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ADA BATHROOM – ITB-OCCC-2022-14
Our File No. OCCC-161
Orange County Community College
Middletown, New York

Bid date: April 14, 2022

Bid time: 2:00 P.M.

This addendum is made part of the referenced plans and specifications.

Please sign to acknowledge receipt of this addendum and fax or email it back to this office (845) 956-5865, jmh@fuscoengineering.com receipt of this addendum must be acknowledged on the Bid Document.

Note: ***Failure to acknowledge receipt of addendum may result in disqualification of the bid.***

The enclosed material represents Addendum #1 for the ADA Bathroom Project at SUNY Orange - Orange County Community College.

MATERIAL PROVIDED:

1. Bid specifications were missing from the original bid document. The bid specifications are included with the addendum.

CLARIFICATION:

1. Question: **Schedule**: Project is due 4/14 and is planned for immediate and award. Prime is to begin within 10 days of NTP and complete within 100 days of NTP (See Special Condition 01000-2 Item #16 & 17). Is there an unstated constraint that this project must be completed before the Fall 2022 semester begins? How soon will the successful offeror be able to take possession of each renovation area?

   Answer: Bid opening is April 14. Actual physical work can begin May 23 following the colleges' graduation. Submittals can be submitted to the engineer for approval once the contracts are signed. Signed contracts, bonding documents and insurances must be delivered to the college within 10 days of the letter of award being issued.

Receipt of Addendum No.1 for the ADA Bathroom project acknowledged:

_____ _____

PRINT COMPANY NAME DATE

_____

SIGNATURE

PART 1 - GENERAL

1.01 GENERAL

A. Various underground and surface structures are shown on the Contract Drawings including water and gas pipes, sewers, electrical cables and conduits, drains, culverts, and miscellaneous structures. These structures are plotted on the Drawings from the best information available, but the locations and dimensions where shown do not purport to be absolutely correct, and the information given shall not be construed as representation that such structures will be found or encountered as plotted. Other structures or pipelines may also be encountered which are not shown on the Drawings.

B. The Contractor shall be entirely responsible for all injuries to water pipes, electric conduits, or cables, drains, sewers, gas mains, poles, telephone and telegraph lines, streets, pavements, sidewalks, curbs and gutters, fences, culverts, building foundations, retaining walls or other structures of any kind met with during the progress of the work and shall be liable for damages to public or private property resulting therefrom.

C. The cost of protection, replacement in their original positions and conditions or payment of damages for injuries thereto of pipelines and structures called for on the Drawings or specified shall be deemed included in the bid price, if no specific item is provided therefor, as part of the overhead cost of the work, and no additional payment will be made therefor. If the Contractor, through negligence, disturbs or injures existing gas, water, electric, or telephone facilities not required for the performance of the work, the facilities will be repaired by the utility companies at the sole expense of the Contractor. For relocation of any existing utility to facilitate construction, the Contractor will make his own arrangements with the utility companies.

D. The Contractor shall, at all times in performance of the work, employ approved methods and exercise reasonable care and skill so as to avoid unnecessary delay, injury, damage, or destruction of utility installations and structures; and shall, at all times in the performance of the work, avoid unnecessary interference with or interruption of utility services and shall cooperate fully with the Owners thereof to that end.

E. Service to fire hydrants shall not be disturbed at any time without permission of the chief of the fire department of the area.

F. All costs for protection and maintenance of the services and utilities shall be included by the appropriate Contractor in the Contract Sum and no separate payment will be made therefor.

G. Wherever the structures to be built under this Contract pass under or near other structures, the Contractor shall exercise the utmost care to protect such structures from damage.

H. The Contractor shall be liable for all damages to any of the existing structures and shall save and keep the Owner and the Engineer harmless from any liability or expense for injuries, damages, or repairs to these structures.

I. Existing utilities damaged during construction through negligence on the part of the Contractor shall be repaired by personnel of the utility companies involved at the expense of the Contractor.

1.02 ADJACENT STRUCTURES

A. Contractor's attention is directed to Part 1.01A of this section relative to the information shown on the Drawings regarding the existing facilities and structures adjacent to the site.

B. At least one week's notice shall be given by the Contractor to all Village, District, or County Departments, public service corporations and property owners whose pipes, poles, tracks, wires, or conduits or other structures may be affected by the work that they may protect, adjust, remove, or rebuild them or take such measures as they may desire to minimize inconvenience.

C. The Contractor shall maintain in service all water, gas, and sewer main connections and shall provide temporary service where necessary.

D. Any fence or part thereof that is damaged or removed during the course of the work shall be replaced or repaired by the Contractor and shall be left in a satisfactory condition as before the starting of the work. The manner in which the fence is repaired or replaced and the materials used in such work shall be subject to the approval of the Engineer. The cost of all labor, materials, equipment, and work for the replacement and repair of any fences shall be included in the contract price or if no specific item is provided therefor, as part of the overhead cost of the work, and no additional payment will be made therefor.

E. The Contractor shall temporarily cover all catch basins when working in the vicinity to prevent excavated material and debris from falling into the catch basins. Temporary covers shall be removed during times of precipitation in order to maintain storm runoff. Any damaged laterals shall be replaced immediately so runoff conditions are not interrupted.

END OF SECTION

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Building demolition excluding removal of hazardous materials and toxic substances.

B. Selective demolition of built site elements.

C. Selective demolition of building elements for alterations purposes.

D. Abandonment and removal of existing utilities and utility structures.

1.02 RELATED REQUIREMENTS

A. Drawings for Limitations on Contractor's use of site and premises.

B. Drawings for description of items to be salvaged or removed for re-use by Contractor.

C. Section 015000 - Temporary Facilities and Controls: Site fences, security, protective barriers, and waste removal.

D. Section 016000 - Product Requirements: Handling and storage of items removed for salvage and relocation.

E. Section 017000 - Execution and Closeout Requirements: Project conditions; protection of bench marks, survey control points, and existing construction to remain; reinstallation of removed products.

F. Section 017419 - Construction Waste Management and Disposal: Limitations on disposal of removed materials; requirements for recycling.

1.03 REFERENCE STANDARDS

A. 29 CFR 1926 - U.S. Occupational Safety and Health Standards; current edition.

B. NFPA 241 - Standard for Safeguarding Construction, Alteration, and Demolition Operations; 2004.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Site Plan: Showing:
   1. Areas for temporary construction and field offices.

C. Demolition Plan: Submit demolition plan as specified by OSHA and local authorities.
   1. Indicate extent of demolition, removal sequence, bracing and shoring, and location and construction of barricades and fences.
   2. Identify demolition firm and submit qualifications.
   3. Include a summary of safety procedures.

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

1.05 QUALITY ASSURANCE

A. Demolition Firm Qualifications: Company specializing in the type of work required.
   1. Minimum of 5 years of documented experience.

PART 2 PRODUCTS

2.01 MATERIALS

PART 3 EXECUTION

3.01 SCOPE

3.02 GENERAL PROCEDURES AND PROJECT CONDITIONS

A. Comply with other requirements specified in Section 017000.

B. Comply with applicable codes and regulations for demolition operations and safety of adjacent structures and the public.
   1. Obtain required permits.
   2. Comply with applicable requirements of NFPA 241.
   3. Use of explosives is not permitted.
   4. Take precautions to prevent catastrophic or uncontrolled collapse of structures to be removed; do not allow worker or public access within range of potential collapse of unstable structures.
   5. Provide, erect, and maintain temporary barriers and security devices.
   6. Use physical barriers to prevent access to areas that could be hazardous to workers or the public.
   7. Conduct operations to minimize effects on and interference with adjacent structures and occupants.
   8. Do not close or obstruct roadways or sidewalks without permit.
   9. Conduct operations to minimize obstruction of public and private entrances and exits; do not obstruct required exits at any time; protect persons using entrances and exits from removal operations.
   10. Obtain written permission from owners of adjacent properties when demolition equipment will traverse, infringe upon or limit access to their property.

C. Do not begin removal until vegetation to be relocated has been removed and specified measures have been taken to protect vegetation to remain.

D. Protect existing structures and other elements that are not to be removed.
1. Provide bracing and shoring.
2. Prevent movement or settlement of adjacent structures.
3. Stop work immediately if adjacent structures appear to be in danger.

E. Minimize production of dust due to demolition operations; do not use water if that will result in ice, flooding, sedimentation of public waterways or storm sewers, or other pollution.

F. If hazardous materials are discovered during removal operations, stop work and notify Architect and Hospital; hazardous materials include regulated asbestos containing materials, lead, PCB's, and mercury.

G. Hazardous Materials: Comply with 29 CFR 1926 and state and local regulations.

H. Perform demolition in a manner that maximizes salvage and recycling of materials.
1. Comply with requirements of Section 017419 - Waste Management.
2. Dismantle existing construction and separate materials.
3. Set aside reusable, recyclable, and salvageable materials; store and deliver to collection point or point of reuse.

3.03 EXISTING UTILITIES

A. Coordinate work with utility companies; notify before starting work and comply with their requirements; obtain required permits.

B. Protect existing utilities to remain from damage.

C. Do not disrupt public utilities without permit from authority having jurisdiction.

D. Do not close, shut off, or disrupt existing life safety systems that are in use without at least 7 days prior written notification to Hospital.

E. Do not close, shut off, or disrupt existing utility branches or take-offs that are in use without at least 3 days prior written notification to Hospital.

F. Locate and mark utilities to remain; mark using highly visible tags or flags, with identification of utility type; protect from damage due to subsequent construction, using substantial barricades if necessary.

G. Remove exposed piping, valves, meters, equipment, supports, and foundations of disconnected and abandoned utilities.

H. Prepare building demolition areas by disconnecting and capping utilities outside the demolition zone; identify and mark utilities to be subsequently reconnected, in same manner as other utilities to remain.

3.04 SELECTIVE DEMOLITION FOR ALTERATIONS

A. Drawings showing existing construction and utilities are based on casual field observation and existing record documents only.
1. Verify that construction and utility arrangements are as shown.
2. Report discrepancies to Architect before disturbing existing installation.

3. Beginning of demolition work constitutes acceptance of existing conditions that would be apparent upon examination prior to starting demolition.

B. Separate areas in which demolition is being conducted from other areas that are still occupied.
   1. Provide, erect, and maintain temporary dustproof partitions of construction specified in Section 015000 in locations indicated on drawings.
   2. Provide sound retardant partitions of construction indicated on drawings in locations indicated on drawings.

C. Maintain weatherproof exterior building enclosure except for interruptions required for replacement or modifications; take care to prevent water and humidity damage.

D. Remove existing work as indicated and as required to accomplish new work.
   1. Remove rotted wood, corroded metals, and deteriorated masonry and concrete; replace with new construction specified.
   2. Remove items indicated on drawings.

E. Services (Including but not limited to HVAC, Plumbing, Fire Protection, and Electrical): Remove existing systems and equipment as indicated.
   1. Maintain existing active systems that are to remain in operation; maintain access to equipment and operational components.
   2. Where existing active systems serve occupied facilities but are to be replaced with new services, maintain existing systems in service until new systems are complete and ready for service.
   3. See Section 011000 for other limitations on outages and required notifications.
   4. Verify that abandoned services serve only abandoned facilities before removal.
   5. Remove abandoned pipe, ducts, conduits, and equipment, including those above accessible ceilings; remove back to source of supply where possible, otherwise cap stub and tag with identification.

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

3.05 DEBRIS AND WASTE REMOVAL

A. Remove debris, junk, and trash from site.

B. Remove from site all materials not to be reused on site; comply with requirements of Section 017419 - Waste Management.

C. Leave site in clean condition, ready for subsequent work.

D. Clean up spillage and wind-blown debris from public and private lands.

END OF SECTION

SECTION 03400
CONCRETE MASONRY UNITS (CMU)

PART 1—GENERAL

SUBMITTAL
Submit product certifications and test reports.

QUALITY ASSURANCE
Certification: Concrete blocks for finishing shall conform to ASTM C90. The provisions of ASTM C90, apply with regard to appearance.

Fire Resistance: Define hourly ratings required as 1, 2, 3 or 4 hours; or as-needed or specified.

DELIVERY, STORAGE AND HANDLING
Masonry units shall be delivered to the jobsite on pallets or standard cube format. Store product in single stacks on level ground and cover with waterproof covering (e.g., tarpaulins) to protect the blocks from inclement weather. Handle blocks carefully to avoid breakage and damage to the surfaces.

PROJECT/SITE CONDITIONS
Protection of Work: Cover tops of walls each day after installation to keep open walls protected and dry.

PART 2—PRODUCTS

PRODUCT NAME
Concrete Masonry Units

MANUFACTURER
York Building Products 950 Smile Way, York, PA 17404 800.673.2408

RELATED MATERIALS
Mortar is available from Workrite®. Refer to Division 4 Masonry Section for mortar type and specifications.

SIZES AND SHAPES
Nominal 2", 4", 6", 8", 10" and 12" standard block thicknesses are available, as well as all standard block shapes. High-strength units for special structural requirements are also available.

MASONRY CLEANERS
Use masonry cleaners such as Prosoco Masonry Cleaner. Follow manufacturer's instructions for proper mixing and application. Do not apply cleaner with pressure spray above 50 psi. *CAUTION! Never use Muriatic Acid solution on units.* Masonry cleaners are specified and to be used on architectural CMU only. No cleaners are needed on standard CMU. Rubbing & pointing of walls only, is required.

Part 3—Execution

INSTALLATION

Lay blocks from more than one pallet at a time during installation. Lay units using the best concrete masonry practices. Lay blocks with the faces level, plumb and true to the line strung horizontally at the face. Complete masonry construction using procedures and workmanship consistent with the best masonry practices.

Cutting: Make all unit cuts, including those for bonding, holes, boxes, etc., with motor-driven masonry saws, using either an abrasive or diamond blade. Cut neatly and locate for best appearance.

Mortar Bedding and Jointing:

- Lay units with full mortar coverage on head and bed joints, taking care not to block cores to be grouted or filled with masonry insulation.
- Tool all mortar joints -when thumbprint hard - into a concave configuration.
- Care should be taken to remove mortar from the face of masonry units before it sets.
- Tuckpoint the joints of scored units for proper appearance. All exterior scored units must be tuckpointed to prevent water penetration. DO NOT USE RAKE JOINTS – UNLESS NOTED.

INSTALLATION RECOMMENDATIONS

- Cavity wall construction is recommended for exterior walls, with proper flashing, venting and weep holes.
- Always test a small, inconspicuous area before using cleaners. Do not use acids or abrasives on finished surfaces.

FLASHING OF MASONRY WORK

Install flashing at locations shown in the plans and in strict accordance with the details and the best masonry flashing practices.

WEEPS AND VENTS

Install weep holes and vents at proper intervals (32" O.C. above bed joints, typical) at courses above grade, above flashing and at any water stops over windows, doors and beams.

INSPECTION

The textured or ground faces shall be free from chips, cracks or any other imperfection that would detract from the overall appearance of the finished wall when viewed from a distance of twenty (20) feet at right angles to the wall with normal lighting.

CLEANING

Keep walls clean daily during installation using brushes. Do not allow excess mortar lumps or smears to harden on the finished surfaces. Harsh cleaning methods after walls have been erected may mar the surface of the blocks.

FINAL CLEANDOWN

Clean the completed walls with masonry cleaner, strictly following the manufacturer's instructions-- including thorough rinsing. Do not use acid or abrasives on the finished surfaces. Failure to strictly follow manufacturer's instructions can result in permanent damage to the block faces. (See note on page 1 under Masonry Cleaners.)

MAINTENANCE

Properly installed and cleaned architectural masonry units need virtually no maintenance other than routine cleaning with standard commercial grade cleaning agents.

SECTION 04 0511
MASONRY MORTARING AND GROUTING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Mortar for masonry.

B. Grout for masonry.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. ACI 530/530.1/ERTA - Building Code Requirements and Specification for Masonry Structures and Related Commentaries; American Concrete Institute International; 2011.

B. ASTM C5 - Standard Specification for Quicklime for Structural Purposes; 2010.

C. ASTM C91/C91M - Standard Specification for Masonry Cement; 2012.

D. ASTM C94/C94M - Standard Specification for Ready-Mixed Concrete; 2014.

E. ASTM C144 - Standard Specification for Aggregate for Masonry Mortar; 2011.

F. ASTM C150/C150M - Standard Specification for Portland Cement; 2012.

G. ASTM C207 - Standard Specification for Hydrated Lime for Masonry Purposes; 2006 (Reapproved 2011).

H. ASTM C270 - Standard Specification for Mortar for Unit Masonry; 2012.

I. ASTM C387/C387M - Standard Specification for Packaged, Dry, Combined Materials for Concrete and High Strength Mortar; 2011b.

J. ASTM C404 - Standard Specification for Aggregates for Masonry Grout; 2011.

K. ASTM C476 - Standard Specification for Grout for Masonry; 2010.

1.04 SUBMITTALS

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

B. Product Data: Include design mix and indicate whether the Proportion or Property specification of ASTM C270 is to be used. Also include required environmental conditions and admixture limitations.

1.05 QUALITY ASSURANCE

A. Comply with provisions of ACI 530/530.1/ERTA, except where exceeded by requirements of the contract documents.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.07 FIELD CONDITIONS

A. Cold and Hot Weather Requirements: Comply with requirements of ACI 530/530.1/ERTA or applicable building code, whichever is more stringent.

PART 2 PRODUCTS

2.01 MORTAR AND GROUT APPLICATIONS

A. At Contractor's option, mortar and grout may be field-mixed from packaged dry materials, made from factory premixed dry materials with addition of water only, or ready-mixed.

B. Mortar Mix Designs: ASTM C270, Property Specification.
   1. Interior, Loadbearing Masonry: Type N.
   2. Interior, Non-loadbearing Masonry: Type N.

C. Grout Mix Designs:

1. Bond Beams and Lintels: 3,000 psi (21 MPa) strength at 28 days; 8-10 inches (200-250 mm) slump; provide premixed type in accordance with ASTM C 94/C 94M.

2.02 MATERIALS

A. Packaged Dry Material for Mortar for Unit Masonry: Premixed Portland cement, hydrated lime, and sand; complying with ASTM C387/C387M and capable of producing mortar of the specified strength in accordance with ASTM C270 with the addition of water only.
   1. Type: Type N.
   2. Color: Standard gray.

B. Packaged Dry Material for Mortar for Repointing: Premixed Portland cement, hydrated lime, and graded sand; capable of producing Type O mortar in accordance with ASTM C270 with the addition of water only.
   1. Color: Standard gray.

C. Packaged Dry Material for Grout for Masonry: Premixed cementitious materials and dried aggregates; capable of producing grout of the specified strength in accordance with ASTM C476 with the addition of water only.

D. Portland Cement: ASTM C150.
   1. Type: Type I - Normal.
   2. Color: Standard gray.

E. Masonry Cement: ASTM C91.
   1. Type: Type N.

F. Hydrated Lime: ASTM C207, Type S.

G. Quicklime: ASTM C5, non-hydraulic type.

H. Mortar Aggregate: ASTM C144.

I. Grout Aggregate: ASTM C404.

J. Water: Clean and potable.

K. Bonding Agent: Latex type.

2.03 MORTAR MIXING

A. Thoroughly mix mortar ingredients using mechanical batch mixer, in accordance with ASTM C270 and in quantities needed for immediate use.

B. Maintain sand uniformly damp immediately before the mixing process.

C. Do not use anti-freeze compounds to lower the freezing point of mortar.

D. If water is lost by evaporation, re-temper only within two hours of mixing.

2.04 GROUT MIXING

A. Mix grout in accordance with ASTM C94/C94M.

B. Thoroughly mix grout ingredients in quantities needed for immediate use in accordance with ASTM C476 for fine and coarse grout.

PART 3 EXECUTION

3.01 PREPARATION

A. Apply bonding agent to existing concrete surfaces.

B. Plug clean-out holes for grouted masonry with brick masonry units. Brace masonry to resist wet grout pressure.

3.02 INSTALLATION

A. Install mortar and grout to requirements of section(s) in which masonry is specified.

B. Work grout into masonry cores and cavities to eliminate voids.

C. Do not install grout in lifts greater than 16 inches (400 mm) without consolidating grout by rodding.

3.03 GROUTING

A. Use either high-lift or low-lift grouting techniques, at Contractor's option, subject to other limitations of contract documents.

B. Low-Lift Grouting:
   1. Limit height of pours to 12 inches (300 mm).
   2. Limit height of masonry to 16 inches (400 mm) above each pour.
   3. Pour grout only after vertical reinforcing is in place; place horizontal reinforcing as grout is poured. Prevent displacement of bars as grout is poured.
   4. Place grout for each pour continuously and consolidate immediately; do not interrupt pours for more than 1-1/2 hours.

C. High-Lift Grouting:
   1. Verify that horizontal and vertical reinforcement is in proper position and adequately secured before beginning pours.
   2. Place grout for spanning elements in single, continuous pour.

3.04 SCHEDULES

A. Interior Masonry Wall Lintels: Type N mortar.

END OF SECTION

SECTION 054000

COLD-FORMED METAL FRAMING SYSTEMS

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. The General Provisions of the Contract, including the General and Supplementary Conditions, apply to the work specified in this Section.

1.02 SCOPE OF WORK

A. Furnish all labor, supervision, materials, tools and equipment necessary for, or incidental to completion of cold-formed metal framing as shown on the Contract Drawings and/or specified herein.

1.03 QUALITY ASSURANCE

A. Quality control, fabrication and erection shall be in accordance with the latest Edition of American Iron and Steel Institute (AISI) Cold-Formed Steel Design Manual-"Specification for the Design of Cold-Formed Steel Structural Members".

B. Inspections

1. Inspections by a qualified/independent authority shall be performed in order to assure strict conformance to the shop drawings at all phases of construction.

2. All members shall be checked for bearing, completeness of attachments, reinforcement, etc.

3. All attachments shall be checked for conformance with the shop drawings and/or Contract Documents. All welds shall be touched up using zinc-rich paint.

4. General inspection of structure shall be completed prior to applying loads to those members.

1.04 SUBMITTALS

A. Shop Drawings shall be documents illustrating materials, shop coatings, steel thicknesses details of fabrication, details of attachment to adjoining work, size, location, and spacing of fasteners for attaching framing to itself, details of attachment to the structure, accessories and their installation, and critical installation procedures. Drawings shall include plans, elevations, sections and details.

B. Samples shall be representative pieces of all framing, component parts and accessories. Unless otherwise specified, pieces shall be twelve (12") inches long and tagged with name of part and manufacturer.

C. Certifications shall be statements from the manufacturer certifying that the materials conform to the appropriate requirements as outlined in the Contract Documents.

D. Engineering calculations or data shall be submitted verifying the framing assembly's ability to meet or exceed design requirements. These calculations shall include, but not be limited to the following items:

1. Framing used to support floors shall be designed for an allowable deflection of L/360. Framing used to support roofs shall be designed for an allowable deflection of L/240.

2. All connections (member to member, and member to structure) shall be thoroughly examined and designed.

3. Selected exterior and interior walls shall be designed to provide frame stability and lateral load resistance. If diagonal steel strapping is used to transfer lateral loads to the structure and foundation, additional framing members may be required to resist the vertical component of the load from the diagonal bracing.

4. Wall bridging shall be designed to provide resistance to minor axis bending and rotation of wall studs.

E. All shop drawings and calculations shall be sealed by a Professional Engineer licensed in the State of New York.

1.05 APPLICABLE DOCUMENTS

A. ASTM Standards

B. American Iron and Steel Institute (AISI) Cold-Formed Steel Design Manual - "Specification for the Design of Cold-Formed Steel Structural Members", latest edition (1986).

C. American Welding Society (AWS): Structural Welding Code (D1.1) Specification for Welding Sheet Steel in Structures (E1.3).

D. Military Specifications (Mil. Spec.) MIL-P-21035... Paint, High Zinc Dust Content, Galvanizing Repair.

E. Federal Specifications (Fed. Spec.) FF-P395...Pin, Drive, Guided and Pin Drive, Power Actuated (Fasteners for Power Actuated and Hand Actuated Fastener Tools) FF-S325...Shield, Expansion; Nail, Expansion; and Nail, Drive Screw (Devices, Anchoring Masonry).

PART 2 - PRODUCTS

2.01 MATERIALS

A. All studs and/or joists and accessories shall be of the type, size, steel thickness and spacing shown on the Contract Drawings. Studs, runners (track), bracing and bridging shall be manufactured per ASTM Specification C955 with a minimum "G-60" coating.

B. All galvanized studs, joists and accessories, 16 gauge or heavier, shall be formed from steel that conforms to the requirements of ASTM A653 with a yield of 50 ksi and as set forth in Section A3.1 of the AISI "Specification for the Design of Cold-Formed Steel Structural Members", latest edition (1986).

C. All galvanized studs, joists, and accessories, 18 gauge, shall be formed from steel that conforms to the requirements of ASTM A653 with a yield of 33 ksi and as set forth in Section A3.1 of the AISI "Specification for the Design of Cold-Formed Steel Structural Members", latest edition (1986).

D. All galvanized studs, joists and accessories, 20 gauge, shall be formed from steel that conforms to the requirements of ASTM A653, with a yield of 33 ksi and as set forth in Section 1.2 of the AISI "Specification for the Design of Cold-Formed Steel Structural Members", latest edition (1986).

E. All galvanized studs, joists, and accessories shall have a minimum G-60 coating.

F. Physical properties and allowable load capabilities of members shall be developed in accordance with AISI "Specification for the Design of Cold-Formed Steel Structural Members", latest edition (1986).

G. All fasteners shall be self-drilling and conform to the requirements of ASTM A-954.

PART 3 - EXECUTION

3.01 STORAGE OF MATERIALS

A. Products shall be protected from conditions that may cause any physical damage.

B. Materials shall be stored on a flat plane.

C. Any damaged materials (e.g. rusted, dented, bent or twisted) shall be removed from the job site.

3.02 INSTALLATION: GENERAL

A. Methods of construction may be either piece by piece (stick-built), or by fabrication into panels.

B. Connections shall be made with self-drilling screws or welding so that the connection meets or exceeds the design loads requires at that connection.

C. Transversely loaded studs need not sit squarely in tracks but must be attached, with the exception of special slip conditions which must be designed accordingly.

D. Axially loaded studs shall be installed seated squarely [within one-sixteenth (1/16") inch] against the web portion of the top and bottom tracks. Track shall rest on a continuous, uniform bearing surface.

E. Cutting of steel framing members may be accomplished with a saw or shear. Torch cutting of load-bearing members is not permitted.

F. Temporary bracing shall be provided and left in place until work is permanently stabilized.

G. Bridging shall be of size and type shown on the drawings and as called for on shop drawings.

H. Install jamb assemblies at all openings. Jambs shall consist of members as determined by calculations and as per manufacturer's standards.

I. Install headers in all openings in axially loaded walls.

J. Provide jack studs to support each end of headers. These studs shall be securely connected to the header and jamb stud and must seat squarely in the lower track of the wall and be properly attached to it.

K. Wall track shall not be used to support any load unless specifically designed for that purpose.

L. All axially loaded members shall be aligned vertically, to allow for full transfer of the loads down to the foundation. Vertical alignment shall be maintained at floor/wall intersections or alternate provisions for load transfer shall be made.

M. Holes that are field cut into steel framing members shall be within the limitations of the product and its design. Provide reinforcement where holes are cut through load-bearing members in accordance with manufacturer's recommendation and as approved by project Architect or Engineer.

N. Touch up all steel bared by welding using zinc-rich paint.

O. Studs shall be spaced to suit the design requirements and limitations of collateral facing materials.

P. Gypsum board shall be attached to steel studs in accordance with ASTM Specification C840, except that the steel drill screws used (Specification ASTM C954) shall be spaced not more than eight (8") inches on center at the edges and ends, and not more than twelve (12") inches on center on the interior of the board.

Q. Provide additional studs at intersections, corners, doors, windows, control joints, etc., and as called for in the shop drawings.

R. Provision for structural movement (expansion) shall be allowed where indicated and necessary by design or code requirements

S. Splicing of axially loaded members shall not be permitted.

T. Wire tying of members is not permitted.

3.03 INSTALLATION: PANELIZED CONSTRUCTION

A. Panels shall be designed to resist construction and handling loads as well as live loads.

B. Handling and lifting of prefabricated panels shall not cause permanent distortion in any member or collateral material.

C. Make all stud to track connections prior to hoisting of panels.

D. Where splicing of track is necessary between stud spacings, a piece of stud shall be placed in the

track fastened with two (2) screws or welds per flange to each piece of track.

E. Complete bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies. If the Erection Contractor is bearing on work set by another trade, it is the Contractor's responsibility to ensure that bearing criteria are met. Any discrepancy shall be brought to the attention of the project Architect or Engineer.

F. Attachment of the panel to the structure shall be as shown on the shop drawings.

G. Align all panels to provide continuity of any wall/floor surface.

3.04 INSTALLATION: NON-PANELIZED (STICKBUILT) CONSTRUCTION

A. Align track accurately at supporting structure and fasten to structure as shown on shop drawings.

B. Track intersections shall butt evenly.

C. Studs shall be plumbed, aligned, and securely attached to flanges or webs of upper and lower tracks. Axially loaded studs shall be seated squarely in both top and bottom tracks.

D. Where splicing of tracks is necessary between stud spacings, a piece of stud shall be placed in the track fastened with two (2) screws or welds per flange to each piece of track.

E. Complete bearing shall be maintained under tracks to provide for load transfer in axially loaded assemblies.

3.05 INSTALLATION: JOISTS

A. Joists shall be located directly over bearing studs or a load distribution member shall be provided to transfer loads.

B. Provide web stiffeners where necessary at reaction points, and at points of concentrated loads.

C. Joists shall be installed with their web area perpendicular to the bearing surface.

D. Bridging, either steel strap or solid, shall be provided as shown on the shop design calculations.

E. Provide additional joists under parallel partitions where the partition length exceeds one-half (1/2) of the joist span.

F. Provide additional framing around all floor/roof openings which are larger than the joist spacing.

G. End blocking shall be provided where joist ends are not otherwise restrained from rotation.

H. Joist ends must be built solidly into masonry construction prior to placing any load on the joist.

I. All bridging, bracing, blocking, strapping, web reinforcement, etc., must be in place prior to loading of floors.

J. Care must be taken by all trades not to disturb joist placement, alignment, plumbness, etc, prior to the completion of the floor system.

K. Care must be taken not to overload the floor system during construction. Place heavy loads, materials, equipment, etc., directly over structural supports or bearing walls.

3.06 FASTENINGS AND ATTACHMENTS

A. Anchorage of the tracks to the structure shall be with methods designed for the specific application. Size of fastener, penetration, type and spacing shall be shown on the shop drawings.

B. Welds shall conform to the requirements of AWS D1.1, AWS D1.3, and AISI Manual Section E2. Weld may be butt, fillet, spot, or groove type, the appropriateness of which shall be determined by, and within the design calculations. All welds shall be touched-up using zinc-rich paint.

C. Steel drill screws shall be of the minimum diameter indicated by the design of that particular attachment detail. Penetration through joined materials shall not be less than three (3) exposed

threads.

D. Screws shall have a protective coating at least equivalent to cadmium or zinc plating (ASTM A165 Type NS) for use in exterior assemblies.

3.07 TOLERANCES

A. Vertical alignment (plumbness) of studs shall be within one nine hundred and sixtieth 1/960th (1/8" in 10'0") of the span.

B. Horizontal alignment (levelness) of walls shall be within 1/960th (1/8" in 10'0") of their respective lengths.

C. Spacing of studs shall not be more than plus one-eighth (+1/8") inch from the designed spacing providing that the cumulative error does not exceed the requirements of the finishing materials.

D. Prefabricated panels shall not be more than one-eighth (1/8") inch out of square within the length of that panel.

END OF SECTION

SECTION 061000

ROUGH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Preservative treated wood materials.

B. Fire retardant treated wood materials.

C. Miscellaneous framing and sheathing.

D. Communications and electrical room mounting boards.

E. Concealed wood blocking, nailers, and supports.

F. Miscellaneous wood nailers, furring, and grounds.

1.02 RELATED REQUIREMENTS

A. None noted.

1.03 REFERENCE STANDARDS

A. ASTM A 153/A 153M - Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware; 2009.

B. ASTM D 2898 - Standard Test Methods for Accelerated Weathering of Fire-Retardant-Treated Wood for Fire Testing; 2009.

C. ASTM E 84 - Standard Test Method for Surface Burning Characteristics of Building Materials; 2010.

D. AWPA U1 - Use Category System: User Specification for Treated Wood; American Wood Protection Association; 2010.

E. PS 20 - American Softwood Lumber Standard; National Institute of Standards and Technology (Department of Commerce); 2005.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide technical data on wood preservative materials and application instructions.

1.05 DELIVERY, STORAGE, AND HANDLING

A. General: Cover wood products to protect against moisture. Support stacked products to prevent deformation and to allow air circulation.

B. Fire Retardant Treated Wood: Prevent exposure to precipitation during shipping, storage, or installation.

PART 2 PRODUCTS

2.01 GENERAL REQUIREMENTS

A. Dimension Lumber: Comply with PS 20 and requirements of specified grading agencies.
   1. If no species is specified, provide any species graded by the agency specified; if no grading agency is specified, provide lumber graded by any grading agency meeting the specified requirements.
   2. Grading Agency: Any grading agency whose rules are approved by the Board of Review, American Lumber Standard Committee (www.alsc.org) and who provides grading service for the species and grade specified; provide lumber stamped with grade mark unless otherwise indicated.

2.02 DIMENSION LUMBER FOR CONCEALED APPLICATIONS

A. Sizes: Nominal sizes as indicated on drawings, S4S.

B. Moisture Content: S-dry or MC19.

C. Miscellaneous Framing, Blocking, Nailers, Grounds, and Furring:
   1. Lumber: S4S, No. 2 or Standard Grade.
   2. Boards: Standard or No. 3.

D. **All wood blocking to be fire retardant type**.

2.03 CONSTRUCTION PANELS

A. Communications and Electrical Room Mounting Boards: PS 1 A-D plywood, or medium density fiberboard; 3/4 inch (19 mm) thick; flame spread index of 25 or less, smoke developed index of 450 or less, when tested in accordance with ASTM E 84.

2.04 ACCESSORIES

A. Fasteners and Anchors:
   1. Metal and Finish: Hot-dipped galvanized steel per ASTM A 153/A 153M for high humidity, exterior sheathing and preservative-treated wood locations, unfinished steel elsewhere.

2.05 FACTORY WOOD TREATMENT

A. Treated Lumber and Plywood: Comply with requirements of AWPA U1 - Use Category System for wood treatments determined by use categories, expected service conditions, and specific applications.
   1. Fire-Retardant Treated Wood: Mark each piece of wood with producer's stamp indicating compliance with specified requirements.

2. Preservative-Treated Wood: Provide lumber and plywood marked or stamped by an ALSC-accredited testing agency, certifying level and type of treatment in accordance with AWPA standards.

B. Fire Retardant Treatment: Where called for on drawings or specifications.
   1. Exterior Type: AWPA U1, Category UCFB, Commodity Specification H, chemically treated and pressure impregnated; capable of providing a maximum flame spread rating of 25 when tested in accordance with ASTM E 84, with no evidence of significant combustion when test is extended for an additional 20 minutes both before and after accelerated weathering test performed in accordance with ASTM D 2898.
      a. Kiln dry wood after treatment to a maximum moisture content of 19 percent for lumber and 15 percent for plywood.
      b. Do not use treated wood in direct contact with the ground.

C. Preservative Treatment:
   1. Preservative Pressure Treatment of Lumber Above Grade: AWPA U1, Use Category UC3B, Commodity Specification A using waterborne preservative to 0.25 lb/cu ft (4.0 kg/cu m) retention.
      a. Kiln dry lumber after treatment to maximum moisture content of 19 percent.
      b. Treat lumber exposed to weather.
      c. Treat lumber in contact with roofing, flashing, or waterproofing.
      d. Treat lumber in contact with masonry or concrete.

PART 3 EXECUTION

3.01 PREPARATION

A. Install sill gasket under bottom plates/channel of framed walls bearing on foundations; puncture gasket cleanly to fit tightly around protruding anchor bolts.

3.02 INSTALLATION - GENERAL

A. Select material sizes to minimize waste.

B. Reuse scrap to the greatest extent possible; clearly separate scrap for use on site as accessory components, including: shims, bracing, and blocking.

C. Where treated wood is used on interior, provide temporary ventilation during and immediately after installation sufficient to remove indoor air contaminants.

3.03 BLOCKING, NAILERS, AND SUPPORTS

A. Provide framing and blocking members as indicated or as required to support finishes, fixtures, specialty items, and trim.

B. In framed assemblies that have concealed spaces, provide solid wood fireblocking as required by applicable local code, to close concealed draft openings between floors and between top story and roof/attic space; other material acceptable to code authorities may be used in lieu of solid wood blocking.

C. In walls, provide blocking attached to studs as backing and support for wall-mounted items, unless item can be securely fastened to two or more studs or other method of support is explicitly indicated.

D. Where ceiling-mounting is indicated, provide blocking and supplementary supports above ceiling, unless other method of support is explicitly indicated.

3.04 INSTALLATION OF CONSTRUCTION PANELS

A. Wall Sheathing: Secure with long dimension perpendicular to wall studs, with ends over firm bearing and staggered, using screws or staples.
   1. Place water-resistive barrier horizontally over wall sheathing, weather lapping edges and ends.

B. Communications and Electrical Room Mounting Boards: Secure with screws to studs with edges over firm bearing; space fasteners at maximum 24 inches (610 mm) on center on all edges and into studs in field of board.
   1. At fire-rated walls, install board over wall board indicated as part of the fire-rated assembly.
   2. Where boards are indicated as full floor-to-ceiling height, install with long edge of board parallel to studs.
   3. Install adjacent boards without gaps.

3.05 TOLERANCES

A. Framing Members: 1/4 inch (6 mm) from true position, maximum.

B. Variation from Plane (Other than Floors): 1/4 inch in 10 feet (2 mm/m) maximum, and 1/4 inch in 30 feet (7 mm in 10 m) maximum.

3.06 CLEANING

A. Waste Disposal: Comply with the requirements of Section 01732.
   1. Comply with applicable regulations.
   2. Do not burn scrap on project site.
   3. Do not burn scraps that have been pressure treated.
   4. Do not send materials treated with pentachlorophenol, CCA, or ACA to co-generation facilities or “waste-to-energy” facilities.

B. Do not leave any wood, shavings, sawdust, etc. on the ground or buried in fill.

C. Prevent sawdust and wood shavings from entering the storm drainage system.

END OF SECTION

SECTION 062000

FINISH CARPENTRY

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Finish carpentry items.

B. Hardware and attachment accessories.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Support framing, grounds, and concealed blocking.

B. Section 099000 - Painting and Coating: Painting and finishing of finish carpentry items.

E. Section 123400 – Plastic Laminate Casework: Shop fabricated cabinet work.

1.03 REFERENCE STANDARDS

A. ASTM C 1048 - Standard Specification for Heat-Treated Flat Glass--Kind HS, Kind FT Coated and Uncoated Glass; 2004.

B. AWI/AWMAC (QSI) - Architectural Woodwork Quality Standards Illustrated; Architectural Woodwork Institute and Architectural Woodwork Manufacturers Association of Canada; 2005, 8th Ed., Version 2.0.

C. BHMA A156.9 - American National Standard for Cabinet Hardware; Builders Hardware Manufacturers Association; 2003 (ANSI/BHMA A156.9).

D. NEMA LD 3 - High-Pressure Decorative Laminates; National Electrical Manufacturers Association; 2005.

E. NHLA G-101 - Rules for the Measurement & Inspection of Hardwood & Cypress; National Hardwood Lumber Association; 2007.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with plumbing rough-in, electrical rough-in, and installation of associated and adjacent components.

1.05 SUBMITTALS

A. Shop Drawings: Indicate materials, component profiles, fastening methods, jointing details, accessories, to a minimum scale of 1-1/2 inch to 1 ft (1:8).

1.06 QUALITY ASSURANCE

A. Grade materials in accordance with the following:
   1. Softwood Lumber: In accordance with rules certified by ALSC; www.alsc.org.
   2. Hardwood Lumber: In accordance with NHLA Grading Rules; www.natlhardwood.org.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Protect work from moisture damage.

PART 2 PRODUCTS

2.01 MATERIALS - GENERAL

A. Unless otherwise indicated provide products of quality specified by AWI Architectural Woodwork Quality Standards Illustrated for Premium grade.

B. Provide materials having fire and smoke properties as required by applicable code.

2.02 WOOD-BASED COMPONENTS

A. Wood fabricated from old growth timber is not permitted.

2.03 LUMBER MATERIALS

A. Hardwood Lumber: birch species, quarter sawn, maximum moisture content of 6 percent; with vertical grain, of quality suitable for transparent finish.

2.04 PLASTIC LAMINATE MATERIALS

A. Plastic Laminate: NEMA LD 3, HGS; Architect to select color; textured, low gloss finish; manufactured by Wilsonart.

2.05 FASTENERS

A. Fasteners: Of size and type to suit application; painted finish in concealed locations and stainless steel finish in exposed locations.

B. Concealed Joint Fasteners: Threaded steel.

2.06 ACCESSORIES

A. Safety Glass: ASTM C 1048, fully tempered; clear; 3 mm thick minimum.

B. Primer: as specified in Section 09 90 00.

C. Wood Filler: Solvent base, tinted to match surface finish color.

2.07 HARDWARE

A. Hardware: Comply with BHMA A156.9.

2.08 FABRICATION

A. Shop assemble work for delivery to site, permitting passage through building openings.

B. Cap exposed plastic laminate finish edges with material of same finish and pattern.

C. When necessary to cut and fit on site, provide materials with ample allowance for cutting. Provide trim for scribing and site cutting.

D. Apply plastic laminate finish in full uninterrupted sheets consistent with manufactured sizes. Fit corners and joints hairline; secure with concealed fasteners. Slightly bevel arises. Locate counter butt joints minimum 2 feet (600 mm) from sink cut-outs.

2.09 SHOP FINISHING

A. Apply wood filler in exposed nail and screw indentations.

B. On items to receive transparent finishes, use wood filler that matches surrounding surfaces and is of type recommended for the applicable finish.

C. Finish work in accordance with AWI Architectural Woodwork Quality Standards Illustrated, Section 1500:

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify adequacy of backing and support framing.

B. Verify mechanical, electrical, and building items affecting work of this section are placed and ready to receive this work.

3.02 INSTALLATION

A. Set and secure materials and components in place, plumb and level.

B. Carefully scribe work abutting other components, with maximum gaps of 1/32 inch (1 mm). Do not use additional overlay trim to conceal larger gaps.

3.03 PREPARATION FOR SITE FINISHING

A. Set exposed fasteners. Apply wood filler in exposed fastener indentations. Sand work smooth.

B. Site Finishing: See Section 09900.

C. Before installation, prime paint surfaces of items or assemblies to be in contact with cementitious materials.

3.04 TOLERANCES

A. Maximum Variation from True Position: 1/16 inch (1.5 mm).

B. Maximum Offset from True Alignment with Abutting Materials: 1/32 inch (0.7 mm).

END OF SECTION

SECTION 079000

JOINT SEALERS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Sealants and joint backing.

B. Precompressed foam sealers.

1.02 RELATED REQUIREMENTS

A. Section 092100 - Gypsum Board Assemblies: Acoustic sealant.

1.03 REFERENCE STANDARDS

A. ASTM C 834 - Standard Specification for Latex Sealants; 2005.

B. ASTM C 919 - Standard Practice for Use of Sealants in Acoustical Applications; 2002.

C. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 2005.

D. ASTM C 1193 - Standard Guide for Use of Joint Sealants; 2005a.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data indicating sealant chemical characteristics, performance criteria, limitations, and VOC information.

1.05 QUALITY ASSURANCE

A. Maintain one copy of each referenced document covering installation requirements on site.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain temperature and humidity recommended by the sealant manufacturer during and after installation.

1.07 COORDINATION

A. Coordinate the work with all sections referencing this section.

1.08 WARRANTY

A. See Section 017000 - Closeout Submittals, for additional warranty requirements.

B. Correct defective work within a five year period after Date of Substantial Completion.

C. Warranty: Include coverage for installed sealants and accessories which fail to achieve airtight seal, exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Polyurethane Sealants:
   1. Bostik, Inc; Product : www.bostik-us.com.
   2. Pecora Corporation; Product : www.pecora.com.
   3. BASF Construction Chemicals, Inc; Product : www.chemrex.com.
   4. Substitutions: See Section 01600 - Product Requirements.

B. Acrylic Emulsion Latex Sealants:
   1. Bostik, Inc: www.bostik-us.com.

2. Pecora Corporation: www.pecora.com.
3. BASF Construction Chemicals, Inc: www.chemrex.com.
4. Substitutions: See Section 01600 - Product Requirements.

C. Preformed Compressible Foam Sealers:
1. Emseal Joint Systems, Ltd: www.emseal.com.
2. Sandell Manufacturing Company, Inc: www.sandellmfg.com.
3. Substitutions: See Section 01600 - Product Requirements.

2.02 SEALANTS

A. Type 1 - General Purpose Exterior Sealant: Polyurethane; ASTM C 920, Grade NS, Class 25, Uses M, G, and A; single component.
1. Color: color as selected to match the adjacent surfaces and materials.
2. Applications: Use for:
a. Control, expansion, and soft joints in masonry & EFIS (coordinate with EFIS manufacturer).
b. Joints between concrete and other materials.
c. Joints between metal frames and other materials.
d. Other exterior joints for which no other sealant is indicated.

B. Type 2 - Exterior Expansion Joint Sealer: Precompressed foam sealer; urethane with water-repellent;
1. Color: Black.
2. Size as required to provide weathertight seal when installed.

C. Type 3 - General Purpose Interior Sealant: Acrylic emulsion latex; ASTM C 834, Type OP, Grade NF single component, paintable.
1. Color: Standard colors matching finished surfaces.
2. Applications: Use for:
a. Interior wall and ceiling control joints.
b. Joints between door and window frames and wall surfaces.
c. Other interior joints for which no other type of sealant is indicated.

D. Type 4 - Acoustical Sealant: Butyl or acrylic sealant; ASTM C 920, Grade NS, Class 12-1/2, Uses M and A; single component, solvent release curing, non-skinning.
1. Applications: Use for concealed locations only:
a. Sealant bead between top stud runner and structure and between bottom stud track and floor.

2.03 ACCESSORIES

A. Primer: Non-staining type, recommended by sealant manufacturer to suit application.

B. Joint Cleaner: Non-corrosive and non-staining type, recommended by sealant manufacturer; compatible with joint forming materials.

C. Joint Backing: Round foam rod compatible with sealant; ASTM D 1667, closed cell PVC; oversized 30 to 50 percent larger than joint width.

D. Bond Breaker: Pressure sensitive tape recommended by sealant manufacturer to suit application.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that substrate surfaces are ready to receive work.

B. Verify that joint backing and release tapes are compatible with sealant.

3.02 PREPARATION

A. Remove loose materials and foreign matter which might impair adhesion of sealant.

B. Clean and prime joints in accordance with manufacturer's instructions.

C. Perform preparation in accordance with manufacturer's instructions and ASTM C 1193.

D. Protect elements surrounding the work of this section from damage or disfigurement.

3.03 INSTALLATION

A. Perform work in accordance with sealant manufacturer's requirements for preparation of surfaces and material installation instructions.

B. Perform installation in accordance with ASTM C 1193.

C. Perform acoustical sealant application work in accordance with ASTM C 919.

D. Measure joint dimensions and size joint backers to achieve width-to-depth ratio, neck dimension, and surface bond area as recommended by manufacturer, except where specific dimensions are indicated.

E. Install bond breaker where joint backing is not used.

F. Install sealant free of air pockets, foreign embedded matter, ridges, and sags.

G. Apply sealant within recommended application temperature ranges. Consult manufacturer when sealant cannot be applied within these temperature ranges.

H. Tool joints concave.

I. Precompressed Foam Sealant: Do not stretch; avoid joints except at corners, ends, and intersections; install with face 1/8 to 1/4 inch (3 to 6 mm) below adjoining surface.

3.04 CLEANING

A. Clean adjacent soiled surfaces.

3.05 PROTECTION

A. Protect sealants until cured.

END OF SECTION

SECTION 081113

HOLLOW METAL DOORS AND FRAMES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Non-fire-rated steel doors and frames.

B. Accessories, including glazing, louvers, and matching panels.

1.02 RELATED REQUIREMENTS

A. Section 087100 - Door Hardware.

B. Section 099000 - Paints and Coatings: Field painting.

1.03 REFERENCE STANDARDS

A. ANSI/ICC A117.1 - American National Standard for Accessible and Usable Buildings and Facilities; International Code Council; 2003.

B. ANSI A250.8 - SDI-100 Recommended Specifications for Standard Steel Doors and Frames; 2003.

C. ANSI A250.10 - Test Procedure and Acceptance Criteria for Prime Painted Steel Surfaces for Steel Doors and Frames; 1998 (R2004).

D. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2007.

E. BHMA A156.115 - Hardware Preparation in Steel Doors and Steel Frames; 2006.

F. NAAMM HMMA 840 - Guide Specifications for Installation and Storage of Hollow Metal Doors and Frames; The National Association of Architectural Metal Manufacturers; 2007.

G. NFPA 80 - Standard for Fire Doors and Fire Windows; National Fire Protection Association; 2007.

H. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

I. UL 10C - Standard for Positive Pressure Fire Tests of Door Assemblies; 1998.

1.04 SUBMITTALS

A. See Section 013000 - Submittals for submittal procedures.

B. Product Data: Materials and details of design and construction, hardware locations, reinforcement type and locations, anchorage and fastening methods, and finishes; and one copy of referenced grade standard.

C. Shop Drawings: Details of each opening, showing elevations, glazing, frame profiles, and identifying location of different finishes, if any.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years documented experience.

B. Maintain at the project site a copy of all reference standards dealing with installation.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Store in accordance with NAAMM HMMA 840.

B. Protect with resilient packaging; avoid humidity build-up under coverings; prevent corrosion.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Steel Doors and Frames:
   1. Windsor Republic Doors: www.republicdoor.com.
   2. Steelcraft: www.steelcraft.com.

2.02 DOORS AND FRAMES

A. Requirements for All Doors and Frames:
   1. Accessibility: Comply with ANSI/ICC A117.1.
   2. Door Top Closures: Flush with top of faces and edges.
   3. Door Edge Profile: Beveled on both edges.
   4. Door Texture: Smooth faces.
   5. Glazed Lights: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.
   6. Hardware Preparation: In accordance with BHMA A156.115, with reinforcement welded in place, in addition to other requirements specified in door grade standard.
   7. Galvanizing for Units in Wet Areas(including Pool and Exterior doors): All components hot-dipped zinc-iron alloy-coated (galvannealed), manufacturer's standard coating thickness.
   8. Finish: Factory primed, for field finishing.

B. Combined Requirements: If a particular door and frame unit is indicated to comply with more than one type of requirement, comply with all the specified requirements for each type; for instance, an exterior door that is also indicated as being sound-rated must comply with the requirements specified for exterior doors and for sound-rated doors; where two requirements conflict, comply with the most stringent.

2.03 STEEL DOORS

A. Exterior Doors and new Doors in Toilet Rooms: LF16 Series Unless noted otherwise:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
   2. Core: Polystyrene foam.
   3. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A 653/A 653M, with manufacturer's standard coating thickness.
   4. Weatherstripping: Separate, see Section 08710.
   5. Finish: Factory primed, for field finishing.

B. Interior Doors LF 16 Series, Non-Fire-Rated Unless noted otherwise:
   1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
   2. Thickness: 1-3/4 inches (44 mm).
   3. Finish: Factory primed, for field finishing.

C. Interior Doors LF 16 Series, Fire-Rated unless noted otherwise:

1. Grade: ANSI A250.8 Level 3, physical performance Level A, Model 2, seamless.
2. Fire Rating: As indicated on Door and Frame Schedule, tested in accordance with UL 10C ("positive pressure").
   a. Provide units listed and labeled by UL.
   b. Attach fire rating label to each fire rated unit.
3. Finish: Factory primed and finished, to match existing.

D. Panels: To be Porcelain Enamel Metal finished insulated panels, color chosen by Architect, with a minimum R value of 7, approximately 1" thick and finished on both interior and exterior sides.

2.04 STEEL FRAMES

A. General:
   1. Comply with the requirements of grade specified for corresponding door.
      a. ANSI A250.8 Level 3 Doors: 14 gage frames.
   2. Finish: Factory primed, for field finishing.
   3. Provide mortar guard boxes for hardware cut-outs in frames to be installed in masonry or to be grouted.
   4. Frames in Masonry Walls: Size to suit masonry coursing with head member 4 inches (100 mm) high to fill opening without cutting masonry units.

B. Exterior Frames and new Frames in Locker Rooms/Toilet Rooms: Face welded, seamless with joints filled.
   1. Galvanizing: All components hot-dipped zinc-iron alloy-coated (galvannealed) in accordance with ASTM A 653/A 653M, with manufacturer's standard coating thickness.
   2. Weatherstripping: Separate, see Section 08710.

C. Interior Door Frames, Non-Fire-Rated: Seamless, with filled joints.

D. Interior Door Frames, Fire-Rated: Seamless, with filled joints.
   1. Fire Rating: Same as door, labeled.

2.05 ACCESSORY MATERIALS

A. Louvers: Roll formed steel with overlapping frame; factory-painted finish, color as selected; factory-installed.
   1. In Fire-Rated Doors: UL-listed fusible link louver, same rating as door.
   2. Style: Sightproof inverted V blade.

B. Glazing: All exterior glazing to be insulated tempered glass, factory installed.

C. Grout for Frames: Portland cement grout of maximum 4-inch slump for hand troweling; thinner pumpable grout is prohibited.

D. Silencers: Resilient rubber, fitted into drilled hole; 3 on strike side of single door, 3 on center mullion of pairs, and 2 on head of pairs without center mullions.

E. Temporary Frame Spreaders: Provide for all factory- or shop-assembled frames.

2.06 FINISH MATERIALS

A. Primer: Rust-inhibiting, complying with ANSI A250.10, door manufacturer's standard.

B. Bituminous Coating: Asphalt emulsion or other high-build, water-resistant, resilient coating.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

3.02 PREPARATION

A. Coat inside of frames to be installed in masonry or to be grouted, with bituminous coating, prior to installation including the frames in the Locker and Toilet Rooms.

3.03 INSTALLATION

A. Install in accordance with the requirements of the specified door grade standard and NAAMM HMMA 840.

B. In addition, install fire rated units in accordance with NFPA 80.

C. Coordinate frame anchor placement with wall construction.

D. Grout frames in masonry construction, using hand trowel methods; brace frames so that pressure of grout before setting will not deform frames.

E. Coordinate installation of hardware.

F. Coordinate installation of glazing.

G. Coordinate installation of electrical connections to electrical hardware items.

3.04 TOLERANCES

A. Clearances Between Door and Frame: As specified in ANSI A250.8.

B. Maximum Diagonal Distortion: 1/16 in (1.5 mm) measured with straight edge, corner to corner.

3.05 ADJUSTING

A. Adjust for smooth and balanced door movement.

END OF SECTION

SECTION 081400

FLUSH WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Flush wood doors; flush configuration; fire rated, non-rated, and acoustical.

1.02 RELATED REQUIREMENTS

A. Section 081113 – Hollow Metal Doors and Frames.

B. Section 087100 - Door Hardware.

C. Section 088000 - Glazing.

D. Section 092100 - Gypsum Board Assemblies:

1.03 REFERENCE STANDARDS

A. ASTM E 413 - Classification for Rating Sound Insulation; 2004.

B. ASTM E 1408 - Standard Test Method for Laboratory Measurement of the Sound Transmission Loss of Door Panels and Door Systems; 1991 (Reapproved 2000).

C. AWI/AWMAC/WI (AWS) - Architectural Woodwork Standards; 2009.

D. ITS (DIR) - Directory of Listed Products; Intertek Testing Services NA, Inc.; current edition.

E. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2010.

F. NFPA 252 - Standard Methods of Fire Tests of Door Assemblies; National Fire Protection Association; 2008.

G. UL (BMD) - Building Materials Directory; Underwriters Laboratories Inc.; current edition.

H. UL 10B - Standard for Fire Tests of Door Assemblies; Current Edition, Including All Revisions.

1.04 SUBMITTALS

A. See Section 013000 - Administrative Requirements for submittal procedures.

B. Product Data: Indicate door core materials and construction; veneer species, type and characteristics.

C. Shop Drawings: Show doors and frames, elevations, sizes, types, swings, undercuts, beveling, blocking for hardware, factory machining, factory finishing, cutouts for glazing and other details.

D. Specimen warranty.

E. Test Reports: Show compliance with specified requirements for the following:
   1. Sound-retardant doors and frames; sealed panel tests are not acceptable.

F. Samples: Submit two samples of door construction, 6 in size cut from top corner of door.

G. Samples: Submit two samples of door veneer, 6 in size illustrating wood grain, stain color, and sheen.

H. Manufacturer's Installation Instructions: Indicate special installation instructions.

I. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Maintain one copy of the specified door quality standard on site for review during installation

and finishing.

B. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section with minimum three years of documented experience.
   1. Company with at least one project in the past 5 years with value of woodwork within 20 percent of cost of woodwork for this Project.

C. Installed Fire Rated Door and Transom Panel Assembly: Conform to NFPA 80 for fire rated class as indicated.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver and store doors in accordance with specified quality standard.

B. Accept doors on site in manufacturer's packaging. Inspect for damage.

C. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 017800 - Closeout Submittals for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Wood Veneer Faced Doors:
   1. Eggers Industries: www.eggersindustries.com.
   2. Haley Brothers: www.haleybros.com.
   3. Marshfield DoorSystems, Inc: www.marshfielddoors.com.
   4. Substitutions: See Section 01600 - Product Requirements.

2.02 DOORS AND PANELS

A. All Doors: See drawings for locations and additional requirements.
   1. Quality Level: Premium Grade, in accordance with AWI/AWMAC/WI Architectural Woodwork Standards.
   2. Wood Veneer Faced Doors: 5-ply unless otherwise indicated.

B. Interior Doors: 1-3/4 inches (44 mm) thick unless otherwise indicated; flush construction.
   1. Provide solid core doors at all locations.
   2. Fire Rated Doors: Tested to ratings indicated on drawings in accordance with NFPA 252, UL 10B, or UBC Standard 7-2-94 ("neutral pressure"); UL or WH (ITS) labeled without any visible seals when door is open.
   3. Sound Retardant Doors: Minimum STC of 35, calculated in accordance with ASTM E 413, tested in accordance with ASTM E 1408.
   4. Wood veneer facing with factory transparent finish. Match existing.

2.03 DOOR AND PANEL CORES

A. Non-Rated Solid Core and 20 Minute Rated Doors: Type particleboard core (PC), plies and faces as indicated above.

B. Fire Rated Doors: Mineral core, Type FD, plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

C. Sound Retardant Doors: Equivalent to Type PC construction with core as required to achieve rating specified; plies and faces as indicated above.

2.04 DOOR FACINGS

A. Wood Veneer Facing for Transparent Finish: Red Oak, veneer grade A, Rotary Cut, book veneer match, running assembly match; unless otherwise indicated. Verify in field, match existing and stain to match Wilsonart 7054-60.
   1. Vertical Edges: Same species as face veneer.

2.05 ACCESSORIES

A. Glazing Stops: Wood with metal clips for rated doors, butted corners; prepared for countersink style tamper proof screws.

2.06 DOOR CONSTRUCTION

A. Fabricate doors in accordance with door quality standard specified.

B. Cores Constructed with stiles and rails:
   1. Provide solid blocks at lock edge for hardware reinforcement.
   2. Provide solid blocking for other throughbolted hardware.

C. Factory machine doors for hardware other than surface-mounted hardware, in accordance with hardware requirements and dimensions.

D. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   1. Exception: Doors to be field finished.

E. Cut and configure exterior door edge to receive recessed weatherstripping devices.

F. Provide edge clearances in accordance with the quality standard specified.

2.07 FACTORY FINISHING - WOOD VENEER DOORS

A. Finish work in accordance with AWI/AWMAC/WI Architectural Woodwork Standards, Section 5 - Finishing for Grade specified and as follows:
   1. Transparent:
      a. System - 1, Lacquer, Nitrocellulose.
      b. Sheen: Flat.

B. Factory finish doors in accordance with approved sample.

C. Seal door top edge with color sealer to match door facing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out-of-tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standard.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.

B. Factory-Finished Doors: Do not field cut or trim; if fit or clearance is not correct, replace door.

C. Use machine tools to cut or drill for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

E. Coordinate installation of glazing.

3.03 TOLERANCES

A. Conform to specified quality standard for fit and clearance tolerances.

B. Conform to specified quality standard for telegraphing, warp, and squareness.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

3.05 SCHEDULE - See Drawings

END OF SECTION

SECTION 08 14 33
STILE AND RAIL WOOD DOORS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Wood doors, stile and rail design; fire rated.

B. Panels of wood and glass.

1.02 RELATED REQUIREMENTS

A. Section 08 71 00 - Door Hardware.

1.03 REFERENCE STANDARDS

A. 16 CFR 1201 - Safety Standard for Architectural Glazing Materials; current edition.

B. ASTM C1048 - Standard Specification for Heat-Strengthened and Fully Tempered Flat Glass; 2012.

C. NFPA 80 - Standard for Fire Doors and Other Opening Protectives; 2016.

D. WDMA I.S. 6A - Interior Architectural Wood Stile and Rail Doors; 2013.

1.04 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Product Data: Indicate stile and rail core materials and construction; veneer species, type and characteristics.

C. Specimen warranty.

D. Warranty, executed in Owner's name.

1.05 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the products specified in this section, with not less than three years of documented experience.

B. Installer Qualifications: Company specializing in performing work of the type specified in this section, with not less than three years of documented experience and approved by manufacturer.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Package, deliver, and store doors in accordance with quality standard specified.

B. Protect doors with resilient packaging sealed with heat shrunk plastic. Do not store in damp or wet areas; or in areas where sunlight might bleach veneer. Seal top and bottom edges with tinted sealer if stored more than one week. Break seal on site to permit ventilation.

1.07 WARRANTY

A. See Section 01 78 00 - Closeout Submittals, for additional warranty requirements.

B. Interior Doors: Provide manufacturer's warranty for the life of the installation.

C. Include coverage for delamination of veneer, warping beyond specified installation tolerances, defective materials, and telegraphing core construction.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Stile and Rail Wood Doors:
   1. Eggers Industries; ____: www.eggersindustries.com.
   2. Marshfield DoorSystems, Inc; _____: www.marshfielddoors.com.
   3. Substitutions: See Section 01 60 00 - Product Requirements.

2.02 DOORS

A. Quality Standard: Paint Grade, Heavy Duty performance, in accordance with WDMA I.S. 6A.

B. Interior Doors: 1-3/8 inches (34.93 mm) thick unless otherwise indicated; solid lumber construction; mortise and tenon joints. Opaque finish Paint Grade finish.

2.03 DOOR AND PANEL FACINGS

A. Materials for Opaque Finishes: Closed-grain wood veneer or other composite material.

B. Adhesive: Type I - Waterproof.

2.04 COMPONENTS

A. Glazed Openings:
   1. Heat-Strengthened and Fully Tempered Glass: ASTM C1048.
   2. Laminated Safety Glass: Comply with 16 CFR 1201 test requirements for Category II.
   3. Fire-Protection-Rated Glass: Safety Certification, 16 CFR 1201, Category II.
   4. Glazing: Single vision units, 1/4 inch (6 mm) thick panes of glass.
   5. Tint: Clear.

B. Panel or Glass Retention Molding: Wood of same species as door facing, molded stop applied one-side,mitered corners; prepared for countersink style tamper proof screws.

C. Door Hardware: As specified in Section 08 71 00.

2.05 DOOR CONSTRUCTION

A. Vertical Exposed Edge of Stiles: Of same species as veneer facing.

B. Fit door edge trim to edge of stiles after applying veneer facing.

C. Bond edge banding to cores.

D. Panels: Raised, 3-ply solid wood.

E. Factory fit doors for frame opening dimensions identified on shop drawings, with edge clearances in accordance with specified quality standard.
   1. Exception: Doors to be field finished.

F. Glazed Openings: Non-removable stops on non-secure side; sizes and configurations as indicated on drawings.

G. Fire Rated Doors: Mineral core type, with fire resistant composite core (FD), plies and faces as indicated above; with core blocking as required to provide adequate anchorage of hardware without through-bolting.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that opening sizes and tolerances are acceptable.

C. Do not install doors in frame openings that are not plumb or are out of tolerance for size or alignment.

3.02 INSTALLATION

A. Install doors in accordance with manufacturer's instructions and specified quality standards.
   1. Install fire-rated doors in accordance with NFPA 80 requirements.

B. Field-Finished Doors: Trimming to fit is acceptable.
   1. Trim fire-rated doors in strict compliance with fire rating limitations.

C. Machine cut for hardware.

D. Coordinate installation of doors with installation of frames and hardware.

3.03 TOLERANCES

A. Conform to specified quality standard for fit, clearance, and joinery tolerances.

3.04 ADJUSTING

A. Adjust doors for smooth and balanced door movement.

B. Adjust closers for full closure.

END OF SECTION

SECTION 087100- DOOR HARDWARE

PART 1 --GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of Contract, including General and Supplementary Conditions and Division-1 Specification sections, apply to work of this section.

1.2 DESCRIPTION OF WORK

A. Definition: "Finish Hardware" includes items known commercially as finish hardware which are required for swing, sliding and folding doors, except special types of unique and non-matching hardware specified in the same section as the door and door frame.

B. Extent of finish hardware required is indicated on drawings and in schedules.

C. Types of finish hardware required include the following:

Butt Hinges
Continuous Hinges
Lock cylinders and keys
Lock and latch sets
Exit devices
Closers
Electronic door control devices
Overhead Holders
Door trim units

1.3 RELATED SECTIONS

A. Division 8 – Hollow Metal Doors and Frames.
B. Division 8 - Flush Wood Doors.
C. Division 16 - Electrical

1.4 QUALITY ASSURANCE

A. Manufacturer: Obtain each type of hardware (latch and lock sets, etc.) from a single manufacturer.

B. Supplier: A recognized architectural finish hardware supplier, with warehousing facilities, who has been furnishing hardware in the project's vicinity for a period of not less than 2 years, and who is, or who employs an experienced architectural hardware consultant who is available, at reasonable times during the course of the work, for consultation about project's hardware requirements, to Owner, Architect and Contractor.

C. Fire-Rated Openings: Provide hardware for fire-rated openings in compliance with NFPA Standard No. 80 and local building code requirements. Provide only hardware which has been tested and listed by UL or an approved testing agency for types and sizes of doors required and complies with requirements of door and door frame labels.

D. Where emergency exit devices are required on fire-rated doors (with supplementary marking on doors with labels indicating "Fire Door to be Equipped with Fire Exit Hardware") provide labels on exit devices indicating "Fire Exit Hardware

E. The supplier shall be responsible for field checking existing openings for proper application of sizes and strikes for all openings.

1.5 REGULATORY REQUIREMENTS

A. Comply with accessibility requirements, comply with Americans with Disabilities Act (ADA), “Accessibility Guidelines for Buildings and Facilities (ADAAG),” ANSI A117.1, FED-STD-795, “Uniform Federal Accessibility Standards.”

1.6 SUBMITTALS

A. Product Data: Submit manufacturers technical product data for each item of hardware in accordance with Division-1 section "Submittals". Include whatever information may be necessary to show compliance with requirements, and include instructions for installation and for maintenance of operating parts and finish.

B. Hardware Schedule: Submit final hardware schedule in a vertical format as recognized by the Door and Hardware Institute (DHI). **Horizontal schedule format will not be accepted**. Coordinate hardware with doors, frames and related work to ensure proper size, thickness, hand, function and finish of hardware.

1. Final Hardware Schedule Content: Based on finish hardware indicated, organize hardware schedule into "hardware sets" indicating complete designations of every item required for each door or opening. Include the following information:
    a. Type, style, function, size and finish of each hardware item.
    b. Name and manufacturer of each item.
    c. Fastenings and other pertinent information.
    d. Index to include location of hardware set cross-referenced to indications on drawings both on floor plans and in door and frame schedule.
    e. Explanation of all abbreviations, symbols, codes, etc., contained in schedule.
    f. Mounting locations for hardware.
    g. Door and frame sizes and materials.
    h. Keying information.
    i. Wiring diagrams with theory of operation.

C. Submittal Sequence: Submit schedule in accordance to Division 1, particularly where acceptance of hardware schedule must precede fabrication of other work (e.g., hollow metal frames) which is critical in the project construction schedule. Include with schedule the product data, samples, shop drawings of other work affected by finish hardware, and other information essential to the coordinated review of hardware schedule.

D. Keying Schedule: Submit separate detailed schedule indicating clearly how the Owner's final instructions on keying of locks has been fulfilled.

E. Samples if Requested: Prior to submittal of the final hardware schedule and prior to final ordering of finish hardware, submit one sample of each type of exposed hardware unit, finish as required, and tagged with full description for coordination with schedule.

F. Templates: Furnish hardware templates to each fabricator of doors, frames and other work to be factory-prepared for the installation of hardware. Upon request, check shop drawings of such other work, to confirm that adequate provisions are made for proper location and installation of hardware.

1.7 PRODUCT HANDLING

A. Tag each item or package separately, with identification related to final hardware schedule, and include basic installation instructions with each item or package.

B. Inventory hardware jointly with representatives of hardware supplier and hardware installer until each is satisfied that count is correct.

C. Deliver individually packaged hardware items at the proper times to the proper locations (shop or project site) for installation.

D. Provide secure lock-up for hardware delivered to the project, but not yet installed. Control handling and installation of hardware items which are not immediately replaceable, so that completion of the work will not be delayed by hardware losses, both before and after installation.

PART 2--PRODUCTS

2.1 SCHEDULED HARDWARE

A. Requirements for design, grade, function, finish, size and other distinctive qualities of each type of finish hardware is indicated in the Finish Hardware Data Sheet and Hardware Schedule at the end of this section. Products are identified by using hardware designation numbers of the following.

B. Manufacturer's Product Designations:

Butt Hinges:	Ives
Continuous Hinges:	Select
Locksets:	Schlage.
Exit Devices:	Monarch Exit Devices
Closers:	LCN Closers
Automatic Door Operators	LCN Closers
Overhead Holders:	Glynn-Johnson
Kickplates:	Ives
Silencers:	Ives
Floor/Wall Stops:	Ives
Threshold & Weatherstrip	National Guard

2.2 MATERIALS AND FABRICATION

A. General:

1. Hand of door: Drawings show direction of slide, swing or hand of each door leaf. Furnish each item of hardware for proper installation and operation of door movement as shown.
2. Manufacturer's Name Plate: Do not use manufacturer's products which have manufacturer's name or trade name displayed in a visible location (omit removable nameplates), except in conjunction with required UL labels and as otherwise acceptable to Architect.
3. Manufacturer's identification will be permitted on rim of lock cylinders only.
4. Finish: All hardware finish shall match US26D unless otherwise indicated. Closer bodies, covers and arms shall be painted to match. Continuous hinges shall be clear aluminum.
5. Lockset Design: Lever handle design shall be similar to “Dane” as manufactured by Falcon Lock Co.
6. Fasteners: Provide hardware manufactured to conform to published templates, generally prepared for machine screw installation. Do not provide hardware which has been prepared for self-tapping sheet metal screws, except as specifically indicated.

7. Furnish screws for installation, with each hardware item. Provide Phillips flat-head screws except as otherwise indicated. Finish exposed (exposed under any condition) screws to match hardware finish or, if exposed in surfaces of other work, to match finish of such other work as closely as possible, including "prepared for paint" in surfaces to receive painted finish.
8. Provide concealed fasteners for hardware units which are exposed when door is closed, except to extent no standard units of type specified are available with concealed fasteners. Do not use thru-bolts for installation where bolt head or nut on opposite face is exposed in other work, except where it is not feasible to adequately reinforce the work. In such cases, provide sleeves for each thru-bolt or use sex screw fasteners.
9. Tools and Maintenance Instructions for Maintenance: Furnish a complete set of specialized tools and maintenance instructions as needed for Owner's continued adjustment, maintenance, and removal and replacement of finish hardware.

2.3 HINGES, BUTTS AND PIVOTS

A. Templates: Except for hinges and pivots to be installed entirely (both leaves) into wood doors and frames, provide only template-produced units.

B. Screws: Furnish Phillips flat-head or machine screws for installation of units, except furnish Phillips flat-head or wood screws for installation of units into wood. Finish screw heads to match surface of hinges or pivots.

C. Hinge Pins: Except as otherwise indicated, provide hinge pins as follows:
1. Steel Hinges: Steel pins.
2. Non-ferrous Hinges: Stainless steel pins.
3. Out-swing Corridor Doors: Non-removable pins.
4. Interior Doors: Non-rising pins.
5. Tips: Flat button and matching plug, finished to match leaves.
6. Number of hinges: Provide number of hinges indicated but not less than 3 hinges per door leaf for doors 90" or less in height and one additional hinge for each 30" of additional height.

D. Acceptable Manufacturers:
1. Ives
2. McKinney
3. Hager

E. Supplier shall be responsible for the correct hinge size to fit any existing frames or doors.

F. Furnish hinges in sizes and types as required by architect’s details to achieve maximum degree of opening.

2.4 CONTINUOUS HINGES

A. Hinge shall be a pinless assembly of three interlocking extrusions applied to the full height of the door and frame without mortising. The door leaf and jamb leaf shall be geared together for the entire length of the hinge and joined by a channel. Hinge knuckle shall be monolithic in appearance. Continuous hinge with visible knuckle separations are not acceptable. Vertical door loads shall be carried on minimum 3/4" acetal bearings through a full 180 degrees. The door leaf and jamb leaf shall have templated screw hole locations for future replacement needs. All heavy duty hinges (HD) shall have a minimum of 32 bearings for a 7' length.

B. Acceptable Manufacturers:
1. Select Products

2. Ives
3. Hager Roton

2.5 LOCK CYLINDERS AND KEYING

A. General: Supplier will meet with Owner to finalize keying requirements and obtain final instructions in writing.

B. Review the keying system with the Owner and provide the type required (master, grandmaster or great-grandmaster), either new or integrated with Owner's existing system. If key pinning charts are required, owner to furnish charts to hardware supplier.

C. Equip all locks and cylinders with Schlage Everest B patented restricted interchangeable core inserts. Furnish temporary keyed cores for the construction period. Contractor shall void the construction keying in the presence of the owner's representative.

D. Metals: Construct lock cylinder parts from brass/bronze, stainless steel or nickel silver.

E. Comply with Owner's instructions for masterkeying and, except as otherwise indicated, provide individual change key for each lock which is not designated to be keyed alike with a group of related locks.

F. Permanently inscribe each key and cylinder with Visual Key Control that identifies cylinder manufacturer key symbol, and inscribe key with the notation "DO NOT DUPLICATE".

G. Key Material: Provide keys of nickel silver only.

H. Key Quantity:
1. Furnish 3 change keys for each lock.
2. 5 master keys for each master system.
3. 5 grandmaster keys for each grandmaster system.
4. One extra blank for each lock.
5. 6 Construction master keys.
6. 6 Control Keys – Construction and Permanent

I. Deliver keys as directed by the owner.

J. Key Control System: Provide a key control system including envelopes, labels tags with self locking clips, receipt forms, 3-way visible card index, and standard metal cabinet, with a capacity for 150% of the number of locks required for this project.
1. Key cabinet and system shall be provided as a part of this contract by the hardware supplier. Cabinet shall be indexed and set up by supplier with the owner's representative.

2.6 LOCKS, LATCHES AND BOLTS

A. Locks shall meet these certifications:
1. Cylindrical Locks - ANSI A156.2 Series 4000, Grade 1 Strength and Operational requirements. Meets A117.1 Accessibility Codes. Latch bolts shall be steel with minimum ½" throw, deadlocking on keyed and exterior functions. ¾" throw anti-friction latchbolt on pairs of fire doors. Strikes: Provide manufacturer's standard wrought box strike for each latch or lock bolt, with curved lip extended to protect frame. Provide 5/8" minimum throw of latch and deadbolt used on pairs of doors.
a. Lock design shall be Falcon T series "DANE" design – Finish to be 626

B. Comply with UL requirements for throw of bolts and latch bolts on rated fire openings.

C. Lock Manufacturers: Subject to compliance with requirements, provide lockset products of the following approved manufacturers:
   1. Falcon Lock Co. “T Series”
   2. Sargent Lock Co. “10 Line”
   3. Corbin Russwin. “CL3300 Series”
   4. Schlage Lock Co. “ND Series”

2.7 CLOSERS AND DOOR CONTROL DEVICES

A. Size of Units: Except as otherwise specifically indicated, comply with the manufacturer's recommendations for size of door control unit, depending upon size of door, exposure to weather and anticipated frequency of use.

B. Closers: All door closers shall be of one manufacturer to provide for proper installation and servicing after installation. Closer shall carry a manufacturer's **TEN YEAR WARRANTY** for hydraulic units.

C. All door closers shall pass UL10C positive pressure fire test.

D. All closers shall meet ANSI A156.4 Grade 1.

E. Acceptable Manufacturers and Products:
   1. Dor-O-Matic “SC70 Series”, “SC80 Series”
   2. Yale Closers “400 Series”, “3500 Series”
   3. Norton Door Controls “7500 Series”, “8500 Series”
   4. LCN “4000 Series”

2.8 EXIT DEVICES

A. General: All devices shall be of one manufacturer to provide for proper installation and serving. Devices shall be non handed and capable of direct field conversion for all available trim functions. All devices shall carry a three year warranty against manufacturing defects and workmanship.

B. All closers shall meet ANSI A156.4 Grade 1.

C. Furnish all exit devices with deadlocking latchbolts or guarded latch (GL)feature.

D. Furnish all exit devices with metal end caps.

E. Furnish cylinders with all lockable exit devices.

F. Furnish required filler plates and shim kits for flush mounting of exit devices on all doors.

G. Acceptable Manufacturers and Types:
   1. Monarch Exit Devices – “24, 25 Series”
   2. Sargent Exit Devices – “8000 Series”
   3. Precision Hardware – “Apex Series”
   4. Von Duprin – “33A, 99 Series”

2.9 DOOR TRIM UNITS

A. Fasteners: Provide manufacturer's standard exposed fasteners for door trim units (kick plates, edge trim, viewers, knockers, mail drops and similar units); either machine screws or self-tapping screws.

B. Fabricate protection plates (armor, kick or mop) not more than 1-1/2" less than door width on stop side and not more than 1/2" less than door width on pull side, x the height indicated. All protection plates shall have all edges beveled (B4E).

C. Metal Plates: Stainless steel, .050" (U.S. 18 ga.).

D. All pull plates and handles to be thru-bolted. Install pull plate prior to push plate to conceal thru-bolts. Provide concealed fasteners for all push/pull applications.

E. Acceptable Manufacturers:
1. Ives
2. Rockwood
3. Quality

2.10 WEATHERSTRIP AND GASKETING

A. General: Except as otherwise indicated, provide continuous weather stripping at each leaf of every exterior door. Provide type, sizes and profiles shown or scheduled. Provide non-corrosive fasteners as recommended by manufacturer for application indicated.

B. Replaceable Seal Strips: Provide only those units where resilient or flexible seal strips is easily replaceable and readily available from stocks maintained by the manufacturer.

C. Acceptable Manufacturers:
1. National Guard Products.
2. Zero Mfg.
3. Reese Mfg.

2.11 THRESHOLDS

A. General: Except as otherwise indicated provide standard aluminum threshold unit of type, size and profile as shown or detailed.

B. Provide welded custom thresholds where scheduled and noted in the hardware sets. Provide cover plates where scheduled.

C. Provide thresholds that are 1” wider than depth of frame unless specified or detailed otherwise.
.

D. Acceptable Manufacturers:
1. National Guard Products.
2. Reese Mfg.
3. Zero Mfg.

2.12 DOOR SILENCERS

All hollow metal frames shall have grey resilient type silencers. Quantity (3) on single doors and quantity (2) on pairs of doors.

2.13 ELECTRICAL HARDWARE

A. Where scheduled supply electrified exit devices that allow for remote retraction of latch bolts by use of a solenoid. Access control system will allow exit devices to be changed from exit only or latched to push-pull operation.

B. Furnish power transfers that are recessed into door and frame. Power transfers to allow electrical power to pass from door to frame without the use of door cords or transfer hinges.

C. Furnish power supplies to operate electrified exit devices. Power supplies to have regulated output that is field selectable for either 24VDC @ 2 amps or 12VDC @ 4 amps. Standard input at 120VAC @ 1amp or 240VAC @ 0.5amp. Power Supplies to have five (5) knockout holes for conduit connection with terminal block that handles up to 14 gauge wire. Power supplies will handle up to 16 amp current inrush to retract exit device latch bolt.

D. Furnish wiring diagrams (riser and point to point) with theory of operation to electrical contractor for use in installing electrical hardware products.

E. Electrical contractor to run all wiring and make all final connections for electrified hardware. Hardware supplier shall be responsible to furnish all wiring diagrams to operate electrified hardware. Access control material and electrified hardware to interface at junction boxes.

PART 3--EXECUTION

3.1 INSTALLATION

A. Mount hardware units at heights indicated in "Recommended Locations for Builders Hardware for Standard Steel Doors and Frames" by the Door and Hardware Institute, except as specifically indicated or required to comply with governing regulations, and except as may be otherwise directed by Architect.

B. Install each hardware item in compliance with the manufacturer's instructions and recommendations. Wherever cutting and fitting is required to install hardware onto or into surfaces which are later to be painted or finished in another way, coordinate removal, storage and reinstallation or application of surface protections with finishing work specified in the Division-9 sections. Do not install surface-mounted items until finishes have been completed on the substrate.

C. Set units level, plumb and true to line and location. Adjust and reinforce the attachment substrate as necessary for proper installation and operation.

D. Drill and countersink units which are not factory-prepared for anchorage fasteners. Space fasteners and anchors in accordance with industry standards.

E. Set thresholds for exterior doors in full bed of butyl-rubber or polyisobutylene mastic sealant.

3.2 ADJUST AND CLEAN

A. Adjust and check each operating item of hardware and each door, to ensure proper operation or function of every unit. Replace units which cannot be adjusted to operate freely and smoothly as intended for the application made.

B. Clean adjacent surfaces soiled by hardware installation.

C. Final Adjustment: Wherever hardware installation is made more than one month prior to acceptance or occupancy of a space or area, return to the work during the week prior to acceptance or occupancy, and make final check and adjustment of all hardware items in such space or area. Clean operating items as necessary to restore proper function and finish of hardware and doors. Adjust door control devices to compensate for final operation of heating and ventilating equipment.

D. Instruct Owner's Personnel in proper adjustment and maintenance of hardware and hardware finishes, during the final adjustment of hardware.

E. Continued Maintenance Service: Approximately six months after the acceptance of hardware in each area, the Installer, accompanied by the representative of the latch and lock manufacturer, shall return to the project and re-adjust every item of hardware to restore proper function of doors and hardware. Consult with and instruct Owner's personnel in recommended additions to the maintenance procedures. Replace hardware items which have deteriorated or failed due to faulty design, materials or installation of hardware units. Prepare a written report of current and predictable problems (of substantial nature) in the performance of the hardware.

3.3 HARDWARE SCHEDULE (see list of hardware noted on plans in the Door Schedule).

-END OF SECTION 087100-

SECTION 092100

GYPSUM BOARD ASSEMBLIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Metal stud wall framing, where not shown in Cold formed metal framing section.

B. Metal channel ceiling framing.

C. Acoustic insulation.

D. Gypsum wallboard.

E. Joint treatment and accessories.

1.02 RELATED REQUIREMENTS

A. Section 054000 - Cold Formed Metal Framing: Interior load-bearing metal stud framing.

B. Section 061000 - Rough Carpentry: Wood blocking product and execution requirements.

C. Section 079200 - Joint Sealers: Acoustic sealant.

1.03 REFERENCE STANDARDS

A. AISI SG02-1 - North American Specification for the Design of Cold-Formed Steel Structural Members; American Iron and Steel Institute; 2001 with 2004 supplement. (replaced SG-971)

B. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2006a.

C. ASTM C 475/C 475M - Standard Specification for Joint Compound and Joint Tape for Finishing Gypsum Board; 2002.

D. ASTM C 557 - Standard Specification for Adhesives for Fastening Gypsum Wallboard to Wood Framing; 2003.

E. ASTM C 645 - Standard Specification for Nonstructural Steel Framing Members; 2007.

F. ASTM C 665 - Standard Specification for Mineral-Fiber Blanket Thermal Insulation for Light Frame Construction and Manufactured Housing; 2006.

G. ASTM C 754 - Standard Specification for Installation of Steel Framing Members to Receive Screw-Attached Gypsum Panel Products; 2004.

H. ASTM C 840 - Standard Specification for Application and Finishing of Gypsum Board; 2007.

I. ASTM C 954 - Standard Specification for Steel Drill Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Steel Studs From 0.033 in. (0.84 mm) to 0.112 in. (2.84 mm) in Thickness; 2004.

J. ASTM C 1002 - Standard Specification for Steel Self-Piercing Tapping Screws for the Application of Gypsum Panel Products or Metal Plaster Bases to Wood Studs or Steel Studs; 2004.

K. ASTM C 1047 - Standard Specification for Accessories for Gypsum Wallboard and Gypsum Veneer Base; 2005.

L. ASTM C 1396/C 1396M - Standard Specification for Gypsum Board; 2006a.

M. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 2005.

N. ASTM E 90 - Standard Test Method for Laboratory Measurement of Airborne Sound

Transmission Loss of Building Partitions and Elements; 2004.

O. ASTM E 413 - Classification for Rating Sound Insulation; 2004.

P. GA-216 - Application and Finishing of Gypsum Board; Gypsum Association; 2007.

Q. GA-600 - Fire Resistance Design Manual; Gypsum Association; 2006.

R. UL (FRD) - Fire Resistance Directory; Underwriters Laboratories Inc.; current edition.

1.04 SUBMITTALS

A. Shop Drawings: Indicate special details associated with fireproofing and acoustic seals.

B. Product Data: Provide data on metal framing, gypsum board, accessories, and joint finishing system.

C. Product Data: Provide manufacturer's data on partition head to structure connectors, showing compliance with requirements.

D. Test Reports: For all stud framing products that do not comply with ASTM C 645 or C 754, provide independent laboratory reports showing maximum stud heights at required spacings and deflections.

PART 2 PRODUCTS

2.01 GYPSUM BOARD ASSEMBLIES

A. Provide completed assemblies complying with ASTM C 840 and GA-216.

B. Interior Partitions Indicated as Acoustic: Provide completed assemblies with the following characteristics:
   1. Acoustic Attenuation: STC of 50 min calculated in accordance with ASTM E 413, based on tests conducted in accordance with ASTM E 90.

C. Fire Rated Assemblies: Provide completed assemblies complying with applicable code.
   1. Gypsum Association File Numbers: Comply with requirements of GA-600 for the particular assembly.
   2. UL Assembly Numbers: Provide construction equivalent to that listed for the particular assembly in the current UL Fire Resistance Directory.

2.02 METAL FRAMING MATERIALS

A. Manufacturers - Metal Framing, Connectors, and Accessories:
   1. Dietrich Metal Framing: www.dietrichindustries.com.
   2. Marino-Ware: www.marinoware.com.
   3. Substitutions: See Section 01600 - Product Requirements.

B. Non-Loadbearing Framing System Components: ASTM C 645; galvanized sheet steel, of size and properties necessary to comply with ASTM C 754 for the spacing indicated, with maximum deflection of wall framing of L/240 at 5 psf (240 Pa).
   1. Exception: The minimum metal thickness and section properties requirements of ASTM C 645 are waived provided steel of 40 ksi (275 MPa) minimum yield strength is used, the metal is continuously dimpled, the effective thickness is at least twice the base metal thickness, and maximum stud heights are determined by testing in accordance with ASTM E 72 using assemblies specified by ASTM C 754.
   2. Studs: "C" shaped with flat or formed webs with knurled faces.
   3. Runners: U shaped, sized to match studs.
   4. Ceiling Channels: C shaped.
   5. Furring: Hat-shaped sections, minimum depth of 7/8 inch (22 mm).

C. Loadbearing Studs for Application of Gypsum Board: As specified in Section 05400.

D. Ceiling Hangers: Type and size as specified in ASTM C 754 for spacing required. Provide

seismic bracing as required to meet ASTM C635 for Seismic Design Category C. Minimum 12 ga hangers. Friction clips are not allowed.

E. Partition Head to Structure Connections: Provide mechanical anchorage devices that accommodate deflection using slotted holes, screws and anti-friction bushings, preventing rotation of studs while maintaining structural performance of partition.
   1. Structural Performance: Maintain lateral load resistance and vertical movement capacity required by applicable code, when evaluated in accordance with AISI North American Specification for the Design of Cold-Formed Steel Structural Members.
   2. Material: ASTM A 653/A 653M steel sheet, SS Grade 50/340, with G60/Z180 hot dipped galvanized coating.
   3. Provide components UL-listed for use in UL-listed fire-rated head of partition joint systems indicated on drawings.
   4. Provide top track preassembled with connection devices spaced to fit stud spacing indicated on drawings; minimum track length of 12 feet (3660 mm).

2.03 GYPSUM BOARD MATERIALS

A. Manufacturers:
   1. National Gypsum Company: www.nationalgypsum.com.
   2. USG: www.usg.com.

B. Gypsum Wallboard: ASTM C 1396/C 1396M. Sizes to minimize joints in place; ends square cut.
   1. Abuse Resistant Type: (USG Sheetrock Gypsum Panels)
      a. Application: Use for vertical surfaces and ceilings, unless otherwise indicated.
      b. Thickness: 5/8 inch (16 mm) unless noted otherwise on drawings.
      c. Edges: Tapered.
   2. Water Resistant/Abuse Resistant Type: (USG Fiberock Aqua-Tough Panels, or equal)
      a. Application: Use for vertical surfaces and ceilings in locations where water resistant gypsum board is called for in the finish schedule, unless otherwise indicated. At a minimum this is all walls and ceiling in all Toilets.
      b. Thickness: 5/8 inch (16 mm) unless noted otherwise on drawings.
      c. Edges: Tapered.

2.04 ACCESSORIES

A. Acoustic Insulation: ASTM C 665; preformed glass fiber, friction fit type, unfaced. Thickness: 3 inch (mm). Install as per batt insulation requirements of insulation section 072116.

B. Acoustic Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board. All exposed sealant to be non-pickable type, see Sealant section.

C. Water-Resistive Barrier: Provide fluid applied waterproof barrier under all new showers up wall a minimum of 8”.

D. Finishing Accessories: ASTM C 1047, galvanized steel or rolled zinc, unless otherwise indicated.
   1. Types: As detailed or required for finished appearance.
   2. Special Shapes: In addition to conventional cornerbead and control joints, provide U-bead at exposed panel edges.

E. Joint Materials: ASTM C 475 and as recommended by gypsum board manufacturer for project conditions.
   1. Tape: 2 inch (50 mm) wide, coated glass fiber tape for joints and corners, except as otherwise indicated.
   2. Tape: 2 inch (50 mm) wide, creased paper tape for joints and corners, except as otherwise indicated.
   3. Ready-mixed vinyl-based joint compound.
   4. Chemical hardening type compound.

F. Screws: ASTM C 1002; self-piercing tapping type; cadmium-plated for exterior locations.

G. Screws: ASTM C 954; steel drill screws for application of gypsum board to loadbearing steel studs and wood trusses and joists where required (in conjunction with adhesive).

H. Adhesive for Attachment to Wood: ASTM C 557.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that project conditions are appropriate for work of this section to commence.

3.02 FRAMING INSTALLATION

A. Metal Framing: Install in accordance with ASTM C 754 and manufacturer's instructions.

B. Suspended Ceilings and Soffits: Space framing and furring members as indicated but never more than 24" O.C. maximum, provide metal framing members at all suspended gypsum board ceilings/soffits/fascias, typical.

C. Studs: Space studs as indicated on the drawings.
   1. Extend partition framing to structure in all locations.
   2. Partitions Terminating at Structure: Attach top runner to structure, maintain clearance between top of studs and structure, and connect studs to track using specified mechanical devices in accordance with manufacturer's instructions; verify free movement of top of stud connections; do not leave studs unattached to track.

D. Openings: Reinforce openings as required for weight of doors or operable panels, using not less than double studs at jambs.

E. Standard Wall Furring: Install at concrete walls scheduled to receive gypsum board, not more than 4 inches (100 mm) from floor and ceiling lines and abutting walls. Secure in place on alternate channel flanges at maximum 24 inches (600 mm) on center.
   1. Orientation: Horizontal.

F. Acoustic Furring: Install resilient channels at maximum 24 inches (600 mm) on center. Locate joints over framing members.

G. Furring for Fire Ratings: Install as required for fire resistance ratings indicated and to GA-600 requirements.

H. Blocking: Install wood blocking for support of:
   1. Framed openings.
   2. Wall mounted cabinets.
   3. Plumbing fixtures.
   4. Wall mounted door hardware.
   5. Wall mounted toilet accessories.

3.03 ACOUSTIC ACCESSORIES INSTALLATION

A. Acoustic Insulation: Place tightly within spaces, around cut openings, behind and around electrical and mechanical items within partitions, and tight to items passing through partitions.

B. Acoustic Sealant: Install in accordance with manufacturer's instructions.
   1. Place one bead continuously on substrate before installation of perimeter framing members.
   2. Place continuous bead at perimeter of each layer of gypsum board.
   3. In non-fire-rated construction, seal around all penetrations by conduit, pipe, ducts, and rough-in boxes.

3.04 GYPSUM BOARD INSTALLATION

A. Comply with ASTM C 840, GA-216, and manufacturer's instructions. Install to minimize butt end

joints, especially in highly visible locations.

B. Fire-Rated Construction: Install gypsum board in strict compliance with requirements of assembly listing.

C. Installation on Metal Framing: Use screws for attachment of all gypsum board.

D. Installation on Wood Framing: For rated assemblies, comply with requirements of listing authority. For non-rated assemblies, install as follows:
   1. Single-Layer Applications: Adhesive application.

3.05 INSTALLATION OF TRIM AND ACCESSORIES

A. Control Joints: Place control joints consistent with lines of building spaces and as indicated.

B. Corner Beads: Install at external corners, using longest practical lengths.

C. Edge Trim: Install at locations where gypsum board abuts dissimilar materials and as indicated.

3.06 JOINT TREATMENT

A. Glass Mat Faced Gypsum Board: Use fiberglass joint tape, bedded and finished with chemical hardening type joint compound.

B. Paper Faced Gypsum Board: Use paper joint tape, bedded with ready-mixed vinyl-based joint compound and finished with ready-mixed vinyl-based joint compound.

C. Finish all gypsum board in accordance with ASTM C 840 Level 4.

D. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.
   1. Feather coats of joint compound so that camber is maximum 1/32 inch (0.8 mm).

3.07 TOLERANCES

A. Maximum Variation of Finished Gypsum Board Surface from True Flatness: 1/8 inch in 10 feet (3 mm in 3 m) in any direction.

END OF SECTION

SECTION 093000

TILING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Tile for wall applications.

B. Abuse Resistant Water Resistant Cementitious backer board as tile substrate, U.N.O.

C. Coated glass mat backer board as tile substrate, abuse resistant.

D. Ceramic accessories as required.

1.02 RELATED REQUIREMENTS

A. Section 061000 – Rough Carpentry.

B. Section 079000 - Joint Sealers.

C. Section 092100 - Gypsum Board Assemblies: Installation of tile backer board.

D. Section DIVISION 22 - Plumbing Fixtures.

1.03 REFERENCE STANDARDS

A. ANSI A108 Series/A118 Series/A136.1 - American National Standard Specifications for the Installation of Ceramic Tile (Compendium); 2005.
   1. ANSI A108.1a - American National Standard Specifications for Installation of Ceramic Tile in the Wet-Set Method, with Portland Cement Mortar; 2005.
   2. ANSI A108.1b - American National Standard Specifications for Installation of Ceramic Tile on a Cured Portland Cement Mortar Setting Bed with Dry-Set or Latex Portland Cement Mortar; 1999 (R2005).
   3. ANSI A108.1c - Specifications for Contractors Option: Installation of Ceramic Tile in the Wet-Set Method with Portland Cement Mortar or Installation of Ceramic Tile on a Cured Portland Cement Mortar Bed with Dry-Set or Latex Portland Cement Mortar; 1999 (R2005).
   4. ANSI A108.4 - American National Standard Specifications for Installation of Ceramic Tile with Organic Adhesives or Water Cleanable Tile-Setting Epoxy Adhesive; 1999 (R2005).
   5. ANSI A108.5 - American National Standard Specifications for Installation of Ceramic Tile with Dry-Set Portland Cement Mortar or Latex-Portland Cement Mortar; 1999 (R2005).
   6. ANSI A108.6 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant, Water Cleanable Tile-Setting and -Grouting Epoxy; 1999 (R2005).
   7. ANSI A108.8 - American National Standard Specifications for Installation of Ceramic Tile with Chemical Resistant Furan Resin Mortar and Grout; 1999 (R2005).
   8. ANSI A108.9 - American National Standard Specifications for Installation of Ceramic Tile with Modified Epoxy Emulsion Mortar/Grout; 1999 (R2005).
   9. ANSI A108.10 - American National Standard Specifications for Installation of Grout in Tilework; 1999 (R2005).
   10. ANSI A108.11 - American National Standard for Interior Installation of Cementitious Backer Units; 1999 (R2005).
   11. ANSI A118.1 - American National Standard Specifications for Dry-Set Portland Cement Mortar; 1999 (R2005).

12. ANSI A118.3 - American National Standard Specifications for Chemical Resistant, Water Cleanable Tile Setting and -Grouting Epoxy and Water Cleanable Tile-Setting Epoxy Adhesive; 1999 (R2005).
13. ANSI A118.4 - American National Standard Specifications for Latex-Portland Cement Mortar; 1999 (R2005).
14. ANSI A118.6 - American National Standard Specifications for Standard Cement Grouts for Tile Installation; 1999 (R2005).
15. ANSI A118.7 - American National Standard Specifications for Polymer Modified Cement Grouts for Tile Installation; 1999 (R2005).
16. ANSI A118.9 - American National Standard Specifications for Test Methods and Specifications for Cementitious Backer Units; 1999 (R2005).
17. ANSI A137.1 - American National Standard Specifications for Ceramic Tile; 2008.

B. ASTM C 1178/C 1178M - Standard Specification for Coated Glass Mat Water-Resistant Gypsum Backing Panel; 2006.

C. TCA (HB) - Handbook for Ceramic Tile Installation; Tile Council of North America, Inc.; 2012.

1.04 SUBMITTALS

A. Product Data: Provide manufacturers' data sheets on tile, mortar, grout, and accessories. Include instructions for using grouts and adhesives.

B. Shop Drawings: Indicate tile layout, patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, control and expansion joints, thresholds, ceramic accessories, and setting details.

1.05 QUALITY ASSURANCE

A. Maintain one copy of TCA Handbook and ANSI A108 Series/A118 Series on site.

1.06 DELIVERY, STORAGE, AND HANDLING

A. Protect adhesives from freezing or overheating in accordance with manufacturer's instructions.

PART 2 PRODUCTS

2.01 TILE

A. Manufacturers: All products by the same manufacturer.
   1. Dal-Tile Corporation: www.daltile.com, or as noted on drawings.

B. Glazed Wall Tile: ANSI A137.1, and as follows:
   1. Moisture Absorption: 3.0 to 7.0 percent.
   2. Size and Shape: as per drawings ().
   3. Edges: Cushioned.
   4. Surface Finish: Matte glaze.
   5. Colors: As scheduled.
   6. Trim Units: Matching bead, bullnose, cove, and base shapes in sizes coordinated with field tile.

2.02 TRIM AND ACCESSORIES

A. Ceramic Accessories: Glazed finish, same color and finish as adjacent field tile; same manufacturer as tile.

B. Thresholds: Marble, white or gray, honed finish; 2 inches (50 mm) wide by full width of wall or frame opening; 1/2 inch (12 mm) thick; beveled one long edge with radiused corners on top side; without holes, cracks, or open seams. ADA compliant.
   1. Applications: Provide at the following locations:
      a. At all Toilet Doorways.

2.03 ADHESIVE MATERIALS

A. Epoxy Adhesive: ANSI A118.3,, thinset bond type.

B. Tile Setting Adhesive: Elastomeric, waterproof, liquid applied, .

2.04 MORTAR MATERIALS

A. Mortar Bond Coat Materials:
   1. Dry-Set Portland Cement type: ANSI A118.1.
   2. Latex-Portland Cement type: ANSI A118.4.

2.05 GROUT MATERIALS

A. Standard Grout: Any type specified in ANSI A118.6 or A118.7.
   1. Color: As selected.

2.06 ACCESSORY MATERIALS

A. Cleavage Membrane: 4 mil (0.1 mm) thick polyethylene film. Under all Ceramic and Porcelain Tile installed.

B. Cementitious Backer Board: ANSI A118.9; High density, cementitious, glass fiber reinforced, 1/2 inch (13 mm) thick; 2 inch (50 mm) wide coated glass fiber tape for joints and corners.

C. Coated Glass Mat Backer Board: ASTM C 1178/C 1178M, with coated inorganic fiberglass mat on both surfaces and integral acrylic coating vapor retarder.
   1. Fire-Resistant Type: Type X core, thickness 5/8 inch (16 mm).

D. Mesh Tape: 2-inch (50 mm) wide self-adhesive fiberglass mesh tape.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that sub-floor surfaces are smooth and flat within the tolerances specified for that type of work and are ready to receive tile.

B. Verify that wall surfaces are smooth and flat within the tolerances specified for that type of work, are dust-free, and are ready to receive tile.

C. Verify that sub-floor surfaces are dust-free and free of substances that could impair bonding of setting materials to sub-floor surfaces.

D. Verify that concrete sub-floor surfaces are ready for tile installation by testing for moisture emission rate and alkalinity; obtain instructions if test results are not within limits recommended by tile manufacturer and setting materials manufacturer.

3.02 PREPARATION

A. Protect surrounding work from damage.

B. Vacuum clean surfaces and damp clean.

C. Seal substrate surface cracks with filler. Level existing substrate surfaces to acceptable flatness tolerances.

D. Install cementitious backer board in accordance with ANSI A108.11 and board manufacturer's instructions. Tape joints and corners, cover with skim coat of dry-set mortar to a feather edge.

E. Install tile backer board in strict accordance with manufacturer's instructions, using galvanized roofing nails or corrosion-resistant bugle head drywall screws. Bed fiberglass self-adhesive tape at all joints and corners with material used to set tiles.

3.03 INSTALLATION - GENERAL

A. Install tile and thresholds and grout in accordance with applicable requirements of ANSI A108.1 through A108.13, manufacturer's instructions, and TCA Handbook

recommendations.

B. Lay tile to pattern indicated. Do not interrupt tile pattern through openings.

C. Cut and fit tile to penetrations through tile, leaving sealant joint space. Form corners and bases neatly. Align floor joints.

D. Place tile joints uniform in width, subject to variance in tolerance allowed in tile size. Make joints watertight, without voids, cracks, excess mortar, or excess grout.

E. Form internal angles square and external angles bullnosed.

F. Install ceramic accessories rigidly in prepared openings.

G. Install thresholds where indicated.

H. Sound tile after setting. Replace hollow sounding units.

I. Keep expansion joints free of adhesive or grout. Apply sealant to joints.

J. Allow tile to set for a minimum of 48 hours prior to grouting.

K. Grout tile joints. Use standard grout unless otherwise indicated.

L. Apply sealant to junction of tile and dissimilar materials and junction of dissimilar planes.

3.04 INSTALLATION - FLOORS - THIN-SET METHODS

A. Not Used.

3.05 INSTALLATION - WALL TILE

A. On toilet room walls install in accordance with TCA Handbook Method W247-12, thin-set over cementitious backer units, with full height waterproofing membrane.

B. Over coated glass mat backer board on studs, install in accordance with TCA Handbook Method W245-12, with full height waterproof membrane.

3.06 CLEANING

A. Clean tile and grout surfaces.

3.07 PROTECTION

A. Do not permit traffic over finished floor surface for 4 days after installation.

END OF SECTION

SECTION 095110

SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Suspended metal grid ceiling system.

B. Acoustical units.

1.02 RELATED REQUIREMENTS

A. Section 079200 - Joint Sealers: Acoustical sealant.

B. Section 283111 - Fire Alarm System: Fire alarm components in ceiling system.

C. Section 237413 – Air Handling and Cooling Systems and Equipment-(HVAC): Air diffusion devices in ceiling.

1.03 REFERENCE STANDARDS

A. ASTM C635 - Standard Specification for the Manufacture, Performance, and Testing of Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings; 2007.

B. ASTM C636/C636M - Standard Practice for Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels; 2008.

C. ASTM E580/E580M - Standard Practice for Installation of Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels in Areas Subject to Earthquake Ground Motions; 2011.

D. ASTM E1264 - Standard Classification for Acoustical Ceiling Products; 2008e1.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Sequence work to ensure acoustical ceilings are not installed until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Do not install acoustical units until after interior wet work is dry.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Product Data: Provide data on suspension system components.

PART 2 PRODUCTS

2.01 ACOUSTICAL UNITS

A. Manufacturers:
   1. Armstrong World Industries, Inc; Product ACT, Ultima,1910: www.armstrong.com.
   2. Substitutions: See Section 01600 - Product Requirements.

B. Acoustical Units - General: ASTM E1264, Class A.

C. Acoustical Tile Type ACT-1: Painted mineral fiber, ASTM E1264 Type IV, form 2, Pattern E, Class A, with the following characteristics:
   1. Size: 2'x2' Model #1910.
   2. Thickness: 3/4".
   3. Light Reflectance: 90 percent (LR 0.90), determined as specified in ASTM E1264.
   4. Ceiling Attenuation Class (CAC): 35, determined as specified in ASTM E1264.
   5. Edge: ACT is square lay in.
   6. Surface Color: White.
   7. Surface Pattern: Fine Texture.
   8. NRC: 0.70.
   9. Up to 86% Recycled Content.
   10. 30 year warranty.

2.02 SUSPENSION SYSTEM(S)

A. Manufacturers:
   1. USG; Product Donn DX and DXL: intermediate duty as a minimum. www.usg.com. System must be approved and meet all requirements for installation in Seismic Design Category C as per ASCE 7-05, ASTM C635, ASTM C636, and CISCA for seismic zone category 0-2.
   2. Substitutions: See Section 016000 - Product Requirements.

B. Suspension Systems - General: ASTM C635; die cut and interlocking components, with stabilizer bars, clips, splices, perimeter moldings, and hold down clips as required. Intermediate Duty as a minimum.

C. Exposed Steel Suspension System: Formed steel, commercial quality cold rolled; intermediate-duty.
   1. Profile: Tee; 15/16 inch (24 mm) wide face. 7/8” minimum perimeter trim/wall angle.
   2. Construction: Double web.
   3. Finish: White painted.

2.03 ACCESSORIES

A. Support Channels and Hangers: Galvanized steel; size and type to suit application, seismic requirements, and ceiling system flatness requirement specified. Minimum 12 Ga wire for hangers.

B. Perimeter Moldings: Same material and finish as grid.
   1. At Exposed Grid: Provide L-shaped molding for mounting at same elevation as face of grid. 7/8” minimum dimension for all wall angle.

C. Acoustical Insulation: Specified in Section 092100.

D. Acoustical Sealant For Perimeter Moldings: Non-hardening, non-skinning, for use in conjunction with suspended ceiling system. To be non-pickable type.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify that layout of hangers will not interfere with other work.

3.02 INSTALLATION - SUSPENSION SYSTEM

A. Install suspension system in accordance with ASTM C636/C636M, ASTM C635, ASTM E580/E580M, and manufacturer's instructions and as supplemented in this section and to meet all Seismic requirements as noted above.

B. Rigidly secure system, including integral mechanical and electrical components, for maximum deflection of 1:360.

C. Lay out system to a balanced grid design with edge units no less than 50 percent of acoustical unit size.

D. Install after major above-ceiling work is complete. Coordinate the location of hangers with other work.

E. Hang suspension system independent of walls, columns, ducts, pipes and conduit. Where carrying members are spliced, avoid visible displacement of face plane of adjacent members.

F. Where ducts or other equipment prevent the regular spacing of hangers, reinforce the nearest affected hangers and related carrying channels to span the extra distance.

G. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability.

H. Support fixture loads using supplementary hangers located within 6 inches (150 mm) of each corner, or support components independently.

I. Do not eccentrically load system or induce rotation of runners.

J. Perimeter Molding: Install at intersection of ceiling and vertical surfaces and at junctions with other interruptions.
   1. Use longest practical lengths.
   2. Overlap and rivet corners.

K. Friction clips are not allowed.

3.03 INSTALLATION - ACOUSTICAL UNITS

A. Install acoustical units in accordance with manufacturer's instructions.

B. Fit acoustical units in place, free from damaged edges or other defects detrimental to appearance and function.

C. Fit border trim neatly against abutting surfaces.

D. Install units after above-ceiling work is complete.

E. Install acoustical units level, in uniform plane, and free from twist, warp, and dents.

F. Cutting Acoustical Units:
   1. Cut to fit irregular grid and perimeter edge trim.
   2. Make field cut edges of same profile as factory edges.

3.04 TOLERANCES

A. Maximum Variation from Flat and Level Surface: 1/8 inch in 10 feet (3 mm in 3 m).

B. Maximum Variation from Plumb of Grid Members Caused by Eccentric Loads: 2 degrees.

END OF SECTION

SECTION 096519 - RESILIENT TILE FLOORING

1.PART - GENERAL

.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 1 Specification Sections, apply to this Section.

.2 SUMMARY

A. This Section includes the following:

1. Vinyl composition tile (VCT).
2. Resilient wall base and accessories.

.3 SUBMITTALS

A. Product Data: For each type of product indicated.

B. Samples for Verification: Full-size units of each color and pattern of resilient floor tile required.

1. Resilient Wall Base and Accessories: Manufacturer's standard-size Samples, but not less than 12 inches (300 mm) long, of each resilient product color and pattern required.

C. Maintenance Data: For resilient products to include in maintenance manuals.

.4 QUALITY ASSURANCE

A. Fire-Test-Response Characteristics: Provide products identical to those tested for fire-exposure behavior per test method indicated by a testing and inspecting agency acceptable to authorities having jurisdiction.

.5 DELIVERY, STORAGE, AND HANDLING

A. Store resilient products and installation materials in dry spaces protected from the weather, with ambient temperatures maintained within range recommended by manufacturer, but not less than 50 deg F (10 deg C) or more than 90 deg F (32 deg C). Store tiles on flat surfaces.

.6 PROJECT CONDITIONS

A. Maintain temperatures within range recommended by manufacturer, but not less than 70 deg F (21 deg C) or more than 95 deg F (35 deg C), in spaces to receive floor tile during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. After postinstallation period, maintain temperatures within range recommended by manufacturer, but not less than 55 deg F (13 deg C) or more than 95 deg F (35 deg C).

C. Close spaces to traffic during floor covering installation.

D. Close spaces to traffic for 48 hours after floor covering installation.

E. Install resilient products after other finishing operations, including painting, have been completed.

.7 EXTRA MATERIALS

A. Furnish extra materials described below that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.

   1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.
   2. Resilient Wall Base and Accessories: Furnish not less than 10 linear feet (3 linear m) for every 500 linear feet (150 linear m) or fraction thereof, of each type, color, pattern, and size of resilient product installed.

2PART - PRODUCTS

.1 MANUFACTURERS

A. Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, the products listed in other Part 2 articles.

.2 COLORS AND PATTERNS

A. Colors and Patterns: See Finish Schedules on drawings.

.3 VINYL COMPOSITION TILE

A. Vinyl Composition Tile (VCT): ASTM F 1066.

   1. Armstrong World Industries, Inc.; .
   2. Azrock Commercial Flooring, DOMCO; .
   3. Tarkett Inc.; .

4. Mannington

B. Wearing Surface: Smooth .

C. Thickness: 0.125 inch (3.2 mm).

D. Size: 12 by 12 inches (305 by 305 mm).

E. Fire-Test-Response Characteristics:

1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm per ASTM E 648.

.4 RESILIENT WALL BASE

A. Wall Base: ASTM F 1861.

1. Armstrong World Industries, Inc.; .
2. Azrock Commercial Flooring, DOMCO; .
3. Burke Mercer Flooring Products; .
4. Johnsonite; .
5. Marley Flexco (USA), Inc.; .
6. Mondo Rubber International, Inc.; .
7. Musson, R. C. Rubber Co.; .
8. Nora Rubber Flooring, Freudenberg Building Systems, Inc.; .
9. Roppe Corporation; .

B. Type (Material Requirement): TV (vinyl).

C. Style: Cove (with top-set toe).

D. Minimum Thickness: 0.125 inch (3.2 mm).

E. Height: varies - see schedules.

F. Lengths: Rolls 100’ (1219 mm) long coils or in manufacturer's standard length.

G. Outside Corners: Premolded.

H. Inside Corners: Premolded.

I. Surface: Smooth.

.5 RESILIENT MOLDING ACCESSORY

A. Description: Cap for cove carpet Cap for cove resilient sheet floor covering Carpet edge for glue-down applications Nosing for carpet Nosing for resilient floor covering Reducer strip for resilient floor covering Joiner for tile and carpet.

1. Burke Mercer Flooring Products; .

2. Johnsonite; .
3. Marley Flexco (USA), Inc.; .
4. Roppe Corporation; .

B. Material: Vinyl.

C. Profile and Dimensions: required for trim and selected by the architect.

.6 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based or blended hydraulic cement based formulation provided or approved by resilient product manufacturer for applications indicated.

B. Adhesives: Water-resistant type recommended by manufacturer to suit resilient products and substrate conditions indicated.

3 PART - EXECUTION

.1 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for installation tolerances, moisture content, and other conditions affecting performance.

1. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of resilient products.
2. Proceed with installation only after unsatisfactory conditions have been corrected.

.2 PREPARATION

A. Prepare substrates according to manufacturer's written recommendations to ensure adhesion of resilient products.

B. Concrete Substrates: Prepare according to ASTM F 710.

1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.
2. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.
3. Moisture Testing:

a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 3 lb of water/1000 sq. ft. (1.36 kg of water/92.9 sq. m) in 24 hours.
b. Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

C. Remove substrate coatings and other substances that are incompatible with adhesives and that contain soap, wax, oil, or silicone, using mechanical methods recommended by manufacturer. Do not use solvents.

D. Use trowelable leveling and patching compound to fill cracks, holes, and depressions in substrates.

E. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.

1. Do not install resilient products until they are same temperature as space where they are to be installed.

F. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation. After cleaning, examine substrates for moisture, alkaline salts, carbonation, and dust. Proceed with installation only after unsatisfactory conditions have been corrected.

.3 TILE INSTALLATION

A. Lay out tiles from center marks established with principal walls, discounting minor offsets, so tiles at opposite edges of room are of equal width. Adjust as necessary to avoid using cut widths that equal less than one-half tile at perimeter.

1. Lay tiles in pattern indicated.

B. Match tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.

1. Lay tiles in pattern indicated, in pattern of colors and sizes indicated.

C. Scribe, cut, and fit tiles to butt neatly and tightly to vertical surfaces and permanent fixtures including built-in furniture, cabinets, pipes, outlets, edgings, door frames, thresholds, and nosings.

D. Extend tiles into toe spaces, door reveals, closets, and similar openings.

E. Maintain reference markers, holes, and openings that are in place or marked for future cutting by repeating on floor tiles as marked on substrates. Use chalk or other nonpermanent, non-staining marking device.

F. Adhere tiles to flooring substrates using a full spread of adhesive applied to substrate to produce a completed installation without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, and other surface imperfections.

.4 RESILIENT WALL BASE INSTALLATION

A. Apply wall base to walls, columns, pilasters, casework and cabinets in toe spaces, and other permanent fixtures in rooms and areas where base is required.

B. Install wall base in lengths as long as practicable without gaps at seams and with tops of adjacent pieces aligned.

C. Tightly adhere wall base to substrate throughout length of each piece, with base in continuous contact with horizontal and vertical substrates.

D. Do not stretch wall base during installation.

E. On masonry surfaces or other similar irregular substrates, fill voids along top edge of wall base with manufacturer's recommended adhesive filler material.

F. Premolded Corners: Install premolded corners before installing straight pieces.

.5 RESILIENT ACCESSORY INSTALLATION

Resilient Molding Accessories: Butt to adjacent materials and tightly adhere to substrates throughout length of each piece. Install reducer strips at edges of floor coverings that would otherwise be exposed.

.6 CLEANING AND PROTECTION

A. Perform the following operations immediately after completing resilient product installation:

1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

    a. Do not wash surfaces until after time period recommended by manufacturer.

B. Protect resilient products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period. Use protection methods recommended in writing by manufacturer.

1. Apply protective floor polish to horizontal surfaces that are free from soil, visible adhesive, and surface blemishes if recommended in writing by manufacturer.

    a. Use commercially available product acceptable to manufacturer.

2. Cover products installed on horizontal surfaces with undyed, untreated building paper until Substantial Completion.
3. Do not move heavy and sharp objects directly over surfaces. Place hardboard or plywood panels over flooring and under objects while they are being moved. Slide or roll objects over panels without moving panels.

END OF SECTION

SECTION 099000

PAINTS AND COATINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Surface preparation.

B. Field application of paints, stains, varnishes, and other coatings.

C. See Schedule - Surfaces to be Finished, at end of Section.

D. Minimum Scope is as follows: all exposed surfaces in and on the additional or new work (interior and exterior) are to be painted unless noted otherwise (as per the schedule below, but never less than a minimum of primer and 2 coats of finish paint or stain/varnish). All previously painted surfaces in areas receiving alterations are to receive a minimum of one coat of primer and one coat of paint to match the adjacent new surfaces and new color as selected by the Architect (See finish plans). All new exposed surfaces in areas receiving alterations are to be painted unless noted otherwise in the same manner as the new exposed surfaces in the addition.

1.02 RELATED REQUIREMENTS

1.03 REFERENCE STANDARDS

A. 40 CFR 59, Subpart D - National Volatile Organic Compound Emission Standards for Architectural Coatings; U.S. Environmental Protection Agency; current edition.

B. New York State Environmental Law (DEP Regulations) Part 205:Architectural and Industrial Maintenance (AIM) Coatings, VOC Content Limits.

C. ASTM D 16 - Standard Terminology for Paint, Related Coatings, Materials, and Applications; 2003.

D. ASTM D 4442 - Standard Test Methods for Direct Moisture Content Measurement of Wood and Wood-Base Materials; 1992 (Reapproved 2003).

E. GreenSeal GS-11 - Paints; 1993.

1.04 DEFINITIONS

A. Conform to ASTM D 16 for interpretation of terms used in this section.

1.05 SUBMITTALS

A. See Section 013000 - Administrative Requirements, for submittal procedures.

B. Certification: By manufacturer that all paints and coatings comply with VOC limits specified.

C. Certification: By manufacturer that all paints and coatings do not contain any of the prohibited chemicals specified; GreenSeal GS-11 certification is not required but if provided shall constitute acceptable certification.

D. Manufacturer's Instructions: Indicate special surface preparation procedures.

E. Maintenance Data: Submit data on cleaning, touch-up, and repair of painted and coated surfaces.

1.06 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing the Products specified in this section with minimum three years documented experience.

1.07 DELIVERY, STORAGE, AND HANDLING

A. Deliver products to site in sealed and labeled containers; inspect to verify acceptability.

B. Container Label: Include manufacturer's name, type of paint, brand name, lot number, brand code, coverage, surface preparation, drying time, cleanup requirements, color designation, and instructions for mixing and reducing.

C. Paint Materials: Store at minimum ambient temperature of 45 degrees F (7 degrees C) and a maximum of 90 degrees F (32 degrees C), in ventilated area, and as required by manufacturer's instructions.

1.08 ENVIRONMENTAL REQUIREMENTS

A. Do not apply materials when surface and ambient temperatures are outside the temperature ranges required by the paint product manufacturer.

B. Do not apply exterior coatings during rain or snow, or when relative humidity is outside the humidity ranges required by the paint product manufacturer.

C. Minimum Application Temperatures for Latex Paints: 45 degrees F (7 degrees C) for interiors; 50 degrees F (10 degrees C) for exterior; unless required otherwise by manufacturer's instructions.

D. Minimum Application Temperature for Varnish Finishes: 65 degrees F (18 degrees C) for interior or exterior, unless required otherwise by manufacturer's instructions.

E. Provide lighting level of 80 ft candles (860 lx) measured mid-height at substrate surface.

1.09 EXTRA MATERIALS

A. See Section 016000 - Product Requirements, for additional provisions.

B. Supply 1 gallon (4 L) of each color; store where directed.

C. Label each container with color in addition to the manufacturer's label.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Paints:
   1. Base Manufacturer: Sherwin-Williams Company: www.sherwin-williams.com.
   2. ICI Paints North America: www.icipaintsinna.com.
   3. Benjamin Moore & Co: www.benjaminmoore.com.

B. Substitutions: See Section 016000 - Product Requirements.

2.02 PAINTS AND COATINGS - GENERAL

A. Paints and Coatings: Ready mixed, except field-catalyzed coatings. Prepare pigments:
   1. To a soft paste consistency, capable of being readily and uniformly dispersed to a homogeneous coating.

B. Volatile Organic Compound (VOC) Content:
   1. Provide coatings that comply with the most stringent requirements specified in the following:
      a. 40 CFR 59, Subpart D--National Volatile Organic Compound Emission Standards for Architectural Coatings.
      b. Ozone Transport Commission (OTC) Model Rule, Architectural, Industrial, and Maintenance Coatings; www.otcair.org; specifically:
         1) Opaque, Flat: 50 g/L, maximum.
         2) Opaque, Nonflat: 150 g/L, maximum.
         3) Opaque, High Gloss: 250 g/L, maximum.
         4) Varnishes: 350 g/L, maximum.
      c. Architectural coatings VOC limits of New York State.

2. Determination of VOC Content: Testing and calculation in accordance with 40 CFR 59, Subpart D (EPA Method 24), exclusive of colorants added to a tint base and water added at project site; or other method acceptable to authorities having jurisdiction.

2.03 PAINT SYSTEMS - EXTERIOR

A. Paint MI-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
   1. Touch-up with latex primer.
   2. Semi-gloss: Two coats of latex enamel; Progreen 200, Sherwin Williams.

2.04 PAINT SYSTEMS - INTERIOR

A. Paint WI-OP-3L - Wood, Opaque, Latex, 3 Coat:
   1. One coat of latex primer sealer.
   2. Semi-gloss: Two coats of latex enamel; Progreen 200, Sherwin Williams.

B. Paint CI-OP-3L - Concrete/Masonry, Opaque, Latex, 3 Coat:
   1. One coat of block filler at walls and latex primer as required by manufacturer at floors.
   2. Flat: Two coats of latex enamel; ProGreen 200, Sherwin Williams.
   3. Floor Enamel: Porch and Floor latex enamel; A32-100, Sherwin Williams.

C. Paint MI-OP-3L - Ferrous Metals, Unprimed, Latex, 3 Coat:
   1. One coat of latex primer.
   2. Semi-gloss: Two coats of latex enamel; Y08 Series, Sherwin Williams.

D. Paint MI-OP-2L - Ferrous Metals, Primed, Latex, 2 Coat:
   1. Touch-up with latex primer.
   2. Semi-gloss: Two coats of latex enamel; Progreen 200, Sherwin Williams.

E. Paint GI-OP-3L - Gypsum Board/Plaster, Latex, 3 Coat:
   1. One coat of alkyd primer sealer.
   2. Eggshell: Two coats of latex enamel; ProGreen 200, Sherwin Williams.

2.05 ACCESSORY MATERIALS

A. Accessory Materials: Linseed oil, shellac, turpentine, paint thinners and other materials not specifically indicated but required to achieve the finishes specified; commercial quality.

B. Patching Material: Latex filler.

C. Fastener Head Cover Material: Latex filler.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that surfaces are ready to receive Work as instructed by the product manufacturer.

B. Examine surfaces scheduled to be finished prior to commencement of work. Report any condition that may potentially affect proper application.

C. Test shop-applied primer for compatibility with subsequent cover materials.

D. Measure moisture content of surfaces using an electronic moisture meter. Do not apply finishes unless moisture content of surfaces are below the following maximums:
   1. Plaster and Gypsum Wallboard: 12 percent.
   2. Masonry, Concrete, and Concrete Unit Masonry: 12 percent.
   3. Interior Wood: 15 percent, measured in accordance with ASTM D 4442.
   4. Exterior Wood: 15 percent, measured in accordance with ASTM D 4442.
   5. Concrete Floors: 8 percent.

3.02 PREPARATION

A. Surface Appurtenances: Remove or mask electrical plates, hardware, light fixture trim, escutcheons, and fittings prior to preparing surfaces or finishing.

B. Surfaces: Correct defects and clean surfaces which affect work of this section. Remove or repair existing coatings that exhibit surface defects.

C. Marks: Seal with shellac those which may bleed through surface finishes.

D. Impervious Surfaces: Remove mildew by scrubbing with solution of tetra-sodium phosphate and bleach. Rinse with clean water and allow surface to dry.

E. Concrete and Unit Masonry Surfaces to be Painted: Remove dirt, loose mortar, scale, salt or alkali powder, and other foreign matter. Remove oil and grease with a solution of tri-sodium phosphate; rinse well and allow to dry. Remove stains caused by weathering of corroding metals with a solution of sodium metasilicate after thoroughly wetting with water. Allow to dry.

F. Gypsum Board Surfaces to be Painted: Fill minor defects with filler compound. Spot prime defects after repair.

G. Concrete Floors to be Painted: Remove contamination, acid etch, and rinse floors with clear water. Verify required acid-alkali balance is achieved. Allow to dry.

H. Galvanized Surfaces to be Painted: Remove surface contamination and oils and wash with solvent. Apply coat of etching primer.

I. Uncoated Steel and Iron Surfaces to be Painted: Remove grease, mill scale, weld splatter, dirt, and rust. Where heavy coatings of scale are evident, remove by hand wire brushing or sandblasting; clean by washing with solvent. Apply a treatment of phosphoric acid solution, ensuring weld joints, bolts, and nuts are similarly cleaned. Prime paint entire surface; spot prime after repairs.

J. Shop-Primed Steel Surfaces to be Finish Painted: Sand and scrape to remove loose primer and rust. Feather edges to make touch-up patches inconspicuous. Clean surfaces with solvent. Prime bare steel surfaces. Re-prime entire shop-primed item.

K. Interior Wood Items to Receive Opaque Finish: Wipe off dust and grit prior to priming. Seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after primer has dried; sand between coats. Back prime concealed surfaces before installation.

L. Interior Wood Items to Receive Transparent Finish: Wipe off dust and grit prior to sealing, seal knots, pitch streaks, and sappy sections with sealer. Fill nail holes and cracks after sealer has dried; sand lightly between coats. Prime concealed surfaces with gloss varnish reduced 25 percent with thinner.

M. Exterior Wood and Wood Composite Materials (Azek, etc..)to Receive Opaque Finish: Remove dust, grit, and foreign matter. Seal knots, pitch streaks, and sappy sections. Fill nail holes with tinted exterior calking compound after prime coat has been applied. Back prime concealed surfaces before installation.

N. Wood Doors to be Field-Finished: Seal wood door top and bottom edge surfaces with clear sealer where modified in field (to match factory finish by wood door manufacturer).

O. Metal Doors to be Painted: Prime metal door top and bottom edge surfaces.

3.03 APPLICATION

A. Apply products in accordance with manufacturer's instructions.

B. Do not apply finishes to surfaces that are not dry. Allow applied coats to dry before next coat is applied.

C. Apply each coat to uniform appearance. Apply each coat of paint slightly darker than preceding

coat unless otherwise approved.

D. Sand wood and metal surfaces lightly between coats to achieve required finish.

E. Vacuum clean surfaces of loose particles. Use tack cloth to remove dust and particles just prior to applying next coat.

3.04 SCHEDULE - SURFACES TO BE FINISHED

A. Do Not Paint or Finish the Following Items:
   1. Items fully factory-finished unless specifically noted.
   2. Fire rating labels, equipment serial number and capacity labels.

B. Paint the surfaces described below under Schedule - Paint Systems.

C. Mechanical and Electrical: Use paint systems defined for the substrates to be finished.
   1. Paint all insulated and exposed pipes occurring in finished areas to match background surfaces, unless otherwise indicated.
   2. Paint shop-primed items occurring in finished areas.
   3. Paint interior surfaces of air ducts and convector and baseboard heating cabinets that are visible through grilles and louvers with one coat of flat black paint to visible surfaces.
   4. Paint dampers exposed behind louvers, grilles, and convector and baseboard cabinets to match face panels.

3.05 SCHEDULE - PAINT SYSTEMS

A. Concrete, Concrete Block, Brick Masonry: Finish all surfaces exposed to view.
   1. Interior: CI-OP-3L, semi-gloss.
   2. Concrete Floors: Color as selected by Architect, see Finish Schedule.

B. Gypsum Board and Existing Plaster (verify in field): Finish all surfaces exposed to view.
   1. Interior Ceilings and Bulkheads: GI-OP-3L, flat.
   2. Interior Walls: GI-OP-3L, semi-gloss.

C. Wood (Wood Doors, Composite Trim and Columns): Finish all surfaces exposed to view.
   1. Exterior trim and frames: WE-OP-3L.
   2. Interior wood trim exposed to view: WI-OP-3L, semi-gloss.

D. Steel Doors and Frames: Finish all surfaces exposed to view; MI-OP-3l,MI-OP-2L and MgE-OP-3L coordinate with Steel Doors and Frames Spec Section 08110, semi-gloss.

E. Steel Fabrications: Finish all surfaces exposed to view.
   1. Exterior: ME-OP-3L, gloss; finish all surfaces, including concealed surfaces, before installation.

F. Galvanized Steel: Finish all surfaces exposed to view.
   1. Exterior: all exposed surfaces to be, MgE-OP-3L.

G. Shop-Primed Metal Items: Finish all surfaces exposed to view.
   1. Finish all exposed surfaces.
   2. Exterior: all miscellaneous (handrails/guardrails, etc..)to match, ME-OP-2L.
   3. Interior: all miscellaneous to match, MI-OP-2L.

END OF SECTION

SECTION 102113

TOILET COMPARTMENTS

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data, Shop Drawings, and Samples.

PART 2 - PRODUCTS

2.1 TOILET COMPARTMENTS AND SCREENS

A. [**Available**]Products:

1. Global, Bobrick or approved equal.

2.2 MATERIALS

A. **Panel, Pilaster, and** Door Material:

1. Steel Sheets for Color-Coated Finish: Mill-phosphatized, corrosion-resistant steel sheet; ASTM A 591/A 591M, Class C, or ASTM A 653/A 653M.
2. Stainless-Steel Sheet: ASTM A 666, Type 304, [**No. 3 or No. 4 directional polish**] [**textured finish**].
3. Plastic Laminate: NEMA LD 3, Grade HGS.
4. Solid-Plastic, Phenolic Core: Solid phenolic core with melamine facing on both sides, without visible glue line or seam, with eased edges and with minimum 3/4-inch- (19-mm-) thick doors and pilasters and minimum 1/2-inch- (13-mm-) thick panels and screens.
5. Solid-Plastic, Polymer Resin: High-density polyethylene with homogenous color, not less than 1 inch (25 mm) thick, with seamless construction and eased edges.
6. Color: **As selected** by owner/engieer.

B. Core Material for Metal-Faced Units: Sound-deadening honeycomb of resin-impregnated kraft paper in thickness required to provide finished thickness of 1 inch (25 mm) minimum for doors, panels, and screens and 1-1/4 inches (32 mm) minimum for pilasters.

C. Core Material for Plastic Laminate: ANSI A208.1, Grade M-2 particleboard, in thicknesses required to provide nominal thicknesses of 1 inch (25 mm) minimum for doors, panels, and screens and 1-1/4 inches (32 mm) minimum for pilasters.

D. Pilaster Shoes and Sleeves (Caps): **Stainless steel**, not less than 3 inches (75 mm) high.

E. Brackets: [**Stirrup**] [**Continuous**].

1. Material: **Stainless steel**

2.3 FABRICATION

A. Toilet Compartments: **Floor anchored**.

B. Urinal Screens: **Floor anchored**.

C. Metal Units: Internally reinforce metal panels for hardware, accessories, and grab bars.

D. Solid-Plastic, Polymer-Resin Units: Provide aluminum heat-sink strips at exposed bottom edges of panels and doors.

E. Doors: Unless otherwise indicated, 24-inch- (610-mm-) wide in-swinging doors for standard toilet compartments and 36-inch- (914-mm-) wide out-swinging doors with a minimum 32-inch- (813-mm-) wide clear opening for compartments indicated to be accessible to people with disabilities.

F. Door Hardware: [**Clear-anodized aluminum or cast-zinc alloy (zamac)**] [**Stainless steel**] [**Chrome-plated brass**]. Provide units that comply with accessibility requirements of authorities having jurisdiction at compartments indicated to be accessible to people with disabilities.

1. Hinges: Self-closing type, adjustable to hold door open at any angle up to 90 degrees.
2. Latches and Keepers: **Surface-mounted** unit designed for emergency access and with combination rubber-faced door strike and keeper.
3. Coat Hook: Combination hook and rubber-tipped bumper, sized to prevent door from hitting compartment-mounted accessories.
4. Door Bumper: Rubber-tipped bumpers at out-swinging doors or entrance screen doors.
5. Door Pull: Provide at out-swinging doors. Provide units on both sides of doors at compartments indicated to be accessible to people with disabilities.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install units rigid, straight, level, and plumb, with not more than 1/2 inch (13 mm) between pilasters and panels and not more than 1 inch (25 mm) between panels and walls. Provide brackets, pilaster shoes, bracing, and other components required for a complete installation. Use theft-resistant exposed fasteners finished to match hardware. Use sleeve nuts for through-bolt applications.

1. Stirrup Brackets: Align brackets at pilasters with brackets at walls.[**Locate wall brackets so holes for wall anchors occur in masonry or tile joints.**]
2. Set hinges on in-swinging doors to hold open approximately 30 degrees from closed position when unlatched. Set hinges on out-swinging doors and swing doors in entrance screens to return to fully closed position.

END OF SECTION 102113

SECTION 108000

TOILET ACCESSORIES

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Accessories for Toilet Rooms and Exam Room sinks.

B. Grab bars.

1.02 RELATED REQUIREMENTS

A. Section 061000 - Rough Carpentry: Concealed supports for accessories, including in wall framing and plates and above ceiling framing where required.

1.03 REFERENCE STANDARDS

A. ASTM A 123/A 123M - Standard Specification for Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products; 2002.

B. ASTM A 269 - Standard Specification for Seamless and Welded Austenitic Stainless Steel Tubing for General Service; 2008.

C. ASTM A 653/A 653M - Standard Specification for Steel Sheet, Zinc-Coated (Galvanized) or Zinc-Iron Alloy-Coated (Galvannealed) by the Hot-Dip Process; 2009.

D. ASTM A 666 - Standard Specification for Annealed or Cold-Worked Austenitic Stainless Steel Sheet, Strip, Plate, and Flat Bar; 2003.

E. ASTM C 1036 - Standard Specification for Flat Glass; 2006.

F. GSA CID A-A-3002 - Mirrors, Glass; U.S. General Services Administration; 1996.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordinate the work with the placement of internal wall reinforcement and concealed ceiling supports to receive anchor attachments.

1.05 SUBMITTALS

A. Product Data: Provide data on accessories describing size, finish, details of function, attachment methods.

B. Manufacturer's Installation Instructions: Indicate special procedures and conditions requiring special attention.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Toilet Accessories:
   1. AJW Architectural Products (ajw.com) or equal.

2.02 MATERIALS

A. Accessories - General: Shop assembled, free of dents and scratches and packaged complete with anchors and fittings, steel anchor plates, adapters, and anchor components for installation.
   1. Grind welded joints smooth.
   2. Fabricate units made of metal sheet of seamless sheets, with flat surfaces.

B. Stainless Steel Sheet: ASTM A 666, Type 304.

C. Stainless Steel Tubing: ASTM A 269, Type 304 or 316.

D. Galvanized Sheet Steel: Hot-dipped galvanized steel sheet, ASTM A 653/A 653M, with G90/Z275 coating.

E. Mirror Glass: Tempered ¼" thick Safety Glass.

F. Adhesive: Two component epoxy type, waterproof, security grade.

G. Fasteners, Screws, and Bolts: Hot dip galvanized, tamper-proof, security type, tamper resistant.

H. Expansion Shields: Fiber, lead, or rubber as recommended by accessory manufacturer for component and substrate.

2.03 FINISHES

A. Stainless Steel: No. 4 satin brushed finish, unless otherwise noted.

B. Baked Enamel: Pretreat to clean condition, apply one coat primer and minimum two coats epoxy baked enamel.

C. Galvanizing for Items Other than Sheet: Comply with ASTM A 123/A 123M; galvanize ferrous metal and fastening devices.

D. Back paint components where contact is made with building finishes to prevent electrolysis.

2.04 TOILET ROOM ACCESSORIES

A. Soap Dispenser, Toilet Tissue Dispenser and Paper Towel Dispenser provided and installed by Contractor, including all required blocking. Cut and patch walls as required. Steris-Kare Soap Dispenser deck mounted, #1307Q5 With Spill Guard Attachment. Verify with Owner prior to ordering. Provide and Install one at each new lavatory.

B. Grab Bars to be 18", 36" and 42" in length; with a peened finish, 1 ½" outside diameter, concealed mounting (snap cover over mounting flange) as manufactured by AJW Architectural Products (UG3X-A series) or equal. Provide and install where shown on the interior elevations or floor plans.

C. Mirrors to be 24" x 48" U716 Series as manufactured by AJW Architectural Products with ¼" tempered glass. To be mounted at a maximum of 40" above the finish floor to the reflective surface, coordinate in field as required. Seal all miter joints. Provide and install a new mirror over each new lavatory.

D. Sanitary Napkin Disposal to be provided and installed by Contractor, Rubbermaid #6140 with rigid liner, white. Confirm with Owner prior to ordering. Provide and install at each new Women's Room water closet.

E. Surface Mounted Toilet Tissue Dispenser; Baywest, Dubl-Serv *80200. Confirm with Owner prior to ordering. Provide at each new water closet.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify existing conditions before starting work.

B. Verify exact location of accessories for installation.

C. Verify that field measurements are as indicated on drawings.

3.02 PREPARATION

A. Deliver inserts and rough-in frames to site for timely installation.

B. Provide templates and rough-in measurements as required.

3.03 INSTALLATION

A. Install accessories in accordance with manufacturers' instructions.

B. Install plumb and level, securely and rigidly anchored to substrate. Provide additional concealed blocking (fire rated) as required to support new accessories. Cut and patch as required.

C. Mounting Heights and Locations: As required by accessibility regulations, as indicated on

drawings and specifications.

END OF SECTION

SECTION 123400

PLASTIC LAMINATE CASEWORK AND COUNTERTOPS

PART 1 – GENERAL

1.1 SUMMARY

A. Related Documents:
   1. Drawings and provisions of the contract including General Conditions Supplementary Conditions and Division 1, apply to this section.

B. Section Includes:
   1. Furnish and install plastic laminate casework and accessories as shown and listed on drawings and specified herein. Includes all countertops, sink cutouts, splashes, supports, shelving, and filler panels necessary for a complete casework installation
   2. All casework on this project uses this specification section as a basis.

C. Related Requirements to be Performed by Others:
   1. Division 06 Section: “Rough Carpentry” for blocking within walls to adequately support casework.
   2. Division 06 Section: “Finish Carpentry”/Millwork.
   3. Division 07 Section: “Preformed Joint Seals” for caulking of casework and/or countertops to abutting walls.
   4. Division 09 Section: “Resilient Base and Accessories” for resilient base applied to manufactured casework.
   5. Division 22 Section: “Plumbing” for furnishing, installation, and hook-up of sinks, fixtures, outlets, strainers, tailpieces, traps, vacuum breakers, and stops shall be performed by the plumbing contractor to state and local codes. In all cases, sink cutouts shall be by the casework contractor.
   6. Division 26 Section: “Electrical” for the electrical contractor to state and local codes shall perform electrical furnishing, installation, and final connections of wiring, conduit, and/or electrical items within casework.

1.2 REFERENCES

A. ANSI-A135: for all hardboard.
B. ANSI-A161.2-1998: for performance of fabricated high-pressure decorative laminate countertops.
C. ANSI-A208.1-2009: for grade M-3 mat-formed wood particleboard.
D. BHMA A156.9: for grade-1 hinge requirements.
E. NEMA 3 LD-2005: for performance requirements of high pressure laminates.
F. SEFA 8PL Recommended Practices: for cabinet construction.

1.3 DEFINITIONS

A. Exposed:
   1. In casework, surfaces visible when drawers and opaque doors (if any) are closed; behind clear glass doors; bottoms of cabinets 42" or more above finished floor; and tops of cabinets less than 78" above finished floor.

B. Semi-Exposed:

1. In casework, surfaces that become visible when opaque doors are open or drawers are extended; bottoms of cabinets more than 30" or tops of cabinets less than 42" above finished floor.

1.4 SUBMITTALS

A. Shop Drawings:
   1. Include catalog numbers and specifications of Manufacturer.
   2. Submit three sets of laser quality, 11 x 17 shop drawings consisting of:
      a. Finish, hardware, construction options selection sheet.
      b. Small scale floor plan showing casework in relation to the building.
      c. Large scale elevations and plan views.
      d. Blocking locations within walls (blocking by Contractor).

B. Samples:
   1. Submit one set of laminate color brochures from standard laminate manufacturers Wilsonart, Formica, Pionite, and Nevamar.
   2. Submit one edge color sample chain.
   3. Submit one set of interior colors samples.

C. Warranty:
   1. Provide sample warranty document stating specified terms as referenced in 1.8.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Must be certified for chain of custody by a third party certification group approved by FSC.

B. Manufacturer must comply with requirements for modular cabinets in Architectural Woodwork Institute including:
   1. Provide affirmation letter from AWI that manufacturer is duly certified for premium grade from the AWI Quality Certification Program for sections P400B, P600, P400C and 1600.
   2. Provide labels indicating that manufactured casework meets AWI standards.

C. Manufacturer to provide SEFA 8 laboratory furniture certificate of performance on construction method.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Delivery and Acceptance Requirements:
   1. Deliver casework once painting, and similar requirements have been completed that will not damage casework. This includes ensuring spaces are enclosed and weather tight.
   2. All casework shall be blanket wrapped for protection during shipping.

B. Storage and Handling:
   1. Casework must be protected from dust, dirt and/or other trades.
   2. Countertops are stacked, properly supported and spaced evenly to avoid warping. Large pieces are stacked first on the pallets with shorter pieces stacked on top.

1.7 SITE CONDITIONS

A. Ambient Conditions:
   1. Do not deliver or install the casework until concrete, masonry, and drywall/plaster work is dry; ambient relative humidity is maintained between 25 – 55% prior to delivery and throughout the life of installation; and the temperature is controlled above 55°F.

2. Casework shall not be stored or installed in non-climate controlled conditions.

1.8 WARRANTY

A. Case Systems shall offer a **Five-Year** warranty to the original owner against defective material and workmanship.
   1. The warranty specifically does not cover any product or hardware, which has been incorrectly installed, including poor climate conditions, exposed to excessive loads or abuse.
   2. All non-casework items supplied, but not manufactured at Case Systems including, but not limited to sinks, fixtures, apparatus, fume hoods, keyboard trays, spray booths, lights, power outlets, and power strips shall be covered under the original manufacturers' warranty.

PART 2– PRODUCTS

2.1 MANUFACTURERS

A. Basis-of-Design Product: **Case Systems**, 2700 James Savage Road, Midland, Michigan 48642 (989) 496-9510 or approved equal.

B. Substitution Limitations:
   1. Substitutions will be considered only when other manufacturers submit substitution requests in accordance with procurement substitution and/or substitution procedures, or provide a comparable product with the following support information detailed below:
      a. Written documentation stating specification compliance regarding construction, materials, and standard of quality and manufacturing techniques.
      b. Note all deviations to the drawings and/or specifications in writing.
      c. The owner, or its designated representative, reserves the right to reject any proposal that in his opinion fails to meet the criteria established by this specification. Such a decision shall be final.

2.2 MATERIALS

A. Provide Plastic Laminate Faced Cabinets Manufactured with:
   1. Particleboard Core:
      a. All particleboard shall be Grade M-3 and shall meet or exceed all requirements as set by ANSI A208.1-2009.

Density	40-50 lbs/cu.ft
Moisture Content	10% Max
Modulus of Rupture	2393 psi
Modulus of Elasticity	398,900 psi
Internal Bond	80 psi
Hardness	500 pounds Min
Linear Expansion	0.35%
Thickness Tolerance	+/- 0.008"
Face Screw Holding	247 pounds Min

   2. MR (Moisture Resistant) Core shall be:
      a. Interior-Grade moisture resistant particleboard.
      b. Meet or exceed M-3 Grade, according ANSI-A208.1-2009.
   3. Low Emitting Core shall be:
      a. NAUF (No added Urea Formaldehyde) M-2 Particleboard:
         i. For casework core having recycled content.
         ii. For casework core being manufactured without the use of urea formaldehyde.

iii. For products having chain-of-custody certificates certifying that the wood used in the casework complies with FSC requirements.

b. NAUF (No added Urea Formaldehyde) Plywood:

i. Plywood that meets or exceeds the standards set forth by the APA for structural use panels.

ii. For casework core being manufactured without the use of urea formaldehyde.

iii. For products having chain-of-custody certificates certifying that the wood used in the casework complies with FSC requirements.

B. Joinery:

1. Mechanical Joinery:

a. All cabinet body components shall be secured utilizing concealed interlocking mechanical fasteners as approved by the AWI Quality Standards 8th Edition -2003 Sections 400A-T-12, 400B-T10 and 1600-T-11.

C. Surface Material:

1. Acceptable laminate color, pattern, and finish as either scheduled or otherwise indicated on drawings or as selected by Architect from manufacturer's standards types and nominal thickness including:

a. Vertical surface decorative grade VGS: .028" thick

b. General purpose decorative grade HGS: .048" thick

c. Cabinet decorative liner grade CLS: .020" thick

d. Non-decorative backer grade BKH: .028" thick

e. Thermally fused melamine laminate

f. Chemical resistant decorative laminate

D. Edge banding:

1. PVC

a. Shall be applied utilizing hot melt adhesive and radiused by automatic trimmers. Edging shall be available in a variety of color options.

E. Adhesives:

1. PVA

a. Adhesive shall be mechanically applied.

b. NAUF, no VOC

2. EVA

a. Adhesive shall be mechanically applied.

2.3 FABRICATION

A. General Cabinet Body Construction:

1. Cabinet Box Style shall be **Standard: Reveal Overlay**.
2. Cabinet Box Core shall be **NAUF Plywood**.
3. Bottoms and ends of cabinets, and tops of wall and tall cabinets (all structural components) shall be 3/4" thick.
4. All panels shall be manufactured with balanced construction.
5. Fixed interior components such as fixed shelves, dividers, and cubicle compartments shall be full 3/4" thick and attached with concealed interlocking mechanical fasteners.
6. Cabinet body exterior surfaces shall be: **HGS**.
7. Cabinet finished interior options shall be: **Finished at All**.
8. Cabinet body interior surfaces shall be: **Cabinet Liner Grade CLS**.
9. Cabinet body front edge shall be: **3mm PVC**.
10. Mounting stretchers are 3/4" thick structural components fastened to end panels and back by mechanical fasteners, and are concealed by the cabinet back.

11. When the rear of a cabinet is exposed, a separate finished 3/4" thick decorative laminate back panel may be specified.
12. Backs of cabinets are 1/2" thick surfaced both sides for balanced construction and fully captured on both sides and bottom.
13. A 5mm diameter row hole pattern 32mm (1-1/4") on center shall be bored in cabinet ends for adjustable shelves. This row hole pattern shall also serve for hardware mounting and replacement and/or relocation of cabinet components.
14. An upper 3/4" thick stretcher shall be located behind the back panel and attached between the end panels with mechanical fasteners. This stretcher is also fastened to the full sub-top thus capturing the back panel.

B. Base Cabinet Construction:
1. All base cabinets, except sink cabinets, shall have a solid 3/4" thick sub-top of core (as specified above), fastened between the ends with interlocking mechanical fasteners.
2. Sink cabinets with a split removable back panel shall have a formed metal front brace, and steel corner gussets shall be utilized to support and securely fasten top in all four corners. Front brace shall be powder coated black.

C. Tall Cabinet Construction:
1. All tall cabinets shall be provided with an intermediate fixed shelf to maintain internal dimensional stability under heavy loading conditions as well as an intermediate 3/4" thick stretcher located behind the back panel and be secured between the cabinet ends with mechanical fasteners. The stretcher shall be secured to the shelf through the back with #8 x 2" plated flat head screws.

D. Wall Cabinet Construction:
1. All wall cabinet bottoms shall be 1" thick core (type specified above), mechanically fastened between end panels and secured to the bottom back stretcher. A lower 3/4" thick stretcher shall be located behind the back panel and attached between the end panels with mechanical fasteners. The stretcher is also secured through the back and into the cabinet bottom.
2. All wall cabinet exterior bottoms shall be: **Match Exterior Surface**.
3. All wall cabinet tops shall be: ¾" thick.

E. Tall and Wall Cabinet Top Edges shall be:**.020" PVC at Top of End Panels, Stretchers & Back**.

F. Tall, Wall and Hutch Tops shall be: **CLS to Match Standard Interior**.

G. Tall, Wall and Hutch Upper Door Reveal shall be: **Standard: 15mm Reveal**.

H. Toe Base of Cabinet:
1. Individual bases shall be constructed of: **MR Board** at Vanities and Kitchen, **NAUF Plywood at all other locations,** factory applied to base and tall cabinets and shall support and carry the load of the end panels, and the cabinet bottom, directly to the floor. The base shall be let in from the sides and back of the cabinet to allow cabinets to be installed tightly together and tight against a wall, also to conceal the top edge of applied vinyl base molding (not supplied by casework manufacturer). There shall be a front to back center support for all bases over 30" wide.
2. Toe Base Height **to be 4”**.
3. Toe Base Options **Standard: Attached**.

I. Drawer Fronts and Solid Doors:
1. All drawer fronts and solid door components shall be: **NAUF Plywood** surfaced both sides for balanced construction.
2. Options shall be: **HPL Door Interior and Exterior (both sides match front surface color), True ¾" Core**
3. Surfaces shall be: **HPL Grade HGS**
4. Door and drawer front edge shall be: **Standard: 3mm PVC**.

J. Drawer Boxes:
1. Drawer box constructed with a full 1/2" thick core shall be: **NAUF Plywood** non-racking, non-deflecting platform bottom that is carried directly by “L” shaped, bottom mount drawer glides.

2. Drawer box at finished interiors shall be: **Standard: Surface to Match Standard Interior**.
3. **Standard: Slides are secured with 1-1/4" long screws driven through the platform and into the sides. Drawer box sides, backs, sub-front, and bottom shall be 1/2". The top edge shall be nominal 1mm (.020") PVC matching the drawer color. Drawer box corners shall be joined with fluted hardwood dowels and glue spaced at a minimum of 32mm on center. Drawer box fronts shall be removable and attached to drawer box sub-front with screws from inside of drawer. Horizontal parting rails between drawers shall be 3/4" thick core, with balanced surfaces, secured to and further reinforcing cabinet ends. File drawer box shall have full-height sides supporting a heavy-duty support rail for hanging file folders**.

K. Doors:
1. Solid Doors shall be: **Standard: ¾" thick core**.

L. Shelves:
1. Adjustable:
   a. Adjustable shelves shall be: **NAUF Plywood** core, with balanced surfaces.
   b. Adjustable shelves in closed cabinets shall be: **Standard: ¾" Shelves, 1" for Shelves Over 36" Wide and Open Cabinets**
   c. All adjustable shelves in open cabinets shall be: 1" thick, except for special use cabinets such as mail, cubical, instrument or locker type units.
   d. Adjustable shelf edge on open cabinets shall be: **Standard: .020" Match Edge at Front**.
   e. Adjustable shelf edge on closed cabinets shall be: **Standard: .020" Match Edge at Front**.
   f. Adjustable shelf shall be set back **Standard: 15mm from the front**.
2. Fixed:
   a. Fixed shelves shall be: **NAUF Plywood**.
   b. Fixed shelves shall be: **Standard: ¾" Shelves, 1" at Opens**.
   c. Fixed shelf surfaces on closed cabinets shall be: **Standard: Match Interior Selections**.
   d. Fixed shelf surfaces on open cabinets shall be: **Standard: Match Interior Selections**.
3. Wall shelving selections for model numbers R204, R205, R206 only shall be:
   a. **3mm PVC**.
   b. **NAUF Plywood**.
   c. **Standard: Thermally Fused**.
4. Wire Shelves shall be white, plastic coated.
5. Hardboard Shelves shall be ¼" thick tempered hardboard. All hardboard shall have a “S2S” surface finish.

M. Specialty Products:
1. Rail Mounted Cabinets:
   a. Wall mounted continuous support rail and cabinet mounted interface hooks shall be an anodized finished extruded aluminum.
   b. Wall mount support shall come factory pre-drilled 8" on center for mounting to 16" or 24" on center studs and in-wall blocking. Blocking is required per manufacturers’ recommendations and is supplied and installed by other specified trade.
   c. Cabinet interface hooks shall be pre-mounted at the factory with deep thread 7mm x 70mm specialty screws. Screws shall not be visible in cabinet interior. Hook styles shall be available for single, and triple height adjustment based on the cabinet model number.
   d. Cabinet lower leveling bar shall be adjustable from cabinet interior and shall allow for plus or minus 3/8" plumb adjustment without additional materials.

e. Recommended maximum load capacity for base cabinets with a 1-1/8" standard laminate countertop, wall cabinets and tall cabinets shall be 100 lbs per linear foot.

f. Rail mounted casework shall be vertically (dependent on model #) and horizontally adjustable.

g. Core material only available in grade M3 particleboard core.

h. **Optional Leg Supports shall be Available to Accommodate Heavier Loads for Tall and Base Rail Cabinets**.

2. Countertops:

a. All counters to be HPL 0.050" material as manufactured by Formica, on 1 1/2" plywood substrate.

i. All joints shall be secured with biscuits for alignment and tight joint fasteners.

ii. Provide 4" high back splashes with thickness matching countertop thickness where shown and at all ends abutting walls and adjacent cabinets.

iii. Provide edges **Self edge of the same material as top**.

iv. The maximum lengths of HPL build-up plywood tops is 8'.

2.4 FINISHES

A. Plastic Laminate Casework Colors:

1. High Pressure Laminate is available in non-premium, non-specialty and manufacturers' standard suede finishes from our select laminate manufacturers, including:

a. **Standard: Wilsonart® in a "60" or "38" matte finish]** and **[Standard: Nevamar® in a "T" textured finish]** and **[Standard: Formica in a "58" finish]** and **[Standard: Pionite in an "N" finish]**.

b. Color: as selected by Architect.

2. Thermally Fused Melamine Laminate that meets performance requirements of ANSI/NEMA 3 LD – 2005 for GP-28.

a. **[Standard: Natural Almond (Wilsonart D30)]** or **[Standard: Fashion Grey (Wilsonart D381)]** or **[Standard: Frosty White (Wilsonart 1573)]**.

3. Cabinet Liner .020" thick, high-pressure cabinet liner conforming to ANSI/NEMA 3 LD – 2005, Grade CLS. Surface texture shall be similar to exterior finish. Color shall match interior.

a. **[Standard: Almond]** or **[Standard: Grey]** or **[Standard: White]**.

B. Solid Surface Countertop Colors:

a. Color: Color as selected by Architect, see drawings.

C. Accessories:

1. Hinges:

a. 5-Knuckle Hinge / Reveal Overlay: To be selected from all available. Three finishes are available as standard in epoxy powder coat: **[Black]** or **[Almond]** or **[Platinum]** and **[Brushed Chrome]** or **[Stainless]**.

b. Inset 5-Knuckle Hinge: Three finishes are available as standard in: **[Black]** or **[Almond]** or **[Platinum]**.

D. Glazed Door Trim shall be one of our standard colors: **[Black]** or **[White]** or **[Almond]** or **[Grey]**.

E. Pulls:

1. **[Aluminum Wire]**

2. **[96mm Stainless Steel]**

F. Countertop Supports shall be in one of our standard colors: **[Light Grey]** or **[Light Neutral]** or **[Black]** or **[White]**.

G. Table Frames shall be in one of our standard colors: **[Light Neutral]** or **[Light Grey]** or **[Black]**.

H. Round Grommet shall be in one of our standard colors: **[Black]** or **[Almond]** or **[Grey]** or **[White]**.

I. Round Grommets shall be in one of our standard colors: **[Black]** or **[Almond]** or **[Grey]** or **[White]**.

2.5 ACCESSORIES

A. Hardware:

1. Hinges:
   a. **[5-Knuckle Hinges / Reveal Overlay: Standard: Hinges shall be: .095" thick steel five-knuckle hospital-tip, institutional Grade (Grade 1 per ANSI/BHMA A156.9) quality with .187" diameter tight pin. Each hinge shall be secured with a minimum of nine No. 8 screws. Hinge shall permit door to swing 270 degrees without binding. Doors less than 48" in height shall have two hinges. Doors over 48" in height shall have three hinges**.
2. Pulls:
   a. One pull shall be: located at the centerline of the drawer, regardless of width, to ensure ease of operation and maximize drawer slide life.
      i. **Standard: Anodized aluminum wire pull, 8mm diameter with 96mm O.C. mounting holes**.
3. Drawer Slides:
   a. **Standard drawer: Self-closing, bottom mount epoxy coated with captive roller and positive in stop. Slide shall have 100 lb. load rating, must be: self-closing and must prevent drawer fronts from contacting the cabinet body. Drawer slides must meet or exceed Grade 1 requirements per ANSI A156.9/BHMA with full extension slides on file and paper storage]**.
   b. File drawer: Full extension, bottom mount epoxy coated with captive roller and positive in stop. Slide shall have 100lb. load rating, must be: full extension, and prevent drawer fronts from contacting the cabinet body. Drawer slides must meet or exceed Grade 1 requirements per ANSI/BHMA.
4. Wall Shelving Hardware:
   a. **Standard duty wall shelving hardware, including standards and brackets, are available in an anochrome finish**.
   b. Bracket Mounted Shelf Core shall be: **NAUF Particleboard**.
   c. Bracket Mounted Shelf Edge shall be: **3mm**.
   d. Bracket Mounted Shelf Surface shall be: **HGS laminate**
5. Shelf Clips:
   a. **[Standard: Plastic]**
      i. Shelf clips shall be injected molded clear plastic, with a double pin engagement 32mm on center and shall have 3/4" and 1" anti-tip locking tabs as approved in AWI 400B-T-9 for premium Grade. Shelf clips shall be: single pin plastic shelf clip with anti-tip locking tabs, used for all 1/4" hardboard shelves.
6. Locks (where shown or noted only):
   a. Lock Locations:
      i. **Selected Cabinets Shown on Drawings**.
   b. Lock Type:
      i. **Standard Lock - National: Five disc tumbler cam locks, chrome plated steel faceplate. All locks keyed alike or keyed differently by room and master keyed. Shall permit a minimum of 50 keying options. Lock core is removable permitting owner to easily change lock arrangements. Inactive door of base and wall cabinets shall be: secured by using an elbow catch, or a chain pull for tall cabinets**.
7. Casters:
   a. Shall be available in both 4" (3" diameter wheel) and 6" (5" diameter wheel) nominal heights. 4" casters must have a minimum load rating of 165 lbs per caster and the 6" casters must have a minimum load rating of 200 lbs per caster. Shall be ball bearing

with 360° swivel. Shall have non-marring wheels available in both locking and non-locking.

8. Catches:
   a. Chain Pulls shall be zinc plated, spring loaded door catch used to hold door securely shut.
   b. Chain Stops shall be zinc plated, looped chain used to limit door swing as specified, mounting plate at each end of chain shall use (4) #7 x 5/8" screws to secure to cabinet door and end panel. They shall be on cabinets at adjoining walls and where casework and countertops can interfere with the door swing of the tall cabinet.
   c. Elbow Catch shall be chrome plated, spring loaded, used to hold non-locking door securely shut.
   d. Roller Catch, (not used with self-closing hinges) shall have: heavy-duty, spring-loaded roller, with molded plastic bumper mounted at door top to keep door securely shut.
   e. Magnetic Catch, (not used with self-closing hinges) shall have: white plastic housing with two 32mm spaced, elongated holes for screw-attachment to allow adjustability.
   f. Catches shall be: **Standard: Magnetic at Base and Wall, 1 Roller at Tall**.
9. Countertop Supports:
   a. Powder coated, formed metal supports. Must provide attachment points between counter top and wall.
10. Grommets:
   a. Paper Grommets are black.
   b. Round Grommets are available in four colors.
   c. Oval Grommets are black.

2.6 SOURCE QUALITY TESTING

A. Cabinet Joinery:
1. Base Cabinet:
   a. Base cabinet testing shall be: done in accordance with SEFA 8PL Recommended Practices Paragraph 4.0 Base Cabinets. All testing shall be performed by SEFA certified independent testing facilities. The following tests shall be performed:
   The SEFA 8 test procedures are accessible on-line at www.sefalabs.com.
   The ANSI/NEMA 3 LD – 2005 test procedures are available on-line at www.global.ihs.com

Test	Paragraph
Cabinet Load	4.2
Cabinet Concentrated Load	4.3
Cabinet Torsion	4.4
Cabinet Submersion	4.5

2. Doors:
   a. Door testing shall be: done in accordance with SEFA 8PL Recommended Practices Paragraph 5.0 Doors. The following tests shall be performed:

Test	Paragraph
Door Hinge Test	5.1
Door Cycle Test	5.2

3. Drawers:
   a. Drawer testing shall be: done in accordance with SEFA 8PL Recommended Practices Paragraph 6.0 Drawers. The following tests shall be performed:

Test	Paragraph
Drawer Static Test	6.1
Drawer Impact Test	6.2
Drawer Internal Rolling Test	6.3
Drawer Cycle Test	6.4

4. Cabinet Surface Finish:
   a. Cabinet surface finish tests shall be: done in accordance with SEFA 8PL Recommended Practices Paragraph 8.0, Cabinet Surface Finish Tests. The following testing shall be performed:

Test	Paragraph
Chemical Spot Test	8.1
Boiling Water Resistance Test (ANSI/NEMA LD 3 -2005 Paragraph 3.5)	8.2
Ball Impact Resistance Test (ANSI/NEMA LD 3 -2005 Paragraph 3.8)	8.3
Dart Impact resistance Test (ANSI/NEMA LD 3 – 2005 Paragraph 3.9)	8.4

5. Edge Delaminating Test:
   a. Edge delaminating tests shall be: done in accordance with SEFA 8PL Recommended Practices Paragraph 8.5, Edge Delaminating Test.
6. Wall, Counter Mounted, and Tall Cabinets Load Test:
   a. The wall mounted cabinet load test shall be: done in accordance with SEFA 8PL Recommended Practices Paragraph 9.0.

PART 3 – EXECUTION

3.1 INSTALLERS

A. Installation shall be: by casework manufacturer's authorized representative.

3.2 INSTALLATION

A. Casework shall not be: installed until concrete, masonry, and drywall/plaster work is dry.
B. +Casework shall be: installed plumb and true and is to be securely anchored in place.
C. The casework contractor shall verify all critical building dimensions prior to fabrication of casework.
D. Provide all labor for unloading, distribution, and installation of casework and related items as specified.
E. All casework shall be: securely anchored to horizontal wall blocking, not to plaster lathe or wall board.
F. The casework manufacturer shall re-configure the casework arrangements to dimensions requiring 2-1/2" or less of filler at each end of wall-to-wall elevations, and to ensure a complete and satisfactory installation.
G. The casework installer shall remove all debris, sawdust, scraps, and leave casework spaces clean.
H. All casework must be installed by casework installer plumb and level, adjust all doors, drawers and hardware to comply with manufacturers specifications and operate properly.

-END OF SECTION-

15060 GENERAL CONDITIONS - PLUMBING

1.0 Governing Conditions

A. General Conditions of the Plumbing Contract shall be in accordance with:

1. "Standard General Conditions of the Construction Contract per AIA 201" - latest edition.

2. "Instructions to Bidders - AIA" - latest edition.

3. Special conditions of the contract as included in general construction documents.

2.0 Drawings

A. The scope of the Plumbing installation is indicated on the plans and in the specifications.

3.0 Shop Drawings and Approvals

A. Furnish shop drawings for approval, six copies on all major items of equipment. Items requiring shop drawings are:
   1. All equipment show on drawing legend and schedule.
   2. Domestic water piping distribution
   3. Sanitary piping distribution

B. The contractor shall be responsible for producing original shop drawings of piping layouts. Modified reproductions of the design documents shall not be acceptable.

C. Shop drawings that are illegible in the opinion of the engineer shall not be acceptable.

D. The materials, workmanship, design and arrangement of all work installed under the contract shall be subject to the approval of the engineer.

E. If material or equipment is installed before it is approved, the contractor shall be liable for the removal and replacement at no extra charge to the owner if, in the opinion of the engineer, the material or equipment does not meet the intent of the drawings and specifications.

F. The words "or approved equal" shall be understood to follow the name of all manufacturers stated herein.

4.0 Workmanship

A. Provide neat mechanical appearance. Provide minor alterations to accomplish. Conceal all piping in all finished areas.

B. With submission of bid, the contractor shall give written notice to the engineer of any materials, apparatus, or omissions believed to be in violation of laws, ordinances, rules or regulations of authorities having jurisdiction. In the absence of such written notice, it is mutually agreed that the contractor shall include the cost of providing all systems in accordance with applicable regulations without extra compensation.

5.0 Materials

A. Provide the best-accepted industry standard equipment and materials. Entire installation shall conform to principles and practices of International Plumbing Code and shall meet New York State Plumbing Code requirements.

B. Substitutions of equipment or materials other than those indicated on the drawings may be made only upon written approval from the engineer. The contractor shall submit his substitution for approval before releasing order for fabrication and/or shipment. Engineer reserves the right to disapprove such substitutions provided, in his opinion, the item offered is not equal to the item specified.

C. Where such approved deviation requires a different quantity and arrangement of materials and equipment from that specified or indicated on the drawings, subject to approval of the engineer, the contractor shall provide any such materials and equipment as required by the system, at no additional cost to the owner.

6.0 Guarantee

A. Contractor shall guarantee all workmanship, materials and performance for a period of one year from the date of the certificate of completion and acceptance of his work. The contractor shall promptly correct, without cost to the owner, such defects upon notice from the owner to do so.

7.0 Codes, Permits, Inspections

A. Comply with plumbing code requirements of the municipality in which located, New York Building Code and National Plumbing Code. Materials per code hereinbefore mentioned. Furnish permit and certificate of final inspection from municipality. Contractor shall pay all fees and inspections and same shall be included in the contract amount.

8.0 Tests

A. Labor, material, instruments and power required for testing shall be furnished by this contractor.

B. Tests shall be performed in the presence and to the satisfaction of the engineer and such other parties as may have legal jurisdiction.

C. Pressure tests shall be applied to piping only before connection of equipment. In no case shall piping, equipment or accessories be subject to pressure exceeding their rating.

D. All defective work shall be promptly repaired or replaced, and the tests shall be repeated until the particular system and component parts thereof receive the approval of the engineer.

E. Any damages resulting from tests shall be repaired, and damaged materials replaced, all to the satisfaction of the engineer.

F. The duration of tests shall be as determined by all authorities having jurisdiction, but in no case less than the time prescribed in the specification.

G. Equipment and systems which normally operate during certain seasons of the year shall be

tested during the appropriate season. Tests shall be performed on individual equipment, system and their controls. Whenever the equipment or system under test is interrelated with and dependent upon the operation of other equipment, systems and their controls, for proper operation, functioning and performance, the latter shall be operated simultaneously with the equipment of system tested.

H. No piping in any location shall be closed up, furred in or covered before testing.

I. The entire drainage and vent system shall have all openings plugged to permit the entire system to be filled with water to the upper level of the highest vent stack above the roof. When a portion of the system is being tested, a vertical stack ten feet above the highest horizontal line to be tested may be installed and that portion of the system filled with water. The water shall remain in the system for a four-hour period minimum, without any lowering of the water level at the overflow.

J. After setting of fixtures and/or equipment, the entire waste and vent system shall be subjected to a smoke test as follows: Fill all trap seals with water. Introduce into the system through a suitable opening, a thick penetrating smoke which is produced in openings above roof, close the vent openings and continue introducing smoke until a pressure of one inch of water has been built up. Maintain pressure for fifteen minutes minimum before starting inspection. Smoke shall not be visible from any joint, fixture connections and/or fixture.

9.0 Job Conditions

A. Contractor shall inform himself of all job conditions, entrance clearances, etc. for his equipment and material. He shall so consider in his estimates. No additional costs shall be allowed in his failure to do so.

10.0 Piping Slopes

A. All horizontal soil, waste, or storm piping of 3 inch diameter or less shall be run in a uniform grade at not less than 1/4" per foot unless otherwise indicated. All horizontal soil waste, or storm piping larger than 3 inches in diameter shall be run in a uniform ratio at not less than 1/8" per foot. All vent piping shall be pitched upward away from fixtures so as to free itself quickly of any condensation.

11.0 Pipe Expansion

A. All pipe connections shall be installed to allow for freedom of movement of the piping during expansion and contraction without springing. Swing joints, expansion loops and expansion joints with proper anchors and guides shall be provided by the contractor where necessary, and/or when shown on drawings. Anchors and guides shall be subject to approval of the engineer.

12.0 Escutcheons

A. Contractor shall provide escutcheons on pipes wherever they pass through the floors, ceilings, walls or partitions.

B. Escutcheons for pipes passing through outside walls shall be solid, cast brass, flat type secured to pipe with a setscrew.

C. Escutcheons for pipes passing through floors shall be split-hinged, case brass type designed to fit pipe on one end and cover sleeve projecting through floor on the other end.

D. Escutcheons for pipes through interior walls, partitions and ceiling shall be split hinged, cast brass, chromium plated type.

13.0 Bases and Supports

A. Provide bases and supports as requried to support equipment furnished under the plumbing contract. Bases and supports shall be provided as required by equipment manufacturer's written instructions or as indicated on plans.

B. Concrete bases shall be a minimum 3,000 psi strength and reinforced with 6"x6" wire mesh.

C. Concrete base dimensions shall be a minimum of four (4) inches high and six (6) inches larger than equipment on all sides.

D. Concrete bases for interior equipment shall be pinned to the concrete floor slab.

E. Where structural metal supports are provided, the contractor shall submit support layout, including dimensions, materials, fasteners and anchors to the engineer for review and approval prior to fabrication.

14.0 Painting

A. The contractor shall paint all unpainted, noninsulated, non-galvanized ferrous metal surfaces of pipes, equipment, fixtures, hangers, supports and accessories as follows:
   1. Exposed - One prime coat of gray paint.
   2. Concealed - One coat of black asphaltum paint.
   3. Underground - Two coats of black asphaltum paint.

B. Uncoated or otherwise unfinished canvas jackets or insulation shall be painted with one coat of glue sizing as soon as possible after installation.

15.0 Cleaning Piping

A. This contractor shall thoroughly clean all piping and equipment of all foreign substances inside and out before being placed in operation.

B. If any part of the system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of the removal of obstruction shall be repaired or replaced when the system is reconnected at no additional cost to the owner.

C During the course of construction all pipes shall be capped in an approved manner to insure adequate protection against the entrance of foreign substances.

16.0 Access Doors and Panels

A. Furnish and install flush type access doors or panel with metal frame for all valves or apparatus located in chases, walls or floors. Finish shall be prime coated.

17.0 Sleeves and Inserts

A. This contractor shall be held responsible for the location of and maintaining in proper position, sleeves, inserts and anchor bolts supplied and/or set in place by him. In the event that failure to do so requires cutting and patching of finished work, it shall be done at this contractor's expense by the concrete and/or masonry contractor.

B. All pipes passing through floors, walls or partitions shall be provided with sleeves having an internal diameter of 1" larger than the outside diameter of the pipe or insulation on covered lines.

C. Sleeves passing through lightproof or soundproof walls, floors and partitions and through firewalls shall be made tight using approved caulking materials.

D. Sleeves through floors and all other walls shall be Schedule 40, black steel pipe, set flush with finished wall or ceiling surfaces, but extending 2" above finished floors.

E. Sleeves through outside walls shall be Schedule 40 black steel pipe with 150 lb. black steel slip-on welding flange welded at the center of the sleeve and shall be painted with one coat of bitmastic paint inside and outside. Modular mechanical seals shall be used to seal the pipe annular space.

F. Sleeves through masonry floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with finished wall or floor surfaces.

G. Sleeves through interior partitions shall be 22- gauge galvanized sheet steel, set flush with finished surfaces of the partitions.

H. Inserts shall be individual or strip type of pressed steel construction with accommodation for removable nuts and threaded rods up to 3/4" diameter, permitting lateral adjustment. Individual inserts shall have an opening at the top to allow reinforcing rods up to 2" diameter to be passed through the insert body. Strip inserts shall have attached rods with hooked ends to allow fastening to reinforcing rods.

END OF SECTION

SECTION 220500 - COMMON WORK RESULTS FOR PLUMBING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Summary: General requirements for motors, hangers and supports, and meters and gages.

B. Submittals: Product Data for materials and equipment specified in this Section.

PART 2 - PRODUCTS

2.1 MOTORS

A. Motor Characteristics:

1. Motors ½ HP and Larger: Three phase.
2. Motors Smaller Than ½ HP: Single phase.
3. Frequency Rating: 60 Hz.
4. Voltage Rating: NEMA standard voltage selected to operate on nominal circuit voltage to which motor is connected.
5. Service Factor: 1.15 for open drip proof motors; 1.0 for totally enclosed motors.
6. Duty: Continuous duty at ambient temperature of 105 deg F (40 deg C) and at altitude of 3300 feet (1005 m) above sea level.
7. Capacity and Torque Characteristics: Sufficient to start, accelerate, and operate connected loads at designated speeds, at installed altitude and environment, with indicated operating sequence, and without exceeding nameplate ratings or considering service factor.
8. Enclosure: Unless otherwise indicated, open drip proof.
9. Motors Used with Variable-Frequency Controllers: Ratings, characteristics, and features coordinated with and approved by controller manufacturer.

2.2 HANGERS AND SUPPORTS

A. Hanger and Pipe Attachments: Factory fabricated with galvanized coatings; nonmetallic coated for hangers in direct contact with copper tubing.

B. Building Attachments: Powder-actuated-type, drive-pin attachments with pullout and shear capacities appropriate for supported loads and building materials.

C. Mechanical-Expansion Anchors: Insert wedge-type attachments with pullout and shear capacities appropriate for supported loads and building materials.

2.3 PRESSURE GAGES AND TEST PLUGS

A. Pressure Gages: Direct-mounting, indicating-dial type complying with ASME B40.100. Dry metal case, minimum 2-1/2-inch (63-mm) diameter with red pointer on white face, and plastic window. Minimum accuracy 3 percent of middle half of range. Range two times operating pressure.

B. Test Plug: Corrosion-resistant brass or stainless-steel body with two self-sealing rubber core inserts and gasketed and threaded cap, with extended stem for units to be installed in insulated piping. Minimum pressure and temperature rating 500 psig at 200 deg F (3450 kPa at 93 deg C).

PART 3 - EXECUTION

3.1 MOTOR INSTALLATION

A. Anchor motor assembly to base, adjustable rails, or other support, arranged and sized according to manufacturer's written instructions.

3.2 GENERAL PIPING INSTALLATIONS

A. Install piping free of sags and bends.

B. Install fittings for changes in direction and branch connections.

C. Install sleeves for pipes passing through concrete and masonry walls, gypsum board partitions, and concrete floor and roof slabs.

D. Exterior Wall, Pipe Penetrations: Mechanical sleeve seals installed in steel or cast-iron pipes for wall sleeves.

E. Comply with requirements in Division 07 Section "Penetration Firestopping" for sealing pipe penetrations in fire-rated construction.

F. Install unions at final connection to each piece of equipment.

G. Install dielectric unions and flanges to connect piping materials of dissimilar metals in gas piping.

H. Install dielectric coupling and nipple fittings to connect piping materials of dissimilar metals in water piping.

3.3 GENERAL EQUIPMENT INSTALLATIONS

A. Install equipment to allow maximum possible headroom unless specific mounting heights are not indicated.

B. Install equipment level and plumb, parallel and perpendicular to other building systems and components, unless otherwise indicated.

C. Install mechanical equipment to facilitate service, maintenance, and repair or replacement of components. Connect equipment for ease of disconnecting, with minimum interference to other installations. Extend grease fittings to accessible locations.

D. Install equipment to allow right of way for piping installed at required slope.

3.4 CONCRETE BASES

A. Anchor equipment to concrete base according to equipment manufacturer's written instructions.

B. Construct concrete bases of dimensions indicated, but not less than 4 inches (100 mm) larger in both directions than supported unit.

C. Install dowel rods on 18-inch (450-mm) centers around the full perimeter of the base to connect concrete base to concrete floor.

D. Install epoxy-coated anchor bolts for supported equipment that extend through concrete base, and anchor into structural concrete floor.

E. Place and secure anchorage devices. Use supported equipment manufacturer's setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

F. Install anchor bolts to elevations required for proper attachment to supported equipment.

G. Use 3000-psi (20.7-MPa), 28-day compressive-strength concrete and reinforcement as specified in Division 03 Section "Cast-in-Place Concrete."

3.5 HANGERS AND SUPPORTS

A. Comply with MSS SP-69 and MSS SP-89. Install building attachments within concrete or to structural steel.

B. Install hangers and supports to allow controlled thermal and seismic movement of piping systems.

C. Install powder-actuated drive-pin fasteners in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches (100 mm) thick.

D. Install mechanical-expansion anchors in concrete after concrete is cured. Do not use in lightweight concrete or in slabs less than 4 inches (100 mm) thick.

E. Load Distribution: Install hangers and supports so piping live and dead loading and stresses from movement will not be transmitted to connected equipment.

F. Horizontal-Piping Hangers and Supports: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Adjustable Steel Clevis Hangers (MSS Type 1): For suspension of noninsulated or insulated stationary pipes, NPS 1/2 to NPS 30 (DN 15 to DN 750).
2. Pipe Hangers (MSS Type 5): For suspension of pipes, NPS 1/2 to NPS 4 (DN 15 to DN 100), to allow off-center closure for hanger installation before pipe erection.
3. Adjustable Steel Band Hangers (MSS Type 7): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8 (DN 15 to DN 200).
4. Adjustable Band Hangers (MSS Type 9): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 8 (DN 15 to DN 200).
5. Adjustable Swivel-Ring Band Hangers (MSS Type 10): For suspension of noninsulated stationary pipes, NPS 1/2 to NPS 2 (DN 15 to DN 50).

G. Vertical-Piping Clamps: Unless otherwise indicated and except as specified in piping system Specification Sections, install the following types:

1. Extension Pipe or Riser Clamps (MSS Type 8): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500).
2. Carbon- or Alloy-Steel Riser Clamps (MSS Type 42): For support of pipe risers, NPS 3/4 to NPS 20 (DN 20 to DN 500), if longer ends are required for riser clamps.

3.6 VIBRATION ISOLATION DEVICE INSTALLATION

A. Adjust vibration isolators to allow free movement of equipment limited by restraints.

B. Install resilient bolt isolation washers and bushings on equipment anchor bolts.

END OF SECTION 220500

SECTION 220523 - GENERAL-DUTY VALVES FOR PLUMBING PIPING

PART 1 - GENERAL (Not Applicable)

PART 2 - PRODUCTS

2.1 GENERAL-DUTY VALVES

A. End Connections: Threads shall comply with ANSI B1.20.1. Flanges shall comply with ANSI B16.1 for cast-iron valves and with ANSI B16.24 for bronze valves. Solder-joint connections shall comply with ANSI B16.18.

B. Two-Piece, Copper-Alloy Ball Valves: Bronze body with full-port, chrome-plated bronze ball; PTFE or TFE seats; and 600-psig (4140-kPa) minimum CWP rating and blowout-proof stem.

C. Bronze, Swing Check Valves: Class 125, bronze body with bronze disc and seat.

D. Bronze Gate Valves: Class 125, bronze body with rising stem and bronze solid wedge and union-ring bonnet.

E. Bronze-Mounted, Cast-Iron Gate Valves: Class 125, OS&Y cast-iron body and solid-wedge disc.

F. Bronze Globe Valves: Class 125, bronze body with bronze disc and union-ring bonnet.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Use gate and ball valves for shutoff duty; globe and ball for throttling duty.

B. Locate valves for easy access and provide separate support where necessary.

C. Install valves for each fixture and item of equipment.

D. Install three-valve bypass around each pressure-reducing valve using throttling-type valves.

E. Install valves in horizontal piping with stem at or above center of pipe.

F. Install valves in a position to allow full stem movement.

G. Install check valves for proper direction of flow in horizontal position with hinge pin level.

END OF SECTION 220523

SECTION 220700 - PLUMBING INSULATION

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data for each type of plumbing insulation material.

B. Quality Assurance: Labeled with maximum flame-spread index of 25 and maximum smoke-developed index of 50 according to ASTM E 84.

PART 2 - PRODUCTS

2.1 INSULATION MATERIALS

A. Flexible Elastomeric: Closed-cell, sponge- or expanded-rubber materials. Comply with ASTM C 534, Type I for tubular materials and Type II for sheet materials.

B. Flexible Elastomeric and Polyolefin Adhesive: Comply with MIL-A-24179A, Type II, Class I.

C. Vapor-Barrier Mastic: Water based; suitable for indoor and outdoor use on below ambient services.

D. Factory-Applied Jackets: When factory-applied jackets are indicated, comply with the following:

1. ASJ: White, kraft-paper, fiberglass-reinforced scrim with aluminum-foil backing; complying with ASTM C 1136, Type I.
2. FSK Jacket: Aluminum-foil, fiberglass-reinforced scrim with kraft-paper backing; complying with ASTM C 1136, Type II.

E. ASJ Tape: White vapor-retarder tape matching factory-applied jacket with acrylic adhesive, complying with ASTM C 1136.

F. FSK Tape: Foil-face, vapor-retarder tape matching factory-applied jacket with acrylic adhesive; complying with ASTM C 1136.

PART 3 - EXECUTION

3.1 PIPE INSULATION INSTALLATION

A. Comply with requirements of the Midwest Insulation Contractors Association's "National Commercial & Industrial Insulation Standards" for insulation installation on pipes and equipment.

B. Insulation Installation at Interior Wall and Partition Penetrations (That Are Not Fire Rated): Install insulation continuously through walls and partitions.

C. Insulation Installation at Fire-Rated Wall, Partition, and Floor Penetrations: Install insulation continuously through penetrations. Seal penetrations. Comply with requirements in Division 07 Section "Penetration Firestopping."

D. Flexible Elastomeric Insulation Installation:

1. Seal longitudinal seams and end joints with adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.
2. Insulation Installation on Pipe Fittings and Elbows: Install mitered sections of pipe insulation. Secure insulation materials and seal seams with adhesive to eliminate openings in insulation that allow passage of air to surface being insulated.

E. Interior Piping System Applications: Insulate the following piping systems:

1. Domestic hot water.
2. Recirculated domestic hot water.
3. Domestic cold water.
4. Exposed water supplies and sanitary drains of fixtures for people with disabilities.

F. Do not apply insulation to the following systems, materials, and equipment:

1. Flexible connectors.
2. Sanitary drainage and vent piping.
3. Drainage piping located in crawlspaces unless otherwise indicated.
4. Chrome-plated pipes and fittings, except for plumbing fixtures for people with disabilities.
5. Piping specialties, including air chambers, unions, strainers, check valves, plug valves, and flow regulators.

3.2 INDOOR PIPING INSULATION SCHEDULE

A. Unless otherwise indicated, do not install insulation on the following:

1. Drainage piping located in crawlspaces.
2. Underground piping.
3. Chrome-plated pipes and fittings unless there is a potential for personnel injury.

B. Domestic Cold Water:

1. NPS 1-1/2 (DN 38) and Smaller: Insulation shall be the following:

a. Flexible Elastomeric: 1/2 inch (13 mm) thick.

2. NPS 2 (DN 50) and Larger: Insulation shall be the following:

a. Flexible Elastomeric: 1/2 inch (13 mm) thick.

C. Domestic Hot and Recirculated Hot Water:

1. NPS 1-1/2 (DN 32) and Smaller: Insulation shall be the following:

a. Flexible Elastomeric 1 inch (25 mm) thick.

2. NPS 2 (DN 50) and Larger: Insulation shall be the following:

a. Flexible Elastomeric: 1 inch (25 mm) thick.

D. Exposed Domestic Water, Domestic Hot Water, and Stops for Plumbing Fixtures for People with Disabilities:

1. All Pipe Sizes: Insulation shall be one of the following:

a. Flexible Elastomeric: 1/2 inch (13 mm) thick.

END OF SECTION 220700

SECTION 221116 - DOMESTIC WATER PIPING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Performance Requirements: Provide components and installation capable of producing domestic water piping systems with 80 psig (550 kPa) unless otherwise indicated.

B. Comply with NSF 61, "Drinking Water System Components - Health Effects; Sections 1 through 9."

PART 2 - PRODUCTS

2.1 PIPE AND FITTINGS

A. Soft Copper Tubing: ASTM B 88, Type L (ASTM B 88M), water tube, annealed temper with copper pressure fittings, cast-copper-alloy or wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.

1. Joining Materials: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder.

B. Hard Copper Tubing: ASTM B 88, Type L (ASTM B 88M), water tube, drawn temper with wrought-copper, solder-joint fittings. Furnish wrought-copper fittings if indicated.

1. Copper Unions: Cast-copper-alloy, hexagonal-stock body, with ball-and-socket, metal-to-metal seating surfaces and solder-joint or threaded ends.
2. Joining Materials: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder.

C. Special-Duty Valves:

1. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for bronze and cast-iron general-duty valves.
2. Comply with requirements in Division 22 Section "Domestic Water Piping Specialties" for vacuum breakers, thermostatic mixing valves, hose bibs, wall hydrants. water hammer arresters, and strainers.

PART 3 - EXECUTION

3.1 INSTALLATIONS

A. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for basic piping installation requirements.

B. Install wall penetration system at each service pipe penetration through foundation wall. Make installation watertight. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for wall penetration systems.

C. Install shutoff valve, hose-end drain valve, strainer, pressure gage, and test tee with valve, inside the building at each domestic water service entrance. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for drain valves, strainers, and pressure gages.

D. Install domestic water piping with 0.25 percent slope downward toward drain for horizontal piping and plumb for vertical piping.

E. Rough-in domestic water piping for water-meter installation according to utility company's requirements.

F. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for basic piping joint construction.

1. Soldered Joints: Comply with procedures in ASTM B 828 unless otherwise indicated.

G. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for pipe hanger and support devices.

H. Support vertical piping at each floor.

3.2 INSPECTING AND CLEANING

A. Inspect and test piping systems as follows:

1. Fill domestic water piping. Check components to determine that they are not air bound and that piping is full of water.
2. Test for leaks and defects in new piping and parts of existing piping that have been altered, extended, or repaired.

B. Clean and disinfect water distribution piping by filling system with water/chlorine solution with at least 50 ppm (50 mg/L) of chlorine. Isolate with valves and allow to stand for 24 hours. Flush system with clean, potable water until no chlorine is in water coming from system after the standing time.

3.3 PIPING SCHEDULE

A. Underground, Service Entrance Piping: Soft copper tubing

B. Aboveground Distribution Piping Type L (Type B) hard copper tubing.

3.4 VALVE SCHEDULE

A. Drawings indicate valve types to be used. Where specific valve types are not indicated, the following requirements apply:

1. Shutoff Duty: Use bronze ball for piping NPS 2 (DN 50) and smaller. Use cast-iron butterfly or gate valves with flanged ends for piping NPS 2-1/2 (DN 65) and larger.
2. Throttling Duty: Use bronze ball or globe valves for piping NPS 2 (DN 50) and smaller. Use cast-iron butterfly valves with flanged ends for piping NPS 2-1/2 (DN 65) and larger.
3. Hot-Water-Piping, Balancing Duty: Calibrated balancing valves.
4. Drain Duty: Hose-end drain valves.

B. Install ball valves close to main on each branch and riser serving two or more plumbing fixtures or equipment connections and where indicated.

C. Install ball valves on inlet to each plumbing equipment item, on each supply to each plumbing fixture not having stops on supplies, and elsewhere as indicated.

D. Install drain valve at base of each riser, at low points of horizontal runs, and where required to drain water distribution piping system.

E. Install swing check valve on discharge side of each pump and elsewhere as indicated.

F. Install ball valves in each hot-water circulating loop and discharge side of each pump.

END OF SECTION 221116

SECTION 221119 - DOMESTIC WATER PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Pipe-Applied, Atmospheric Vacuum Breakers: ASSE 1001, with floating disc and atmospheric vent.

B. Hose Connection Vacuum Breakers: ASSE 1011, nickel-plated bronze, with nonremovable and manual drain features and garden-hose threaded connection.

C. Reduced-Pressure-Principle Backflow Preventers: ASSE 1013.

D. Water Regulators: ASSE 1003.

E. Balancing Valves: MSS SP-110 for two-piece, copper-alloy ball valves, with memory stop.

F. Thermostatic Mixing Valves: Manually adjustable, bronze body. Include check stop and union on hot- and cold-water-supply inlets.

G. Wall Hydrant: ASME A112.21.3M, recessed, nonfreeze, automatic draining, antibackflow type, with key operator and threaded inlet, garden-hose threaded outlet, and rough-bronze finish.

H. Ball-Valve-Type, Hose-End Drain Valves: MSS SP-110, with garden-hose thread complying with ASME B1.20.7 and cap with brass chain.

I. Water Hammer Arrester: Bellows or piston type with pressurized cushioning chamber.

J. Strainers: Y-pattern, bronze body, 125-psig (860-kPa) minimum steam working pressure.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install backflow preventers at each water-supply connection to mechanical equipment, where shown on plans and where required by authorities having jurisdiction.

END OF SECTION 221119

SECTION 221316 - SANITARY WASTE AND VENT PIPING

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Minimum Pressure Requirement for Soil, Waste, and Vent: 10-foot head of water (30 kPa).

B. Comply with NSF 14, "Plastic Piping Components and Related Materials," for plastic piping components.

PART 2 - PRODUCTS

2.1 PIPES AND FITTINGS

A. Copper Drainage Tube and Fittings: ASTM B 306, Type DWV drawn temper with wrought-copper, Type DWV drainage fittings.

B. Hub-and-Spigot Cast-Iron Soil Pipe and Fittings: ASTM A 74, Service class; ASTM C 564 rubber gaskets.

C. Hubless Cast-Iron Soil Pipe and Fittings: ASTM A 888 or CISPI 301, with ASTM C 1277 shielded couplings.

D. PVC Plastic, DWV Pipe and Fittings: ASTM D 2665, Schedule 40, plain ends with PVC socket-type, DWV pipe fittings.

PART 3 - EXECUTION

3.1 PIPING INSTALLATION

A. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for basic piping installation requirements.

B. Install cast-iron soil piping according to CISPI's "Cast Iron Soil Pipe and Fittings Handbook," Chapter IV, "Installation of Cast Iron Soil Pipe and Fittings."

C. Install wall penetration system at each pipe penetration through foundation wall. Make installation watertight. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for wall penetration systems.
   1. Sleeves are not required for cast-iron soil piping passing through concrete slabs-on-grade if slab is without membrane waterproofing.

D. Make changes in direction for soil and waste drainage and vent piping using appropriate branches, bends, and long-sweep bends. Sanitary tees and short-sweep

1/4 bends may be used on vertical stacks if change in direction of flow is from horizontal to vertical. Use long-turn, double Y-branch and 1/8-bend fittings if 2 fixtures are installed back to back or side by side with common drain pipe. Straight tees, elbows, and crosses may be used on vent lines. Do not change direction of flow more than 90 degrees. Use proper size of standard increasers and reducers if pipes of different sizes are connected. Reducing size of drainage piping in direction of flow is prohibited.

E. Lay buried building drainage piping beginning at low point of each system. Install true to grades and alignment indicated, with unbroken continuity of invert. Place hub ends of piping upstream. Install required gaskets according to manufacturer's written instructions for use of lubricants, cements, and other installation requirements. Maintain swab in piping and pull past each joint as completed.

F. Install soil and waste drainage and vent piping at the following minimum slopes, unless otherwise indicated:
   1. Building Sanitary Drain: 2 percent downward in direction of flow for piping NPS 3 (DN 80) and smaller; 1 percent downward in direction of flow for piping NPS 4 (DN 100) and larger.
   2. Horizontal Sanitary Drainage Piping: 2 percent downward in direction of flow.
   3. Vent Piping: 1 percent down toward vertical fixture vent or toward vent stack.

G. Install PVC soil and waste drainage and vent piping according to ASTM D 2665.

H. Install underground PVC soil and waste drainage piping according to ASTM D 2321.

I. Do not enclose, cover, or put piping into operation until it is inspected and approved by authorities having jurisdiction.

J. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for basic piping joint construction.

K. Soldered Joints: Use ASTM B 813, water-flushable, lead-free flux; ASTM B 32, lead-free-alloy solder; and ASTM B 828 procedure unless otherwise indicated.

L. Comply with requirements in Division 22 Section "Common Work Results for Plumbing" for pipe hanger and support devices.

3.2 PIPE SCHEDULE

A. Aboveground Applications: Hubless, cast-iron soil pipe and fittings; PVC plastic, DWV pipe and fittings with solvent-cemented joints; Copper drainage tube and fittings with soldered joints.

B. Belowground Applications: Hubless, cast-iron soil pipe and fittings; Hub-and-spigot, cast-iron soil pipe and fittings; PVC plastic, DWV pipe and drainage-pattern fittings with cemented joints.

END OF SECTION 221316

SECTION 221319 - SANITARY WASTE PIPING SPECIALTIES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data.

PART 2 - PRODUCTS

2.1 MANUFACTURED UNITS

A. Cleanouts:

1. Application: Floor cleanout, wall cleanout and installation in exposed piping.
2. Body or Ferrule Material: Cast iron.
3. Clamping Device: Required.
4. Outlet Connection: Threaded.
5. Closure: Brass plug with tapered threads.
6. Adjustable Housing Material: Cast iron with threads.
7. Frame and Cover Material and Finish: Nickel-bronze, copper alloy.
8. Frame and Cover Shape: Round.
9. Top Loading Classification: Light Duty.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install cleanouts at grade and extend to where building sanitary drains connect to building sanitary sewers.

B. Install trench drains where indicated. Set tops of drains flush with finished floor.

1. Trap drains connected to sanitary building drain.
2. Install drain flashing collar or flange so no leakage occurs between drain and adjoining flooring. Maintain integrity of waterproof membranes.

END OF SECTION 221319

SECTION 224000 - PLUMBING FIXTURES

PART 1 - GENERAL

1.1 SECTION REQUIREMENTS

A. Submittals: Product Data for each type of plumbing fixture, including trim, fittings, accessories, appliances, appurtenances, equipment, and supports.

B. Regulatory Requirements: Comply with requirements in ICC A117.1, "Accessible and Usable Buildings and Facilities" for plumbing fixtures for people with disabilities.

C. Regulatory Requirements: Comply with requirements in Public Law 102-486, "Energy Policy Act," about water flow and consumption rates for plumbing fixtures.

D. NSF Standard: Comply with NSF 61, "Drinking Water System Components - Health Effects," for fixture materials that will be in contact with potable water.

PART 2 - PRODUCTS

2.1 SCHEDULED FIXTURES

A. Furnish and install plumbing fixtures as specified in the “Schedule of Plumbing Equipment” on Drawing P-001.

PART 3 - EXECUTION

3.1 INSTALLATIONS

A. Install fitting insulation kits on fixtures for people with disabilities.

B. Install fixtures with flanges and gasket seals.

C. Install flushometer valves for accessible water closets with handle mounted on wide side of compartment. Install other actuators in locations that are easy for people with disabilities to reach.

D. Fasten wall-hanging plumbing fixtures securely to supports attached to building substrate when supports are specified, and to building wall construction where no support is indicated.

E. Fasten floor-mounted fixtures to substrate. Fasten fixtures having holes for securing fixture to wall construction, to reinforcement built into walls.

F. Fasten wall-mounted fittings to reinforcement built into walls.

G. Fasten counter-mounting plumbing fixtures to casework.

H. Secure supplies to supports or substrate within pipe space behind fixture.

I. Install individual supply inlets, supply stops, supply risers, and tubular brass traps with cleanouts at fixture.

J. Install water-supply stop valves in accessible locations.

K. Install traps on fixture outlets. Omit traps on fixtures having integral traps. Omit traps on indirect wastes unless otherwise indicated.

L. Install escutcheons at wall, floor, and ceiling penetrations in exposed, finished locations and within cabinets and millwork. Use deep-pattern escutcheons where required to conceal protruding pipe fittings.

M. Seal joints between fixtures and walls, floors, and counters using sanitary-type, one-part, mildew-resistant, silicone sealant. Match sealant color to fixture color.

N. Install piping connections between plumbing fixtures and piping systems and plumbing equipment. Install insulation on supplies and drains of fixtures for people with disabilities.

O. Ground equipment.

END OF SECTION 224000

SECTION 10 21 13.19
PLASTIC TOILET COMPARTMENTS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Solid plastic toilet compartments.

B. Urinal and vestibule screens.

1.02 RELATED REQUIREMENTS

A. Section 06 10 00 - Rough Carpentry: Blocking and supports.

B. Section 10 28 00 - Toilet, Bath, and Laundry Accessories.

1.03 REFERENCE STANDARDS

A. NFPA 286 - Standard Methods of Fire Tests for Evaluating Contribution of Wall and Ceiling Interior Finish to Room Fire Growth; 2015.

1.04 ADMINISTRATIVE REQUIREMENTS

A. Coordination: Coordinate the work with placement of support framing and anchors in walls and ceilings.

1.05 SUBMITTALS

A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.

B. Shop Drawings: Indicate partition plan, elevation views, dimensions, details of wall supports, door swings.

C. Product Data: Provide data on panel construction, hardware, and accessories.

PART 2 PRODUCTS

2.01 SOLID PLASTIC TOILET COMPARTMENTS

A. Toilet Compartments: Factory fabricated doors, pilasters, and divider panels made of solid molded high density polyethylene (HDPE) , tested in accordance with NFPA 286, floor-mounted unbraced.
   1. Color: as selected by Owner.

B. Doors:
   1. Thickness: 1 inch.
   2. Width: 24 inch.
   3. Width for Handicapped Use: 36 inch , out-swinging.
   4. Height: 55 inch.

C. Panels:
   1. Thickness: 1 inch.
   2. Height: 55 inch.

D. Pilasters:
   1. Thickness: 1 inch.
   2. Width: As required to fit space; minimum 3 inch.

E. Screens: Without doors; to match compartments; mounted to wall with two panel brackets .

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that field measurements are as indicated.

B. Verify correct spacing of and between plumbing fixtures.

C. Verify correct location of built-in framing, anchorage, and bracing.

3.02 INSTALLATION

A. Install partitions secure, rigid, plumb, and level in accordance with manufacturer's instructions.

B. Maintain 3/8 to 1/2 inch space between wall and panels and between wall and end pilasters.

C. Attach panel brackets securely to walls using anchor devices.

D. Attach panels and pilasters to brackets. Locate head rail joints at pilaster center lines.

3.03 TOLERANCES

A. Maximum Variation From True Position: 1/4 inch.

B. Maximum Variation From Plumb: 1/8 inch.

3.04 ADJUSTING

A. Adjust and align hardware to uniform clearance at vertical edge of doors, not exceeding 3/16 inch.

B. Adjust hinges to position doors in partial opening position when unlatched. Return out-swinging doors to closed position.

C. Adjust adjacent components for consistency of line or plane.

END OF SECTION

DIVISION 16000
ELECTRICAL SPECIFICATIONS

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- 1.0 General Description
- 2.0 Scope

16050 Supplemental General Conditions
- 1.0 Governing Conditions
- 2.0 Supplementary General Conditions
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- 1.0 Applicable Codes
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- 1.0 Materials Standards
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16440 Individual Equipment Circuits
- 1.0 Description and Location
- 2.0 Wiring Method
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16460 General Purpose Branch Circuits
- 1.0 Description
- 2.0 Wiring Method

16010 SCOPE & GENERAL DESCRIPTION

1.0 General Description- These specifications cover furnishing all labor and materials to provide a complete and operative electrical system for The Village of Highland Falls Senior Center.

2.0 Scope - The systems described in these plans and specifications include but are not limited to the following:

1. Branch feeder circuits.
2. Branch panels.
3. Lighting fixtures.
4. General purpose circuits.
5. Individual equipment circuits.

16050 GENERAL CONDITIONS

1.0 Governing Conditions - General conditions of the electrical contract shall be in accordance with the "General Conditions of the Contract.

2.0 Supplementary General Conditions - Supplementary general conditions may be provided for all mechanical and electrical work and are contained in the General Construction documents. This contractor should read and understand same.

3.0 Drawings - Work on this project as described in these specifications is shown on drawings of sheets appropriately titled and plot plan.

4.0 National Electrical Code - Entire installation shall be made in accordance with the latest edition of National Electrical Code. Contractor shall cooperate with NEC inspector on the installation.

5.0 Safety - The contractor shall perform all work in accordance with Rule #23 of the New York State Standards of the Labor Board and shall take special precaution during the construction to avoid any exposed live parts. When working on live equipment, the contractor shall give other trades adequate warning and provide adequate protection and warning for others. All open trenches shall be barricaded at all times and safety lighted at night.

6.0 Field Measurements - The contractor shall verify in the field, all measurements necessary for his work and shall assume responsibility for their accuracy.

7.0 Excavation and Backfill – All excavation and backfill for electrical work shall be performed by the contractor.

8.0 Temporary Power and Lighting Service – The contractor shall install, maintain and remove temporary electrical service for lighting and power for construction purposes. If during the course of this project it is necessary to interrupt electric lighting or power service, this contractor shall provide temporary power and lighting as required and directed. Existing lighting and power may be interrupted only upon written consent of the owner, after 48 hours notice.

9.0 Existing Systems and Equipment – Portions of existing services, cables, conduits, panels or equipment may be reused and/or altered. See drawings for details.

10.0 Tests and Energizing - After the electrical installation is complete, the contractor shall test all circuits, busses and equipment and verify to ensure that they are free from grounds and short circuits before energizing. All 600-volt cable shall be tested using megohmeter. Cables of higher voltage rating shall be tested using a D.C. high potential tester. Equipment shall be energized only after said tests have been conducted and test results evaluated.

11.0 Prevailing Wage Rates - Provisions of the New York State Labor Law require payment of “Prevailing Wage Rates" in certain public projects. Where applicable, these will be made a part of this contract.

12.0 Other General Conditions -

1. Intent - It is the intent of these plans and specifications to provide alterations and/or new construction as indicated on the drawings and in the specifications to provide complete systems in every respect, capable of operating as designed. It is not intended that every fitting, minor detail or feature be shown on drawings. The contractor shall be responsible for any detail necessary for completion of these systems in accordance with good practice. Installation shall be executed so as to contribute to efficiency of operation, minimum maintenance, accessibility and sightliness. The installation shall conform and accommodate itself to the building structure, its equipment and its usage. No piping or equipment shall be installed in such a manner as to interfere with the operation of any doors or windows. Requirements specified herein shall govern applicable portion of mechanical and electrical sections whether so stated herein or not.

2. Regulations and Certificates - All work shall be done in strict accordance with rules and regulations of local and state authorities having jurisdiction over such work, utility companies operating where apparatus is being installed, National Fire Protection Association, IEEE and insurance companies. Where discrepancies occur between above regulations and these plans and specifications, requirements of the regulations shall take precedence, except that these specifications shall be minimum requirements and that no changes shall be made without approval of the engineer. Complete approval of all above mentioned authorities shall be secured and their certificates of approval shall be delivered to the owner before final acceptance. Any and all drawings or documents required (in addition to contract drawings) shall be furnished in order to secure above-mentioned approvals.

3. Drawings and Measurements - Contract drawings for mechanical and electrical work are in part diagrammatic, intended to cover the general design and extent of the systems and indicate general arrangement of equipment, ducts, conduits, piping and approximate sizes and locations of equipment and outlets. Drawings are not intended to be scaled for roughing-in measurements nor to serve as shop drawings. Where drawings are required for these purposes or have to be made from field measurements, they shall be prepared by the various trades and coordinated by the contractor. Where job conditions require reasonable changes from indicated locations and arrangements, such changes shall be made without cost to the owner. Exact locations of all grilles, registers, plumbing fixtures, electrical fixtures, panelboards, etc., shall be governed by plans, elevations and details.

4. Record Drawings - During the course of construction the respective contractor shall keep a careful record (in drawing form) of all deviations from the work as shown on the contract drawings on the installation of pipes, ducts, electric outlets, equipment, invert elevations, etc. These drawings shall be delivered to the engineer before the final certificate of payment is issued.

5. Accessibility - Locate all equipment which must be serviced, operated or maintained, in fully accessible position. Equipment shall include but not be limited to valves, traps, cleanouts, motors, controllers, drain points, etc. Furnish access doors where required. Minor deviations from the drawings may be made to allow for better accessibility, but changes of magnitude or which involve extra cost shall not be made without approval.

6. Access Doors and Panels - Furnish flush type door or panel with metal frame for all junction boxes or apparatus located in chases, walls or floors. Finish shall be prime coat.

7. Quiet Operation - All work shall operate under all conditions of load without any sound or vibration which is objectionable in the opinion of the engineer. In case of moving machinery, sound or vibration noticeable outside of room in which it is installed or annoyingly noticeable inside its own room will be considered objectionable by the engineer shall be corrected in approved manner by the contractor at the latter's expense.

8. Covering of Work - No pipe fittings or other work of any kind shall be covered up or hidden from view before it has been examined or approved by the engineer or other authority having jurisdiction. Any unfaithful or imperfect work or material which may be discovered shall be removed and corrected immediately before being condemned, and other work and materials shall be furnished which shall be satisfactory to the engineer.

9. Guarantee - The contractor shall guarantee all workmanship, materials, performance for a period of one year from the date of the certificate of completion and acceptance of his work. The contractors shall promptly correct any defects upon notice from the owner to do so, without cost to the owner.

10. Waterproofing - Where any work pierces waterproofing, the installation shall be as approved by the engineer. The contractor shall furnish all necessary sleeves, caulking and flashing as required to make the openings absolutely watertight.

11. Excavation and Backfill - All excavation and backfill shall be by the contractor. Cleanup, all disturbed areas.

12. Fire Stopping-All penetrations through fire and smoke rated walls, floors and ceilings shall be thoroughly sealed with 3M brand Fire Barrier CP25WB latex based caulk, or approved equal. Install in accordance with manufacturer's instructions.

13. Equipment Returns – As part of this contract, contractors shall ensure that suppliers of any and all equipment supplied for this project agree to accept the return of any equipment on this project that is in undamaged condition and has not been put into service with a maximum restocking fee of 25%, up until the date of certified substantial completion of the project.

16080 CODES, PERMITS AND INSPECTIONS

1.0 Applicable Codes - The entire installation shall conform to the rules and regulations of the following parties having jurisdiction:

1. National Electrical Code of the National Fire Protection Association, latest edition.

2. State Codes, Local Electrical Codes and other regulations of municipality.

3. "Specifications for Electrical Installations" issued by supplying electric utility company.

2.0 Permits - Contractor shall obtain all permits required by local utility company ordinances. Contractor shall cooperate with utility companies on electric and telephone installations. Contractor shall obtain approval of all utilities on service entrances.

3.0 Certificate of Inspection - Upon completion, the contractor shall furnish a certificate of final inspection to the owner from the New York Board of Fire Underwriters covering all electrical installations in these plans and specifications in his contract. The cost of said inspection shall be borne by the contractor and shall be included in the contract amount.

4.0 Electric Utility Company Standards - Entire installation shall conform to all rules and regulations for service as issued by the utility company.

5.0 Laws, Ordinances and Fees - This contractor shall give all necessary notices, obtain all permits, and pay all taxes, fees and other documents and obtain all necessary approvals of all local, County, New York and/or State of New York Departments, having jurisdiction; obtain all required Certificates of Inspection for his work and deliver same to the engineer before request for acceptance and final payment for the work. This contractor shall include in the work, without extra cost to the owner, any labor, materials, services, apparatus, drawings (in addition to contract drawings and documents) which are necessary in order to comply with all applicable laws, ordinances, rules and regulations whether or not shown on drawings and/or specified. With submission of bid, the contractor shall give written notice to the engineer of any materials or equipment believed inadequate or unsuitable in violation of laws, ordinances, rules or regulations of authorities having jurisdiction and any necessary items of work omitted. In the absence of such written notice, it is mutually agreed that this contractor has included the cost of all required items in his proposal, and that he will be responsible for the approved satisfactory functioning of the entire system without extra compensation.

6.0 O.S.H.A. - All work on this project shall be accomplished in accordance with Federal statutes such as the Occupational Safety and Health Act (1970).

16100 MATERIALS, WORKMANSHIP AND GUARANTEE

1.0 Materials Standards - All materials shall be new and comply with the best accepted industry standards and shall bear the Underwriters' Laboratories (UL) seal of approval. All material shall be of such quality and dimensions specified and shall be manufactured in accordance with American Standards Association, National Electrical Manufacturers Association, I.E.E.E., and Underwriter's Laboratories. In any conflict, the engineer shall be sole judge of whether or not these conditions are met or whether the "or equal" clause is met. All conductors on entire project shall be copper. Abbreviations in the plans and specifications may be used as follows:

EMT - "Electro Metallic Tubing" - Thin wall conduit.
GIC - "Galvanized Iron Conduit" - Heavy wall conduit.
PVC - "Polyvinyl Chloride" - Schedule 40 or 80 conduit as specified.

Samples - Contractor may be required to submit sample of all materials used to the engineer. Materials may be rejected any time during project if installed without presenting samples, if found to be not equal to the quality specified in its category. The engineer shall be the sole judge of this matter.

2.0 Appearance of Work - All work shall be executed to present a neat mechanical appearance and leave the installation in proper operating order.

3.0 Guarantee - The contractor shall replace any work or material which develops defects from ordinary wear and tear within one year of the date of the final certificate of approval. Replacement shall be made without cost to the owner.

4.0 Layout, Cutting and Patching - The contractor shall layout all conduits, box locations, etc., in advance of pouring concrete or installation of walls. Any cutting or patching required because of the contractor's neglect to properly lay out the work shall be performed at the expense of the contractor and shall be approved by the engineer to assure a workmanlike job. Contractor shall verify all dimensions shown on plans and shall be responsible for dimensions and conduit sizes to assure adequate sizing where larger conduits are installed to provide for more than one circuit per conduit. Contractor shall cooperate with other contractors on locations of facilities where conflicts of location arise.

5.0 Shop Drawings and Samples - Before ordering material shipped to the job, submit to engineer six copies of shop drawings for review giving all details, dimensions, etc., of the following equipment:

PANELBOARDS, LIGHT FIXTURES

Contractor shall also furnish samples of wire, cable, plug receptacles, light switches, disconnect switches and other small parts as requested by the engineer.

6.0 Rigid Steel Conduit and EMT - All rigid steel conduit shall be full weight standard i.p.s. galvanized or Sheradized threaded conduit equal to National Electric Products Company "Sheraduct" or approved equal, and no conduit smaller than 3/4" in size shall be used on any part of the installation. Rigid steel conduit shall be used in floor slab and on all main feeders to light panels, power panels, etc. All conduits, where located in outside walls, underground or underfloors, shall have joints redleaded. Conduits buried underground, chased in roof planking or in slab on grade shall be painted with two coats of asphaltum paint. Conduits shall be continuous from outlet to outlet, and from outlets to cabinets, junction or pull boxes and shall enter and be secured to all boxes in such a manner that each system shall be electrically continuous from service to all outlets. Terminals of all conduits shall be furnished with double locknuts and bushings. Changes in direction of conduit where concealed shall be made by means of standard radius bend, and where exposed by means of Crouse-Hinds or equal galvanized or sheradized threaded condulets. Armored cable shall be used only for short connections to fractional horsepower utility motors. Electrical metallic tubing may be permitted on exposed ceiling work and for concealed branch circuit wiring where not installed in slab construction.

7.0 Junction and Pull Boxes - Junction or pull boxes shall be furnished and installed under this section of the specifications where indicated on the drawings, wherever else such a box may be deemed necessary to facilitate the pulling or splicing of wires or cables. All such boxes must be accessible and shall be built only from approved detail working drawings. Conduits shall enter these boxes through tight fitting clearance holes. Covers for the boxes shall be designed for quick removal. Where junction boxes are required for splicing box for special recessed fixtures, consult the engineer before installing and determine exact location of each box. Each feeder passing through a pull box shall be tagged with tag of fireproof material, or designated in another approved manner. Generally, junction boxes and pull box shall not be exposed in finished spaces. Where necessary, reroute conduits or make other arrangements to meet approval of engineer.

16420 PANELS AND APPURTENANCES

1.0 Description of System – System shall consist of single phase, three wire and three phase, four wire circuit breaker panels located as shown.

2.0 Description of Panels – Panels are described on drawings. Number of spare breakers and space allowed for future expansion is shown on drawings. Contractor may substitute equal equipment to that specified provided breakers have equal interrupting rating, NEMA class rating and approval is given by the engineer. All panels shall be furnished for the voltage, capacity and interrupting rating required. Branch panels installed shall be Square 'D' or approved equal and shall be properly braced to withstand short circuits equal to the circuit breaker interrupting rating. All panelboards shall be dead front safety type equipped with thermal magnetic molded case circuit breakers of frame and trip ratings as shown on schedule. Bussing Assembly and Temperature Rise Panelboard bus structure and main lugs or main breaker shall have current ratings as shown on the panelboard schedule. Such rating shall be established by heat rise tests with maximum hot spot temperature on any connector or bus bar not to exceed 50 degrees C rise above ambient. Heat rise test shall be conducted in accordance with Underwriters' Laboratories Standard UL 67. The use of conductor dimensions will not be accepted in lieu of actual heat tests. All bus bars shall be copper.

Circuit Breakers – Circuit breakers shall be equipped with individually insulated, raced and protected connectors. The front face of all circuit breakers shall be flush with each other. Large permanent individual circuit members shall be affirmed to each breaker in a uniform position (or equip each breaker with a circuit card holder and neatly printed card identifying the circuit). Tripped indication shall be clearly shown by the breaker handle taking a position between "ON" and "OFF".

Integrated Equipment Rating – Each panelboard, as a complete unit, shall have a rating equal to or greater than the integrated equipment rating shown on the panelboard schedule on the plans. Such rating shall be established by test with the circuit breaker mounted on the panelboard. The short circuit tests on the circuit breaker and on the panelboard structure shall be made simultaneously connected to its rated voltage source. Method of testing shall be per pro-ratings. The source shall be capable of supplying the specified panelboard short circuit current or greater. Test data showing the completion of such tests upon the entire range of distribution and power panelboard to be furnished shall be submitted to the engineer, if requested by him, with or before the submittal or approval drawings. Testing of panelboard circuit breakers for short circuit rating only with the breaker individually mounted is not acceptable. Also, testing of the bus structure by applying a fixed fault to the bus structure alone is not acceptable. Cabinet Panelboards shall be listed by Underwriters' Laboratories and shall bear UL label.

3.0 Wiring Method – All panel feeders shall be copper THWN or THHN insulated in galvanized conduit as shown on one line drawing from main service to all panels. Install conductors in said conduit as shown. Conduit type shall be as designated on one line diagram.

16440 INDIVIDUAL EQUIPMENT CIRCUITS

1.0 Description and Location - Install all individual equipment circuits as shown on drawings.

2.0 Wiring Method - Install all individual equipment circuits with Type THHN copper conductors in conduit. Type MC (BX) insulated copper conductors may be utilized for drop whips from junction box to device, unless otherwise noted. Connect and test. Furnish and install all wiring and furnish and install disconnect switches on equipment furnished and installed by others.

3.0 Mechanical Equipment - Contractor shall furnish and install all power wiring, disconnect switches and connections as required to all mechanical equipment spaces to fans, air handlers, etc., as shown on drawings. Electrical control systems of all HVAC and plumbing equipment shall be furnished by contractor.

16460 GENERAL PURPOSE BRANCH CIRCUITS

1.0 Description - Install general-purpose branch circuits as shown on one-line diagrams on plan.

2.0 Wiring Method - All general purpose branch circuits shall be installed as shown on drawings. Conductor and conduit sizes are shown on drawings. No wire size smaller than #12 AWG copper shall be used. No conduit smaller than 3/4" shall be used. All boxes shall be 4" square or larger and minimum depth of 1-1/2". All conduits and boxes shall be concealed in all areas except mechanical rooms, pipe tunnel and storage areas. Metallic armored cable may be used at locations shown on drawings and for whips to branch devices. All circuits installed in floor slab shall be rigid galvanized iron conduit. All conduits installed in or below any concrete shall be rigid galvanized iron conduit and coated with "Bitumastic". All junction boxes shall be sized as shown on drawings or as per N.E.C. requirements. Provide swing cover or screw as shown or dictated by usage. All junction boxes shall be code grade steel galvanized. All junction boxes shall be accessible. Contractor is required to provide and install access doors or panels for same unless otherwise noted. It is noted that the hereinbefore-described wiring method is applicable to various other signal systems as well as general purpose circuits as herein described.

Location of Outlets - Locate outlets as shown on drawing.

See plans for locations of other lighting and power outlets.

3.0 Control of Circuits - Circuit control shall be provided as shown on drawings. Where no switches are shown on the drawings, the breaker switch in panel shall be used as the switching means, and shall be of the switching duty type.

4.0 Wiring Devices - Shall be as listed in legend and schedule described on drawings.

5.0 Connections - All connections shall be made using Buchanan Compression Type connectors or equal, using nylon or P.V.C. insulators.

6.0 Plates - All switches, receptacles and wiring device plates shall be chrome/brushed stainless steel as desired by Architect. Furnish and install same as directed.

16500 LIGHTING AND EQUIPMENT

1.0 Description and Guarantee - Contractor shall furnish and install all lighting equipment as shown on the drawings and as contained in these specifications. All material shall be NEMA standard manufactured and shall be Underwriters Laboratories approved and shall bear that seal of approval. Contractor shall furnish and install all lamps of types and sizes as described on plans in the schedule of electrical equipment to the maximum size permitted by the fixture design. Equipment shall be tested and rendered operative by the contractor.

2.0 Lighting Fixture Schedule - The contractor shall furnish and install the lighting fixtures complete for each and every light outlet in the type, quality and size of fixture indicated on plans and as described in the schedule. It shall be the responsibility of the contractor to check the plans with the schedule for completeness, as this schedule is made up for the purpose of indicating the general type, quality and size of fixtures that will be required. The use of catalog numbers describing a fixture does not necessarily include all the required accessories that may be required for a complete installation. The use of a vendor's name and catalog is for convenience in specifying the quality, style, size, finish and general type of fixture required and does not intentionally exclude similar equipment available from other manufacturers. This contractor shall include all fixtures, wiring, hanging, uncrating, connecting up, and making ready to operate. All fixture wire for fixtures shall be not less than #16 gauge, but larger if capacity of fixture requires it. All splices shall be pressure type connectors as hereinbefore described. Contractor shall include the cost of furnishing and installing all lamps for all fixtures under this contract throughout. All lamps for all fixtures shall be furnished in type specified. All tubes for all fluorescent fixtures shall be furnished by General Electric, Westinghouse, Sylvania or approved equal of color as later selected and type called for under each fixture type. The engineer reserves the privilege of having samples specified lighting fixtures mounted in place in operating condition for evaluation prior to final approval. In the event any fixture type is rejected for aesthetic or other reasons, the contractor shall procure and install other suitable fixtures as directed until a satisfactory approval is granted. Any difference in cost of fixtures thus approved shall be mutually agreed upon before installation, but all work involved in sample installations and final approval by the engineer shall be at no additional expense to the owner.

3.0 Installation of Lighting Fixtures - Fixtures shall be completely wired in accordance with the latest requirements of the National Electrical Code. All pendant type fixtures in the same room shall be installed at a uniform height from the floor and hang plumb. Fixtures shall be rigidly mounted in fixture stud in outlet box. Malleable iron hickies or extension pieces shall be provided where required. Each lighting fixture unit shall be installed in a manner approved by the manufacturer using a fastening method approved to sustain three times the weight of each unit. Use only stems, fittings and appurtenances provided by same fixture manufacturer. All suspended units where used with suspended ceiling shall be suspended from a structural portion of building and shall not be dependent upon ceiling for support. Contractor shall furnish and install all miscellaneous materials required to install lighting fixtures. Provide and install suitable cover plates or canopy for fixture outlet box where the fixture does not provide a suitable cover. Fixtures located on exterior of building shall be installed with cadmium-plated brass screws. Contractor shall confer with the general contractor to locate and install pendant-ceiling fixtures and install supports for any ceiling fixtures which require special provision for their support. Installation of all lighting fixtures shall be done by experienced mechanics. Lighting fixtures shall not be installed until finished coat of paint has been applied to ceilings and walls and allowed to dry thoroughly. Lighting fixtures in the equipment rooms shall not be installed until all piping and ductwork is in place. Lighting fixtures layout shown on plans is typical layout for bid purposes but must be modified by the contractor to provide adequate lighting of the equipment space according to final construction conditions. Any relocation of fixtures due to duct or piping interference shall be as directed by Architect, at the expense of the contractor and not billed to the owner.

16920 COMPLETION OF WORK

1.0 Testing - Completed installation shall be tested. Cable shall be tested with ohmmeter for grounds, opens, insulation resistance. Cable insulation resistance shall be in the megohm range in the category required by I.P.C.E.A. for the cable.

2.0 Acceptance - In the presence of engineer and owner, demonstrate operation of systems and that all specifications have been met to the satisfaction of the owner.

3.0 Miscellaneous - Provide all miscellaneous spare parts, devices and appurtenances as required. Install and test.

4.0 Close Out -

1. Contractor shall provide 2 copies of all O&M manuals, warranty and catalog cut data in a 3 ring binder, neatly arranged, to the owner prior to application of final payment. Binder shall be acceptable to owner and engineer prior to approval of final payment.

2. Demonstrate to building maintenance personnel correct preventive and schedule maintenance services.

3. Provide warranty to owner, including points of contact for warranty work for system installation and manufacturers equipment installed.

Final payment will not be released until contract closeout is complete.

DIVISION 15000

HEATING, VENTILATING & AIR-CONDITIONING SYSTEMS SPECIFICATIONS (HVAC)
PLUMBING SPECIFICATIONS (P)
SPRINKLER SPECIFICATIONS (SP)

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- 2.0 Piping and Supply
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15010 GENERAL DESCRIPTION AND SCOPE - HVAC

1.0 General Description - These plans and specifications cover furnishing and installing all equipment, materials, transportation and labor to provide complete and operative heating, ventilating and air-conditioning systems at The Village of Highland Falls Senior Center..

Included also are specific detailed instructions as may be later issued by the engineer.

2.0 Scope - The entire installation shall consist of but not be limited to furnishing and installation of the following:

1. Dampers, diffusers and louvers.
2. Electrical connections.
3. Ventilation exhaust fans and ductwork.
4. Testing and rendering operative of all new systems.
5. Meeting of all codes and ordinances.
6. Payments of all fees.

15020 GENERAL DESCRIPTION AND SCOPE - PLUMBING

1.0 General Description - These plans and specifications cover furnishing all labor, materials, transportation and equipment to provide a complete and operative plumbing system for The Village of Highland Falls.

2.0 Scope - These plans and specifications include but are not limited to the following:

1. Water supply piping, hot and cold, including piping insulation.
2. Fixtures including supply and drainage fittings.
3. Sanitary Drainage, waste and vent piping.
4. Removal of existing systems.
5. Testing and rendering operative of all new systems.
6. Meeting of all codes and ordinances.
7. Payments of all fees.

15050 GENERAL CONDITIONS - HVAC

1.0 Governing Conditions - Governing Conditions of the Heating, Ventilating and Air-Conditioning Contract shall be in accordance with all provisions of the Bid Documents, Contract Documents, Specifications and Supplementary General Conditions, including "Standard General Conditions of the Construction Contract" (NSPE/ACED-56465, latest edition) and/or "General Conditions of the Contract for Construction" (AIA Document A201, latest edition).

Supplementary General Conditions may be provided for all mechanical work and are contained in the General Construction Documents. The contractor should read and understand these conditions.

2.0 Drawings, Specifications, Bid Documents - System layout and details shown on drawings - HVAC series. Scale as noted. Do not scale drawings. Refer to architectural drawings for actual dimensions. Follow drawings as far as practical and supplement by actual field conditions.

All work within this Section shall be subject to all provisions of the bidding documents, contract documents, specifications and all Supplementary General Conditions thereto.

Provide all labor, materials, equipment, apparatus, tools, services, appliances, plant, permanent and temporary facilities required in performing all operations necessary for the complete installation of heating, ventilating and air conditioning facilities as called for within this Section of the specifications and drawings.

Provisions within this Section of the specifications are complementary to all other Sections of the specifications, to the drawings, and to the site and job conditioning.

It is the intention that these specifications, and drawings accompanying same, shall provide for the furnishing and installing of the heating, ventilating and air-conditioning systems complete as specified and shown. Any work shown on the drawings and not particularly described in the specifications or vice versa, or any work changes which may be evidently necessary to complete the installation shall be furnished by the contractor.

3.0 Shop Drawings and Approvals - Furnish shop drawings for all major items of equipment. Items requiring shop drawings:

Ductwork - new and alterations to existing
Diffusers and grilles
Exhaust Fans

Submit shop drawings for approval and cuts of all equipment and appliances prior to start any work. No items of equipment will be permitted on the site until this approval has been given. Contractor shall allow ample time for checking and processing and shall assume responsibility for delays incurred due to rejected items.

4.0 Workmanship - Provide neat, mechanical appearance. Provide minor alterations to suit job conditions to accomplish. Special attention shall be given to headroom requirements where ducts and piping are exposed.

5.0 Materials - Provide best-accepted industry standard equipment as per manufacturer and catalog numbers shown. Piping materials shall meet ASME test codes. Cooling equipment ratings should be per ARI standards. All equipment shall be new and corrosion protected.

6.0 Guarantee - Contractor shall guarantee all workmanship, materials and correct operation for a period of one year and shall repair promptly any leaks or breakdowns during that period. Where specific items have greater manufacturer's guarantee period, this guarantee is in addition to manufacturer's liability. Guarantee shall be in writing to the Owner. All air conditioning compressors shall be guaranteed for five

years. The contractor shall promptly correct any defects upon notice from the owner to do so, without cost to the owner.

7.0 Codes, Permits and Inspections - Comply with all building code requirements of New York State Building Code, National Electrical Code, NFPA, and all applicable Federal, State and Municipal laws, ordinances and regulations. The contractor shall apply for and obtain all required permits and inspections and pay all fees.

8.0 Ducts and Hangers - Provide all duct work for the various heating and ventilating systems complete in every respect and ready to operate.

Material shall be galvanized sheet, ASTM A-653 / A653M. All galvanized steel ducts shall be of gauges shown on drawings and as follows:

Round	Rectangular Greatest Dimension	Gauge
0" - 8	0" - 12"	26
9" - 12"	13" - 30"	24
Over 12"	Over 30"	22

All rectangular ducts shall be crossbroken.

Methods of construction and metal gauges shall be as set forth in SMACNA guide (latest edition). All ducts shall be straight and smooth on the inside and neatly finished joints. Slip joints shall be used in the direction of the airflow.

All duct joints shall be sealed using liquid duct sealant and wrap joints with duct tape.

Ducts shall be securely supported in approved manner, and so constructed and installed as to be free from vibration, "panting" or "oil canning" under all operating conditions, especially on startup and shutting down.

Horizontal ducts shall be suspended by galvanized bond iron hangers on 3" centers from joints, angle irons or floor slabs. Each hanger band shall run completely across bottom of duct and be supported at each floor level by approved angle iron supports.

Where space permits, duct elbows shall have a centerline radius 1-1/2 times the dimensions of the duct in the plane of the bend. Where space does not permit, the minimum radius of 1.25 may be used without concentric splitters or square elbows with turning vanes similar to Tuttle and Bailey "Ducturns" or approved equal. When concentric splitters are used, the radius of the bends shall be carefully located for low loss elbows.

All branch ducts shall be equipped with volume dampers. (Accessible).

Approved access doors shall be located on ducts and housing for cleaning and maintenance of ducts, dampers, damper operators and equipment not otherwise accessible.

All ducts 36"-45" wide shall be reinforced by 1" x 1" x 1/8" angles on 4'-0" on centers.

Ductwork shall present neat workmanlike appearance, straight and plumb or level as location requires. Set openings symmetrically across walls, located to comply with architectural details.

Provide fire dampers where shown and/or required. Construct in accordance with NBFU Bulletin No. 90 (latest edition).

Provide double thick 14 oz cotton canvas connections wherever ductwork adjoins air-moving equipment. Minimum 4" separation.

The inside of all ductwork where visible through openings shall be painted with two prime coats of flat black paint.

9.0 Insulation -

1. All supply and return air ductwork shall be externally insulated with minimum R-6 (installed value) fiberglass insulation when located inside the building envelope in unconditioned spaces and R-8 (installed value) when located outside the building envelope. Insulation shall have reinforced foil Kraft facing and be adhered to ducts by 4" strips of bonding adhesive on 8" centers. All joints shall butt together and be sealed with 2" flaps. Materials shall be Owens-Corning RFK-75 or approved equal.

2. Vibration Isolation: All motorized equipment shall be insulated with approved vibration eliminator.

3. All piping to be insulated in accordance with the New York State Energy Conservation Construction Code, latest edition.

10.0 Accessibility - Contractor shall fully inform himself regarding any and all peculiarities and limitations of the space available for the installation of all work and materials furnished and installed under the contract. Due care shall be exercised so that all parts of his work are made quickly and easily accessible. All concealed equipment, valves, controls, etc., provided with access doors of sufficient size and as approved by architect.

11.0 Supports - The contractor shall guarantee that the work as installed by him will not result in the transmission of objectionable noise or vibration to any occupied parts of the building; and, he shall take full responsibility for any necessary modifications of his equipment, or of the foundations and supports for the same necessary to secure this result.

12.0 Temporary Heat - The contractor shall furnish and install all temporary heating equipment and shall fuel and maintain same during course of project. He shall render it operative and maintain a minimum working temperature throughout the building of 55 degrees F. The contractor shall read and thoroughly understand this Section and his participation in the requirement of temporary heating.

The contractor shall NOT use permanent heating equipment for temporary heat until same is accepted by owner.

13.0 Protection of Apparatus - All pipe and duct openings shall be protected by temporary covers to exclude entrance of debris or other foreign matter during construction. All equipment shall be properly protected from damage during the course of building construction.

14.0 Access Doors and Panels-Furnish and install flush type access doors or panels with metal frame to permit access to control dampers, valves, devices, fire dampers, etc. Furnish insulated duct access panels for access to devices within ducts.

15.0 Mechanical Identification – All piping and equipment shall be labeled with industry standard labels and stamps.

15060 GENERAL CONDITIONS - PLUMBING

1.0 Governing Conditions - General Conditions of the Plumbing Contract shall be in accordance with:

1. "Standard General Conditions of the Construction Contract.

2.0 Drawings - Plumbing installation shown in drawings and on supplementary drawings supplied.

3.0 Shop Drawings and Approvals - Furnish shop drawings for approval, six copies on all major items of equipment. Items requiring shop drawings are:

All equipment show on drawing legend and schedule

The materials, workmanship, design and arrangement of all work installed under the contract shall be subject to the approval of the engineer.

If material or equipment is installed before it is approved, the contractor shall be liable for the removal and replacement at no extra charge to the owner if, in the opinion of the engineer, the material or equipment does not meet the intent of the drawings and specifications.

The words "or approved equal" shall be understood to follow the name of all manufacturers stated herein.

4.0 Workmanship - Provide neat mechanical appearance. Provide minor alterations to accomplish. Conceal all piping in all finished areas.

The contractor shall give written notice to the engineer of any materials, apparatus, or omissions believed to be in violation of laws, ordinances, rules or regulations of authorities having jurisdiction. In the absence of such written notice, it is mutually agreed that the contractor shall include the cost of providing all systems in accordance with applicable regulations without extra compensation.

5.0 Materials - Provide the best-accepted industry standard equipment and materials. Entire installation shall conform to principles and practices of National Plumbing Code and shall meet New York State Plumbing Code requirements.

Substitutions of equipment or materials other than those indicated on the drawings may be made only upon written approval from the engineer. The contractor shall submit his substitution for approval before releasing order for fabrication and/or shipment. Engineer reserves the right to disapprove such substitutions provided, in his opinion, the item offered is not equal to the item specified.

Where such approved deviation requires a different quantity and arrangement of ductwork, piping, wiring, conduit and equipment from that specified or indicated on the drawings, subject to approval of the engineer, the contractor shall provide any such ductwork, piping, structural supports, insulation, controllers, motors, starters, electrical wiring and conduit, and any other additional equipment required by the system, at no additional cost to the owner.

6.0 Guarantee - Contractor shall guarantee all workmanship, materials and performance for a period of one year from the date of the certificate of completion and acceptance of his work. The contractor shall promptly correct, without cost to the owner, such defects upon notice from the owner to do so.

7.0 Codes, Permits, Inspections - Comply with plumbing code requirements of the municipality in which located, NYS Building Code and National Plumbing Code. Materials per code hereinbefore mentioned. Furnish permit and certificate of final inspection from municipality. Contractor shall pay all fees and inspections and same shall be included in the contract amount.

8.0 Roof Penetrations - All roof penetrations shall be provided by the contractor where necessary, and/or when shown on drawings.

Contractor shall layout all plumbing facilities in advance of pouring or laying walls for all chases, sleeves,

etc. He shall be responsible for locations of same.

9.0 Tests - Labor, material, instruments and power required for testing shall be furnished by this contractor.

Tests shall be performed in the presence and to the satisfaction of the engineer and such other parties as may have legal jurisdiction.

Pressure tests shall be applied to piping only before connection of equipment. In no case shall piping, equipment or accessories be subject to pressure exceeding their rating.

All defective work shall be promptly repaired or replaced and the tests shall be repeated until the particular system and component parts thereof receive the approval of the engineer.

Any damages resulting from tests shall be repaired, and damaged materials replaced, all to the satisfaction of the engineer.

The duration of tests shall be as determined by all authorities having jurisdiction, but in no case less than the time prescribed in the specification.

Equipment and systems which normally operate during certain seasons of the year shall be tested during the appropriate season. Tests shall be performed on individual equipment, system and their controls. Whenever the equipment or system under test is interrelated with and depends upon the operation of other equipment, systems and their controls, for proper operation, functioning and performance, the latter shall be operated simultaneously with the equipment of system tested.

No piping in any location shall be closed up, furred in or covered before testing.

The entire drainage and vent system shall have all openings plugged to permit the entire system to be filled with water to the upper level of the highest vent stack above the roof. When a portion of the system is being tested, a vertical stack ten feet above the highest horizontal line to be tested may be installed and that portion of the system filled with water. The water shall remain in the system for a four-hour period minimum, without any lowering of the water level at the overflow.

After setting of fixtures and/or equipment, the entire waste and vent system shall be subjected to a smoke test as follows: Fill all trap seals with water. Introduce into the system through a suitable opening, a thick penetrating smoke which is produced in openings above roof, close the vent openings and continue introducing smoke until a pressure of one inch of water has been built up. Maintain pressure for fifteen minutes minimum before starting inspection. Smoke shall not be visible from any joint, fixture connections and/or fixture.

10.0 Job Conditions - Contractor shall inform himself of all job conditions, entrance clearances, etc. for his equipment and material.

11.0 Slopes - All horizontal soil, waste, or storm piping of 3 inch diameter or less shall be run in a uniform grade at not less than 1/4" per foot unless otherwise indicated. All horizontal soil waste, or storm piping larger than 3 inches in diameter shall be run in a uniform ratio at not less than 1/8" per foot. All vent piping shall be so graded as to free itself quickly of any condensation.

12.0 Piping - General - Pipe Expansion - All pipe connections shall be installed to allow for freedom of movement of the piping during expansion and contraction without springing. Swing joints, expansion loops and expansion joints with proper anchors and guides shall be provided by the contractor where necessary, and/or when shown on drawings. Anchors and guides shall be subject to approval of the engineer.

Bases and Supports - The contractor shall provide all bases and supports not part of the building structure, of required size, type and strength as approved by the engineer, for all equipment and materials furnished by him.

All equipment, bases and supports shall be adequately anchored to the building structure to prevent

shifting of position under operating conditions.

Sleeves, Inserts and Anchor Bolts - The contractor shall provide and will be held responsible for the location of, and maintaining in proper position all sleeves, inserts and anchor bolts required for his work. In the event that failure to do so requires cutting and patching of finished work, it shall be done at the contractor's expense.

Escutcheons - Contractor shall provide escutcheons on pipes wherever they pass through the floors, ceilings, walls or partitions.

Escutcheons for pipes passing through outside walls shall be solid, cast brass, flat type secured to pipe with a setscrew.

Escutcheons for pipes passing through floors shall be split-hinged, case brass type designed to fit pipe on one end and cover sleeve projecting through floor on the other end.

Escutcheons for pipes through interior walls, partitions and ceiling shall be split hinged, cast brass, chromium plated type.

13.0 Painting - The contractor shall paint all unpainted, noninsulated, non-galvanized ferrous metal surfaces of pipes, equipment, fixtures, hangers, supports and accessories as follows:

Exposed - One prime coat of gray lead and oil paint.
Concealed - One coat of black asphaltum paint.
Underground - Two coats of black asphaltum paint.

Uncoated or otherwise unfinished canvas jackets or insulation shall be painted with one coat of glue sizing as soon as possible after installation.

14.0 Cleaning Piping - The contractor shall thoroughly clean all piping, ducts, and equipment of all foreign substances inside and out before being placed in operation.

If any part of the system should be stopped by any foreign matter after being placed in operation, the system shall be disconnected, cleaned and reconnected wherever necessary to locate and remove obstructions. Any work damaged in the course of the removal of obstruction shall be repaired or replaced when the system is reconnected at no additional cost to the owner.

During the course of construction all ducts and pipes shall be capped in an approved manner to insure adequate protection against the entrance of foreign substances.

15.0 Access Doors and Panels - Furnish and install flush type access doors or panel with metal frame for all valves or apparatus located in chases, walls or floors. Finish shall be prime coated.

16.0 Sleeves and Inserts - This contractor shall be held responsible for the location of and maintaining in proper position, sleeves, inserts and anchor bolts supplied and/or set in place by him. In the event that failure to do so requires cutting and patching of finished work, it shall be done at this contractor’s expense by the concrete and/or masonry contractor.

All pipes passing through floors, walls or partitions shall be provided with sleeves having an internal diameter of 1" larger than the outside diameter of the pipe or insulation on covered lines.

Sleeves passing through lightproof or soundproof walls, floors and partitions and through firewalls shall be made tight using approved caulking materials.

Sleeves through floors and all other walls shall be Schedule 40, black steel pipe, set flush with finished wall or ceiling surfaces, but extending ½" above finished floors.

Sleeves through outside walls shall be Schedule 40 black steel pipe with 150 lb. black steel slip-on welding flange welded at the center of the sleeve and shall be painted with one coat of bitmastic paint inside and outside. The space between sleeve and pipe shall be packed with oakum to within 2" of each

face of the wall. The remaining space shall be packed and made water tight with a waterproof compound.

Sleeves through masonry floors or interior masonry walls shall be Schedule 40 black steel pipe, set flush with finished wall or floor surfaces.

Sleeves through interior partitions shall be 22- gauge galvanized sheet steel, set flush with finished surfaces of the partitions.

Inserts shall be individual or strip type of pressed steel construction with accommodation for removable nuts and threaded rods up to 3/4" diameter, permitting lateral adjustment. Individual inserts shall have an opening at the top to allow reinforcing rods up to ½" diameter to be passed through the insert body. Strip inserts shall have attached rods with hooked ends to allow fastening to reinforcing rods.

15080 SUPPLEMENTAL GENERAL CONDITIONS (HVAC, P)

1.0 Contractual Relationship with Owner - Upon award of this contract, the contractor shall save harmless the owner and his agents from any or all causes of action arising out of the contractor's negligence.

2.0 O.S.H.A. - All work on this project shall be accomplished in accordance with Federal Statutes such as the Occupational Safety and Health Act (1970).

3.0 Other General Conditions -

1. Intent - It is the intent of these plans and specifications to provide alterations and/or new construction as indicated on the drawings and in the specifications to provide complete new systems in every respect, capable of operating as designed. It is not intended that every fitting, minor detail or feature be shown on drawings.
The contractor shall be responsible for any detail necessary for completion of these systems in accordance with good practice.

   Installation shall be executed so as to contribute to efficiency of operation, minimum maintenance, accessibility and sightliness. The installation shall conform and accommodate itself to the building structure, its equipment and its usage. No piping or equipment shall be installed in such a manner as to interfere with the operation of any doors or windows.

   Requirements specified herein shall govern applicable portions of mechanical and electrical sections whether so stated herein or not.

2. Regulations and Certificates - All work shall be done in strict accordance with rules and regulations of local and state authorities having jurisdiction over such work, utility companies operating where apparatus is being installed, National Fire Protection Association, IEEE and insurance companies. Where discrepancies occur between above regulations and these plans and specifications, requirements of the regulations shall take precedence, except that these specifications shall be minimum requirements and that no changes shall be made without approval of the engineer.

   Complete approval of all above mentioned authorities shall be secured and their certificates of approval shall be delivered to the owner before final acceptance. Any and all drawings or documents required (in addition to contract drawings) shall be furnished in order to secure above-mentioned approvals.

3. Drawings and Measurements - Contract drawings for mechanical and electrical work are in part diagrammatic, intended to cover the general design and extent of the systems and indicate general arrangement of equipment, ducts, conduits, piping and approximate sizes and locations of equipment and outlets.
Drawings are not intended to be scaled for roughing-in measurements nor to serve as shop drawings. Where drawings are required for these purposes or have to be made from field measurements, they shall be prepared by the various trades and coordinated by the contractor.

   Where job conditions require reasonable changes from indicated locations and arrangements, such changes shall be made without cost to the owner.

   Exact locations of all grilles, registers, plumbing fixtures, electrical fixtures, panelboards, etc., shall be governed by plans, elevations and details.

4. Record Drawings - During the course of construction the respective contractor shall keep a careful record (in drawing form) of all deviations from the work as shown on the contract

drawings on the installation of pipes, ducts, electric outlets, equipment, invert elevations, etc. These drawings shall be delivered to the engineer before the final certificate of payment is issued.

5. Accessibility - Locate all equipment which must be serviced, operated or maintained, in fully accessible position. Equipment shall include but not be limited to valves, traps, cleanouts, motors, controllers, drain points, etc. Furnish access doors where required. Minor deviations from the drawings may be made to allow for better accessibility, but changes of magnitude or which involve extra cost shall not be made without approval.

6. Access Doors and Panels - Furnish flush type door or panel with metal frame for all dampers, valves, cleanouts or apparatus located in chases, walls or floors. Finish shall be prime coat.

7. Quiet Operation - All equipment shall operate under all conditions of load without any sound or vibration which is objectionable to the opinion of the engineer. In case of moving machinery, sound or vibration noticeable outside of room in which it is installed or annoyingly noticeable inside its own room will be considered objectionable. Sound or vibration conditions considered objectionable by the engineer shall be corrected in approved manner by the contractor at the latter's expense.

8. Covering of Work - No pipe fittings or other work of any kind shall be covered up or hidden from view before it has been examined or approved by the engineer or other authority having jurisdiction. Any unfaithful or imperfect work or material which may be discovered shall be removed and corrected immediately before being condemned, and other work and materials shall be furnished which shall be satisfactory to the engineer.

9. Waterproofing - Where any work pierces waterproofing, the installation shall be as approved by the engineer. Contractor shall furnish all necessary sleeves, caulking and flashing as required to make the openings absolutely watertight.

10. Site Conditions – The Contractor shall familiarize himself with the site and understand all the conditions under which he will be obligated to operate in performing his part of the contract. No allowance will be subsequently made in this connection to this contract or for any errors through omission or negligence on his part.

4.0 Firestopping-All penetrations through fire and smoke rated walls, floors, and ceilings shall be thoroughly sealed with 3M Brand Fire Barrier CP25WB latex based caulk, or approved equal. Install in accordance with manufacturer's instructions.

5.0 Equipment Returns-As part of this contract, contractors shall ensure that suppliers of any and all equipment supplied for this project agree to accept the return of any equipment on this project that is in undamaged condition and has not been put into service with a maximum restocking fee of 25%, up until the date of certified substantial completion of the project.

6.0 Building Services Shutdowns – All building services shutdowns, including electric, gas, water, and telephone utilities, and HVAC, sprinkler, and plumbing systems in existing buildings, for the purpose of performing cutovers and tie-ins of new systems, shall be strictly coordinated with the appropriate utility companies and the building owner.

15400 WATER SUPPLY SYSTEM

1.0 Service - Furnish and install new water service.

2.0 Piping and Supply - All piping supply shall be Type "L" copper above grade inside of building. All fittings shall be wrought copper. Clean all areas to be connected using fine sand cloth. Solder using paste type non-corrosive flux of petrolatum base. Joints shall be soldered within an hour of flux applications. All copper shall be tempered type and shall not be bent. Furnish proper mechanical support before soldering. All solder for Type "L" shall be 95-05 or approved equal.

All fixtures shall be provided with separate valves. Furnish and install at accessible locations at all fixtures.

Furnish and install non-freeze hose bibbs at locations shown.

3.0 Hangers - Furnish and install pipe hangers in accordance with the following spacing schedule:

Size Pipe	Ctr to Ctr Spacing
½"	6'
3/4" - 1"	8'
1 1/4" - 2"	10'
2 ½" - 5"	12'

4.0 Air Chambers - Furnish and install full size air chambers as follows:

Locations	Height
Top of all main risers	2'-0"
Each fixture	1'-0"

The above applies to all hot and cold pipes and fixtures.

5.0 Piping Insulation - All domestic cold, hot water supply, and recirculation piping shall be insulated with Certain Teed 500 degree Snap-on Heavy Density Pipe insulation, or approved equal. The insulation shall have an average thermal resistance of at least 4.0 (square foot) (degrees F)/BTUH per inch of thickness on a flat surface at a mean temperature of 75 degrees F.

Application - Insulation shall be applied over clean dry pipe with all joints butted firmly together. Do not install insulation when air temperature is lower than 35 degrees or higher than 120 degrees. Do not leave adhesive strip exposed to air. Adhere self-sealing lap immediately after removing paper backing.

Fittings and valves shall be insulated and fitted with Manville Zeston PVC pipe fitting covers and Hi-Lo Temp Insulation Inserts, or approved equal. Insulation thickness shall be as per New York State Energy Code.

All piping insulation shall comply with New York State Energy Code Requirements.

INSULATION SCHEDULE (DOMESTIC WATER PIPING 140□ AND BELOW)

RUNOUTS	□1	1 1/4"-4"	5" AND LARGER
Cold Water	1/2"	1/2"	1" 1"
Hot Water	1/2"	3/4"	1" 1 1/2"
Hot Water Recirc	— 3/4"	1"	1 1/2"

All piping shall be marked with pipe identification by Seton, or similar.

6.0 Sterilization of Water Piping - Water piping shall be sterilized by introducing into the system a solution of liquid chlorine or sodium chlorine. Chlorine content of solution shall not be less than 50 ppm. Solution shall remain the system not less than eight hours during which time all faucets, valves, etc., shall be opened and closed not less than three times each, at intervals of not less than 30 minutes.

At conclusion of eight-hour period, flush sterilizing solution from system. Reflush, as many as may be required with fresh water until residual chlorine content in any part does not exceed 0.05 ppm.

7.0 Valves - The entire plumbing system shall be provided with valves so located that they can be operated, replaced and repaired and afford complete control of the water to each group of fixtures, each riser and wherever else required.

Each fixture shall have supply stops. Exposed supply stops shall be polished chrome finish.

All valves shall be 150 lb. type that can be repacked under pressure when wide open. Where possible one make of valve shall be used throughout (NIBCO, Jenkins, Crane or Walworth).

Provide 125# sweat globe valves for drains and blow-offs.
Valves 3/4" and smaller shall be ball or globe valves, larger size shall be solid wedge type gate valves. Valves two inch and smaller shall be all bronze with screwed or sweat type ends. Valves 2-1/2" and larger shall be iron body bronze-mounted gate valves with screwed or flanged ends.

8.0 Pressure Reducing Valves and Backflow Preventors - Furnish and install pressure reducing valves and/or backflow preventors as required by local municipality.

9.0 Temporary Water Supply - Contractor shall furnish and install piping for temporary water supply to building from existing supply to building for the use of all trades.

15420 DRAINAGE, WASTE AND VENT SYSTEM

1.0 Drainage, Waste and Vent - All piping above grade shall be Type DWV copper or no-hub cast iron down to 6" above grade. All piping below this point, in slab and below grade shall be service weight cast iron. All copper piping connections shall be soldered using standards hereinbefore described. All cast iron piping shall be no-hub above grade bell and spigot type below grade and shall have neoprene insert joints.

All lines shall be sloped 1/8" per foot minimum. All horizontal changes of direction shall be 1/8 bend (45 degree maximum). Vertical changes shall be "TY".

2.0 Cleanouts - All cleanouts shall be closed gas tight by heavy cast bronze screw type plugs with raised hex heads. Plugs shall be full size up to and including 4".

All cleanouts in finished floors shall have a heavy cast bronze plug with straight thread and tapered shroud that seals against caulk lead seat in body, coated cast-iron extension body with cut off serrations and polished brass access cover and frame with integral lugs for adjustment to level of finished floor. (Zurn, Smith, Wade)

Wall cleanouts shall be covered with 6" nickel bronze cover set flush with finished wall and held in place by means of integral anchoring lugs. (Zurn, Smith, Wade)

All cleanouts in finished floors to be covered with linoleum or other applied composition flooring materials shall have recessed inlay type nickel cover.

Soil, waste and storm drains shall be provided with cleanouts at the base of each stack, at every change or direction greater than 45 degrees.

15440 FLOOR DRAINS

1.0 Floor Drains- Provide and install floor drains in mechanical rooms and others as shown on plans. Provide extra heavy cast iron drain and vent pipes to floor drain trap. All areas served by floor drains shall have hose bibb or similar permanent water source made available by this contractor.

Floor drains shall have cast iron body with bottom outlet and nickel bronze stainer sized as shown on plans. Drains shall be manufactured by Zurn or approved equal.

Install floor drains as shown on drawing with bottom outlet caulk connection. Provide with trap and internal backwater valve with bronze valves and seat. Provide strainer as shown on plan.

15460 FIXTURES AND INSTALLATION

1.0 Schedule of Equipment - Shown on drawings.

2.0 Fixture Installation - Fixture trim, faucets, stop valves, escutcheons and waste pipe exposed to view in finished areas shall be brass with polished chromium plating over nickel finish, guaranteed not to strip or peel.

Faucet locations shall be uniform with the cold water faucet on the right side of the fixture and hot water on the left.

This contractor shall be responsible for providing these portions of the fixture trim which are not supplied with the fixture, but are required for the complete installation. All fixtures shall be carefully checked to determine the portion which must be provided to complete the installation.

All fixtures shall be provided with separate stop valves for hot and cold water so that each fixture may be separately controlled without effecting any other fixture.

Provide a capped air chamber 18" long with one size larger than the branch on each hot and cold-water riser to each fixtures.

3.0 Carriers - Furnish and install fixture carriers on all lavatories. See legend and schedule for type and size.

15820 VENTILATION - EXHAUST FANS AND SYSTEMS

1.0 Description - The contractor shall furnish and install complete and operative, several exhaust fans and exhaust systems consisting of fans, housings, frames, ductwork, grilles, insulation, electrical controls and appurtenances to render the systems completely operative as per drawings and specifications.

2.0 Equipment and Installation - The contractor shall furnish and install exhaust fans in various locations shown. See plans for technical data on various exhaust system components in the several areas shown.

This contractor shall furnish and install entire fan system complete and operative including fan, housing, motor operated louver curb and exhaust grille.

Wall mounted fans shall be furnished and installed complete and back draft damper, gasketing and

Provide disconnects for all fans, mounted in housing.

Provide back draft dampers and operators on all fans.

Provide vents in locations, sizes and capacities as shown on plans and drawings.

Provide vents in locations, sizes and capacities as shown on plans and drawings.

All fans shall be equipped with insect and bird screens.

All exhaust fans and systems shall be controlled as shown on plans.

15920 SYSTEM TESTING, ADJUSTMENT AND OPERATION

1.0 Testing - Render all equipment operative. Check system for proper operation. Run all equipment long enough to dry out and test all controls for proper operation and operation of all safety controls.

2.0 Adjustment and Balancing - Operate all equipment on cooling cycles and balance volume dampers on all ducts and registers to effect comfort and proper cfm. All testing and balancing shall be performed by a Certified HVAC Testing and Balancing Contractor.

5.0 Contract Close Out-

a. In the presence of the owner, engineer or architect; demonstrating operation of systems and that all specifications have been met to the satisfaction of all parties.

b. Provide required spare parts, devices and appurtenances.

c. Provide 2 copies of O & M manuals, shop drawings and catalog cuts, bound in 3 ring binder or similar.

d. Demonstrate to building maintenance personnel correct preventive maintenance and scheduled maintenance services.

e. Provide warranties to owner, including points of contact for warranty work for system installation and manufacturers equipment installed.

Final payment will not be released until contract closeout is complete.