Plywood with hardwood edgeband.
2. Closet Rods: Chrome plated steel.

G. Interior Auxiliary Materials:

1. Screws: FS FF-S-111.
2. Nails: FS FF-N-105.
3. Anchors: Type required for secure anchorage.
4. Adhesives: Low VOC types.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Provide 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 Section 1700 for the same grade specified for type of woodwork involved.
- C. Install materials and systems in accordance with manufacturer's instructions and approved submittals. Install materials and systems in proper relation with adjacent construction. Use non-corrosive fasteners for exterior work. Coordinate with work of other sections.
- D. Comply with manufacturer's requirements for cutting, handling, fastening and working treated materials.
- E. Repair minor damage, clean and protect.

END OF SECTION

SECTION 07 21 00
THERMAL INSULATION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide thermal insulation.

1.2 SUBMITTALS

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

PART 2 PRODUCTS

2.1 MATERIALS

A. Board Insulation:

- 1. Manufacturers: Hunter Panels; ICA/Insulation Corporation of America; Knauf Insulation; or approved equal.
- 2. Application: Foundation walls.
- 3. Application: Under slabs-on-grade.
- 4. Type: Extruded polystyrene, rigid.
 - a. Standard: ASTM C 578.

B. Loose Fill Insulation:

- 1. Manufacturers: Blow-In-Blanket LLC; Icynene, Inc.; Knauf Insulation; or approved equal.
- 2. Application: Thermal insulation.
- 3. Type: Cellulosic-fiber.
 - a. Standard: ASTM C 739.

C. Spray-Applied Cellulose Insulation:

- 1. Manufacturer: International Cellulose Corporation; National Fiberor approved equal.
- 2. Application: Exterior walls.
- 3. Standard: ASTM C 1149, Type 1.

D. Spray-Applied Polyurethane Insulation (Open Cell and Closed Cell):

- 1. Manufacturer: BASF Polyurethane Foam Enterprises LLC; Icynene, Inc.; or approved equal.
- 2. Application: Exterior walls.
- 3. Standard: ASTM C 1029.

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 thickness in one layer over entire area, tightly fitting around penetrations.
- B. Pour loose insulation into cavities indicated; provide uniform coverage at correct density and thickness.
- C. Protect installed insulation.

END OF SECTION

SECTION 07 46 00

SIDING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide exterior clapboard siding.

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. Fiber-Cement Siding:

1. Manufacturers: Cement Board Fabricators; Cemplank, Inc.; CertainTeed Corp.; GAF Materials Corporation; James Hardie, Inc.; Nichiha Fiber Cement; WeatherBoards FiberCement Siding; or approved equal.
2. Basis of Design: James Hardie Artisan Lap, 8 ¼ inch with 7 inch exposure.
3. Type: Plain boards.
4. Standard: ASTM C 1186, Type A, Grade II, factory primed.
5. Surface Texture: Smooth.
6. Finish: Shop-applied primer for field finish.
7. Trim: Extruded aluminum, Xtreme Trim, as follows:
 - a. Horizontal reveals
 - b. Vertical reveals
 - c. Inside corners
 - d. Outside corners
8. Siding Accessories: Non-corrosive fasteners.

B. Fiber-Cement Soffits:

1. Manufacturers: Cement Board Fabricators; Cemplank, Inc.; CertainTeed Corp.; GAF Materials Corporation; James Hardie, Inc.; Nichiha Fiber Cement; WeatherBoards FiberCement Siding; or approved equal.
2. Basis of Design: James Hardie Non-vented smooth ½ inch.
3. Standard: ASTM C 1186, Type A, Grade II, factory primed.
4. Surface Texture: Smooth.
5. Finish: Shop-applied primer for field finish.
6. Trim: Extruded aluminum, Xtreme Trim, as follows:
 - a. Horizontal reveals
 - b. Vertical reveals

- c. Inside corners
- d. Outside corners
- 7. Siding Accessories: Non-corrosive fasteners.

PART 3 EXECUTION

3.1 INSTALLATION

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

END OF SECTION

SECTION 07 54 00

THERMOPLASTIC MEMBRANE ROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide thermoplastic membrane roofing.

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 manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 10 years.

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. Thermoplastic Polyolefin Sheet (TPO) Roofing:
 - 1. Manufacturers: Carlisle SynTec Incorporated; ERSystems / Prairie Technologies; Firestone Building Products Co.; Flex Membrane International; GAF Materials Corp.; GenFlex Roofing Systems; Johns Manville International, Inc.; Mule-Hide Products Co., Inc.; Sarnafil, Inc.; Stevens Roofing Systems; Versico; or approved equal.
 - 2. Type: Fully adhered.
 - 3. Membrane: TPO, 60 mils, fabric reinforced.
 - 4. Walkways: Walkway board.
 - 5. Insulation: Polyisocyanurate board.
 - 6. Insulation Profile: Tapered.

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. Begin roof installation only in presence of manufacturer's representative. Minimize seams and shingle overlaps to shed water.
- E. Install walkway protection over an additional layer of membrane at locations indicated and where required to provide access to roof mounted equipment.
- F. Restore or replace damaged components. Protect work from damage.

END OF SECTION

SECTION 07 61 00
SHEET METAL ROOFING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide sheet metal roofing.

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. Sheet Metal Roofing:
 - 1. Manufacturers: Englert, Inc.; Petersen Aluminum Corp.; or approved equal.
 - 2. Seam Type: Standing-seam.
 - 3. Metal: 24 gauge Galvalume, ASTM A-792-83, 2-coat 70 percent Kynar 500 fluoropolymer.
 - 4. Basis-of-Design: Englert Series 1101, 1 inch high, 16 inch wide standing seam snap-lock system.
- B. Auxiliary Materials:
 - 1. Asphalt saturated organic felt underlayment.
 - 2. Batten bars and strips.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with SMACNA Sheet Metal Manual recommendations. Comply with accessory manufacturers' instructions and recommendations. Coordinate installation with roofing system to ensure weathertight performance.
- B. Anchor securely to structure to withstand inward and outward loads.
- C. Isolate dissimilar metals to prevent galvanic corrosion.

END OF SECTION

SECTION 07 62 00

SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.1 SUMMARY

- A. Provide flashing and sheet metal.

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: Beach Sheet Metal Co., Inc.; Berger Building Products, Inc.; Englert, Inc.; Fiberweb Clark/Hammerbeam Corp.; Hohmann & Barnard, Inc.; National Sheet Metal Systems, Inc.; Nervastral Inc.; Petersen Aluminum Corp.; Quickflash Weatherproofing Products, Inc.; Sandell Construction Solutions; SBC Industries Flashings; or approved equal.
- 2. Application: Metal counterflashing and base flashing.
- 3. Application: Exterior wall flashing and expansion joints.
- 4. Application: Built-in scuppers.
- 5. Application: Gutters and downspouts.
- 6. Metal: Zinc-coated steel.
 - a. Standard: ASTM A 653, G90 hot-dip galvanized, 2-Coat 70 percent Fluoropolymer, 20-gauge (.0359 inch).

- B. Auxiliary Materials:

- 1. Solder compatible with metal.
- 2. Bituminous isolation coating.
- 3. Mastic and elastomeric sealants.
- 4. Epoxy seam sealer.
- 5. Rosin-sized building paper slip sheet.
- 6. Polyethylene underlayment.
- 7. Asphaltic roofing cement.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Follow recommendations of SMACNA Sheet Metal Manual. Allow for expansion. Isolate dissimilar materials.
- 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. Restore damaged components and finishes. Clean and protect work from damage.

END OF SECTION

SECTION 07 84 00

FIRESTOPPING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide firestopping.

1.2 SUBMITTALS

- A. Product Data: Submit manufacturer's product data and installation instructions for each material and product used.
- B. 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. Fire Performance: UL 2079, ASTM E 814, and local regulations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Firestopping Systems:
 - 1. Manufacturers: 3M; A/D Fire Protection; e.z. Barrier; WR Grace & Co.; Hilti, Inc.; Nelson Firestop Products; Specified Technologies, Inc.; Tremco; or approved equal.
 - 2. Applications as Applicable to Assembly: Through-penetrations, fire-resistive joints, perimeter fire containment, smoke seals.
 - 3. Types as Applicable to Assembly: Endothermic and intumescent sealants, pillows, putty and wrap strips.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Review extent of work with authorities having jurisdiction and obtain approval of installation thicknesses and methods.
- B. Sequence work to avoid need for removal of firestopping by work of other trades.
- C. Comply with manufacturer's instructions and recommendations. Securely anchor insulation with safing clips. Install firestopping without gaps or voids.
- D. Protect, inspect and repair work until final acceptance.

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 manufacturer's 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.
- B. Field-Constructed Mock-Ups: Each joint type.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Exterior Joints in Vertical Surfaces, Silicone:
 - 1. Manufacturers: Dow Corning; GE Silicones; Tremco; or approved equal.
 - 2. Materials: Two component silicone sealant.
- B. Exterior Joints in Vertical Surfaces, Urethane:
 - 1. Manufacturers: Pecora Corp.; Sika Corp.; Sonneborn; Tremco; or approved equal.
 - 2. Materials: Two-component urethane sealant.
- C. Exterior Joints in Vertical Surfaces, Preformed Compression Seals:
 - 1. Manufacturers: Watson-Bowman Acme Corp.; or approved equal.
 - 2. Materials: Preformed precompressed foam sealant.
- D. Exterior Joints in Horizontal Surfaces, Urethane:
 - 1. Manufacturers: Pecora Corp.; Sandell Construction Solutions; Sika Corp.; Sonneborn; Tremco; or approved equal.
 - 2. Materials: Self-leveling urethane sealant, ASTM C 920.
- E. Exterior Paving Joint Fillers, Bituminous:
 - 1. Manufacturers:
 - 2. Materials: Bituminous fiber.

- F. Interior Joints, Limited Movement, Acrylic:
 - 1. Manufacturers: Bostik; Pecora Corporation; Polymeric Systems, Inc.; Sonneborn Building Products; Tremco; or approved equal.
 - 2. Materials: Acrylic-emulsion, ASTM C 834.
 - 3. VOC Content: Less than 50 g/L.

- G. Interior Joints, Sanitary Silicone:
 - 1. Manufacturers: Dow Corning; GE Advanced Materials; Tremco; or approved equal.
 - 2. Materials: One-part mildew-resistant silicone sealant, ASTM C 920.
 - 3. VOC Content: Less than 50 g/L.

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 more than 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 Doors:
 - 1. Manufacturers: Amweld Building Products; Ceco Door Products; Curries Co.; Mesker Door; Steelcraft Manufacturing; or approved equal.
 - 2. Material: Minimum 18-gauge steel sheet.
 - 3. Thickness: 1-3/4 inches.
 - 4. Finish: Factory primed and field painted.
 - 5. Accessories:
 - a. Silencers.
- B. Interior Steel Frames:
 - 1. Manufacturers: Amweld Building Products; Ceco Door Products; Curries Co.; Mesker Door; Steelcraft Manufacturing; or approved equal.
 - 2. Material: Minimum 16-gauge steel sheet.
 - 3. Corners: Mitered or coped.
 - 4. Type: Welded.
 - 5. Finish: Factory primed and field painted.
- C. Exterior Steel Doors:
 - 1. Manufacturers: Amweld Building Products; Presray Critical Containment Solutions, a

- Division of Pawling Corp.; Steel Door Institute; Steelcraft Manufacturing; Windsor Republic Doors; or approved equal.
2. Material: Minimum 16-gauge galvanized steel sheet.
 3. Door Thickness: 1-3/4 inches, thermally insulated.
 4. Finish: Factory primed and field painted.
 5. Insulation: Polyisocyanurate core.

D. Exterior Steel Frames:

1. Manufacturers: Amweld Building Products; Steel Door Institute; Steelcraft, Div. of IR Security Technologies; Windsor Republic Doors; or approved equal.
2. Material: Minimum 14-gauge galvanized steel sheet.
3. Corners: Mitered or coped.
4. Type: Welded.
5. Finish: Factory primed and field painted.
6. Frames thermally broken.

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./square foot degree F (ASTM C 236) for all exterior doors and elsewhere as noted.
- C. Provide acoustically improved doors with minimum STC of 33 (ASTM E 90 and ASTM E 413) where indicated.
- D. Hardware: Prepare doors and frames to receive hardware on final schedule. Provide for 3 silencers on single doorframes; 2 on double doorframes.
- 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 11 16

ALUMINUM DOORS AND FRAMES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide interior aluminum 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.
- 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.
- B. Source: Provide products of one manufacturer for each type of frame required for the work of this section. Provide secondary materials and products, which are acceptable to the frame manufacturers.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Interior Aluminum Doors and Sidelight Frames:
 - 1. Manufacturers: Frameworks Manufacturing Co., Inc.; Kawneer Inframe; Raco Altura; Wilson Partitions; or approved equal.
 - 2. Aluminum: Extruded aluminum 6063 or 6463-T5 alloy.
 - 3. Frame Type: KD, knock-down type, machined for mortised hardware; field machining and drilling not acceptable.
 - 4. Anchors and Fasteners: Manufacturer's standard units.
 - 5. Finish: Clear anodized.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Fabricate work to be rigid, neat and free from seams, defects, dents, warp, buckle, and exposed fasteners.
- B. Prepare doors and frames to receive hardware on final schedule. Provide for 3 silencers on single doorframes; 2 on double doorframes.

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 manufacturer's 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."] [WI's "Manual of Millwork."]
- E. Fire Rated Wood Doors: Meet NFPA 80 requirements.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Interior Stile and Rail Wood Doors:
 - 1. Manufacturers: Algoma Hardwoods, Inc.; Architectural Door Division Maiman Co.; Artistic Doors & Windows, Inc.; Baillargeon Doors, Inc.; Eggers Industries; JELD-WEN, Inc.; Simpson Door Company; Somerset Door & Column Co.; or approved equal.
 - 2. Basis-of-Design: VT Industries, Heritage Collection.
 - 3. Sustainable Design: Low-emitting materials, adhesives.
 - 4. Sustainable Design: Low-emitting materials, no added urea-formaldehyde.
 - 5. Type: Glazed stile and rail and wood panel stile and rail.
 - 6. Thickness: 1-3/4 inches thick.
 - 7. Grade: Custom.
 - 8. Frames: Aluminum interior framing.
 - 9. Face: Birch veneer.
 - 10. Finish: Transparent.

11. Finish Application: Factory finished.
12. Auxiliary Materials:
 - a. Glazed panels.

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.
- 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. 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. Access Doors:
 - 1. Manufacturers: J. L. Industries; Karp Associates; Milcor; or approved equal.
 - 2. Frames: 16-gauge (.0598 inch) sheet steel with flange.
 - 3. Doors: 14-gauge (.0625 inch) sheet steel.
 - 4. Door Type: Flush panel.
 - 5. Locking Devices: Cylinder locks.
 - 6. 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 33 00
COILING DOORS AND GRILLES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide overhead coiling grilles at
 - 1. Reception desk
 - 2. Kitchen counter

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. Interior Overhead Coiling Counter Grilles:
 - 1. Manufacturers: Cookson Company, Cornell Iron Works, Overhead Door Corp., or approved equal.
 - 2. Grille Curtain and Finish: Aluminum, clear anodized.
 - a. Standard: ASTM B 221.
 - 3. Operation: Manual.
 - 4. Mounting: Between the jambs.
 - 5. Auxiliary Materials:
 - a. Helical torsion spring counterbalance
 - b. Hood for curtain and operating mechanism.

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 assemblies complete with all hardware, anchors, inserts, supports and accessories. Test and adjust operation.
- C. 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. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 5 years.
- D. 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. Aluminum Entrances and Storefront:
 - 1. Manufacturers: ACI Distribution - Vitro; EFCO Corp.; Kawneer Company; Pacific Aluminum - Architectural Glazing Systems; SMI Systems; Tubelite; Vistawall Architectural Products; YKK AP America, Inc.; or approved equal.
 - 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: Wide 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. Aluminum Finish: Clear anodized.
 - 11. Auxiliary Materials:
 - a. Aluminum infill panels.
 - b. Push/pulls, doorstops, overhead holders, and deadlocks.
 - c. Weatherstripping and thresholds.
 - d. Exit devices.

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. Coordinate with glass and glazing work; install hardware and adjust for smooth, proper operation.
- E. Clean and protect completed system; repair damage.

END OF SECTION

SECTION 08 44 33

SLOPED GLAZING ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide sloped glazing assemblies at
 - 1. Front entry canopy
 - 2. Over administrative wing

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. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- D. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 5 years.

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. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Sloped Glazing Systems:
 - 1. Manufacturers: EFCO Corp.; INKAN Ltd.; Kalwall Systems, Skyroofs; Kawneer Company; Naturalite/EPI Skylight Systems; Super Sky Products; Vistawall Architectural Products; Wausau Metals; or approved equal.
 - 2. Type: Site-assembled, self-supporting aluminum-framed sloped glazing system with exterior metal cap retainers over main and cross-rafter, ridges, and hips.
 - 3. Primary Components: Extruded aluminum framing, internal reinforcement, trim, and filler units, sealants, and gaskets.
 - 4. Anchors, Clips, and Accessories: Aluminum, nonmagnetic stainless steel, or galvanized steel.
 - 5. Construction: Thermal-break type.
 - 6. Glazing: Opaque FRP with Lumira Aerogel.

7. Aluminum Finish: Fluoropolymer, 2-coat.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with AAMA guide specification for window walls, and 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. Tolerances: Not more than plus or minus 1/8 inch in 20 feet from true plumb, level, alignment, and location. Flush joints shall be within plus or minus 1/32 inch of true flush.
- C. Anchor framing members securely in place; coordinate work with glass and glazing, sealants, and firestopping work specified elsewhere.
- D. Clean and touch up entire systems inside and out and protect until final acceptance.

END OF SECTION

SECTION 08 54 13

FIBERGLASS WINDOWS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide fiberglass windows.
 - 1. Fixed
 - 2. Awning

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. Warranty: Submit manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
 - 1. Warranty Period: 5 years.
- E. Maintenance Data: Submit manufacturer's maintenance data, including 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. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.
- C. Performance: Comply with AAMA/NWWDA 101/I.S.2 for performance class and grade of window specified.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fiberglass Windows:
 - 1. Manufacturers: Alpen (Serious) Windows, 925 Series; Fibertec Windows, 300 Series; Marvin Windows & Doors, Integrity All Ultrex; or approved equal.
 - 2. Window Members: Pultruded reinforced fiberglass with minimum wall thickness of 0.75-0.077 inches.
 - 3. Grade: Light commercial.
 - a. Standard: AAMA/NWWDA 101/I.S. 2, Grade 40.
 - 4. Window Type: Fiberglass windows with high-performance exterior finish.
 - 5. Window Operation: Awning windows.
 - 6. Window Operation: Casement windows.
 - 7. Glazing: Triple insulating glass with low-e coating.

8. Glazing Color: Clear glass.
9. Glazing Pattern: Single pane per sash.
 - a. Ventilator opening limit device.
 - b. Operating hardware.
 - c. Insect screening.

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 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. Samples: Submit two representative samples of each material specified indicating visual characteristics and finish. Include range samples if variation of finish is anticipated.
- C. 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.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Door Hardware:
 - 1. Manufacturers: ASSA ABLOY Door Security Solutions; Corbin Russwin Architectural Hardware; Dorma Architectural Hardware; FSB USA; Jackson Corp.; Omnia Industries, Inc.; Onity (formerly TESA ESI); PBB, Inc.; Sargent Manufacturing; Schlage Lock Co.; Yale Locks and Hardware; or approved equal.
 - 2. Quality Level: Commercial.
 - 3. Locksets and Latchsets: Mortise type.
 - 4. Lock Cylinders: Interchangeable.
 - 5. Keying: Owner's requirements.
 - 6. Hinges and Butts: Full-mortise type at interior, with nonremovable pins at exterior doors.
 - 7. Closers, Door Control, and Exit Devices: High frequency.
 - 8. Push/Pull Units: Through-bolted type.
 - 9. Hardware Finishes: Satin stainless finish on exposed surfaces.
 - 10. Auxiliary Materials:
 - a. Door Trim Units: Kickplates, edge trim, and related trim.
 - b. Stops and overhead door holders.
 - c. Soundstripping.
 - d. Weatherstripping and thresholds.
 - e. Knox box for fire emergency keys.

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. Adjust operation, clean and protect.

END OF SECTION

SECTION 08 92 00

LOUVERS AND VENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide louvers and vents.

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. Aluminum Wall Louvers:
 - 1. Manufacturers: Airline Products, Airolite; Construction Specialties; Industrial Louvers; McGill Architectural Products; Nystrom Building Products, Inc.; or approved equal.
 - 2. Material: Aluminum extrusions.
 - 3. Blades: Horizontal storm-resistant louvers.
 - 4. Blade Type: Fixed.
 - 5. Finish: Fluoropolymer, 2-coat.
 - 6. Auxiliary Materials:
 - a. Bird screens.
 - b. Insect screens.
 - c. Blank-off panels.
 - d. Insulated blank-off panels.

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. Comply with AMCA Standard 500 and provide units with AMCA Certification rating seal. Comply with SMACNA Sheet Metal Manual except as otherwise indicated.
- C. Provide separate continuous sills where needed to prevent water penetration. Maintain equal

blade-to-blade and blade-to-frame spacing for uniform appearance. Provide concealed vertical mullions and reinforcement as needed.

- D. Provide anchors, supports and accessories as needed. Provide gaskets, flashings and fillers as necessary to make installation watertight.
- E. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 09 00 00 - FINISH SCHEDULE

GREENFIELD SENIOR CENTER

Prepared by
Dietz & Company Architects, Inc.

4-Dec-15

Space	Finishes			
	Floor	Base	Walls	Ceilings
Entry				
Vestibule	Walkoff mat	6" high paver tile	Painted GWB	Painted GWB
Entry lobby	Paver tile	6" high paver tile	Painted GWB	Painted GWB
Reception desk area	TT Carpet	5/4 x 6 Stained Wood	Painted GWB	ACT
Lounge	TT Carpet	5/4 x 6 Stained Wood	Painted GWB	Painted GWB
Administration				
Executive Director	TT Carpet	6" profiled vinyl	Painted GWB	ACT
Activities Director	TT Carpet	6" profiled vinyl	Painted GWB	ACT
Business Office	TT Carpet	6" profiled vinyl	Painted GWB	ACT
Volunteer Coordinator	TT Carpet	6" profiled vinyl	Painted GWB	ACT
Social Worker/Outreach	TT Carpet	6" profiled vinyl	Painted GWB	ACT
Small Conference Room/Growth Office	TT Carpet	6" profiled vinyl	Painted GWB	ACT
Guest Professional Office	TT Carpet	6" profiled vinyl	Painted GWB	ACT
Kitchenette	Rubber tile	6" profiled vinyl	Painted GWB	ACT
Staff Restroom	Rubber tile	6" profiled vinyl	Painted GWB	ACT
Function Areas				
Café	Paver tile	5/4 x 6 Stained Wood	Painted GWB	ACT
Gallery	Vinyl plank	5/4 x 6 Stained Wood	Painted GWB	ACT
Gallery Storage	Vinyl plank	6" profiled vinyl	Painted GWB	ACT
Kitchen	Ceramic tile	6" profiled vinyl	Ceramic tile	Mylar ACT
Kitchen Storage	Ceramic tile	6" profiled vinyl	FRP	Mylar ACT
Kitchen Office	Ceramic tile	6" profiled vinyl	FRP	Mylar ACT
Kitchen Staff Restroom	Ceramic tile	6" profiled vinyl	FRP	Mylar ACT
Restrooms	Ceramic tile	Ceramic tile	Ceramic tile	ACT
Program Areas				
Group Fitness Room	Wood athletic floor	5/4 x 6 Stained Wood	Painted GWB	ACT
Recreation Room	Vinyl plank	5/4 x 6 Stained Wood	Painted GWB	ACT
Computer Training Room	Vinyl plank	6" profiled vinyl	Painted GWB	ACT
Arts and Crafts Room	Vinyl plank	6" profiled vinyl	Painted GWB	ACT
Classroom/Meeting Room	Vinyl plank	6" profiled vinyl	Painted GWB	ACT
Miscellaneous				
Custodial Office and Storage	Rubber tile	6" profiled vinyl	Painted GWB	ACT
Laundry Room	Rubber tile	6" profiled vinyl	Painted GWB	ACT
Other Storage	Rubber tile	6" profiled vinyl	Painted GWB	ACT
Mechanical Room	Sealed concrete	6" profiled vinyl	Painted GWB	ACT
Electrical Room	Sealed concrete	6" profiled vinyl	Painted GWB	ACT
Server Room	Rubber tile	6" profiled vinyl	Painted GWB	ACT

SECTION 09 21 16

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide gypsum board assemblies.

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. 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. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship and level of finish.
- E. Performance: Fire, structural, and seismic performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Gypsum Board:
 - 1. Manufacturers: Georgia Pacific; National Gypsum Co.; Lafarge North America; United States Gypsum Company, or approved equal.
 - 2. Application: Interior walls, partitions, and ceilings with tape and joint compound finish.
 - 3. Application: Cementitious backer units for application of tile.
 - 4. Application: Steel framing systems to receive gypsum board.
 - 5. Application: Insulation in gypsum board assemblies.
 - 6. Application: Installation of access panels in gypsum board assemblies.
 - 7. Material Standard: ASTM C1396.
 - 8. 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.
 - 9. Type: Water-resistant gypsum backing board.
 - a. Type: Regular and fire-rated types as required:
 - b. Typical Thickness: 5/8 inch.
 - 10. Type: Sag-resistant gypsum board.
 - a. Type: Regular and fire-rated types as required for ceilings.
 - b. Thickness: 1/2 inch.
 - 11. Joint Treatment: ASTM C474 and ASTM C840, 3-coat system, paper or fiberglass tape.
 - 12. Auxiliary Materials:

- a. Corner bead, edge trim and control joints.
- b. Gypsum board screws, ASTM C 1002.
- c. Gypsum board nails, ASTM C 514.
- d. Fastening adhesive.
- e. Fastening adhesive, low VOC type.
- f. Concealed acoustical sealant, low VOC type.
- g. Mineral fiber thermal insulation.

B. Cementitious Backer Units:

1. Manufacturers: Smartboard Building Products Inc.
2. Material Standard: ANSI A118.9.
3. Type: Cement-coated Portland cement panels.
 - a. Thickness: 1/2 inch nominal.

C. Steel Framing for Walls and Partitions:

1. Manufacturers: CLARKWESTERN Building Systems; Dietrich Metal Framing, Inc.; MARINO; or approved equal.
2. Material Standard: ASTM C645.
3. Stud Thickness: 20 gauge (.0329 inch).
4. Stud Depth, Typical: 3-5/8 inches.
5. Furring Channel Thickness: 20 gauge (.0329 inch).
6. Auxiliary Framing Components: Furring brackets, resilient furring channels, Z-furring members, and non-corrosive fasteners.

D. Steel Framing for Suspended and Furred Ceilings:

1. Manufacturers: CLARKWESTERN Building Systems; Dietrich Metal Framing, Inc.; MARINO; or approved equal.
2. Material Standard: ASTM C645.
3. Attachment: Standard.
4. Stud Thickness: 20 gauge (.0329 inch).
5. Accessories: Furring channels, hangers and inserts.

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 continuous vapor retarder at exterior walls.
- E. Provide fire-rated systems where indicated and where required by authorities having jurisdiction.
- F. Install boards vertically. Do not allow butt-to-butt joints and joints that do not fall over framing

members.

- 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.
- 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 manufacturer's 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.
- B. Tile: ANSI A 137.1.
- C. Tile Setting Materials: ANSI A 118 series standard specifications.
- D. Tile Installation: ANSI 108 series standard specifications and Tile Council of America, Handbook for Ceramic Tile Installation.
- E. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Tile:
 - 1. Manufacturers: American Marazzi Tile, Inc.; American Olean Tile Co.; American Slate Company; DalTile Corporation; Echeguren Slate, Inc.; Endicott Clay Products Co.; Hakatai Enterprises, Inc.; Hirsch Glass Corp.; Porcelanosa USA; Quartzitec, Inc.; Summitville Tiles, United States Ceramic Tile Co.; Superior Art Building Material, LLC; Superior Art Decor Material, Inc., or approved equal.
 - 2. Application: Interior wall tile over tile backer board at wet areas.
 - 3. Application: Interior floor tile over concrete slab.
 - 4. Type: Ceramic mosaic tile.
 - 5. Type: Porcelain tile.
 - 6. Type: Quarry tile.
 - 7. Type: Paver tile.
- B. Setting Materials:
 - 1. Manufacturers: American Olean Tile Co.; American Slate Company; Bostik, Inc.; Custom Building Products; LATICRETE International, Inc.; MAPEI Corp. ; ProSpec (formerly Bonsal branded products); Schluter System LP; SGM, Inc.; Super-Tek Products, Inc.; TEC Specialty

- Construction Brands, Inc.; or approved equal.
- 2. Mortar setting bed.
 - a. Latex additive.
- 3. Thin-set mortar.
 - a. Latex-Portland cement mortar.
- 4. Grout.
 - a. Latex-Portland cement grout.
- 5. Waterproofing membrane under tile.
 - a. ANSI A 118.10.
- 6. Crack suppression membrane under tile.
 - a. ANSI A 118.10.
- 7. Elastomeric sealants, low VOC type.
- 8. Stone thresholds.

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. Grout and cure, clean and protect.

3.2 SCHEDULE

- A. Tile Schedule:
 - 1. Lobby and Cafe Floors: Paver tile over concrete slab with latex-Portland cement mortar and latex-Portland cement grout.
 - 2. Kitchen Walls: Glazed ceramic mosaic tile over tile backer board with thin-set latex-modified cement mortar and latex-Portland cement grout.
 - 3. Kitchen Floors: Quarry tile over concrete slab with latex-Portland cement mortar and latex-Portland cement grout.
 - 4. Toilet Room Walls: Glazed ceramic mosaic tile over tile backer board with thin-set latex-modified cement mortar and latex-Portland cement grout.
 - 5. Toilet Room Floors: Unglazed ceramic mosaic tile over concrete slab with latex-Portland cement mortar and latex-Portland cement grout.

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. 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. Extra Stock: Submit extra stock equal to 2 percent of amount installed.

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.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Mineral Fiber Acoustical Ceilings:
 - 1. Manufacturers: Armstrong World Industries; Celotex; Hunter Douglas Contract / Techstyle Ceilings; Tectum, Inc.; USG; or approved equal.
 - 2. Panel Size: 24 by 24 inches.
 - 3. Panel Edge: Reveal.
 - 4. Panel Recycled Content: Not less than 40 percent.
 - 5. Grid: Exposed flush grid.
 - 6. Suspension System: Intermediate duty.
 - 7. Auxiliary Materials:
 - a. Edge molding and trim.
 - b. Hold-down clips and impact clips.
 - c. Concealed acoustical sealant, low VOC type (less than 50 g/L).

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

END OF SECTION

SECTION 09 64 00

WOOD FLOORING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide wood flooring, including floor preparation and finishing.

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. Maintenance Data: Submit manufacturer's maintenance data, including maintenance schedule.
- D. Extra Stock: Submit extra stock equal to 2 percent of total 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. Comply with recommendations of National Oak Flooring Manufacturer's Association, Maple Flooring Manufacturer's Association, and the American Parquet Association as applicable.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Wood Strip Flooring for Athletic Courts:
 - 1. Manufacturers: Connor AGA; Horner Flooring; Robbins, or approved equal.
 - 2. Sustainable Design: FSC Certified Lumber.
 - 3. Sustainable Design: Low-emitting materials, adhesives and finish coating.
 - 4. Species: Edge-grain first grade, northern hard maple.
 - 5. Thickness: 25/32 inch thick.
 - 6. Face Width: 1-1/2 inches.
 - 7. Installation System: Resilient mounting.
 - 8. Finish: Site finished.
- B. Auxiliary Materials:
 - 1. Trim, vented base, moldings, thresholds, and reducer strips.
 - 2. Metal feature strips.
 - 3. Underlayments, mounts, low VOC adhesives, mastics, 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 and with

uniform appearance. Coordinate with work of other sections.

- B. Comply with National Oak Flooring Manufacturer's Association Installation Manual for oak flooring, the Maple Flooring Manufacturer's Association for maple flooring, and the American Parquet Association for parquet flooring as applicable. Provide adequate expansion space.
- C. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 09 65 00
RESILIENT FLOORING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide resilient flooring and floor preparation.

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. Extra Stock: Submit extra stock equal to 2 percent of total 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. Performance: Fire performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Rubber Tile Flooring:
 - 1. Manufacturers: Burke Mercer Flooring Products; Johnsonite; Nora Rubber Flooring; Pirelli Rubber Flooring; Roppe Corp., or approved equal.
 - 2. Type: Rubber tile, ASTM F 1344, Class 1A, solid color.
 - 3. Thickness: 1/8 inch.
 - 4. Profile: Smooth.
 - 5. Size: 24 inches by 24 inches.
 - 6. Auxiliary Materials:
 - a. Edge strips and terminations.
 - b. Leveling compound.
 - c. Low VOC adhesives (less than 60 g/L).
- B. Vinyl Sheet Flooring:
 - 1. Manufacturers: Armstrong World Industries; Forbo Industries; Mannington Commercial Resilient; Tarkett, or approved equal.
 - 2. Type: Sheet Vinyl With Backing: ASTM F 1303, Type I, binder content 90 percent.
 - 3. Wearing Surface: Smooth.
 - 4. Seams: Heat welded.
 - 5. Auxiliary Materials:
 - a. Edge strips and terminations.
 - b. Leveling compound.
 - c. Low VOC adhesives (less than 60 g/L).

C. Vinyl Plank Flooring:

1. Manufacturers: Armstrong World Industries; Forbo Industries; Mannington Commercial Resilient; Roppe; Tarkett, or approved equal.
2. Type: 28 mil wear layer, 0.125 inch overall thickness.
3. Size: 4 inches by 36 inches.
4. Wearing Surface: Smooth.
5. Auxiliary Materials:
 - a. Edge strips and terminations.
 - b. Leveling compound.
 - c. Low VOC adhesives (less than 60 g/L).

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations. Install in proper relation to adjacent work.
- B. Prepare surfaces by cleaning, leveling and priming as required. Test adhesive for bond before general installation. Level to 1/8 inch in 10 foot tolerance.
- C. Tile Flooring: Install tile with tight joints and with one-way pattern. Layout to prevent less than 1/2 tile units.
- D. Sheet Flooring: Install sheets with tight joints and pattern in adjoining areas running in the same direction. Layout to minimize seams as approved.
- E. Clean, polish, and protect.

END OF SECTION

SECTION 09 65 13

RESILIENT BASE AND ACCESSORIES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide resilient wall base and accessories.

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. Submit extra stock equal to 2 percent of total 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. Performance: Fire performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Resilient Wall Base:
 - 1. Manufacturers: AFCO Rubber Corp., Johnsonite, Roppe, VPI Floor Products, or approved equal.
 - 2. Standard: ASTM F 1861.
 - 3. Type: TV (vinyl).
 - 4. Group: I (solid, homogeneous)
 - 5. Style: Cove and straight.
 - 6. Thickness: 0.125 inch
 - 7. Height: 6 inches.
 - 8. Auxiliary Materials:
 - a. Low VOC adhesives (less than 50 g/L).

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with manufacturer's instructions and recommendations. Install in proper relation to adjacent work.
- B. Install base and accessories to minimize joints. Install base with joints as far from corners as practical.
- C. Clean, polish, and protect.

END OF SECTION

SECTION 09 68 13

TILE CARPETING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide carpet tile and floor preparation.

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. Extra Stock: Submit extra stock equal to 2 percent of total 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. Performance: Fire performance meeting requirements of building code and local authorities.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Carpet Tile:
 - 1. Manufacturers: Collins and Aikman Floor Coverings; Interface Flooring Systems; Lees Commercial Carpets; Milliken Carpet; United Technical Products, or approved equal.
 - 2. Sustainable Design: CRI Green Label Plus; or approved equal.
 - 3. Material: As selected.
 - 4. Installation Method: Partial glue-down.
 - 5. Auxiliary Materials:
 - a. Edge guards.
 - b. Low VOC adhesives (less than 50 g/L), low VOC cements and fasteners.
 - c. Leveling compound.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Comply with recommendations of Carpet and Rug Institute (CRI 104) Standard for Installation Specification of Commercial Carpet.
- B. Prepare surfaces and install materials in accordance with manufacturer's instructions and approved submittals. Clean, patch, and level substrate. Install materials in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections.
- C. Install edge guards and reducer strips as required; clean and protect.

END OF SECTION

SECTION 09 80 00
ACOUSTICAL TREATMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Provide acoustical ceiling panels.

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.
- B. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fabric Wrapped Panels:
 - 1. Manufacturers: Interior Acoustics, Inc.; Panel Solutions; StretchWall Products, Inc.; or approved equal.
 - 2. Core Materials: Fiberglass board, mineral-fiber board, fiberglass blanket overlay, particleboard, plywood, wood.
 - 3. Edge Profile: Square.
 - 4. Panel Edge: Extruded PVC.
 - 5. Attachment Devices: Concealed on backside of panel.
 - 6. Auxiliary Materials:
 - a. Clips and hangers.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Take field measurements prior to fabrication where practical. Comply with ASTM C 636.
- 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. Adjust, clean, and touch up all system components.

END OF SECTION

SECTION 09 91 00

PAINTING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide painting and surface preparation.

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 manufacturer's full range of color and finish options if additional selection is required.
- C. Extra Stock: Submit 2 unopened gallons of each paint and color used in the project.

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. Mock-Ups: Provide mock-up as required to demonstrate quality of workmanship.
 - 1. Provide 4 foot x 4 foot mock-ups of each type of surface.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Painting:
 - 1. Manufacturers of Regular Paints: Benjamin Moore; Durox Paints & Wallcoverings; ICI Devco Coatings; Kelly-Moore Paints; Miller Paint Co. / Devine Color; PPG Architectural Finishes, Inc. - Pittsburgh Paints; Pratt & Lambert Paints; Rodda Paint; Sherwin-Williams; United Gilsonite Laboratories; or approved equal.
 - 2. Manufacturers of Multicolor Coatings: Polomyx; Zolatone; or approved equal.
 - 3. Application: Interior unfinished surfaces.
 - 4. Application: Exterior unfinished surfaces.
 - 5. Application: Exposed mechanical and electrical items.
 - 6. Primary Coating Type: Latex based paints.
 - 7. Primary Coating Type: Low VOC interior paints.
 - a. Flat Paints: Less than 50 g/L.
 - b. Non-Flat Paints: Less than 150 g/L.
 - c. Paints applied to Ferrous Metals: Less than 250 g/L.
 - 8. Primary Paint Systems: Primer plus two finish coats.

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. Match approved mock-ups for color, texture, and pattern. Re-coat or remove and replace work which does not match or shows loss of adhesion. Clean up, touch up and protect work.

3.2 PAINT SCHEDULE

- A. Gypsum Drywall Walls:
 - 1. Gloss: Satin.
 - 2. System:
 - a. 1 coat latex primer.
 - b. 2 coats latex finish.
- B. Gypsum Drywall Walls and Ceilings in Bathrooms, Kitchens and Wet Areas:
 - 1. Gloss: Semi.
 - 2. System:
 - a. 1 coat latex primer.
 - b. 2 coats latex finish.
- C. Gypsum Drywall Ceilings:
 - 1. Gloss: Flat.
 - 2. System:
 - a. 1 coat latex primer.
 - b. 2 coats latex finish.
- D. Interior Wood for Transparent Finish:
 - 1. Gloss: Satin.
 - 2. System:
 - a. 1 coat water base sealer.
 - b. 2 coats water base varnish.
- E. Interior Wood for Stain Finish:
 - 1. Gloss: Satin.
 - 2. System:
 - a. 1 coat water base wood stain.
 - b. 1 coat water base sealer.
 - c. 2 coats water base varnish.
- F. Exterior Trim and Siding for Painted Finish:

1. Gloss: Flat.
2. System:
 - a. 1 coat exterior primer, by material provider.
 - b. 2 coats latex enamel.

G. Ferrous Metals:

1. Gloss: Semi.
2. System:
 - a. 1 coat rust-inhibiting primer.
 - b. 2 coats alkyd enamel.

H. Galvanized Metal:

1. Gloss: Semi.
2. System:
 - a. 1 coat galvanized metal primer.
 - b. 2 coats alkyd enamel.

END OF SECTION

SECTION 10 11 00

VISUAL DISPLAY SURFACES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide visual display boards.
 - 1. Markerboards: (1) Kitchen, (1) Administrative area, and (1) Custodian office.
 - 2. Tackboards: (1) Vestibule, (1) Reception desk, (1) Kitchen, (1) Administrative area, and (1) Custodian office

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. Markerboards:
 - 1. Manufacturers: AARCO Products, Inc.; Aywon Chalkboard & Corkboard, Inc.; Claridge Products & Equipment; EverProducts by Glenroy, Inc.; Greensteel; Marsh Industries, Inc.; Weyel International; or approved equal.
 - 2. Materials: Porcelain enamel face for liquid-type markers, core material, and backing.
 - 3. Operation: Fixed.
 - 4. Trim: Metal frame and tray, anodized or powder coated finish.
- B. Tackboards:
 - 1. Manufacturers: AARCO Products, Inc.; Aywon Chalkboard & Corkboard, Inc.; Claridge Products & Equipment; EverProducts by Glenroy, Inc.; Greensteel; Marsh Industries, Inc.; Weyel International; or approved equal.
 - 2. Materials: Plastic-impregnated cork.
 - 3. Operation: Fixed.
 - 4. Trim: Metal frame and tray, anodized or powder coated finish.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Take field measurements before fabrication where possible; do not delay 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. Tolerances: 1/16 inch in 20 feet from true plumb, level and alignment. Limit flush variation between adjacent panels to 1/16 inch. Provide tight and closed gaps between panels unless detailed otherwise.
- D. Restore damaged finishes. Clean and protect work from damage.

END OF SECTION

SECTION 10 14 00

SIGNAGE

PART 1 GENERAL

1.1 SUMMARY

- A. Provide 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.
- 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. Interior Signage:
 - 1. Manufacturers: ASI Sign Systems; Best Sign Systems, Inc.; INNERFACE Architectural Signage, Inc.; InPro Corporation; Nova Polymers, Inc.; Seton Identification Products; The Supersine Co.; Vista System; Vomar Products; or approved equal.
 - 2. Type: Unframed.
 - 3. Material: Plastic.
 - 4. Copy: Raised lettering.
- B. Exterior Signage, Dimensional Letters and Numbers:
 - 1. Manufacturers: Nova Polymers, Inc.; or approved equal.
 - 2. Type: Cast.
 - 3. Material: Aluminum, anodized 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. 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.
- 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. Toilet Compartments:
 - 1. Manufacturers: Accurate Partitions Corp; Bobrick Washroom Equipment; General Partitions Manufacturing; Global Partitions; Hadrian, Inc.; Young Group Ltd. (The); Knickerbocker Partition; Santana Products; Sanymetal; or approved equal.
 - 2. Compartments: Floor and ceiling supported.
 - 3. Screens: Wall-hung.
 - 4. Style: Standard privacy style.
 - 5. Material: Solid polymer:
 - a. Solid, high-density polyethylene (HDPE) or polypropylene (PP).

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 inch.
- C. Adjust hardware, clean, and protect work.

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.
- 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 and Bath Accessories:
 - 1. Manufacturers: American Specialties, Inc.; Bobrick Washroom Equipment; Bradley Corp.; Hafele America Co.; Tubular Specialties Mfg., Inc. (TSM); or approved equal.
 - 2. Accessory: Paper towel dispensers.
 - 3. Accessory: Toilet tissue dispensers, double roll.
 - 4. Accessory: Waste receptacles.
 - 5. Accessory: Grab bars.
 - 6. Accessory: Soap dispensers, deck mounted.
 - 7. Accessory: Mop and broom holders.
 - 8. Accessory: Robe hooks.
 - 9. Accessory: Undercounter lavatory pipe guards.
 - 10. 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 30 00
FIREPLACES AND STOVES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide fireplaces and stoves.

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. Prefabricated Fireplaces:
 - 1. Manufacturers: Firebox 900SS, EcoSmartFire; Heatilator; Heat-N-Glo Fireplace Products; Lennox Hearth Products; Majestic; Miles Industries - Valor Gas Fireplaces; Town & Country Fireplaces Ltd.; Travis Industries, or approved equal.
 - 2. Type: Radiant.
 - 3. Fuel: Bioethanol.
 - 4. Construction: Sheet metal.
 - 5. Style: Contemporary, one-sided.

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 75 00

FLAGPOLES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide flagpole 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.

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. Flagpoles:
 - 1. Manufacturers: American Flagpole; Concord Industries; Eder Flag Manufacturing; Morgan Francis AABEC Pole; or approved equal.
 - 2. Shape: Entasis tapered.
 - 3. Type: Vertical pole.
 - 4. Mounting: Ground-set.
 - 5. Material and Finish: Aluminum with clear anodized finish.
 - 6. Accessories:
 - a. Lightning protection.
 - b. Internal halyard.
 - c. Halyard/cleat cover.

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 11 31 00
RESIDENTIAL APPLIANCES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide residential appliances.

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 manufacturer's standard warranty. Include labor and materials to repair or replace defective materials.
- D. 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. Kitchen Appliances:
 - 1. Manufacturers: Electrolux Major Appliances; Frigidaire Co.; GE Appliances; KitchenAid, Inc.; Maytag Co.; Whirlpool Corp.; or approved equal.
 - 2. Appliance: Refrigerator/freezers.
 - 3. Appliance: Microwave ovens.
 - 4. Appliance: Hot water dispensers.
- B. Laundry Appliances:
 - 1. Manufacturers: GE Appliances; Maytag Co.; Whirlpool Corp.; or approved equal.
 - 2. Appliance: Clothes washers, electric.
 - 3. Appliance: Clothes dryers, electric.
- C. Dryer Vents:
 - 1. Manufacturers: GE Appliances; In-O-Vate Technologies, Inc.; or approved equal.
 - 2. Type: Recessed dryer boxes.
 - 3. Type: Radiused dryer exhaust vent fittings.

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 11 40 00

FOOD SERVICE EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Provide commercial food service equipment.

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. 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.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Commercial Food Service Equipment:
 - 1. Manufacturers: Hobart Corp.; American Delphi, Inc.; Food Warming Equipment Co., Inc.; or approved equal.
 - 2. Application: Receiving and handling equipment.
 - 3. Application: Food storage and refrigeration equipment.
 - 4. Application: Food preparation equipment.
 - 5. Application: Exhaust hoods with integral fire suppression system.
 - 6. Application: Pot washing and dishwashing equipment.
 - 7. Application: Garbage collection and storage equipment.
 - 8. Application: Utility hook-ups for owner-furnished equipment.
 - 9. Food Service Equipment Materials:
 - a. Stainless Steel: AISI Type 304, No. 4 polished finish.
 - b. Tops, Sinks, Dishtables, and Drainboards: 14 gauge (0.0625-inch) stainless steel.
 - c. Cabinet Bodies and Doors: 20 gauge (0.0329-inch) stainless steel.
 - d. Drawers: 18 gauge (0.0358-inch) stainless steel body with 16 gauge (0.0598-inch) stainless steel front.
 - e. Shelves: 14 gauge (0.0625-inch) stainless steel.
 - 10. Food Service Equipment:

- a. Range: Six-burner units, with standard and convection ovens, stainless-steel sides and stainless-steel back and legs for curb base.
- b. Microwave Oven: 1200-W cooking power.
- c. Refrigerator/Freezer: Stainless steel exterior, compressors, condensers, piping, and storage areas, capacity as required for projected quantities.
- d. Warewashing Machine: Dishwashing, pot and pan washing.
- e. Exhaust Hoods: NFPA 96, light fixtures, exhaust duct, and grease removal.

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 11 52 13

PROJECTION SCREENS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide projection screens for
 - 1. Gallery
 - 2. Classroom
 - 3. Arts and Crafts Room
 - 4. Computer Room

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. Front Projection Screens:
 - 1. Manufacturers: Da-Lite Screen Company, Inc.; Draper, Inc.; Stewart Filmscreen Corp.; or approved equal.
 - 2. Operation: Manual all locations, except Gallery.
 - 3. Operation: Electric, at Gallery only.
 - 4. Mounting: Surface mounting at ceiling or suspended.
 - 5. Viewing Surface: Multipurpose reflective high-gain reflective.
 - 6. Edge Treatment: Black masking borders.

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 11 61 00

THEATER AND STAGE EQUIPMENT

PART 1 GENERAL

1.1 SUMMARY

- A. Provide theater and stage equipment.

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. 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. Fire Resistance Requirements: NFPA 701.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Portable Platform Systems:
 - 1. Manufacturers: SICO, Inc.; StageRight Corp.; Wenger Corp.; or approved equal.
 - 2. Frame: Cold-rolled galvanized steel.
 - 3. Frame: Heavy gauge extruded aluminum shapes.
 - 4. Platform Finish: Slip-resistant plastic surface on plywood or honeycomb core.
 - 5. Stage Platform Height: 24 inches.

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 12 20 00

WINDOW TREATMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide window treatments.

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. Roller Shades:
 - 1. Manufacturers: Hunter Douglas Contract Window Coverings; Hunter Douglas Nysan Shading Systems; Kirsch; Levolor; LouverDrape; MechoShade Systems, Inc.; RollEase, Inc.; or approved equal.
 - 2. Shadecloth: Mesh.
 - 3. Shadecloth: Blackout added to opaque in Gallery, Classroom, Arts and Crafts Room.
 - 4. Operation: Chain-operated.

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

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NARRATIVE PREPARED FOR
DIETZ & COMPANY ARCHITECTS, INC.



CEC Project No. 20150104

Prepared by Roger S. Harris, William Skwirz, Dave Evans and William Hughes.

December 1, 2015

HVAC SYSTEM RECOMMENDATIONS

General System Zone Layout

Three new air-to-air heat pump air handling units manufactured by Trane or equal, each with an associated Energy Recovery Ventilation (ERV) unit, associated duct work and terminal diffusers and grilles would serve three zones. Since the building will be heavily insulated in the walls and roof, the conductive heating loads will be minimized. Outdoor air intake to provide fresh air will be a significant portion of the heating load; therefore the use of ERV units is ideal for minimizing energy usage. Supplemental heating will be supplied by electric duct coils if necessary.

One vertical air handler unit would serve the southern office wing of the building and be located in the Mechanical Room. This unit is estimated at 2,800 cfm and would be associated with a 7-ton heat pump unit located on grade in the area immediately to the north of the mechanical room. The air handler would be connected to a small 400 cfm ERV unit, also located in the mechanical room.

1. The second air handler unit would serve the gallery, café and kitchen with approximately 4,000 cfm. The associated ERV would move about 1,300 cfm of ventilation air flow. Both horizontal air handler and ERV would be located in an accessible attic mechanical room over the kitchen. A 10-ton heat pump unit would be located at the rear of the building on a ground mounted concrete pad.

The third air handler unit would serve the remainder of the building spaces with approximately 4,700 cfm. The associated ERV would move about 900 cfm of air ventilation air flow. Both the horizontal air handler and ERV would be located in an attic mechanical room over the kitchen. The associated 12-ton heat pump unit would be located at the rear of the building on a ground mounted concrete pad.

Ventilation Systems

Each ERV unit shall have an efficiency of at least 50% during cooling and at least 68% in heating. The ERV unit shall be manufactured by Renew-Aire or equal that utilizes a core type exchanger for both sensible and latent energy recovery. Each ERV will be fitted with outside air and exhaust motorized dampers to close during unoccupied periods.

Exhaust fans will be controlled to work with each of the associated air handlers during the economizer mode using comparative enthalpy and opposed blade, air tight dampers. Each exhaust fan shall have an air flow capacity equal to the associated air handler. In the economizer mode, the air handler would bring outside air in to the HVAC zone with the return air damper closed or modulated. Fresh air intake and exhaust louvers in the attic shall be manufactured by Greenheck or equal. Each louver shall be 6" deep extruded aluminum and shall have a feet per minute (fpm) air flow rate which does not exceed the maximum of 500 fpm for the intake or exhaust for acoustical mitigation.

HVAC Distribution

The new supply, return, exhaust and outside air ductwork shall be G90 galvanized sheet metal meeting the requirements of building code and industry standards for low pressure ductwork. Ductwork shall be of the gauge thickness, material type, and constructed and erected in accordance with the appropriate



Sheet Metal and Air Conditioning Contractors National Association (SMACNA) Standards and NFPA guidelines. The use of flexible ductwork shall be limited to a maximum of 5 feet per run and not allowed to be used for any changes in direction. Flexible duct is expressly prohibited from penetrating any fire or smoke barrier with a required fire resistance rating of one hour or more. Flexible ducts must be in compliance and listed under UL 181 and have a sealed vapor barrier on both the inside and outside. All ductwork joints shall be sealed with a water-based duct sealer.

Diffusers shall be Metal Aire 5700 series, aluminum square face, four-way diffusion with round duct connection. Diffuser noise criteria (NC) rating must be less than 25 for quiet operation at specified air flow. Side wall double deflecting supply diffusers shall be louvered, aluminum, low profile Metal Aire 4004, aluminum series, with an NC rating of 25 or less in given application. Ceiling exhaust and wall and ceiling return grilles to be Metal Aire RH louvered aluminum grilles without a damper.

All of the refrigerant piping for each of the split air conditioning systems shall be insulated with a minimum of 1" thick wall flexible, closed-cell elastomeric insulation in tubular form which is protected from the ultraviolet rays of the sun for exterior runs with a PVC jacket. Insulation shall have a maximum thermal conductivity of 0.27 Btu-in./h-ft²-°F at a 75°F mean temperature when tested in accordance with ASTM C 177 or ASTM C 518, latest revisions. All fresh air, supply air, and return air ducts within the building or attic shall be insulated with a minimum of R-value of 8 FSK type fiberglass duct wrap, clinched stapled at seam every two inches.

A decentralized HVAC control system would be integrated with the HVAC systems. The ERV ventilation controls would be connected into an electronic time clock to shut down ventilation during the unoccupied periods. Simple thermostatic controls would control the heat pump function and would include a comparative enthalpy economizer sequence for each of the new air handlers.

The kitchen is anticipated to include a six burner electric stove with an exhaust hood connected to a kitchen exhaust fan that is listed for UL 752, with 16 gauge welded ductwork. The exhaust hood shall encompass a chemical fire suppression system within the hood interlocked with the electrical power of the stove and the building fire alarm system. The hood shall be sized appropriately to encompass the physical dimension of the cooking equipment.

Air conditioning condensate shall be piped from each air handler unit with PVC rigid piping including a trap. Piping shall discharge to an approved location. Each attic air handler shall have a secondary accessory condensate collection pan with a float switch interlocked with the air handler to de-energize the air handler upon detection of a condensate leak.

Applicable air handlers, ERV units and ductwork are required to have seismic restraints to meet the current code.

Refrigerant piping shall be installed from each air handler coil to the condensing units located outside. Refrigerant piping specialties shall be provided and installed as necessary to complete installation as recommended by the equipment manufacturer including but not limited to the applicable manufacturer specified sizes of filter-dryers, liquid indicators, solenoid valves, thermal expansion valves, refrigerant fill and reclaim ports, etc. All specialties shall be installed per the equipment manufacturer's instructions. The liquid line filter-dryer with a rated working pressure of a minimum of 600 psig must be of the replaceable core type to permit proper system cleanup, filtration and moisture removal.



Air Test and Balance

A NEEB accredited testing and balancing contractor will provide a report of the air flow to each diffuser and exhaust grille. The report will also document the ERVs exhaust to outside and outside air intake as well as flows for the air handlers and exhaust fans. All airflow volumes shall be balanced to within 10% of specified values.

Commissioning

A Commissioning Agent will be engaged by the Owner to commission all HVAC systems and controls. Commissioning was requested by the Owners Project Manager and helps to ensure that all systems work as intended.



ELECTRICAL SYSTEMS RECOMMENDATIONS

Service and Distribution

The electrical service shall be an 800 amp, 120/208 volt, 3 phase, 4 wire underground service, extending from a Utility Company owned pad mount transformer. Primary power for the transformer shall extend underground from the nearest utility riser pole. A new 800 amp main distribution panel board and main circuit breaker shall be provided. Circuit breakers shall be provided as necessary to serve branch circuit panel boards throughout the building.

Wiring shall be THHN or XHHW, rated 75 degrees C minimum and suitable for wet and dry locations. All wire shall be copper. Cable shall be installed in rigid galvanized steel conduit in damp locations, concrete encased PVC with rigid steel stub-ups in underground locations, or in EMT elsewhere. MC cable shall be used in interior locations where concealed.

Receptacles and switches shall be 20 amp, NEMA specification grade, with lexan cover plates and “draft barriers” behind plates on all exterior walls.

Exit Lights

Self-contained thermoplastic LED type exit lights shall be provided as necessary to mark the means of egress.

Emergency Lighting

Self-contained LED type emergency battery units with dual heads shall be provided as necessary to properly illuminate the means of egress in the event of a power outage. Remote LED dual emergency heads shall be provided outside of each door leading outdoors.

Lighting

All lighting shall be energy efficient LED type lighting, consisting of drop-in troffers, linear, pendent and round recessed. Occupancy sensors and day lighting harvesting shall control the lighting. All lighting and controls shall meet the requirements of the Massachusetts Stretch Code, and shall be DLC approved for maximum rebates offered by the Eversource utility company.

Fire Alarm

A new addressable fire alarm system shall be provided. The system shall be municipally connected via a new local energy master box. The system shall consist of manual pull stations at all egress doors, system connected smoke detectors in all common areas and path of egress, and control modules as necessary to shut down any mechanical equipment exceeding 2000 cfm. Horn/strobe annunciation devices shall be provided throughout as required by Code. In the event of alarm, the system shall automatically:

1. Update the control/display at the fire alarm control panel.



2. Sound all alarm signals throughout the building at the evacuation rate.
3. Turn on all strobe lights throughout the building.
4. Initiate the transmission of an alarm to the local fire department via the required municipal connection.
5. Operate the control module relay contacts to shut down all HVAC units.

Tel/Data

New tel/data service shall extend underground in a 4" conduit, and extend from the building to the nearest riser pole. Tel/data outlets, with CAT 6 cabling, shall be provided as necessary within the new building.



FIRE PROTECTION RECOMMENDATIONS

This project will require a new fire service from the adjacent street and enter the building where directed by the architect. The entire building will be protected with a dry pipe system.

Provide and install a new backflow preventer as required by the local water department having jurisdiction. The backflow preventer shall be of the type as required by the local water department. The backflow preventer size shall be capable of flowing water to meet the most hydraulically demanding system.

Outline of Codes/Guidelines Used

The new dry pipe fire sprinkler systems shall meet the requirements of NFPA 13, 2010 Edition, NFPA 101 and the Commonwealth of Massachusetts building and Fire Codes and applicable amendments.

Basic Arrangement and Zoning

The proposed new fire protection system will be comprised of one (1) zone for the entire building. If so desired, the Attic can be piped and controlled independently from the occupied portion of the new building. The Attic can have its own control valve and dry pipe valve. The entire occupied portion of the new building can have its own control valve and dry pipe valve. With independent control valves the Attic can be serviced without interruption of the other occupied areas of the building and vice versa.

Systems Identification

A complete identification system shall be provided for all fire protection control valves. Valve chart shall be computer generated and installed in a wall mounted frame and installed where directed by the architect.



PLUMBING RECOMMENDATIONS

Building Design

The building infrastructure, such as the water service, water heater, grease interceptors and building drainage systems, will be new and sized to meet the requirements of the proposed new facility.

Storm Drainage Piping

The proposed new roof area is to be drained using gutters and downspouts. No piped interior roof drainage system is planned.

Sanitary Waste and Vent Piping

New sanitary waste and vent piping systems are to be piped throughout the proposed new building addition to suit proposed plumbing fixture layouts.

Grease interceptors in the kitchen area are to be provided to meet the requirements of the local health department, sewer authority and plumbing code requirements.

Domestic Water Service

Domestic water service will have a water meter and backflow prevention device installed at the incoming service. Provisions are to be made for lawn sprinkler systems to be connected near the domestic water service.

This new domestic hot and cold water is to be piped throughout the proposed new building to suit proposed new plumbing fixture layouts.

All drain lines for back flow prevention devices are to be piped to the exterior of the building where possible.

A new electric domestic hot water heater, mixing valve and piping system are to be provided. This new water heating system is to be adequately sized to provide hot water for the new plumbing fixtures proposed for the building plumbing fixtures. The domestic hot water system for the proposed new building is to be a recirculated system requiring a hot water recirculation piping and a circulator pump.

Plumbing Fixtures

The proposed plumbing fixtures shall be water-saving type fixtures. Toilet room area fixtures will use hard-wired, sensor operated faucets and flush valves.

1. Water Closets: Water closets shall be wall mounted, (1.28 gallon per flush (GPF)), siphon jet type; with electronic hands-free flushometer that is hard wired. Water closets shall be provided with commercial/institutional grade closet carriers with dual feet plus an auxiliary anchor support; and institutional weight open front seats furnished less cover and with heavy duty stainless steel check hinges.
2. Urinals: All urinals shall be wall mounted, (0.5 GPF), and of the siphon jet action type, with electronic hands free flush, hardwired on stand-by power.



3. Lavatories and Sinks: Lavatories and sinks shall meet the following criteria:
 - Counter-set under mount lavatories shall be stainless steel except where integral to the counter top.
 - Electronic hands-free faucets hard wired and on stand-by power shall be provided for lavatories in restrooms. Restroom lavatories with other than hands-free faucets shall be rated for a water flow of (2.0 GPM)
 - Wall mounted lavatories shall be vitreous china or stainless steel with an integral back splash, provided with specifically designed and manufactured carriers.
 - Self-rimming/drop-in and under-mount lavatories and sinks shall be bedded in sealant before fixture is set, and caulked upon completion.
 - Faucet spout reach shall be appropriate to sink size, and spout shall be swing or rigid type as suited for the application.

4. Dual Height ADA Electric Water Coolers: Electric Water Coolers shall be stainless steel, wall mounted fixture dual height with bottle filler unit, vandal-proof and easy-flex spout.

5. Trim: Fixture stops serving lavatories, sinks, and similar fixtures shall incorporate threaded inlets. Fixture stops shall be of the heavy-duty commercial grade type and shall be the loose-key type in public areas. Fixture trims shall comply as follows:
 - Traps, drains, and tail pieces for general domestic sinks and lavatories connected to the sanitary drain system shall be (17-gauge) cast brass. Sink strainers and drains shall be stainless steel or chrome plated cast brass.
 - Piping to plumbing fixtures shall be supported and anchored to the structure, not the fixture.
 - Independent water isolation valves or supply stops shall be provided for each fixture or equipment item.

6. Floor Drains: Floor drains are required where water may likely accumulate and create a hazard, and also where intensive wet cleaning operations are required, including the following areas:
 - Kitchen
 - Mechanical equipment rooms.
 - Toilet rooms with two or more flushometer operated fixtures or water closets.

Floor drains shall include sediment buckets. Floor drain grates shall be sized and traffic rated for the application, with grates that are fixed or set so as not to slip or deform with anticipated traffic. Floor drains shall have minimum (3 in.) diameter outlets.

7. Water Heaters: Electric water heaters shall be Energy Star certified, FM and ASHRAE 90.1 compliant. Water heaters are to be ASME stamped and National Board Registered for 150 psi with ASME rated T&P relief valve, Fiberglass insulation, jacket and drain valve.

Building Water System General Design Criteria: Building water systems shall incorporate the following features:



- Piping systems shall be properly insulated per the International Energy Conservation Code adopted by the state of Massachusetts.
- All pipe penetrations at expansion joints are have approved pre-engineered expansion joints.
- Pipe mains shall be designed for the maximum calculated flow at the design stage and to provide a 20% allowance for future expansion.
- Water pipe sizing criteria is to be for event usage.
- The system distribution design shall utilize appropriate fixture unit values per the State of Massachusetts Plumbing code, with the cold water system mains, risers, and major branches sized on the basis of flushometer system curves.
- Hot water systems may be sized on the basis of flush tank curves.
- Water hammer arrestors shall be provided at all quick closing valves and other potential shock sources, including flushometer branches, ends of long branches subject to hydraulic shock, and required equipment connections. Arrestors shall be sized in accordance with PDI guidelines, including upsizing of arrestors for systems.
- Shut-off valves for water systems shall utilize stainless steel trim. Ball valves shall be used for all pipe sizes. Ball valves shall be full port, and extended stems shall be provided to clear insulation.

Backflow Protection: Backflow prevention devices shall be installed in compliance with plumbing code and the device listing requirements. BFP devices shall conform to applicable ASSE Standards or equivalent AWWA and USC FCCCHR Standards.

Hot Water Supply: Hot water systems shall be provided with pumped circulation and dead-legs shall be kept to a minimum.

Hot Water Circulation and Temperature Maintenance: Hot water system temperature maintenance is required to ensure rapid availability of hot water at use points, and to minimize wasted water and energy. This shall be accomplished through the use of pumped (forced) circulation systems.

Drainage Systems: Waste, and vent systems shall meet the requirements of reference plumbing codes. Each plumbing fixture or drain shall be trapped and vented in accordance with code requirements. Vent systems serving plumbing systems are of the conventional through-the-roof type, consisting of dedicated waste and parallel vent stacks. The sizing and pitch of drainage piping shall be per code and requirements described in this section. Piping, materials, and joint methods shall comply with specifications this section. A sanitary DWV system shall be provided to serve conventional sanitary plumbing fixtures.

- Distribution: Vent systems shall slope upwards toward the roof terminal, and dry vents shall not offset horizontally less than (6 in.) above the flood level rim of the highest fixture served. Connections between vent pipes and a vent stack shall be made at least (6 in.) above the highest fixture on the floor connected to the system, but not less than (38 in.) above the floor.
- Cleanouts: The provision of adequate cleanouts is merely providing access for cleaning stoppages and does not supersede a thoughtful system design to minimize stoppages.



- Cleanouts shall be provided as required by code, including at the base of waste stacks, and to serve upstream ends of horizontal drains and fixture branches.
- Wall cleanouts shall be specified with appropriate plugs. Tapping of plugs directly into the waste or vent stack is not permitted.
- Indirect Waste: Indirect waste connections shall be provided for all plumbing fixtures/equipment that is of public health concern, as well as for equipment drainage as required. Equipment shall discharge with an appropriate air gap to an approved indirect waste receptor.

Insulation Systems

Insulation should be applied to plumbing systems to limit heat loss, prevent condensation, protect people from hot or extremely cold surfaces, and improve the operating efficiency of all systems. Insulation materials should have a fire hazard rating not to exceed 25 for flame spread and 50 for fuel contributed and smoke developed or as required by applicable codes and regulations. All materials should be factory tested as an assembly. Fire ratings should be determined by the standard method of testing for surface-burning characteristics of building materials, ASTM E84 or NFPA Standard 255. Insulation approved for use shall have a UL label or a certified test report from an approved testing laboratory. All adhesives, sealers, vapor barrier coatings, and so on used in conjunction with insulation should be compatible with the material to which they are applied. Any cement, sealer or coating used should be resistant to vermin and mold. All insulation surfaces ASJ jacket and be durable and, where exposed, protected from damage due to maintenance operations, vandalism, weather, and normal wear and tear. Pipe fitting and valves, where possible, should be protected using factory- pre-molded fittings, covers, and factory-protect insulation. Insulation systems will be specified to meet industry standards, and comply with State Energy Code requirements.

Fire-Stopping Systems

All pipe penetrations in rated walls and floors are to be properly fire stopped. Fire stopping is to meet the required UL ratings assembly for each type of pipe penetration within the wall or floor assembly.

Proposed System Materials

Aboveground Piping shall be no-hub cast iron soil pipe, with Husky SD Series 4000 couplings, or Mission Heavyweight (HW), 4-band couplings; with anchors and restraints as per CISPI requirements. For waste and vent pipe 2" and larger use cast iron pipe. For air conditioning condensate and indirect waste, waste and vent piping 1 1/2" and smaller use Type L copper with copper DWV sweat fittings. Type L copper for domestic hot, cold and recirculation supply piping. Use "Silva-Brite" 100 Lead-Free solder on cold and hot water piping. Provide non-corrosive, lead-free type flux.

Provide chrome plating for all exposed piping to plumbing fixtures in toilet rooms, and finished rooms, etc., including chrome plated traps.

For exposed waste and vent piping within the Kitchen use stainless steel for sanitary, grease waste and grease vent in lieu of chrome brass or copper piping. Stainless Steel Push-Fit Pipe and Fittings shall meet



ASME A112.3.1, ASTM A 666. Type 316L stainless steel pipe and fittings shall have socket and spigot ends for gasket joints. It shall be AISI 316L Austenitic Stainless Steel. Provide all necessary adaptors and fittings necessary to connect to different piping systems. All hangers, anchors rods, and supports, etc. on stainless steel piping are to be stainless steel.



SECTION 21 00 00
FIRE SUPPRESSION

PART 1 GENERAL

1.1 SUMMARY

- A. Provide fire suppression 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.
 - 2. Provide hydraulic calculations for pipe sizing.
- 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. Coordinate location of systems to avoid interference with location of structure and other building systems. Notify Owner prior to construction of conflicts which cannot be resolved.
- C. Local Fire Department Requirements: Comply with requirements of the local Fire Department pertaining to fire sprinkler systems. Obtain approval from the local Fire Marshal, in writing, of proposed fire-protection system before proceeding with installation.
- D. Compliance: NFPA 13, Standard for the Installation of Sprinkler Systems, NFPA 101 Life Safety, NFPA 24 Standard for the Installation of Private Fire Service, NFPA 25 Standard for the Inspection, Testing and Maintenance of Water Based Fire Protection Systems, Commonwealth of Massachusetts Fire and Building Codes. All materials, equipment and devices shall be UL listed and/or FM approved.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fire Suppression Systems:
 - 1. Application: Building fire-suppression water-service system.
 - 2. Application: Building fire-suppression sprinkler system.
 - 3. Type: Facility fire-suppression water-service piping:
 - a. Fire-department connection.
 - 4. Type: Fire-suppression sprinkler system:
 - a. Dry pipe.
 - 5. Components: Suitable for service:

- a. Piping and fittings.
- b. Galvanized steel piping for dry system
- c. Dry Alarm valve and associated trim.
- d. Air compressor and air maintenance device.
- e. Devices; pressure switches, electric bell and supervisory switches.
- f. Hangers and supports.
- g. Backflow preventer.
- h. General-duty valves.
- i. Sprinklers.
- j. Valve chart.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials and systems in accordance with NFPA requirements and good industry practice. 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 all piping properly. Pitch all dry system piping per NFPA 13.
- C. Conceal piping above ceilings wherever possible.
- D. All pendent sprinklers shall be centered in the ceiling tiles.
- E. Clearly label and tag all components.
- F. Hydrostatically test all system components at 200 PSI for two (20 hours).
- 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 00 00

PLUMBING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide plumbing systems including supply, waste, and vent 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.
 - 2. Provide hydraulic calculations for pipe sizing.
- 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. Coordinate location of systems to avoid interference with location of structure and other building systems. Notify Owner prior to construction of conflicts which cannot be resolved.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Plumbing Systems:
 - 1. Manufacturers, Piping, Valves and Fittings: Anvil International; Lawler Mfg. Co., Inc.; MAPA Products; or approved equal.
 - 2. Manufacturers, Sleeves, Hangers and Supports: Advanced Support Products, Inc.; Anvil International; JV-Industries, LLC; MAPA Products; MIRO Industries, Inc.; PHP Systems and Design; Universal Support Systems, LLC; or approved equal.
 - 3. Manufacturers, Identification Systems: Seton Identification Systems. Seton Identification Products; or approved equal.
 - 4. Manufacturers, Insulation: Knauf Insulation; or approved equal.
 - 5. Manufacturers, Thermostatic Water Mixing Valves: Lawler Mfg. Co., Inc.; or approved equal.
 - 6. Manufacturers, Fixtures, Fittings and Trim: Bradley Corp.; Chicago Faucet Co. (The); Delta Faucet Co.; Grohe America Inc., a Sub. of Friedrich Grohe; TOTO USA, Inc.; or approved equal.
 - 7. Application: Facility water distribution.
 - 8. Application: Facility sanitary sewerage.
 - 9. Application: Electric domestic water heaters.
 - 10. Application: Domestic water heat exchangers.

11. Application: Commercial plumbing fixtures.
12. Application: Drinking fountains and water coolers.
13. Sustainable Design: Waterless urinals.
14. Sustainable Design: Low-flow toilets.
15. Sustainable Design: Energy efficient equipment.
16. Sustainable Design: Energy efficient fixtures.
17. Sustainable Design: Commissioning.
18. Components: Suitable for service.
 - a. Fixtures.
 - b. Piping.
 - c. Pumps.
 - d. Expansion fittings and loops.
 - e. Meters and gauges.
 - f. General-duty valves.
 - g. Hangers and supports.
 - h. Heat tracing.
 - i. Vibration and seismic controls.
 - j. Identification devices.
 - k. Piping insulation.

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. Install shutoff valves on each piece of equipment on both hot and cold water supply.
- D. Clearly label and tag all valves and components.
- E. Sterilize water distribution system. Flush and test all systems for proper operation. Adjust system to prevent water hammer.
- F. Test and balance all systems for proper operation.
- G. Restore damaged finishes. Clean and protect work from damage.
- H. 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 heat transfer equipment for building HVAC 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. 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 location of systems to avoid interference with location of structure and other building systems. Notify Owner prior to construction of conflicts which cannot be resolved.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Heating, Ventilating and Air-Conditioning Systems:
 - 1. Manufacturers, Piping, Valves and Fittings: Anvil International; MAPA Products; Natural; Taco Inc.; or approved equal.
 - 2. Manufacturers, Sleeves, Hangers and Supports: Advanced Support Products, Inc.; Anvil International; JV-Industries, LLC ; MAPA Products; MIRO Industries, Inc.; PHP Systems and Design; Universal Support Systems, LLC; or approved equal.
 - 3. Manufacturers, Identification Systems: Seton Identification Products; or approved equal.
 - 4. Manufacturers, Duct Liner/Wrap: Knauf, Certainteed; or approved equal.
 - 5. Manufacturers, Insulation: Knauf Insulation, Certainteed; or approved equal.
 - 6. Manufacturers, Thermostats: Honeywell, Reliable Controls; or approved equal.
 - 7. Application: Central heating, ventilating and air-conditioning systems.
 - 8. Components: Suitable for service:
 - a. Motors.
 - b. Expansion fittings and loops.
 - c. Meters and gages.
 - d. General-duty valves.
 - e. Hangers and supports.
 - f. Vibration and seismic controls.
 - g. Identification devices.

- h. Anti-microbial coatings for HVAC ducts and equipment.
- i. Anti-microbial ultraviolet emitters for HVAC ducts and equipment.
- j. Testing, adjusting, and balancing devices.
- k. Duct insulation.
- l. Piping insulation.
- m. Instrumentation and control devices.
- n. Refrigerant piping.
- o. HVAC ducts and casings.
- p. Air plenums and chases.
- q. Air duct accessories.
- r. HVAC fans.
- s. Special exhaust systems.
- t. Air terminal units.
- u. Air outlets and inlets.
- v. Ventilation hoods.
- w. Packaged compressor and condenser units.
- x. Air-to-air energy recovery equipment.
- y. Indoor central-station air-handling units.

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. Install shutoff valves on each piece of equipment on both hot and cold water supply.
- D. 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.
- E. Clearly label and tag all components.
- F. Test and balance all systems for proper operation.
- G. Restore damaged finishes. Clean and protect work from damage.
- H. 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 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. 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 location of systems to avoid interference with location of structure and other building systems. Notify Owner prior to construction of conflicts which cannot be resolved.
- C. Compliance: National Electrical Code.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Electrical Systems:
 - 1. Manufacturers: FSR, Inc.; Panduit Corp.; Wheatland Tube Company; Wiremold/Legrand; or approved equal.
 - 2. Application: Interior lighting.
 - 3. Application: Emergency lighting.
 - 4. Application: Exit signs.
 - 5. Application: Special purpose lighting.
 - 6. Application: Exterior lighting.
 - 7. Sustainable Design: Energy efficient equipment.
 - 8. Sustainable Design: Energy efficient fixtures.
 - 9. Sustainable Design: Energy efficient bulbs.
 - 10. Sustainable Design: Occupancy sensors.
 - 11. Sustainable Design: Perimeter daylighting controls.
 - 12. Sustainable Design: Energy modeling.
 - 13. Sustainable Design: Commissioning.
 - 14. 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.
- 15. IEEE Illumination Levels: Suitable for service:
 - a. Public areas.
 - b. Offices.
 - c. Circulation.
 - d. Kitchen.
 - e. Storage.
 - f. Mechanical.
 - g. Parking lots.
- 16. Components: Suitable for service:
 - a. Cables, conduit and tubing.
 - b. Grounding and bonding devices.
 - c. Hangers and supports.
 - d. Raceway and boxes.
 - e. Cable trays.
 - f. Vibration and seismic controls.
 - g. Identification devices.
 - h. Service entrance components.
 - i. Switchboards.
 - j. Low-voltage power switchgear.
 - k. Grounding components.
 - l. Panelboards.
 - m. Overcurrent protective devices.
 - n. Motor controllers.

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. Comply with National Electrical Code and building code requirements. Maintain continuity of circuits required to supply new or existing equipment in service.
- C. Center ceiling-mounted elements in center of ceiling tiles as applicable.
- D. Conceal conduit to the greatest extent practical.
- E. Install switches, thermostats and similar items at uniform height above finished floor. Locate switches within rooms at strike side of door unless noted otherwise.
- F. Gang-mount multiple control and outlet locations. Mount multiple types of controls and outlets as close together as practical and in-line with each other. Avoid back-to-back box locations.
- G. Clearly label and tag all components.
- H. Test all systems for proper operation.
- I. Restore damaged finishes. Clean and protect work from damage.

- J. 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. 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. 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 location of systems to avoid interference with location of structure and other building systems. Notify Owner prior to construction of conflicts which cannot be resolved.
- C. Compliance: FCC regulations.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Communications Systems:
 - 1. Manufacturers: Hubbell Premise Wiring; The Chamberlain Group, Inc.; or approved equal.
 - 2. Application: Structured cabling systems.
 - 3. Application: Data communications systems.
 - 4. Application: Voice communications systems for telephones, facsimiles, modems and messaging.
 - 5. Sustainable Design: Energy efficient equipment.
 - 6. Components: Suitable for service:
 - a. Communications services.
 - b. Grounding and bonding.
 - c. Hangers and supports.
 - d. Conduits and backboxes.
 - e. Cable trays.
 - f. Surface raceways.
 - g. Underground ducts and raceways.
 - h. Vibration and seismic controls.
 - i. Identification devices.

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. 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 28 00 00

ELECTRONIC SAFETY AND SECURITY

PART 1 GENERAL

1.1 SUMMARY

- A. Provide electronic safety and security 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. 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 location of systems to avoid interference with location of structure and other building systems. Notify Owner prior to construction of conflicts which cannot be resolved.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Electronic Safety and Security Systems:
 - 1. Manufacturers: FCI; EST.; Notifier; or approved equal.
 - 2. Application: Fire detection and alarm.
 - 3. Sustainable Design: Energy efficient equipment.
 - 4. Sustainable Design: Commissioning.
 - 5. Components: Suitable for service:
 - a. Conductors and cables.
 - b. Grounding and bonding.
 - c. Hangers and supports.
 - d. Conduits and backboxes.
 - e. Cable trays.
 - f. Surface raceways.
 - g. Vibration and seismic controls.
 - h. Identification devices.

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. Comply with National Electrical Code and building code requirements. Maintain continuity of circuits required to supply new or existing equipment in service.
- C. Provide core drilling as required for new work.
- D. Conceal conduit to the greatest extent practical.
- E. Center ceiling-mounted elements in center of ceiling tiles as applicable.
- F. Maintain indicated fire ratings of walls, partitions, ceilings and floors at penetrations. Seal with firestopping to maintain fire rating.
- G. Test all systems for proper operation. Label circuits in electrical panels.
- H. Restore damaged finishes. Clean and protect work from damage.
- I. Instruct Owner's personnel in proper operation of systems.

END OF SECTION

SECTION 31 10 00

SITE CLEARING

PART 1 GENERAL

1.1 SUMMARY

A. Work by General Contractor

Demolition, clearing and grubbing required for this work includes, but is not necessarily limited to removal and disposal, removal and delivery to the Owner, or removal and reuse of the following:

1. Bituminous pavement, curbing
2. Utilities
3. Trees, shrubs, vegetation
4. Concrete slabs, footings, steps
5. Site Elements such as signs, existing light footings, bollards, furnishings, light poles, and luminaries
5. Other items as noted on the drawings required to complete the work.
6. Debris and rubble within the project limits
7. Removal of all above- and below- grade site improvements
8. Disconnection, capping or sealing, and removing site utilities, or abandoning in place.
9. Protection of trees and items to remain (See Division 01 Tree Protection)
10. Stripping and stockpiling Topsoil.
11. Clearing and preparation of site.

1.2 SUBMITTALS

- A. Clearing Plan: Submit list of proposed operations, and identify site improvements and features to remain. Include proposed location for stockpiles.

1.3 QUALITY ASSURANCE

A. Qualifications

Provide at least one person who shall be present at all times during demolition operations and who shall be thoroughly familiar with the procedures involved and who shall direct and coordinate the operation and ensure coordination with the applicable utility agencies.

B. Codes and Standards

In addition to complying with all pertinent code and regulations, comply with the requirements

of those insurance carriers providing coverage for this work.

- C. Pre-demolition Conference
Conduct conference at project site. Follow Conference requirements as outlined in Front End Documents.

PART 2 PRODUCTS

2.1 MATERIALS

A. Site Clearing:

1. Application: Clearing of designated existing site improvements and landscaping.
2. Type: Tree protection, erosion control, siltation control, and dust control materials suitable for site conditions.

2.2 JOB CONDITIONS

A. Dust and Mud Control

Use all means necessary to prevent the spread of dust and mud during performance of the work of the Section; thoroughly moisten and clean all surfaces as required to prevent mud and dust from being a nuisance to the site residents and the neighbors. Add calcium chloride as necessary.

B. Protection of Existing Utilities

Follow the procedures outlined below in PART 3.

C. Clearing and Grubbing

Clear designated areas of the site of tree and shrub vegetation, including grinding of stumps and removing debris, and chipping of tree limbs as required to accommodate new construction shown on drawings. Note: All trunks, stumps, and roots must be removed from the site where new construction will take place.

D. Construction Fencing

Maintain temporary protective barriers 8' high chain link fence with tension wire top and bottom and dust control scrim through the course of construction.

PART 3 EXECUTION

3.1 SITE CLEARING OPERATIONS

- A. Protection of existing trees, vegetation, landscaping, and site improvements not scheduled for clearing which might be damaged by construction activities.
- B. Trimming of existing trees and vegetation as recommended by arborist for protection during construction activities.
- C. Clearing and grubbing of stumps and vegetation, and removal and disposal of debris, rubbish, designated trees, and site improvements.
- D. Topsoil stripping and stockpiling.
- E. Temporary erosion control, siltation control, and dust control.

- F. Temporary protection of adjacent property, structures, benchmarks, and monuments.
- G. Temporary relocation of fencing, and site improvements scheduled for reuse.
- H. Watering of trees and vegetation during construction activities.
- I. Removal and legal disposal of cleared materials.

3.2 CLEARING

- A. Prevent damage to existing improvements indicated to remain, including improvements on and off site. Protect existing trees and vegetation indicated to remain. Do not stockpile materials, and restrict traffic within drip line of existing trees to remain. Provide and maintain temporary guards to encircle trees or groups of trees to remain; obtain approval before beginning work.
- B. Water vegetation as required to maintain health. Cover temporarily exposed roots with wet burlap and backfill as soon as possible. Coat cut plant surfaces with approved emulsified asphalt plant coating.
- C. Repair or replace vegetation, which has been damaged, or pay damages. Remove heavy growths of grass before stripping. Stockpile satisfactory topsoil containing no large stones, foreign matter and weeds on site for reuse.
- D. Completely remove all improvements including stumps and debris except for those indicated to remain. Remove below grade improvements at least 12 inches below finish grade and to the extent necessary so as not to interfere with new construction. Remove abandoned mechanical and electrical work as required.
- E. Prevent erosion and siltation of streets, catch basins and piping. Control windblown dust. Remove waste materials and unsuitable soil from site and dispose of in a legal manner.

END OF SECTION

SECTION 31 20 00

EARTH MOVING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide earthwork operations.

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, 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. 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.
 - 2. Application: Subbase materials, drainage fill, common fill, and structural fill materials for slabs, pavements, and improvements.
 - 3. Application: Suitable fill from off-site if on-site quantities are insufficient or unacceptable, and legal disposal of excess fill off-site.
 - 4. Application: Rock excavation without blasting unless blasting is specifically authorized.
 - 5. Subbase Material: Graded gravel or crushed stone.
 - 6. Bedding Course: Graded crushed gravel and sand.
 - 7. Borrow Soil: Off-site soil for fill or backfill.
 - 8. Drainage Fill: Ashed gravel or crushed stone.
 - 9. Common Fill: Mineral soil free from unsuitable materials.
 - 10. Structural Fill: Graded gravel.
 - 11. 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 percent of maximum dry density to suitable depth.
 - 2. Unpaved Areas: Top 6 inches of subgrade and each fill layer to 90 percent maximum dry density.
- D. Place acceptable materials in layers not more than 8 inches loose depth for materials compacted by heavy equipment and not more than 4 inches 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 inch above or below required subgrade and within a tolerance of 1/2 inch in 10 feet.
- 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 23 19

DEWATERING

PART 1 GENERAL

1.1 SUMMARY

- A. Provide dewatering for construction activities.

1.2 SUBMITTALS

- A. Shop Drawings: Submit for approval plan showing layout of dewatering system.
- B. Test Reports: Submit observation well reports recording groundwater levels.

1.3 QUALITY ASSURANCE

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

PART 2 PRODUCTS

2.1 MATERIALS

- A. Dewatering Systems:
 - 1. Application: Dewatering of excavated areas.
 - 2. Service: Systems for groundwater control and disposal.

PART 3 EXECUTION

3.1 DEWATERING ACTIVITIES

- A. Dewatering Applications:
 - 1. Lowering and controlling groundwater levels during excavation and construction.
 - 2. Control of hydrostatic pressures during excavation and construction.
 - 3. Control of surface and subsurface water, ice, and snow related to dewatering.
 - 4. Standby equipment for system back-up.
 - 5. Legal disposal of water removed from excavations.
- B. Dewatering:
 - 1. Provide a system to lower and control groundwater in order to permit construction activities. Install sufficient dewatering equipment to drain water-bearing strata above and below bottom of foundations, drains, and other excavations.
 - 2. Operate dewatering system continuously until dewatering is no longer required. Dispose of water removed from excavations in a manner to avoid endangering public health, property, and portions of work under construction or completed. Provide flow control devices as required by governing authorities.

END OF SECTION

SECTION 31 25 00

EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide all equipment and materials, and do all work necessary to construct a complete erosion and sediment control program for minimizing erosion and sediment control provisions and specified herein are the minimum requirements for an erosion control program. The Contractor shall provide additional erosion sediment control materials and methods as required to effect the erosion and siltation control principles specified herein.
- B. Provide temporary erosion- and sedimentation-control measures to prevent soil erosion and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways, according to erosion- and sedimentation-control Drawings and requirements of authorities having jurisdiction.
- C. Erosion control and maintenance program, shall include, but not be limited to, installation and maintenance of silt fences, hay bale check dams, and installation schedules of erosion control structures.

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.
- B. Proposed methods, materials to be employed, and schedule for effecting erosion and siltation control and preventing erosion damage shall be submitted for approval. Submittals shall include:
 - 1. List of proposed material including manufacturer's product data.
 - 2. Schedule of erosion control program indicating specific dates for implementing programs in each major area of work.
 - 3.

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

1.4 EMERGENCY OPERATION PROCEDURES

- 1. The Contractor shall have on-call at all times capable, responsible representatives who, when authorized, will mobilize the necessary personnel, materials, and equipment, and otherwise provide the required action when notified of any impending emergency situation.
- 2. The Contractor shall supply a telephone number to the Owner with which the Contractor may be contacted in the evenings and on weekends. The Contractor shall prepare a 24-hour "duty roster" for this purpose and submit it in writing to the Architect.

PART 2 PRODUCTS

2.1 MATERIALS

2.01 SILT FENCE

- A. Silt fence shall be "Envirofence" preassembled silt fence structure, manufactured by Mirafi, Inc., Charlotte, NC, or approved equal.
1. Each package shall include oak post, industrial polypropylene netting, Mirafi 100 sediment control fabric, metal coupler and instructions.
 2. Overall length of each fence section shall be minimum 100 ft.; fabric width minimum of 3 ft., post length minimum of 4 ft. - 6 in.; and post spacing minimum of 8 ft.
 3. Posts shall be tapered for ease of installation, and beveled at top to resist splitting.

2.02 STRAW BALES

Straw bales for construction of erosion control barrier, straw bale check dam, and catch basin filter dam shall be new, firm wire or nylon-bound livestock grade.

2.03 CRUSHED STONE

Crushed stone for hay bale check dam and catch basin filter dam shall conform to MDOT Specifications Section M2.01.3

2.04 FILTER FABRIC

Filter fabric for catch basin filter dam shall be Mirafi 140N drainage fabric, manufactured by Mirafi, Inc., Charlotte, NC, or approved equal.

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. Work by General Contractor

Bituminous concrete pavement and granite curbing required for this work is indicated on the drawings and includes, but is not necessarily limited to:

1. Asphalt Drive and Parking Spaces

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. Application: Roadways.
 2. Application: Base for pavers.
 3. Asphalt-Aggregate Mixture: Plant-mixed, hot-laid asphalt-aggregate mixture, ASTM D 3515, complying with local DOT and DPW regulations.
 4. Prime Coat: Cut-back asphalt, ASTM D 2027.
 5. Tack Coat: Emulsified asphalt, ASTM D 977.
 6. Marking Paint: Alkyd-resin type, lead and chromate free, yellow.
 7. 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 feet 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-inch 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 inch in 10 feet for grade and alignment of top of forms; 1/4 inch in 10 feet 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. 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.
 - 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. Epoxy Adhesive: ASTM C 881.
 - j. Expansion Joints

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. Dispose of over-mixed concrete off-site in a legal manner.
- E. 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 are not acceptable.

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. 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 Tolerance: 1/8 inch in 10 feet for grade and alignment; 1/4 inch 10 feet 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. Granite Curbs and Gutters:
 - 1. Vertical Granite Curb: Sawed top and smooth quarry split face.
 - 2. 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 inch to 3/4 inch wide. Point joints with mortar and tool concave; remove surplus mortar and clean curbs.

END OF SECTION

SECTION 32 30 00
SITE IMPROVEMENTS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide site improvements and amenities.

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. Site Improvements:
 - 1. Manufacturers: Landscape Forms, Forms + Surfaces, Maglin, AAL Lighting-Pole Mounted fixtures, Bega- Illuminated Bollards; Sureloc Aluminum/Steel Edging; or approved equal.
 - Exterior site furnishings.
 - Landscape edging.
 - Wooden Dumpster Enclosure
 - Benches, cast aluminum or stainless steel and wood.
 - Trash receptacles, metal.
 - Bollards, stainless steel LED lighting.
 - Site lighting, pole mounted fixtures.
 - Site signage, directional and informational signage.
 - 2. Custom Fabrication: Stainless Steel Handrails for Stairs

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 function. Clean and protect work from damage.

END OF SECTION

SECTION 32 31 00
FENCES AND GATES

PART 1 GENERAL

1.1 SUMMARY

- A. Provide ornamental fencing and gates.

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. Shop Drawings: Provide shop drawings prior to fabrication of all fencing and gate assemblies.

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. Field verify location prior to installation.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Fences and Gates:
 - 1. Manufacturers: Ameristar Montage Plus with double top rail. 4' high with lockable gate.

PART 3 EXECUTION

3.1 INSTALLATION

- A. Install materials in accordance with manufacturer's instructions and approved submittals. Comply with ASTM F 567. Install materials in proper relation with adjacent construction and with uniform appearance. Coordinate with work of other sections. Install posts to depth to avoid frost heave.
- B. Cut pipe with pipe-cutters only. Cutting with backsaws is not acceptable. Tack weld gates for strength. Use spring loaded latches, not yokes.
- C. Restore or replace damaged components. Clean and protect work from damage.

END OF SECTION

SECTION 32 32 00
RETAINING WALLS

PART 1 GENERAL

1.1 SUMMARY

- A. Provide retaining walls.

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. Provide shop drawings of all proposed walls. Provide third party reviewed signed and stamped engineering drawings.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Retaining Walls:
 - 1. Manufacturers: Basalite Concrete Products, LLC Corporate Offices; Keystone Retaining Wall Systems, Inc.; Tensar International Corporation; VERSA-LOK Retaining Wall Systems; or approved equal.
 - 2. Application: Site retaining walls.
 - 3. Type: Modular concrete retaining walls.
 - 4. Material: Segmented concrete units.

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 function. Clean and protect work from damage.

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. Application: Trees, shrubs, plants, and ground cover.
 - 2. Application: Finish grading and lawns.
 - 3. Application: Topsoil and soil amendments.
 - 4. Application: Initial maintenance of landscape materials.
 - 5. Application: Pruning and relocation of existing plant materials.
 - 6. Application: Reconditioning existing lawns.
 - 7. Plant Materials: Deciduous trees and shrubs.
 - 8. Plant Materials: Coniferous trees and shrubs.
 - 9. Plant Materials: Ground cover and plants.
 - 10. Lawns: Seed, new crop seed mixture.
 - 11. Topsoil: Site stockpile.
 - 12. Topsoil: From offsite
 - 13. Soil Amendments: Based on soil testing.

14. 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.

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 1,000 square feet for plant beds and 2 pounds per inch of trunk for tree pits.
- C. Install soil mix to a depth of 18 inches in plant beds; 6" deep in lawn areas; excavate tree pits 2x the width of root ball.
- D. For seeded lawns, apply seed at rate of 5 pounds per 1,000 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.
- 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. Testing: Hydrostatic tests at minimum 2 times working pressure for 2 hours.

PART 2 PRODUCTS

2.1 MATERIALS

- A. Water Service Piping Systems:
 - 1. Application: Water service piping for buildings.
 - 2. Piping: Ductile iron, cement lines, and at least Class 52 Thickness
 - 3. Piping: Copper.
 - 4. Tees: Stainless Steel
 - 5. Hosebibs: Stainless Steel
 - 6. Thrust Blocks
 - 7. Gate Valves and Valve Boxes
 - 8. Valves: Suitable for service.
 - 9. Anchorages: Suitable for service.
 - 10. 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. 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.
- 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. Sanitary Sewerage Systems:
 - 1. Application: Sewerage piping and systems for building wastes.
 - 2. Pipe and Fittings: Hub-and-spigot cast-iron pipe.
 - 3. Pipe and Fittings: Hubless cast-iron pipe.
 - 4. Pipe and Fittings: PVC. Meeting MHD Standards.
 - 5. Pipe and Fittings: Non-reinforced concrete.
 - 6. Pipe and Fittings: Reinforced concrete. Meeting MHD Standards.
 - 7. Sleeves, Couplings, Gaskets and Valves: Suitable for service. Meeting MHD Standards.
 - 8. Manholes, Cleanouts and Catch Basins: Suitable for service. Meeting MHD Standards.
- 9. Precast grease trap

The precast grease trap tank shall be a 1000 gallon tank constructed of a reinforced cement concrete chamber, designed to a loading capacity of AASHTO HS20-44, and shall be constructed to the minimum dimensions shown on the drawings, and shall include inlet and outlet tees. The tank shall be constructed with 5000 P.S.I @ 28 day concrete. Steel reinforcing shall conform to ASTM A-615 GR. 60, A-185, or A-497, with 1" minimum cover. All construction joints in the tank shall be watertight and sealed with 1" diameter butyl rubber or equivalent. Minimum construction specifications shall be as for Model GT 1000, as manufactured by Chase Precast Corp, Model GT 6X6-1 as manufactured by Rotondo & Sons, or approved equal. The inlet and outlet openings shall be cast with "V" openings into the structure, and all pipes entering or exiting the structure shall be grouted in place. Grease trap tank shall include 24 inch diameter sanitary sewer manhole frame and covers brought to grade over all access covers.

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.

- B. The storm drainage system required for this work is indicated on the drawings and includes, but is not necessarily limited to:
 - storm drainage pipe and subdrains
 - catch basins, manholes, storm drains and interconnecting lateral lines
 - required fittings and bends
 - testing

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: Stormceptor, CertainTeed Corp., Foundation and Pipe Products; Invisible Structures, Inc.; Reed & Graham, Inc. Geosynthetics Division; or approved equal.
 - 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; or approved equal.
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.

C. Manhole Frames and Covers and Traps

1. Shall conform to MHD Specifications.

D. HDPE Drainage Pipe

This pipe shall conform to MHD Standard Specifications Section M5.03.01. The pipe shall be constructed of high-density polyethylene. The pipe shall be seamless with corrugations on the exterior and shall have a smooth interior waterway. Corrugated plastic pipe shall not be used for flared ends or in other applications where the pipe will be exposed to vandalism and ultraviolet radiation. Cost of pipe shall include connections to flared ends of other material.

E. Polyvinyl Chloride Pipe and Perforated Polyvinyl Chloride Pipe

PVC pipe and fittings for drainage and subdrainage applications shall meet ASTM D 1785 Standard Specifications for PVC plastic pipe, Type I Schedule 80. Joints shall be made in accordance with ASTM D 2855 Recommended Practice for Making Solvent-cemented Joints with PVC Pipe and Fittings.

F. Precast reinforced concrete manholes

Shall consist of precast reinforced riser sections, a concentric or eccentric to and a base section conforming with the typical manhole details.

Precast manhole section shall be manufactured in accordance with ASTM Standard Specification for Precast Reinforced Concrete Manhole Sections, designation C 478.

G. Precast Concrete Basins

Precast concrete basins shall consist of pre-cast reinforced riser sections, haunched concentric cone top section, and a base section conforming to the typical catch basin details. Where required by shallow installations or directed by the Engineer, provide a flat slab top constructed to support HS-20 wheel loading.

Pre-cast catch basins shall be manufactured in accordance with ASTM Designation C 478. The

minimum compressive strength of the concrete for all sections shall be 4,000 psi of a 28 day test. The circumferential steel reinforcement for riser sections and base walls shall be 0.17 square inch per linear foot. Reinforcing in the bottoms of bases shall be of the same design.

H. Area Drain

Area drain shall be a drain basin with PVC body, cast iron grate and water-tight pipe adaptors, and shall be H-20 rated for parking lots, driveways and similar load-bearing roadway applications. Water-tight pipe adaptor shall be gasketed and allow for fitting of specified corrugated polyethylene ADS N-12 drain pipe. The area drain shall be 12" drain basin with standard 12" dia. cast iron perforated grate by Nyloplast/ADS, Inc., local representative: ADS, Inc., 58 Wyoming Street, Ludlow, MA, 01056, tel. 800-733-3555 or 413-589-0515.

I. Decorative Drain Covers

Contractor to submit samples for review and selection.

Area Drain grates shall be MODEL 9055DR-12R DEL SOL 12inch ROUND. Each set to be complete with matching frame model 9001FDR-12. Frame to have installation details as shown on plans.

Drain grate material shall be cast gray iron (or) from 100% recycled materials. All drain grate castings shall be manufactured true to pattern and component parts, and shall fit together in a satisfactory manner. The castings shall be of uniform pattern and quality, free from blowholes, hard spots, shrinkage, distortion or other defects. Castings shall be cleaned by shot blasting.

J. Stormwater treatment chamber

The contractor shall furnish and install a complete stormwater treatment chamber at the location shown on the plans. The stormwater treatment chamber shall be a Stormceptor model STC 450i or STC 900 (specific model as noted on the plans), distributed by Rinker Materials, Houston, TX, or approved equal. The stormwater treatment chamber shall include any by-pass structures, inlet structures, or any other appurtenances necessary to provide the required treatment and intended function as shown on the plans. Any variation from the proposed locations, dimensions, inverts, or other parameters shall be detailed on a plan and submitted to the Engineer for review and approval.

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