SPECIFICATION MANUAL

Cedar Street Apartments

1900, 1902 and 1904 Cedar Street
Richmond, VA

March 12, 2010

07.36

Walter Parks Architect
313 North Adams Street Richmond, VA 23220

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SECTION 01 00 00
GENERAL REQUIREMENTS

0101 Scope of Work

The work is constructing an apartment complex. The contract, the drawings, the specifications, including the general requirements, and all addenda attached are incorporated to form the contract documents. In the event of a discrepancy, the contract shall govern over specifications and drawings, the specifications over the drawings, and the general requirements over other sections of the specifications.

0102 Investigation

The Contractor shall become thoroughly familiar with the provisions of the contract, drawings, specifications, general requirements, and addenda thereto, as well as the building site and conditions affecting the work. No allowances will be made subsequently on behalf of the Contractor for errors due to his negligence in failing to acquaint himself with the contract documents and the site conditions for his failure to determine the Owner's desired meaning and intention of these contract documents before starting work.

0103 Insurance

A. Contractor agrees to protect, indemnify and hold the Owner harmless against all loss, cost damage, liability or expense which Contractor may incur or sustain in connection with or in consequence of any claim of personal injury or property damage (including death or destruction) and of any and all other claims of whatsoever character or nature, in any manner or in any way arising out of, connected with, growing out of or a result of performance of this Contract or of breach thereof, or of any activity (or inactivity) whatever conducted or permitted by Contractor, and whether or not caused by a negligent act or omission on the part of Contractor, irrespective of by whom or on whose behalf such claim, suit or action may be asserted or brought. In addition, Contractor will service any such claims or demand, defend any such suit or action, and satisfy any judgment, including court costs, which may be awarded therein.

B. In addition to and not in lieu of satisfaction of the foregoing, Contractor agrees to procure and keep in force for the following insurance in companies acceptable to Contractor:

1. Workmen's Compensation and Employer's Liability providing statutory benefits and with minimum liability limits of $100,000 for Employer's Liability Coverage.
2. Comprehensive General Public Liability Insurance with minimum liability limits of $100,000 each person and $300,000 each occurrence for personal injury (including employees) and $100,000 each occurrence and $100,000 aggregate for property damage. This insurance shall include independent contractor coverage, elevator and hoist coverage, contractual coverage, and completed operation coverage.
3. Comprehensive Automobile Liability Insurance for all owned, non-owned and hired vehicles with minimum liability limits of $100,000 for each person and $300,000 each accident for bodily injury and $100,000 for each accident for property damage.

C. Contractor agrees to furnish Contractor with certificates of insurance indicating compliance with the above requirements and specifically evidencing contractual coverage for assumed liability in the contract. Each such certificate shall contain a provision that the same will not be canceled without ten (10) days prior written notice to Contractor.

D. Certificate of Insurance forms will be provided by the Contractor.

0104 Work Progress and Scheduling

Time is of the essence in this Contract. Contractor agrees to supply materials, labor and equipment as necessary to commence his work when directed by Owner. He shall diligently pursue the completion of his work and coordinate his work that being done on the project by Subcontractor and other trades so that his work or the work of others shall not be delayed or impaired by any act or omission of an act by Contractor. Contractor shall have complete control of the premises on which the work is to be performed and shall have the right to decide the time or order in which the various portions of the work shall be installed or the priority of the work of other Subcontractors, and in general, all matters representing the timely and orderly conduct of the work of Contractor on the premises. Contractor will maintain a coordinated progress schedule for the benefit of all Subcontractors, and the Subcontractor is required to perform his work in accordance with such schedule. This paragraph shall also cover changes or extra work agreed to. Contractor, in agreeing to complete the work within the time specified, has taken in to consideration and made allowances for the ordinary delays of common carriers, delays in securing material for workmen, changes, omissions and alterations. The Subcontract is responsible for following the progress of the work and the current progress schedule on display in the field office. Any allowance for the extension of time beyond that called for on the current progress schedule shall be agreed upon in writing between Contractor and Contractor. Contractor shall not be liable to Contractor for any delay to Contractor's work resulting from the act, negligence of default of others, or by reason of fire or other casualty, or on account of riots, strikes or other combined action of the workmen, or on account of any act of God, or any other cause beyond Contractor's control, or on account of any circumstances caused or contributed to by Contractor. The Contractor shall reimburse the Contractor for any loss, damage or extra expense paid or incurred by the Contractor which is due to Contractor's failure to deliver any and all materials, as required, or to properly perform any and all work in keeping with the progress of the general construction work or to properly perform any term, covenant or condition contained in this subcontract. The payment of such sums shall be in addition to the liquidated damages sum set forth above as compensation to Contractor for delay in completion.

0105 Changes, Extras and Substitutions

Changes in the work: should Owner at any time during the progress of the work request any alteration or deviations in the scope of work in this contract, he shall have right and power to make such requests and the Contractor shall submit, within a reasonable time thereafter, an itemized estimate of any cost changes he foresees to make the alterations or deviations. It is distinctly understood and agreed, regardless from whom orders may be taken for alterations or deviations in the scope of work, no alterations or deviations are to be made except by a contract change order issued by Contractor and then only if such order sets forth the amount of any addition or deduction and is signed by both parties thereto. If Contractor initiates a substitution, deviation or change in the work which affects the scope of work or causes expense to Owner, Contractor shall be liable for the expenses thereof

0106 Defective Work and Claims

Payments otherwise due may be withheld by Contractor on account of defective work not remedied, claims filed, reasonable evidence indicating probability of filing of claims, failure of Contractor to make payments properly to its Subcontractors or for material or labor, or a reasonable doubt that the contract can be completed for the balance then unpaid. If the said causes are not removed, on written notice Contractor may rectify the same at Subcontractor's expense. Contractor may offset against any sums due Contractor hereunder the amount of any

liquidated or unliquidated obligation of Contractor to Contractor, whether or not arising out of this agreement.

0107 Approvals and As-Built Drawings

Contractor shall carefully examine specifications requirements, for approval material to be submitted such as shop drawings, data, schedules, samples, etc. Then he shall submit such material at his own expense and in such form as required by the contract documents in sufficient time to prevent any delay in the delivery of such materials and the installation thereof If "in-place" or "as-built" drawings are specified to be prepared by Contractor, these shall be prepared and submitted to Architect before final payment is requested.

0108 Cleanup

Contractor acknowledges that the execution of his work will result in an indeterminate amount of debris; Contractor agrees to retrieve, pick up and remove from the job site all such debris during the course of this work and on final completion of his work. Disposal of debris shall be done on a day-to-day basis as is reasonable. If after 24 hours notice Contractor has not diligently proceeded with the cleanup as outlined in this paragraph, then Owner has the right to proceed with the cleanup work with his own labor at Contractor's cost and expense. Unless specifically excepted under Scope of Work on the face of the contract, the terms of this paragraph will be strictly adhered to.

0109 Materials and Equipment

Unless otherwise specified, all materials and equipment shall be new and of the best quality of their respective kinds. Materials or equipment shall be delivered to the site in the manufacturer's original, unopened, labeled containers and be adequately protected against moisture, tampering or damage. Proposed substitutions to materials or equipment specified by manufacturer's name or trade name shall be superior to the original in all respects. At the Architect's option, detailed specifications, performance data or samples may be required to be submitted in addition to that data required in the specifications. In circumstances where the manufacturers of materials or fixtures used on this job provide installation or maintenance directions not covered in these specifications, or detailed on the drawings, the Contractor furnishing or installing the item shall follow such directions as though specifically mentioned.

0110 Protection of Work

Contractor shall take every reasonable precaution to protect his work or materials from loss or damage. If Contractor or his employees are responsible for any loss or damage to the work or materials of suppliers, or another Contractor, then he shall be charged with same, and any monies necessary to replace such loss or damage shall be deducted from monies due Contractor.

0111 Temporary Facilities

The Contractor shall provide and maintain sanitary toilet facilities from start to finish of the work and these are to be used exclusively rather than buildings under construction or completed. The Contractor shall obtain and have installed a temporary power service line to a point convenient for all trades. The Contractor shall provide temporary water for all trades. Before submitting proposal, Contractor shall verify the source or location of temporary power and water. Contractor will provide his own storage as needed on the site, and there will be no storage allowed in unfinished or finished buildings unless specifically authorized in writing by the Owner.

0112 Tests and Inspections

If the contract documents, laws, ordinances, rules, regulations or orders of any public authority having jurisdiction require any work to be inspected, tested or approved, the Contractor shall give the Contractor notice of its readiness and of the date arranged so the Contractor may observe such inspections, testing or approval.

0119 Permits. Licenses and Codes

All permits, licenses and easements necessary for the prosecution of his work shall be procured and paid for by Contractor. Contractor shall give all notices and comply with all laws, ordinances, rules and regulations bearing on the conduct of the work as drawn and specified. If Contractor observes that drawings and specifications are at variance herewith, he shall promptly notify Contractor in writing. If Contractor knowingly performs any work contrary to such laws, ordinances, rules and regulations without such notice to Contractor, he shall bear all costs arising there from.

END OF SECTION

SECTION 01 40 00
QUALITY CONTROL AND TESTING

GENERAL

Requirements Included: Contractor will employ and pay for the services of an Independent Testing Laboratory to perform specified testing

I . Contractor shall co-operate with the laboratory to facilitate the execution of its required Services.
2. Employment of the laboratory shall in no way relieve Contractor's obligations to perform the Work of the Contract.

Related Requirements: Conditions of the Contract - Inspections and testing required by laws, ordinances, rules, regulations, orders or approvals of public authorities:

Each Specification listed: Laboratory tests required, and standards for testing.

Section 01 00 00 Submittals
Division 31 Site Work (General Notes)
Division 3 Concrete (General Notes)

Laboratory Duties: Co operate with Owner/Engineer and Contractor; provide qualified personnel after due notice.

Perform specified inspections, sampling and testing of materials and methods of construction:

Comply with specified standards. Ascertain compliance of material with requirements of Contract Documents.

Promptly notify Owner/Engineer and Contractor of observed irregularities or deficiencies of work or products.

Promptly submit five copies of written report of each test and inspection to Owner/Engineer.

Submit written report in accordance with Section 1 A Each report shall include:

Date issued. Project title and number. Testing laboratory name, address and telephone number. Name and signature of laboratory inspector. Date and time of sampling or inspection. Record of temperature and weather conditions. Date of test. Identification of product and specification section. Location of sample of test in the Project. Type of inspection of test. Results of tests and compliance with Contract Documents. Interpretation of test reports, when requested by Owner/Engineer.

Perform additional tests as required by Owner/Architect.

Limitations of Authority of Testing Laboratory: Laboratory is not authorized to -

1. Release, revoke, alter or enlarge on requirements of Contract Documents.
2. Approve or accept any portion of the Work.
3. Perform any duties of the Contractor.

Contractor's Responsibilities: Cooperate with laboratory personnel, provide access to work and to

Manufacturer's operations.
Secure and delivery to the laboratory adequate quantities of representational samples of materials proposed to be used and which require testing.
Furnish copies of Products test reports as required.

Furnish accidental labor and facilities:

1. To provide access to Work to be tested.
2. To obtain and handle samples at the Project site or at the source of the product to be tested.
3. To facilitate inspections and tests.
4. For storage and curing of test samples.

Notify laboratory sufficiently in advance of operations to allow for laboratory assignment of personnel and scheduling of tests.

Employ and or pay for the services of a qualified independent testing laboratory, approved by the Owner/Architect, to perform additional inspections, sampling and testing required:

1. For the Contractor's convenience.
2. When initial tests indicated Work does not comply with Contract Documents.
3. Develop mix design and test each design for each different strength or type concrete specified.

Specific Test, Inspections and Methods Required:

Base and Fill Tests: One laboratory test for moisture-density relationship of subgrade material, and one laboratory test for moisture density relationships of flexible base. Test in accordance with Tex-113-E.

One field density test per lift of each 10,000 s.f of parking lot subgrade for "Density Control of Compaction" in accordance with latest ASTM D-2922. Minimum of 3 tests total for each area.

One field density test per lift of each 10,000 s.f of parking lot flexible base for "Density Control of Compaction" in accordance with latest ASTM D-2922. Minimum of 3 tests total for each area.

One field density test per lift of each 2,500 s.f of subgrade below buildings for "Density Control of Compaction" in accordance with latest ASTM D-2922. Minimum of 3 tests total for each area.

One field density test per lift of each 2,500 s.f of flexible base below buildings for "Density Control of Compaction" in accordance with latest ASTM D-2922. Minimum of 3 tests total for each area.

Asphaltic Concrete Paving Tests: Laboratory density and stability tests(THD Bulletin C14)on asphaltic concrete for each day's operations.

Field in-place density tests ASTM D-2950 on asphaltic concrete for each day's operation.

Concrete Mix Design Tests: Mix design tests: shall include confirmation cylinders in accordance with ASTM C-39 and analysis of course and fine aggregates in accordance with ASTM C-33 for each different strength concrete specified. See Section 03 00 00, Cast-in-Place Concrete and on structural drawings.

Concrete Tests: Compression and Slump Tests: Compression test in accordance with ASTM C-162 and C-39. Samples for strength tests of each class of concrete placed each day shall be taken not less than once a day, nor less than once for each 74 cubic yards of concrete, nor less

than once for each 5,000 square feet of surface area for slabs or walls. Each sample shall consist of a set of four cylinders. If total volume of concrete is such that frequency of testing as required above would provide less than five strength tests for a given class of concrete, tests shall be made from at least five randomly selected batches or from each batch if fewer than five batches are used. Miscellaneous concrete walks on fill shall be excluded from the testing requirements. Slump tests to be made by the testing laboratory with each set of cylinders in accordance with ASTM C-143, recorded, and included in report.

Make 7 day tests on two cylinders and 28 day tests on two cylinders. Identify all cylinders to show date and exact location of concrete tested in structure. submit 7 day test reports and 28 day test reports. The 28 day reports shall include the 7 day test reports of companion cylinders for comparison.

Strength level of an individual class of concrete shall be considered satisfactory if both of the following requirements are met:

a. The average of all sets of three consecutive strength tests equal or exceed required fc.
b. No individual strength test (average of two cylinders) fall below required fc by more than 500 psi.

If any strength test (average of 2 cylinders at 28 days) of laboratory-altered cylinders falls below required fc by more than 500 psi, and computations indicate that load carrying capacity may have been significantly reduced, tests of cores drilled from the area in question may be required in accordance with "Method of Obtaining and Testing Drilled Cores and Sawed Beams of Concrete" (ASTM C-42). In such case, three cores shall be taken for each strength test more than 500 psi below required f'c.

In the event the core test does not meet the specified strength, the work in question shall be removed and rebuilt by the Contractor at his sole expense.

Should core tests be required, they shall be completed by a Testing Laboratory of the Owner's choice at the Contractor's expense regardless of core test results.

Cellular Concrete Floor Underlayment Tests:' Make 4 test cubes during progress of the work for each 100 cubic yards or fraction thereof placed in any one day. Test 2 cubes at 7 days, and 2 cubes at 28 days.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

GENERAL

Work Included: Cast-in-place Concrete slab on fill.

Cast-in-place concrete walls and spread footings.

Cast-in-place equipment pads.

Vapor barrier under slabs on grade.

Surface finish of walls.

Related Work:

Section 01 33 00:	Submittals for Concrete Mix Design
Section 01 40 00:	Quality Control and Testing
Section 03 30 13:	Concrete Formwork
Section 03 30 15:	Concrete Reinforcement
Section 05 50 00	Miscellaneous Fabrications
Mechanical Items to be Cast in Concrete	
Electrical Items to be Case in Concrete	

Quality Assurance: Perform cast-in-place work in accordance with ACI 318, unless specified otherwise in this Section.

Submittals: Submit proposed mix design of each class of concrete to inspection with certified test reports for review prior to commencement of work in accordance with Section 01 33 00.

Testing Agency: Inspection and testing will be performed by firm in accordance with Section 01 40 00.

Provide free access to work and cooperate with appointed firm.

Current tests of cement and aggregates may be performed to ensure conformance with requirements stated herein.

Reference Standards:

ASTM C33:	Concrete Aggregates
ASTM C150:	Portland Cement
ACI 318:	Building Code Requirements for Reinforced Concrete
ASTM C494:	Chemical Admixtures for Concrete
ASTM C94:	Ready-Mix Concrete
ACI 304:	Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete
ACI 305:	Recommended Practice for Hot Weather Concreting
ACI 306:	Recommended Practice for Cold Weather Concreting

ACI 301: Specifications for Structural Concrete for Buildings

PRODUCTS: 3000 lb. (air Entrained where exposed to freezing). 4" slump. no fly ash permitted.

END OF SECTION

SECTION 03 30 13
CONCRETE FORMWORK

GENERAL

Work Included: Wood formwork for all above grade site cast concrete, complete with shoring, bracing and anchorage.

Form openings for mechanical and electrical work

Coordinate installation of items supplied by other sections of work.

Related Work:

Section 03 00 00: Cast-In-Place Concrete
Section 05 50 00: Metal fabrications to be embedded in concrete.
Mechanical items to be embedded in concrete.
Electrical items to be embedded in concrete.

Quality Assurance: Construct and erect concrete formwork in accordance with ACI 301 and 347 and applicable construction safety regulations for place of Work.

Reference Standards:

ACI 301: Specification for Structural Concrete for Buildings. ACI 347: Recommended Practice for Concrete Formwork.

PRODUCTS

Wood Form Materials:

Plywood: Southern yellow pine species; solid one side grade; sound undamaged mill oiled sheets with clean true edges.

Lumber: Southern yellow pine species; #2 grade; with grade stamp clearly visible.

Formwork Accessories:

Nails, Spikes, Lag Bolts, Through Bolts, Anchorages: Sized as required; of sufficient strength and character to maintain formwork in place while placing concrete.

Form Ties: Removable or Snap-Off metal type of fixed or adjustable length; minimum working strength of 3000 psi when assembled; free of defects that will leave holes large than 1 " in concrete surface.

Form Release Agent: Noxcrete Form Coating as manufactured by Noxcrete Chemicals, Inc.

Fillets for Chamfered Corners: 3/4" x 3/4" size; maximum possible lengths, type required to produce uniformly straight lines and tight edge joints on exposed concrete. Miter chamfer strips at changes in direction.

Expansion Joint Material: Asphalt impregnated formed felt; thickness as indicated; depth as required for concrete section being placed; position flush with surface of concrete.

EXECUTION

Storage: Store formwork material off ground in ventilated and protected manner to prevent deterioration from moisture.

Formwork Erection: Verify lines, levels and centers before proceeding with formwork. Ensure that dimensions agree with drawings.

Construct formwork, shoring and bracing to meet design and code requirements, so that resultant finished concrete conforms to required shapes, lines and dimensions.

Arrange and assemble formwork to permit dismantling and stripping so that concrete is not damaged during its removal.

Align joints and make watertight to prevent leakage or mortar disfigured appearance of concrete. Keep form joints to minimum.

Obtain Owner/Architect review before framing openings in structural members which are not indicated on drawings.

Provide bracing to ensure stability of formwork. Prop or strengthen previously constructed formwork liable to be over stressed by construction loads.

Provide chamfer strips at all exposed outside corners.

Construct formwork to maintain tolerances as outlined in ACI 301.

Apply form release agent when concrete surfaces will receive special finishes or applied Coverings which are affected by agent. Soak inside surfaces of untreated forms with clean water. Keep surfaces wet prior to placing concrete.

Inserts. Embedded Parts and Openings: Provide formed openings when required for pipes, conduits, sleeves, and other work to be embedded in and passing through concrete members. Obtain Architect's review for openings 6" or larger in main structural members.

Locate and set soundly in place items which will be cast directly into concrete.

Coordinate work of other sections and cooperate with trade involved in forming and setting openings, slots, recesses, chases, sleeves, bolts, anchors, reglets and other inserts. Do not perform work unless specifically indicated on drawings or reviewed prior to installation.

Install concrete accessories in accordance with manufacturer's recommendations; straight, level and plumb. Ensure items are not disturbed during concrete placement

Provide temporary ports or openings in formwork when required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain. Close temporary ports or Openings with tight fitting panels, flush with inside face of forms, neatly fitted so that joints will be apparent in exposed concrete surfaces.

Field Quality / Control: Inspect and check completed formwork, shoring and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties and parts are secure.

Inform Owner/Architect when formwork is complete and has been cleaned, to allow for review. Obtain review prior to placing concrete.

For exposed concrete surfaces do not reuse wood type formwork more than three times. Do not patch formwork.

Allow Owner/Architect to review each section of formwork prior to reuse.

Cleaning: Clean forms as erection proceeds to remove foreign material. Remove cuttings, shavings, and debris from with-in forms. Flush with water or use compressed air to remove remaining foreign material. Ensure that water and debris dram to exterior through clean-out ports.

Form Removal: Notify Owner/Architect prior to removing formwork.

Do not remove forms and bracing until concrete has gained sufficient strength to carry its own weight and construction and design load which are liable to be imposed upon it Verify strength of concrete by compressive test results.

Remove formwork progressively and in accordance with code requirements and so that no shock loads or unbalanced loads are imposed on structure.

Loosen forms carefully. Do not wedge pry bars or hammers against concrete surfaces.

Remove forms not directly supporting weight of concrete as soon as stripping operations will not damage concrete, but not until concrete has set at least 24 hours.

END OF SECTION

SECTION 03 30 15
CONCRETE REINFORCEMENT

GENERAL

Work Included: Reinforcing steel bars, and welded steel wire fabric for cast in place concrete, complete with tie wire and in place.

Support chairs and bar supports for reinforcing.

Related Work:

Section 01 33 00	Shop Drawing submittals
Section 03 30 00	Cast-in-place concrete

Quality Assurance: Perform concrete reinforcing work in accordance with CRSI 63 and 65 unless specified otherwise in this section.

Source Quality Control: Submit certified copies of mill test report of supplied concrete reinforcing, indicating physical and chemical analysis, including tensile and bend tests.

All concrete reinforcing bars shall bear the quality marks of the Concrete Reinforcing Steel Institute and the identifying mill marks of the manufacture supplying the bars.

Provide Owner/Engineer with access to fabrication plant to facilitate inspection of reinforcement. Notify of commencement and duration of shop fabrication, in sufficient time to allow for proper inspection.

Reference Standards:

ACI 318: Building Code Requirements for Reinforced Concrete.

CRSI 63: Recommended Practice for Placing Reinforcing Bars.

CRSI 65: Recommended Practice for Placing Bar Supports, Specifications and Nomenclature.

ASTM A-185: Welded Steel Wire Fabric for Concrete Reinforcement

ASTM A-615: Deformed and Billet Steel Bars for Concrete Reinforcement.

AWS D- 12.1: Welding Reinforcing Steel, Metal Inserts and Connections in Reinforced Concrete Construction.

ACI 315: American Concrete Institute - Manual of Standard Practice.

ASTM C 1399 Average Residual Strength of Fiber Reinforced Concrete.

Shop Drawings: Submit shop drawings in accordance with Section 01 33 00.

Indicate bar sizes, spacings, lengths, laps, locations and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.

PRODUCTS

See General Notes, Division 3 - Concrete, Section 03 30 00, Reinforcing Steel on Structural Engineering Drawings.

FIBERMESH-

Provide Fibermesh 300 - 100 percent virgin polypropylene fibrillated fibers with e3®patented technology containing no reprocessed olefin materials and specifically manufactured to an optimum gradation for use as concrete reinforcement. Application per cubic yard shall equal a minimum of 0.1% by volume (1.5 lbs/yd3, 0.9 kg/m3).

Alternate Manufacturer: Propex Concrete Systems, 6025 Lee Highway, Suite 425, PO Box 22788, Chattanooga, TN 37422 USA, tel: 423-892-8080, fax: 423-892-0157, web site: fibermesh.com.

EXECUTION

Placement: Place reinforcing supported and secured against displacement. Do not deviate from true alignment.

Before placing concrete, ensure reinforcing is clean, free of loose scale, dirt or other foreign coatings which would reduce bond to concrete.

In slab on grade, place conduit, pipe and other such lines under the reinforcement. Do not bundle conduit lines.

Do not weld reinforcement or tack weld anything to it unless indicated.

Install welded wire fabric in lengths as long as practicable, lapping at least one mesh. Offset and laps in adjacent widths to prevent continuous laps.

All splices not indicated must be reviewed by the Owner/Engineer. Comply with ACI 318 for minimum lap of spliced bars.

END OF SECTION

SECTION 04 05 00
MASONRY

GENERAL

SCOPE: This section covers the furnishing of all labor, materials, services, equipment and appliances required in conjunction with all masonry, complete, including:

a Anchors, ties and flashings.
b. Horizontal masonry wall reinforcement.
c. Expansion and control joint fillers.
d. Sawing, cutting and patching of brick work as required for the work of this contract.
e. cleaning and pointing brick
f. samples.

SAMPLES: SUBMIT FOR APPROVAL OF THE, ARCHITECT

1. Face brick: Belden Brick, Glen-Gery Brick or Taylor Clay Products in shapes and sizes shown on drawings. Color selections are based on Belden Brick.

Color: Brick Color 1: To be selected by Architect
Brick Color 2: To be selected by Architect
Brick Color 3: To be selected by Architect

2. Sample Masonry Panel: After material samples are approved, build one sample panel of masonry on the project site where directed Sample panel shall not be built in or as part of the structure. Panel shall not be less than 4 feet long by 2 feet high and shall be of typical wall thickness and construction for masonry represented. If panel is not approved, additional panels must be erected.

PRODUCTS:

1. Anchors and Ties: Anchors for anchorage of masonry to structure. Heckmann No. 260 corrugated wall ties. 7/8" x 7" long deeply corrugated, 22 gauge mill galvanized steel.

2. Wall Flashings: Non-reinforced, homogeneous, extruded elastomeric sheeting, 0.030 UL thick, NERVASTRAL 3 00. fasten in place with NERVAPLAST mastic.

4. Concrete Masonry Unit: Normal weight unit in shapes as shown on drawings.

5. Mortar: ASTM C270, Type "S", with average compressive strength at 28 days of 1,200 psi. Color mortar as selected by Architect

a. Materials for masonry:
Portland Cements- ASTM C150, Type 1
Hydrated Lime- ASTM C207
Sand- ASTM C144
Water- Local tap water

EXECUTION:

1. General: The following general instructions shall be followed in carrying out the work under this section. Face brick work, inch ding bond and mortar joints, must match approved

sample panel.

a Cold Weather: When temperature is below 40 ° F, and falling, or forecast to occur within 48 hours, provide with Underwriters' Laboratories approved flame beaters. Maintain materials and work above 50° F for 72 hours. Do not use any admixtures to prevent freezing Do not lay frozen materials or build on frozen surfaces. Lay masonry units dry.
b. Scaffolding: Furnish, erect, maintain and move scaffolding required for installation of masonry. Construct and maintain in strict accordance with all applicable laws and regulations. Equip with ample protection permit other trades to work on scaffolds at proper times, as required

c. Laying: Lay all masonry plumb and true to line with level, accurate spaced courses, bond, corners and reveals. Before new work is started, remove loose mortar. Lay all cellular masonry unit with webs in vertical position. No unit having a film of water or frost on its surfaces shall be laid Adjust each unit to final position while mortar is still soft and plastic. Remove any unit that is disturbed after mortar has stiffened and relay with fresh mortar. The sizes of any two adjacent units shall be within permitted tolerances so that the difference between the vertical faces of such unit shall not exceed 1/8". Units in exposed to view walls shall be free from chipped edges. Tolerance shall be judged from the industry standard. Size of 3/8" joint for both horizontal and vertical joints.

2. Wall Flashings: Clean surfaces and remove projections mat might damage flashings. Install sheets of flashing in solid troweled mastic. Seal penetrations with mastic.

3. Mortar Accurately measure materials in established proportions and mix with as much water as may be necessary to produce the wettest workable consistency possible with uniform color.

4. Jointing: Joints in exposed to view masonry walls, except control joints and joints to be pointed sealed or caulked shall be approximately 3/8" wide, tooled concave with mortar thoroughly compacted. Tooling shall be done when the mortar is thumb print hard. Joints shall form uniformly straight and true lines; smooth and free of tool marks.

5. Laying Brick: Wet clay brick in such manner that each unit is nearly saturated, surface dry when laid Brick that is cored, recessed or has other deformities shall not be used where deformities will be exposed to view. Fill joints completely with mortar. Form weeps with glass fiber rope at all structural supports where masonry start. Space weeps not over 30" o.c. horizontally. Lay brick facings with better face of brick exposed. Unless otherwise indicated lay brick facing in 1/2 running
bond

6. Pointing and Cleanup: Masonry surfaces shall not be cleaned until mortar has been hardened Masonry surfaces shall be left clean, free of mortar daubs, dirt, stain and discoloration, including scum from cleaning operations and with tight mortar joints throughout. Metal tools and metal brushes shall not be used for cleaning

a. Clay brick surfaces: Water soak and then clean with "SHURCLEAN", (Proprietary masonry cleaning agents) used in conformance with manufacturer's printed recommendations. Remove green efflorescence in conformance with brick manufacturer's recommendations.

7. Cleanup: Clean up all debris caused by the work of this section, keeping the premises clean and neat at all times.

END OF SECTION

SECTION 05 50 00
MISCELLANEOUS METALS

GENERAL

Work Included: Custom fabricate ferrous metal items 14 gauge and heavier, prime paint finish.

Structural steel framing members, structural steel support members, base plates, stair stringers, complete framing with welds, washers, nuts, shims, bolts and headed concrete anchors.

Steel embedded items in concrete with shear stud anchors.

Steel rails as indicated on the drawings.

Related Work:

Section 01 01 00: Shop drawing submittals
Section 03 30 00: Base plates cast in concrete

Reference Standards:

ASTM A-36: Structural Steel
ASTM A-307: Low-Carbon Steel Externally and Internally Threaded Fasteners
ASTM A-325: High Strength Bolts for Structural Steel Joints Including Suitable Nuts and Plain Hardened Washers
ASTM A-500, Grade B: Cold formed welded and seamless carbon steel rectangular shape structural tubing (Fy = 46,000 psi)
AWS D I .1: Structural Welding Code
FS TT-p-86: Paint, Red-Lead Base, Ready Mixed
FS TT-p-645: Primer, Paint, Zinc-Chromate, Alkyd Type

Shop Drawings: submit shop drawings of miscellaneous metals in accordance with Section 01 33 00.

Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners and accessories.

Include erection drawings, elevations and details where applicable.

Indicate welded connections using standard AWS welding symbols. Indicate net weld lengths.

PRODUCTS

General: Provide items indicated in schedule at end of this section, complete in respect to function as intended

Materials:

Steel: ASTM A-36 Columns: ASTM A-500, Grade B Bolts, Nuts and Washers: High strength type recommended for structural steel joints; ASTM A-325.

Welding Materials: Applicable AWS Dl. l, type required for materials being welded.

Headed Stud Type Concrete Anchors (HCA): ASTM A108-58T low carbon steel fastened in accordance with manufacturer's recommendations.

Primer: Red lead FS TT-p-86 zinc chromate alkyd FS TT-p-645.
Fabrication: Verify dimensions on site prior to shop fabrication.

Fabricate items with joints neatly fitted and properly secured.

Fit and shop assemble in largest practical sections, for delivery to site.

Grind exposed welds smooth and flush with adjacent finished surfaces.

Exposed mechanical fastenings: Flush countersunk screws or bolts unobtrusively located consistent with design of structure, exempt where specifically noted otherwise.

Make exposed joints flush butt type hair line joints were mechanically fastened.

Supply components required for anchorage of metal fabrication. Fabricate anchorage and related components of same material and finish as metal fabrication, unless otherwise specified in Schedule herein.

Thoroughly clean surfaces of rust, scale, grease and foreign matter prior to prime painting.

Prime paint items as scheduled. Do not shop prime surfaces in contact with concrete or requiring field welding. Shop prime in I coat. Provide minimum 1.25 oz/sq. ft. similar coating

EXECUTION

Erection: Obtain Owner/Engineer's review prior to site cutting or making adjustments which are not part of scheduled work.

Install items square and level, accurately fitted and free from distortion of defects.

Make provisions for erection stresses by temporary bracing. Keep work in alignment.

Replace items damaged in course of installation.

Perform field welding in accordance with AWS Dl.l.

After installation, touch up field welds and scratched and damaged prime painted surfaces. Use a pruner consistent with shop coat.

Supply to appropriate sections, items requiring to be east into concrete complete with necessary setting templates.

END OF SECTION

SECTION 05 51 00
METAL STAIRS

PART 1 - GENERAL

1. RELATED DOCUMENTS

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

2. SUMMARY

a. This Section includes the following:

1) Preassembled steel stairs
2) Ornamental steel-framed stairs.

3. PERFORMANCE REQUIREMENTS

a. Delegated Design: Design this project element, including comprehensive engineering analysis by a qualified design professional, to meet or exceed the program requirements, performance requirements, LEED Certification, code compliance, applicable ASTM quality standard, and design criteria as outlined and / or referenced within this RFP package.

4. SUBMITTALS

a. Product Data: For metal stairs and the following:
1) Prefilled metal-pan stair treads.
2) Paint products.
3) Grout.
4) Product Data for Recycled Content: Indicating percentages by weight of postconsumer and preconsumer recycled content for products having recycled content. Include statement indicating costs for each product having recycled content.

b. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

c. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

d. Qualification Data: For qualified Professional Engineer.

e. Welding certificates.

5. QUALITY ASSURANCE

a. Installer Qualifications: Fabricator of products.

b. National Association of Architectural Metal Manufacturers (NAAMM) Stair Standard: Comply with "Recommended Voluntary Minimum Standards for Fixed Metal Stairs" in NAAMM AMP510, "Metal Stairs Manual," for class of stair designated, unless more stringent requirements are indicated.

PART 2 - PRODUCTS

1. METALS, GENERAL

a. Metal Surfaces, General: Provide materials with smooth, flat surfaces, unless otherwise indicated. For components exposed to view in the completed Work, provide materials without seam marks, roller marks, rolled trade names, or blemishes.

b. Recycled Content of Steel Products: Provide products with an average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25%.

2. FERROUS METALS

a. Steel Plates, Shapes, and Bars: Shall conform to ASTM A36/A36M–05, Standard Specification for Carbon Structural Steel.

b. Steel Tubing: Shall conform to ASTM A500–03a, Standard Specification for Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes (cold formed) or ASTM A513–07, Standard Specification for Electric-Resistance-Welded Carbon and Alloy Steel Mechanical Tubing, Type 5 (mandrel drawn)].

c. Rolled-Steel Floor Plate: Shall conform to ASTM A786/A786M–05, Standard Specification for Hot-Rolled Carbon, Low-Alloy, High-Strength Low-Alloy, and Alloy Steel Floor Plates, rolled from plate complying with ASTM A36/A36M–05, Standard Specification for Carbon Structural Steel or ASTM A283/A283M–03, Standard Specification for Low and Intermediate Tensile Strength Carbon Steel Plates, Grade C or D.

3. NONFERROUS METALS

a. General Finishes:

1) Aluminum Finishes: Mill finish or clear anodized.

b. Aluminum Extrusions: Shall conform to ASTM B221/B221M–06, Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes, Alloy 6063–T6.

c. Aluminum Castings: Shall conform to ASTM B26/B26M–05, Standard Specification for Aluminum-Alloy Sand Castings, Alloy 443.0-F.

d. Bronze Extrusions: Shall conform to ASTM B455–05, Standard Specification for Copper-Zinc-Lead Alloy (Leaded-Brass) Extruded Shapes, Alloy UNS No. C38500 (extruded architectural bronze).

e. Bronze Castings: Shall conform to ASTM B584–06a, Standard Specification for Copper Alloy Sand Castings for General Applications, Alloy UNS No.C83600 (leaded red brass) or No. C84400 (leaded semired brass).

f. Nickel Silver Castings: Shall conform to ASTM B584–06a, Alloy UNS No. C97600 (20% leaded nickel bronze).

PART 3 - EXECUTION

1. FIELD QUALITY CONTROL

a. Testing and Inspecting: Owner to engage a qualified testing and inspecting agency to perform field tests and inspections and prepare test reports in compliance with CO-7 DB section 16.

END OF SECTION 05 51 00

SECTION 05 52 13
PIPE AND TUBE RAILINGS

PART 4 - GENERAL

1. SUMMARY

a. Section Includes:
   1) Installation of steel pipe and tube railings.

2. SYSTEM DESCRIPTION

a. Performance Requirements: Install railings capable of withstanding effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1) Handrails:
      a) Uniform load of 50 pound-force per foot applied in any direction.
      b) Concentrated load of 200 pound-force applied in any direction.
      c) Uniform and concentrated loads need not be assumed to act concurrently.
      d) Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

3. 1.3 SUBMITTALS

a. Welding certificates.

PART 5 - PRODUCTS

1. METALS

a. Brackets, Flanges, and Anchors: Cast or formed metal of same type of material and finish as supported rails, unless otherwise indicated.

2. MISCELLANEOUS MATERIALS

a. Fasteners: Provide concealed fasteners, unless unavoidable or standard for railings indicated.
   1) Steel Railings: Plated steel fasteners complying with ASTM B633, Class Fe/Zn 25 for electrodeposited zinc coating.

b. Welding Rods and Bare Electrodes: Select per AWS specifications for metal alloy welded.

c. Shop Primers: Provide primers that comply with Section 09 91 00 – Painting.

d. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79.

3. FINISHES

a. Steel and Iron:
   1) Shop-Primed Steel Finish: Prepare to comply with SSPC-SP 6/NACE No. 3, "Commercial Blast Cleaning" and apply primer to comply with SSPC-PA 1.

PART 3 - EXECUTION

3.1 INSTALLATION

A. General: Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation.
   1. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet.

b. Anchor railing ends to metal stud walls with round flanges connected to railing ends and anchored to wall construction with anchors and bolts.

c. Adjusting and Cleaning:
   1) Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting.
   2) Galvanized Surfaces: Clean field welds, bolted connections, and abraded areas and repair galvanizing to comply with ASTM A780.

END OF SECTION 05 52 13

SECTION 05 73 00
DECORATIVE METAL RAILINGS

PART 6 - GENERAL

1. RELATED DOCUMENTS

a. Drawings and General Provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

2. SUMMARY

a. Section Includes:
   1) Steel and metal decorative railings with painted tube steel guard and handrail, with perforated infill on tabs, with diagonal cable with turnbuckles.

b. Related Sections:
   1) Division 05 Section "Pipe and Tube Railings" for railings fabricated from pipe and tube components.
   2) Division 06 Section " Rough Carpentry" for wood blocking for anchoring railings, and 06 01 20 – Interior Architectural Woodwork

3. DEFINITIONS

a. Railings: Guards, handrails, and similar devices used for protection of occupants at open-sided floor areas, pedestrian guidance and support, visual separation, or wall protection.

4. PERFORMANCE REQUIREMENTS

a. Delegated Design: Design railings, including comprehensive engineering analysis by a qualified professional engineer, using performance requirements and design criteria indicated.

b. General: In engineering railings to withstand structural loads indicated, determine allowable design working stresses of railing materials based on the following:
   1) Stainless Steel: Sixty (60%) percent of minimum yield strength.
   2) Steel: Seventy-two (72%) percent of minimum yield strength.

c. Structural Performance: Railings shall withstand the effects of gravity loads and the following loads and stresses within limits and under conditions indicated:
   1) Handrails and Top Rails of Guards:
      a) Uniform load of 50 lbf/ft. (0.73 kN/m) applied in any direction.
      b) Concentrated load of 200 lbf (0.89 kN) applied in any direction.
      c) Uniform and concentrated loads need not be assumed to act concurrently.

   2) Infill of Guards:

a) Concentrated load of 50 lbf (0.22 kN) applied horizontally on an area of 1 sq. ft. (0.093 sq. m).
b) Infill load and other loads need not be assumed to act concurrently.

d. Control of Corrosion: Prevent galvanic action and other forms of corrosion by insulating metals and other materials from direct contact with incompatible materials.

5. SUBMITTALS

a. Product Data: For the following:
1) Grout, anchoring cement, and paint products.
2) Product Data for Recycled Content: For products having recycled content, documentation indicating percentages by weight of post-consumer and pre-consumer recycled content. Include statement indicating costs for each product having recycled content.

b. Shop Drawings: Include plans, elevations, sections, details, and attachments to other work.

c. Samples for Initial Selection: For products involving selection of color, texture, or design.

d. Samples for Verification: For each type of exposed finish required.
1) Fittings and brackets.

e. Delegated-Design Submittal: For installed products indicated to comply with performance requirements and design criteria, including analysis data signed and sealed by the qualified professional engineer responsible for their preparation.

f. Qualification Data: For qualified Professional Engineer.

g. Welding certificates.

6. QUALITY ASSURANCE

a. Source Limitations: Obtain each type of railing from single source from single manufacturer.

b. Product Options: Information on Drawings and in Specifications establishes requirements for system's aesthetic effects and performance characteristics. Aesthetic effects are indicated by dimensions, arrangements, alignment, and profiles of components and assemblies as they relate to sightlines, to one another, and to adjoining construction. Performance characteristics are indicated by criteria subject to verification by one or more methods including structural analysis, preconstruction testing, field testing, and service performance.

1) Do not modify intended aesthetic effects, as judged solely by Architect, except with Architect's approval. If modifications are proposed, submit comprehensive explanatory data to Architect for review.

c. Welding Qualifications: Qualify procedures and personnel according to the following:
   1) AWS D1.1/D1.1M, "Structural Welding Code - Steel".

7. PROJECT CONDITIONS

a. Field Measurements: Verify actual locations of walls and other construction contiguous with railings by field measurements before fabrication and indicate measurements on Shop Drawings.

8. COORDINATION AND SCHEDULING

a. Coordinate selection of shop primers with topcoats to be applied over them. Comply with paint and coating manufacturers' written recommendations to ensure that shop primers and topcoats are compatible with one another.

b. Coordinate installation of anchorages for railings. Furnish setting drawings, templates, and directions for installing anchorages, including sleeves, concrete inserts, anchor bolts, and items with integral anchors, that are to be embedded in concrete or masonry. Deliver such items to Project site in time for installation.

c. Schedule installation so wall attachments are made only to completed walls. Do not support railings temporarily by any means that do not suit structural performance requirements.

PART 7 - PRODUCTS

1. METALS, GENERAL

a. Metal Surfaces, General: Provide materials with smooth surfaces, without seam marks, roller marks, rolled trade names, stains, discolorations, or blemishes.

b. Brackets, Flanges, and Anchors: Same metal and finish as supported rails unless otherwise indicated.
   1) Provide cast-metal brackets with flange tapped for concealed anchorage to threaded hanger bolt.

c. See drawings for perforated panels.

2. STAINLESS STEEL

a. Castings: ASTM A 743/A 743M, Grade CF 8M or CF 3M.

b. Sheet, Strip, Plate, and Flat Bar: ASTM A 666, Type 316.

c. Bars and Shapes: ASTM A 276, Type 316.

d. Wire Rope and Fittings:

1) Basis-of-Design Product: Subject to compliance with requirements, provide "Ultra-Tec" Cable Railing System by R.B. Wagner, Milwaukee, WI or comparable product by one of the following:
   a) Cable Connection (The).
   b) Carl Stahl DecorCable, Inc.
   c) Johnson, C. Sherman, Co., Inc.
   d) Loos & Co., Inc.; Cableware Division.
   e) Secosouth, Inc.

2) Wire Rope: 1/4 inch, 1-by-19 wire rope made from wire complying with ASTM A 492, Type 316.
3) Wire-Rope Fittings: Connectors of types indicated, fabricated from stainless steel, and with capability to sustain, without failure, a load equal to minimum breaking strength of wire rope with which they are used.

3. STEEL AND IRON

a. Recycled Content of Steel Products: Provide products with average recycled content of steel products so postconsumer recycled content plus one-half of preconsumer recycled content is not less than twenty-five (25%) percent.

b. Tubing: ASTM A 500 (cold formed) or ASTM A 513.

c. Bars: Hot-rolled, carbon steel complying with ASTM A 29/A 29M, Grade 1010.

d. Plates, Shapes, and Bars: ASTM A 36/A 36M.

e. Cast Iron: Either gray iron, ASTM A 48/A 48M, or malleable iron, ASTM A 47/A 47M, unless otherwise indicated.

4. FASTENERS

a. Fastener Materials: Unless otherwise indicated, provide the following:
   1) Stainless-Steel Components: Type 316 stainless-steel fasteners.
   2) Uncoated Steel Components: Plated-steel fasteners complying with ASTM B 633, Class Fe/Zn 25 for electrodeposited zinc coating where concealed; Type 304 stainless-steel fasteners where exposed.
   3) Dissimilar Metals: Type 316 stainless-steel fasteners.

b. Fasteners for Anchoring to Other Construction: Select fasteners of type, grade, and class required to produce connections suitable for anchoring railings to other types of construction indicated and capable of withstanding design loads.

c. Provide concealed fasteners for interconnecting railing components and for attaching railings to other work unless otherwise indicated.

d. Anchors, General: Anchors capable of sustaining, without failure, a load equal to six times the load imposed when installed in unit masonry and four times the load imposed when installed in concrete, as determined by testing according to ASTM E 488, conducted by a qualified independent testing agency.

e. Post-Installed Anchors: Torque-controlled expansion anchors or chemical anchors.
   1) Material for Interior Locations: Carbon-steel components zinc plated to comply with ASTM B 633 or ASTM F 1941 (ASTM F 1941M), Class Fe/Zn 5, unless otherwise indicated.
   2) Material for Exterior Locations and Where Stainless Steel Is Indicated: Alloy Group 2 (A4) stainless-steel bolts, ASTM F 593 (ASTM F 738M), and nuts, ASTM F 594 (ASTM F 836M).

5. MISCELLANEOUS MATERIALS

a. Wood Rails: Hardwood rails complying with Division 06 Section 06 01 20 – Interior Architectural Woodwork

b. Welding Rods and Bare Electrodes: Select according to AWS specifications for metal alloy welded.

c. Universal Shop Primer: Fast-curing, lead- and chromate-free, universal modified-alkyd primer complying with MPI#79 and compatible with topcoat.
   1) Use primer containing pigments that make it easily distinguishable from zinc-rich primer.

d. Bituminous Paint: Cold-applied asphalt emulsion complying with ASTM D 1187.

e. Nonshrink, Nonmetallic Grout: Factory-packaged, nonstaining, noncorrosive, nongaseous grout complying with ASTM C 1107. Provide grout specifically recommended by manufacturer for interior and exterior applications.

f. Anchoring Cement: Factory-packaged, nonshrink, nonstaining, hydraulic-controlled expansion cement formulation for mixing with water at Project site to create pourable anchoring, patching, and grouting compound.
   1) Water-Resistant Product: At exterior locations provide formulation that is resistant to erosion from water exposure without needing protection by a sealer or waterproof coating and that is recommended by manufacturer for exterior use.

6. FABRICATION

a. General: Fabricate railings to comply with requirements indicated for design, dimensions, member sizes and spacing, details, finish, and anchorage, but not less than
that required to support structural loads.

b. Assemble railings in the shop to greatest extent possible to minimize field splicing and assembly. Disassemble units only as necessary for shipping and handling limitations. Clearly mark units for reassembly and coordinated installation. Use connections that maintain structural value of joined pieces.

c. Make up wire-rope assemblies in the shop to field-measured dimensions with fittings machine swaged. Minimize amount of turnbuckle take-up used for dimensional adjustment so maximum amount is available for tensioning wire ropes. Tag wire-rope assemblies and fittings to identify installation locations and orientations for coordinated installation.

d. Cut, drill, and punch metals cleanly and accurately. Remove burrs and ease edges to a radius of approximately 1/32 inch (1 mm) unless otherwise indicated. Remove sharp or rough areas on exposed surfaces.

e. Form work true to line and level with accurate angles and surfaces.

f. Fabricate connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate. Locate weep holes in inconspicuous locations.

g. Cut, reinforce, drill, and tap as indicated to receive finish hardware, screws, and similar items.

h. Connections: Fabricate railings with welded connections unless otherwise indicated.

i. Welded Connections: Cope components at connections to provide close fit, or use fittings designed for this purpose. Weld all around at connections, including at fittings.
   1) Use materials and methods that minimize distortion and develop strength and corrosion resistance of base metals.
   2) Obtain fusion without undercut or overlap.
   3) Remove flux immediately.
   4) At exposed connections, finish exposed welds to comply with NOMMA's "Voluntary Joint Finish Standards" for Type 1 welds: no evidence of a welded joint.

j. Form changes in direction as follows:
   1) As detailed.

k. Close exposed ends of hollow railing members with prefabricated end fittings.

l. Provide wall returns at ends of wall-mounted handrails unless otherwise indicated. Close ends of returns, unless clearance between end of rail and wall is 1/4 inch (6 mm) or less.

m. Brackets, Flanges, Fittings, and Anchors: Provide wall brackets, flanges, miscellaneous fittings and anchors to interconnect railing members to other work unless otherwise indicated.
   1) At brackets and fittings fastened to plaster or gypsum board partitions, provide crush-resistant fillers, or other means to transfer loads through wall finishes to structural supports and prevent bracket rotation and crushing of substrate.

n. Provide inserts and other anchorage devices for connecting railings to concrete or masonry work. Fabricate anchorage devices capable of withstanding loads imposed by railings. Coordinate anchorage devices with supporting structure.

o. For railing posts set in concrete, provide steel sleeves not less than 6 inches (150 mm) long with inside dimensions not less than 1/2 inch (13 mm) greater than outside dimensions of post, with metal plate forming bottom closure.

p. Toe Boards: Where indicated, provide toe boards at railings around openings and at edge of open-sided floors and platforms. Fabricate to dimensions and details indicated.

7. STAINLESS-STEEL FINISHES

a. Surface Preparation: Remove tool and die marks and stretch lines, or blend into finish.

b. Polished Finishes: Grind and polish surfaces to produce uniform finish, free of cross scratches.
   1) Run grain of directional finishes with long dimension of each piece.

c. Directional Satin Finish: No. 4.

d. When polishing is completed, passivate and rinse surfaces. Remove embedded foreign matter and leave surfaces chemically clean.

8. STEEL AND IRON FINISHES

a. For nongalvanized-steel railings, provide nongalvanized ferrous-metal fittings, brackets, fasteners, and sleeves, except galvanize anchors to be embedded in exterior concrete or masonry.

b. Preparing Nongalvanized Items for Shop Priming: Prepare uncoated ferrous-metal surfaces to comply with SSPC-SP 3, "Power Tool Cleaning".

c. Primer Application: Apply shop primer to prepared surfaces of railings unless otherwise indicated. Comply with requirements in SSPC-PA 1, "Paint Application Specification No. 1: Shop, Field, and Maintenance Painting of Steel," for shop painting. Primer need not be applied to surfaces to be embedded in concrete or masonry.

   1) Shop prime uncoated railings with universal shop primer.

PART 8 - EXECUTION

1. EXAMINATION

a. Examine plaster and gypsum board assemblies, where reinforced to receive anchors, to verify that locations of concealed reinforcements have been clearly marked for Installer. Locate reinforcements and mark locations if not already done.

2. INSTALLATION, GENERAL

a. Fit exposed connections together to form tight, hairline joints.

b. Perform cutting, drilling, and fitting required for installing railings. Set railings accurately in location, alignment, and elevation; measured from established lines and levels and free of rack.

   1) Do not weld, cut, or abrade surfaces of railing components that have been coated or finished after fabrication and that are intended for field connection by mechanical or other means without further cutting or fitting.

2) 2. Set posts plumb within a tolerance of 1/16 inch in 3 feet (2 mm in 1 m).
3) 3. Align rails so variations from level for horizontal members and variations from parallel with rake of steps and ramps for sloping members do not exceed 1/4 inch in 12 feet (5 mm in 3 m).

c. Adjust railings before anchoring to ensure matching alignment at abutting joints.

d. Fastening to In-Place Construction: Use anchorage devices and fasteners where necessary for securing railings and for properly transferring loads to in-place construction.

3. RAILING CONNECTIONS

a. Welded Connections: Use fully welded joints for permanently connecting railing components. Comply with requirements for welded connections in "Fabrication" Article whether welding is performed in the shop or in the field.

4. ANCHORING POSTS

a. Use steel pipe sleeves preset and anchored into concrete for installing posts. After posts
have been inserted into sleeves, fill annular space between post and sleeve with nonshrink, nonmetallic grout or anchoring cement, mixed and placed to comply with anchoring material manufacturer's written instructions.

b. Unless indicated otherwise, cover anchorage joint with flange of same metal as post, attached to post with set screws.

c. Anchor posts to metal surfaces with flanges, angle type, or floor type as required by conditions, connected to posts and to metal supporting members as follows:
1) For steel railings, weld flanges to posts and bolt to metal-supporting surfaces.

5. ATTACHING RAILINGS

a. Anchor railing ends to concrete and masonry with sleeves concealed within railing ends and anchored to wall construction with anchors and bolts.

b. Anchor railing ends to metal surfaces with flanges bolted to metal surfaces and welded to railing ends or connected to railing ends using nonwelded connections.

c. Attach handrails to walls with wall brackets. Provide brackets with 1-1/2-inch (38-mm) clearance from inside face of handrail and finished wall surface. Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.
1) Use type of bracket with flange tapped for concealed anchorage to threaded hanger bolt.
2) Locate brackets as indicated or, if not indicated, at spacing required to support structural loads.

d. Secure wall brackets to building construction as follows:
1) For concrete and solid masonry anchorage, use drilled-in expansion shields and

hanger or lag bolts.

2) For hollow masonry anchorage, use toggle bolts.

3) For steel-framed partitions, use hanger or lag bolts set into wood backing between studs. Coordinate with stud installation to locate backing members.

6. CLEANING

a. Clean stainless steel by washing thoroughly with clean water and soap, rinsing with clean water, and wiping dry.

b. Touch-up Painting: Immediately after erection, clean field welds, bolted connections, and abraded areas of shop paint, and paint exposed areas with the same material as used for shop painting to comply with SSPC-PA 1 for touching up shop-painted surfaces.

1) Apply by brush or spray to provide a minimum 2.0-mil (0.05-mm) dry film thickness.

7. PROTECTION

a. Protect finishes of railings from damage during construction period with temporary protective coverings approved by railing manufacturer. Remove protective coverings at time of Substantial Completion.

b. Restore finishes damaged during installation and construction period so no evidence remains of correction work. Return items that cannot be refinished in the field to the shop; make required alterations and refinish entire unit, or provide new units.

END OF SECTION 05 73 00

SECTION 06 05 60
DECORATIVE PLASTIC LAMINATE

PART 1 - GENERAL

1.1 SUMMARY

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

B. Section Includes:

1. Standard decorative laminate surfacing for finishing countertops as indicated, including accessories and trim needed for a complete installation.

1.2 RELATED WORK

A. Work of this section is related to work specified in the following sections:

1. Division 06 Section 06 01 20 – Interior Architectural Woodwork

1.3 REFERENCES

A. Reference Standards: In addition to requirements, comply with applicable provisions of following for design, materials, fabrication, and installation of component parts:

1. NEMA LD3-1995.

1.4 SUBMITTALS

A. Product Data: Manufacturer's technical literature for decorative plastic laminate material, adhesive for bonding plastic laminate, miscellaneous accessories and related components.

B. Samples:

1. Decorative plastic laminates, 5 by 7 inches (125 by 175 mm), for each type, color, pattern, and surface finish.

C. Informational Submittals: Submit following packaged separately from other submittals:

1. Manufacturer's written handling, storage and installation instructions.

1.5 QUALITY ASSURANCE

A. Fabricator/Installer Qualifications: Company specializing in fabricating and installing decorative plastic

A. laminate finished work with a minimum 3 years experience.

B. Source Limitations: Obtain decorative plastic laminate materials through one source from a single manufacturer.

C. Fire-Test-Response Characteristics: Provide decorative plastic laminate with the following surfaceburning characteristics as determined by testing identical products per ASTM E 84 by UL or another testing and inspecting agency acceptable to authorities having jurisdiction:

1. Flame-Spread Index: 25 or less.
2. Smoke-Developed Index: 450 or less.

1.6 DELIVERY, STORAGE AND HANDLING

A. Deliver, store, handle, and protect materials in accordance with manufacturer’s written instructions.

1. Provide protective coverings of suitable material. Take special precautions at corners.

1.7 SEQUENCING

A. Coordinate sizes and locations of plumbing, cut-outs and other related Work specified

in other Sections to ensure that interior architectural woodwork can be supported and installed as indicated.

PART 2 - PRODUCTS

2.1 MATERIALS AND COMPONENTS

A. Decorative Plastic Laminate: Manufacturers standard and custom decorative surface papers with melamine resins, bonded under heat and pressure to kraft paper backing sheet with phenolic resins.
B. Standard Decorative Laminate – General Purpose Type Decorative Laminate:
   1. Grade: Grade 10, HGS
   2. Thickness: .048 Inches (1.2mm).
   3. Surface burning characteristics in accordance with ASTM E84.
   4. Finish:
   5. Colors and Patterns: As selected by Architect from manufacturer's full range.
C. Edges: Grade HGS

2.2 ACCESSORY MATERIALS

A. Adhesive for Bonding Plastic Laminate: Unpigmented contact cement

PART 3 – EXECUTION

3.1 EXAMINATION AND PREPARATION

A. Examine surfaces for conditions that would adversely affect decorative plastic laminate surfacing.

3.2 INSTALLATION

A. General: Install decorative plastic laminate in accordance with manufacturer's written installation instructions, approved Submittals and requirements of Division 6 Section 06 01 20 – Interior Architectural Woodwork
B. Provide templates and rough-in measurements.

3.3 CLEANING AND PROTECTION

A. Cleaning:
   1. Clean decorative plastic laminate surfaces in accordance with manufacturer's instructions.
B. Protection:
   2. Do not permit construction near unprotected surfaces.

END OF SECTION

SECTION 06 07 00
WOOD TREATMENT

PART 1 - GENERAL

1.1 SUMMARY

A. Sections Includes:
1. Preservative pressure treatment.
2. Fire-retardant pressure treatment.
3. Applied preservative treatment.
B. Related Sections:
1. Section 06 10 00 – Rough Carpentry.
2. Section 06 01 20 – Interior Architectural Woodwork

1.2 DEFINITIONS

A. Pressure Treatment: Pressure impregnation with preservative and fire-retardant chemicals.

1.3 SUBMITTALS

A. General: Submit in accordance with Section 01 33 00.
B. Product Data: Submit following:
1. Product data for:
a. Wood preservative treatment, including type of preservative used, net amount of preservative retained, and chemical treatment manufacturer's written instructions for handling, storing, installing, and finishing treated material.
b. Fire-retardant treatment, including physical properties of treated materials, both before and after exposure to elevated temperatures, ASTM D 5516 and ASTM D 5664.
c. Waterborne treatment, including statement identifying required moisture content of treated materials before shipment to Project site.
C. Informational Submittals: Submit following:
1. Test/Evaluation Reports showing Code compliance as specified in Quality Assurance Article.
2. Certifications specified in Quality Assurance Article.
3. Manufacturer's instructions.

1.4 QUALITY ASSURANCE

A. Grade Marks:
1. Pressure Treatment: Include quality mark of grading agency which maintains continued supervision, testing, inspection, and re-examination service over product quality as described in AWPA standards.
2. Fire-Retardant Treated Wood: Imprint each piece with mark attesting to FR-S rating.
B. Manufacturer Qualifications: Company specializing in manufacturing Products specified in this Section.
C. Applicator Qualifications: Acceptable to manufacturer with experience on at least five projects of similar nature.
D. Regulatory Requirements: Submit research/evaluation reports showing Code compliance for following:

1. Preservative-treated wood products.
2. Fire-retardant-treated wood products.

E. Certifications: Manufacturer's certification that products furnished for Project meet or exceed specified requirements.

1. Certify treatment will not have adverse affect on finish.

1.5 DELIVERY, STORAGE, AND HANDLING

A. General: Comply with Section 01 00 00.
B. Stack lumber, plywood, and other panels; place spacers between each bundle to provide air circulation. Provide for air circulation around stacks and under coverings.
1. Fire-Retardant Treated Wood: Keep materials dry during delivery and storage.
a. Protect against exposure to weather.

PART 2 - PRODUCTS

2.1 WOOD TREATMENTS

A. Kiln dry pressure-treated products after treatment to following maximum moisture contents:
1. Lumber: 19-percent.
2. Plywood: 15-percent.
B. Wood Preservative Pressure Treatment:
1. Solid Sawn Lumber, Decking, and Timber: AWPA C2.
a. Waterborne Treatments: AWPA Standard P5. Do not use for glue laminated members after gluing.
3. Plywood: AWPA C9.
4. Use of chromated copper arsenate (CCA) not allowed.
5. Provide preservative treatment of quaternary ammonia, copper, and ammonia or amine.
6. Acceptable Products and Manufacturers:
a. Preserve Plus ACQ, Chemical Specialties, Inc., Charlotte, NC.
b. Wolmanized Natural Select Wood Treatment, Arch Wood Protection, Inc., Smyrna, GA.
c. Accepted Substitute in accordance with Section 01 00 00.
7. Acceptable Products and Manufacturers:
a. CCA Preservative, Hoover Treated Wood Products, Inc., Thomson, GA.
b. SupaTimber CCA [with UltraWood water repellent], Chemical Specialties, Inc., Charlotte, NC.
c. Accepted Substitute in accordance with Section 01 00 00.
8. For applications listed, provide following retention rates:
a. Above Ground: 0.20 pound/cubic foot.
9. Do not incise surfaces of lumber at exposed to view locations.
10. Treat following items:
a. Surfaces in contact with concrete or ground.
b. Floor screeds.
c. Sills, plates, soles, and furring in contact with exterior concrete or masonry walls or in direct contact with soils or located within 8 inches of soils.
d. Blocking and sleepers in contact with exterior concrete or masonry walls or in direct contact with soils.
e. Wood used with roofing, flashing, and waterproofing such as
1) Curbs.
2) Cants.
3) Nailers.
C. Preservative Cut Surface Treatment Applied at Site: AWPA M4.
1. Water repellent containing 2-percent copper naphthenate solution.
2. Compatible with preservative pressure treatment.
3. Pigment: Colored.

4. Acceptable Products and Manufacturers:
a. Number 10 Green Preservative, Cuprinol Group, Cleveland, OH.
b. Green EndCoat, Osmose Wood Preserving, Inc., Griffen, GA.
c. Accepted Substitute in accordance with Section 01600.
D. Wood Fire Retardant Pressure Treatment:
1. AWPA C20 for lumber.
2. AWPA C27 for plywood.
3. Chemically treat and pressure impregnate wood products.
4. Capable of providing maximum flame spread/smoke development rating of 25/25 (FR-S Rating).
5. Not required to have brush treatment of cuts made in field.
6. Equilibrium moisture content of not more than 28 percent, ASTM D3201 procedures at 92 percent relative humidity.
7. Not detrimental to structural properties of plywood when exposed to elevated temperatures and high humidity, ASTM D5516.
8. Not capable of bleeding through or adversely affecting type of finish indicated.
9. Not capable of corroding metals, MIL-L-19140E.
10. Acceptable Products and Manufacturers, Interior:
a. D-Blaze, Chemical Specialties, Inc., Charlotte, NC.
b. Dricon, Hickson Corporation, Atlanta, GA.
c. Pyroguard, Hoover Treated Wood Products, Thomson, GA.
d. Accepted Substitute in accordance with Section 01 00 00.
11. Treat following wood items with Interior Type A treatment:
a. Blocking above ceilings.
b. Blocking within return air plenums.
c. Blocking within walls.

PART 3 - EXECUTION

3.1 EXAMINATION

A. General: Examine conditions and proceed with work in accordance with Section 01 40 00.

3.2 APPLICATION

A. Wood Treatment Applied to Cut Surfaces at Site: Comply with AWPA M4 and with Section 01 60 00.
1. Apply preservative treatment in accordance with manufacturer's instructions to:
a. Preservative pressure treated wood site-sawn ends.
b. Holes cut through preservative pressure treated wood.
2. Allow preservative to cure prior to erecting members.

B. Wood Fire Retardant Pressure Treated Wood: Do not rip cut.
1. Do not mill.
2. Only end cuts and bored holes are permitted.

END OF SECTION

SECTION 06 10 00
ROUGH CARPENTRY

1.GENERAL

a. The work covered by this Section of the Specifications consists of furnishing all labor, materials, and equipment to complete all rough and finish carpentry including the installation of millwork and finish hardware.

b. This Contractor shall furnish and erect all items of carpentry work shown or reasonably implied by the Drawings or Specifications that may be required for the completion of the entire work as directed. Furnish and erect all scaffolding, centering, furring, blocking, etc., that may be required. It is not the intention of this Specification or the Drawings to enumerate all the miscellaneous carpentry required for the building. The Contractor shall carefully examine the Drawings and furnish all items required to carry out the evident intent of the Drawings in a proper manner and according to the best current practice.

c. All millwork shall be assembled at the mill insofar as practical, and delivered ready for erection. When it is necessary to cut and fit on the job, the material shall be made with ample allowance for cutting. Finished work shall be erected plumb, true and in accordance with the Drawings.

d. Finished work shall be blind-nailed insofar as possible and surface nails shall be set.

2. ROUGH CARPENTRY MATERIALS

a. Concrete Forms:

1. Construct forms complete of sufficient strength to carry wet load of concrete, without deforming. Joints to be leakproof Forms to be designed to be removable without prying or hammering against concrete. Shall mold concrete to exact form shown in Drawings.

2. Cooperate with other trades to install embedded items. Be present during pour for any necessary emergency repairs.

b. Plates - 2 x 6 #2 or better surface dried tested yellow Pine, MMC, 19%. Plates shall be wolmanized when in contact with concrete. Fire retardant treated at exterior walls.

c. Studs - 2 x 4 #2 or better Yellow Pine or Fir, surface dried MMC, 19%. Fire retardant treated at exterior walls.

d. Floor Trusses - Submit Engineered drawings for floor trusses.

e. Ceiling Joists. Roof Rafters and Trusses - Submit Engineer design drawings for roof trusses.

f. Sub-Floor - 3/4" x 4 x 8 OSB (Tongue and Groove).

g. Roof Sheathing- 5/8" x 4 x 8 OSB with steel "H" clips.

h. Wall Sheathing – 7/16" x 4 x 8 OSB,

3. INSTALLATION OF ROUGH CARPENTRY

Sole plates laid over 30# felt, shall be ramset into concrete maximum 4' - 0" on center and minimum 12" from each end on exterior perimeter sills. 3 - 1/2" bright plated 3/8" dia. pin with 7/8" bright plated disc. spaced 4' - 0" o.c. on interior plates may be used if approved by Prince George County. Minimum 2 pins or bolts per plate piece not more than 12" from ends. Double top plates, double studs at openings exceeding 3' - 0" in width and triple studs at openings exceeding 6' - 0" in width. Triple at comers. Where openings exceed 3' - 0" in width, the header shall be supported by one stud and where the opening exceeds 6' - 0", each end shall be supported by two studs. Diagonal metal strap bracing secured to studs of all walls and main interior partitions. Opening through floors, roofs, or ceiling to be framed with double members. Unless otherwise shown, studs shall be placed 16" o.c. Install firestop framing in accordance with the Virginia Statewide Code. Frame all openings for ducts, grilles, registers, scuttles, etc. All nailing shall be in accordance with the best practice to develop maximum strength of materials, to withstand the corrosive conditions of the region.

Exterior exposed wood materials shall be nailed with galvanized coated nails to prevent staining.

END OF SECTION

SECTION 06 16 00
SHEATHING

GENERAL

Work Included: Structural and non-structural wall, floor and roof framing.

Built-up structural columns.

Wall and roof sheathing.

Plywood floor sheathing

Sill flashings under exterior located frame walls.

Related Work:

Section 03 00 00: Setting anchorage in foundations for wood framing.

Quality Assurance: Lumber to have visible grade stamp, of an agency certified by NFPA

Reference Standards:

APA: American Plywood Associates. PS 1: Construction and Industrial Plywood. PS-20: American Softwood Lumber Standard. NFPA: National Forest Products Association National Design Specification for Stress Grade Lumber and Its Fastening.

PRODUCTS

Lumber and Sheet Materials:

Lumber: PS-20, graded in accordance with NFPA Grading Rules; maximum moisture content of 19 percent; of the following species and grades:

Studs, Joists, Structural and Non-Structural light framing: Southern Yellow Pine, No. 2 grade or better.

Beams, Posts and Timbers: .40 retention pressure preservative treated pine.

Softwood Plywood: PS-I or APA rated; Standard sheathing as noted on drawings.

Accessories:

Nails, Spikes and Staples: Galvanized for exterior locations, high humidity locations and treated wood; plain finish for other interior locations; size and type to suit application.

Bolts, Nuts, Washers, Lags and Screws: Medium carbon steel; sized to suit application; galvanized for exterior locations, high humidity locations and treated wood; plain finish for other interior locations.

Joist Hangers: Sized and profiled to suit application; galvanized finish.

Fasteners: Toggle bolt type for anchorage to hollow masonry. Expansion shield lag bolt for

anchorage to solid masonry or concrete. Bolts or power activated type for anchorage to steel.

Wood Treatment Materials:
Wood Preservative: Pentachloraphenol type, clear.

Sound isolation pad – Iso-Sill by AcoustiGuard or Model Wallmat by Kinetics.

EXECUTION

Wood Treatment: Shop pressure test and deliver to site ready for installation, wood materials requiring pressure impregnated preservatives, cementitious materials. Brush apply two coats of preservative treatment on wood in contact with cementitious materials.

Apply preservative treatment in accordance with manufacturer's instructions. Ensure site-sawn ends are similarly treated Allow preservative to cure prior to erecting members.

Framing: Erect wood framing members true to lines and levels. Do not deviate from true alignment more than 1/4".

Space framing members as noted on drawings (maximum 24" o.c.)

Construct members of continuous pieces in lengths as long as possible.
Construct and erect required built-up beams and lintels.

Double wall framing members at openings. Space short members above and below openings in the same manner as walls.

Coordinate installation of wood trusses.

Sheathing and Sub flooring: Place roof and wall sheathing with end joints staggered. Secure sheets over firm bearing. Maintain surface flatness of maximum 1/8" in 10 feet or more.

END OF SECTION

SECTION 064023
INTERIOR ARCHITECTURAL WOODWORK

PART 1 - GENERAL

1.1 SUMMARY

A. This Section includes the following:
1. Interior standing and running trim.
2. Interior frames and jambs.
3. Wood casework

B. Interior architectural woodwork includes wood furring, blocking, shims, and hanging strips unless concealed within other construction before woodwork installation.

1.2 SUBMITTALS

A. Product Data: For cabinet hardware and accessories and finishing materials and processes.

B. Shop Drawings: Show location of each item, dimensioned plans and elevations, large-scale details, attachment devices, and other components.

C. Samples:
1. Lumber and panel products for transparent finish, for each species and cut, finished on one side and one edge.
2. Lumber and panel products with shop-applied opaque finish, for each finish system and color, with exposed surface finished.
3. Thermoset decorative panels, for each type, color, pattern, and surface finish.

D. Woodwork Quality Standard Compliance Certificates: WI-certified compliance certificates.

E. Green Submittals:
1. Product Data: For installation adhesives, including printed statement of VOC content.
2. Product Data:
a. For each composite-wood product used, documentation indicating that the bonding agent contains no urea formaldehyde.
b. For each adhesive used, documentation indicating that the adhesive contains no urea formaldehyde.

1.3 QUALITY ASSURANCE

A. Quality Standard: Unless otherwise indicated, comply with WI's "Manual of Millwork."
1. Provide WI-certified compliance for woodwork, including installation.

1.4 PROJECT CONDITIONS

A. Environmental Limitations: Do not deliver or install woodwork until building is enclosed, wet work is complete, and HVAC system is operating and maintaining temperature and relative humidity at occupancy levels during the remainder of the construction period.

PART 2 - PRODUCTS

2.1 MATERIALS

A. Wood Species and Cut for Transparent Finish: per Architect.

B. Wood Species for Opaque Finish: MDF with recycled content or finger-jointed pine.

C. Wood Products:

1. Recycled Content of Medium-Density Fiberboard and Particleboard: Provide products with an average recycled content so postconsumer recycled content plus one-half of preconsumer recycled content is not less than 25 percent.
2. Hardboard: AHA A135.4.
3. Medium-Density Fiberboard: ANSI A208.2, Grade MD, made with binder containing no urea formaldehyde.
4. Particleboard: ANSI A208.1, Grade M-2-Exterior Glue.
5. Softwood Plywood: DOC PS 1, Medium Density Overlay.
6. Veneer-Faced Panel Products (Hardwood Plywood): HPVA HP-1, made with adhesive containing no urea formaldehyde.

D. Thermoset Decorative Panels: Particleboard or medium-density fiberboard finished with thermally fused, melamine-impregnated decorative paper complying with LMA SAT-1.

E. High-Pressure Decorative Laminate: NEMA LD 3, grades as indicated or, if not indicated, as required by woodwork quality standard.

2.2 WOODWORK TYPES

A. Interior Woodwork Grade: Economy.

B. Interior Standing and Running Trim for Transparent Finish:

1. Grade: Economy.
2. Wood Species and Cut: Match other woodwork in same area of building.

C. Interior Standing and Running Trim for Opaque Finish:

1. Grade: Economy.
2. Wood Species: White pine; finger-jointed.

D. Interior Frames and Jambs for Transparent Finish:

1. Grade: Economy.
2. Species: Match other woodwork in same area of building.
3. Fire-Rated Frames and Jambs: 20-minute rating.

E. Interior Frames and Jambs for Opaque Finish:

1. Grade: Economy.
2. Species: White pine; finger-jointed.

F. Wood Cabinets for Transparent Finish:

1. Grade: Economy.
2. Wood Species and Cut for Exposed Surfaces: As selected by Architect.
3. Cabinet Interior:

2.3 CABINET HARDWARE AND ACCESSORIES

A. General: Provide cabinet hardware and accessory materials associated with architectural woodwork, except for items specified in Division 08 Section "Door Hardware (Scheduled by

Describing Products)."

B. Butt Hinges: 2-3/4-inch (70-mm), 5-knuckle steel hinges made from 0.095-inch- (2.4-mm-) thick metal, and as follows:

1. Semiconcealed Hinges for Flush Doors: BHMA A156.9, B01361.
2. Semiconcealed Hinges for Overlay Doors: BHMA A156.9, B01521.

C. Back-Mounted Pulls: BHMA A156.9, B02011.

D. Drawer Slides: BHMA A156.9, B05091; heavy duty.

E. Door Locks: BHMA A156.11, E07121.

F. Drawer Locks: BHMA A156.11, E07041.

G. Exposed Hardware Finishes: For exposed hardware, provide finish that complies with BHMA A156.18 for BHMA finish number indicated.

1. Brushed Chromium Plated: BHMA 625 for brass or bronze base; BHMA 651 for steel base.

2.4 MISCELLANEOUS MATERIALS

A. Furring, Blocking, Shims, and Hanging Strips: Softwood or hardwood lumber, kiln-dried to less than 15 percent moisture content.

B. Adhesives, General: Do not use adhesives that contain urea formaldehyde.

2.5 FABRICATION

A. General: Complete fabrication to maximum extent possible before shipment to Project site. Where necessary for fitting at site, provide allowance for scribing, trimming, and fitting.

1. Interior Woodwork Grade: Economy.
2. Shop cut openings to maximum extent possible. Sand edges of cutouts to remove splinters and burrs. Seal edges of openings in countertops with a coat of varnish.
3. Install glass to comply with applicable requirements in Division 08 Section "Glazing" and in GANA's "Glazing Manual." For glass in wood frames, secure glass with removable stops.

B. Interior Standing and Running Trim:

1. For transparent-finished trim items wider than available lumber, use veneered construction. Do not glue for width.
2. Backout or groove backs of flat trim members and kerf backs of other wide, flat members, except for members with ends exposed in finished work.
3. Assemble casings in plant except where limitations of access to place of installation require field assembly.

C. Wood Casework:

1. Manufactured wood casework, fabrication per manufacturer.

D. Plastic Laminate Cabinets:

1. Manufactured plastic laminate casework; fabrication per manufacturer.

E. Plastic-Laminate Countertops:

1. High-Pressure Decorative Laminate Grade: HGS.
2. Colors, Patterns, and Finishes: As selected by Architect from laminate manufacturer's full range of solid colors.
3. Edge Treatment: Same as laminate cladding on horizontal surfaces.
4. Core Material at Sinks: Medium-density fiberboard made with exterior glue.

2.6 SHOP FINISHING

A. Finish architectural woodwork at fabrication shop. Defer only final touchup, cleaning, and polishing until after installation.

B. Backpriming: Apply one coat of sealer or primer, compatible with finish coats, to concealed surfaces of woodwork. Apply two coats to back of paneling.

C. Transparent Finish:
1. Grade: Economy.
2. Finish: Catalyzed lacquer.
3. Stain: As selected by Architect from manufacturer standard selections.

D. Opaque Finish:
1. Grade: Economy.
2. Paint: As indicated in Division 09 Section “Interior Painting.”
3. Color: As selected from manufacturer's full range.
4. Sheen: As selected by Architect.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Before installation, condition woodwork to average prevailing humidity conditions in installation areas. Examine shop-fabricated work for completion and complete work as required, including removal of packing and backpriming.

B. Grade: Install woodwork to comply with requirements for the same grade specified in Part 2 for fabrication of type of woodwork involved.

C. Install woodwork level, plumb, true, and straight to a tolerance of 1/8 inch in 96 inches (3 mm in 2400 mm). Shim as required with concealed shims.

D. Scribe and cut woodwork to fit adjoining work, refinish cut surfaces, and repair damaged finish at cuts.

E. Anchor woodwork to anchors or blocking built in or directly attached to substrates. Secure with countersunk, concealed fasteners and blind nailing as required for complete installation. Use fine finishing nails or finishing screws for exposed fastening, countersunk and filled flush with woodwork and matching final finish if transparent finish is indicated.

F. Standing and Running Trim: Install with minimum number of joints possible, using full-length pieces (from maximum length of lumber available) to greatest extent possible. Fill gaps, if any, between top of base and wall with plastic wood filler, sand smooth, and finish same as wood base if finished.

G. Cabinets: Install without distortion so doors and drawers fit openings properly and are

accurately aligned. Adjust hardware to center doors and drawers in openings and to provide unencumbered operation.

H. Countertops: Anchor securely by screwing through corner blocks of base cabinets or other supports into underside of countertop. Calk space between backsplash and wall with sealant specified in Division 07 Section "Joint Sealants."

END OF SECTION 064023

SECTION 07 21 00
THERMAL INSULATION

SCOPE: This Contractor shall furnish and install all building insulation noted, detailed or called for on Drawings and specified. Insulation shall fully separate all apartment units.

MATERIALS: The following materials shall be used for the locations and conditions stated:

a. Roof - . Provide stabilized GreenFiber Cocoon Insulation for spray-applied application in any exterior or interior wall cavity or open attic space. Resistance (R) - 38, installed in strict accordance with manufacturer's written instructions.

b. Walls - Batt type insulation having side flow Resistance R- 13 (R- 13 at party walls or walls separating air-conditioned and non air-conditioned spaces) installed in strict accordance with manufacturer's written instructions.

c. Framed Floors (ALL floors)- Batt type insulation having a Resistance R- 19, installed in strict accordance with manufacturer's written instructions.

INSTALLATION

a. All exterior walls, walls separating each living unit and ceilings of heated areas are to receive insulation as noted above, and installed per manufacturer's recommendations.

b. All batts shall be firmly anchored to structural surfaces.

c. All joints shall be lapped.

d. Insulation shall be integral and unbroken around electrical boxes, conduits, and plumbing pipes.

e. Install insulation full and tightly in space between studs and joints where water and waste lines occur.

END OF SECTION

SECTION 07 41 00
PREFORMED METAL ROOF AND WALL PANELS

PART 1 GENERAL

1.1 SUMMARY:
Scope of Work
Furnish and Install Preformed Metal Roofing System with continuous interlocking panel connections. Provide all necessary accessories, ridges, hips, valleys, eaves, rakes, corners, miscellaneous flashing, attachment clips and closure members to ensure a weathertight installation.

1.2 SECTION INCLUDES
Preformed aluminum wall panels.

1.3 PERFORMANCE REQUIREMENTS
Design Requirements:
Provide UL90 Rated Roof System that has been tested in accordance with UL580 test procedure. System shall meet performance criteria as installed.

Performance Criteria: Roof system shall conform to structural requirements as it relates to the substrate to which the roof panels are applied.

Wind Loading: Design and size components to withstand dead and live loads caused by wind pressures as follows:
Positive pressure: 15.8 psf normal to panel.
Maximum Deflection under Design Loads: 1/180 of span.

System Movement: Accommodate movements due to thermal expansion and contraction, dynamic loading, and deflection of structural support system without damage to panel system or loss of weatherproofing capability.

Fabricate panels in full length with no transverse seams when panel lengths are 70'-0" or less. The use of transverse seams shall be acceptable for lengths greater than 70'0". Manufacturer's details for end lap conditions shall be strictly adhered to.
All panels shall be fastened to the framing members with concealed anchor clips designed to allow for thermal movement of the panels, except where specific fixed points are required.
Roof panels, anchor clips, closures, flashings and accessories shall be the product of a single manufacturer.
All trim and flashing components shall be fabricated in lengths of 12'-0" to minimize joint details. Allowance for thermal expansion and contraction of trim and flashing components shall be incorporated in their design.

1.4 SUBMITTALS
Submit under provisions of Section 01 01 00. Alternates to this specification must be submitted ten (10) days prior to bid date.
Product Data: Submit manufacturer's current product specifications and installation instructions.

Shop Drawings: Include small scale roof plan and elevations, as required. Show details of trim and flashing conditions, fastening and anchoring methods, weatherproofing techniques, terminations, and penetrations.

Selection Samples: Submit actual metal chips with full range of colors available for Architect's

selection.

Verification Samples: Submit two samples of each type of metal panel required, not less than 12 inches, and illustrating finished panel profile, color, sheen, and texture.
Test Reports: Submit copies of test reports verifying performance capability of panel system. ASTM E-1592.
Clip Fastener Pull Out Test and Calculations.
Air Infiltration (ASTM E-283) and Water Penetration (ASTM E-331) Test Data.
Coating Performance Test Data (See Section 2.3 Finishes).
Certified statement from the roofing panel manufacturer that the manufacturer has a minimum of ten (10) years' experience in the roll forming process of metal roofing systems.
Certified statement from the roofing panel manufacturer that the roofing panel is tension leveled during the roll forming process.

1.7 QUALITY ASSURANCE
Manufacturer's Qualifications:
All panels are to be factory formed and packaged per job requirements.
Manufacturer shall have a minimum of ten (10) years' experience in the factory fabrication of metal roof panels. Specification is based upon the products of ATAS International, Inc. No other manufacturer of metal roof systems shall be accepted as an alternate product without prior written approval. These substitution requests must meet specifications and must be submitted a minimum of ten (10) days prior to date of bid.

Installer: Company specializing in the type of work required for this project, with not less than 2 years of documented experience.

Regulatory Requirement: All local building code requirements are to be followed for both design and installation of metal roof system.

1.8 DELIVERY, STORAGE AND HANDLING

A. Do not deliver materials of this section to project site until suitable facilities for storage and protection are available.
B. Protect materials from damage during transit and at project site. Store under cover but sloped to provide positive drainage. Do not expose materials with strippable protective film to direct sunlight or extreme heat.
C. Do not allow storage of other materials or allow staging of other work on installed metal panel roof system.
D. Upon receipt of delivery of metal roof system, and prior to signing the delivery ticket, the installer is to examine each shipment for damage and for completion of the consignment.

1.9 FIELD MEASUREMENTS

Field measurements should be taken by the installer for verification of dimensional correctness in relationship to original plans, prior to providing manufacturer with a bill of material.

1.10 SEQUENCING AND SCHEDULING

Installer shall coordinate with general contractor as to scheduled delivery time after receipt of field verified bill of material by manufacturer as it relates to actual project scheduling.

1.11 WARRANTY

A. Submit manufacturer's standard 20 year finish warranty for color retention, adhesion, and freedom from chalking.

B. Submit 2 year weathertightness and workmanship warranty from installer.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Design is based on products manufactured by
ATAS International, Inc., 6612 Snowdrift Road
Allentown, PA 18106. Telephone: 610-395-8445.

B. Requests to use alternate systems must be submitted in writing to the project architect at least ten (10) days prior to bid date. Submitted items must be per provision noted in section 1.6 of this project specification.

2.2 MATERIALS

Select one of the following:

A. Aluminum Sheet: ASTM B 209 Prefinish as specified under panel type.

2.3 FINISHES

Select one of the following:

A. Fluoropolymer Coating: Provide multi-coat PVF^2 Kynar 500®/Hylar 5000® finish system on exposed metal surfaces.

2.4 PANEL SYSTEMS

A. Belvedere Series Corrugated Panel.

B. Opaline Series Wall Panels.

2.5 FABRICATION

A. Panels:
   1. Factory fabricated in a controlled environment.
   2. Panels to be tension leveled during rollforming process.
   3. Panels to be produced in longest lengths possible, except when modular units are utilized.

B. Form all components true to shape, accurate in size, square and free from distortion or defects. Cut panels to precise lengths indicated on approved shop drawings or as required by field conditions.

2.6 ACCESSORIES

A. Provide formed accessories of same gauge and finish as the primary panel system, unless otherwise indicated on the drawings.

B. Sealants: As specified in Section 07 92 00.

C. Fasteners: Corrosion resistant fasteners as required for project conditions and panel type.

PART 3 EXECUTION

3.1 EXAMINATION

A. Installer shall examine all substrates on which panel system and accessories are to be applied.
   1. If surfaces are not suitable for application of panel system, installer shall notify the architect in writing.
   2. Installation shall not proceed until surface is acceptable to all parties.

B. Installer must field verify all necessary dimensions prior to fabrication of materials.

3.2 INSTALLATION

A. Install metal panels and accessories in strict accordance with ATAS International, Inc. instructions.
B. Protect surfaces from contact with cementitious materials and other dissimilar metals with bituminous paint or other coatings.
C. Fasten panels to structural support with fasteners provided or approved by panel manufacturer. Install panels plumb, level, and true to line.
D. Fully interlock panels or nest with adjacent panels; apply sealants as required to achieve weathertight installation.
E. Install roof panels with no transverse seams, unless a modularized system is being utilized.
F. Remove protective masking from panels immediately after each panel is installed.
G. Do not allow shavings, metal dust or chips to fall on panels.
H. Care should be taken during handling of panels to prevent bending, twisting, abrasion, scratching, denting, etc.
I. Workmanship to comply with standards established by the Architectural Sheet Metal Community.

3.3 ADJUSTING AND CLEANING

A. Touch up minor abrasions with matching paint provided by panel manufacturer. Remove and replace panels that cannot be satisfactorily touched up. See Metal Construction Association Technical Bulletin #95-1051.
B. Sweep and remove chips, shavings and dust from roof on a daily basis during installation period. Leave installed work clean, free from grease, finger marks and stains. Remove all protective masking from material immediately after installation of product.
C. Upon completion of installation, remove scraps and debris from project site.

3.4 PROTECTION

A. Provide protection as required to assure that completed work of this section will be without damage or deterioration at date of substantial completion.
B. Safety clothing, equipment and precautions must be utilized according to safety standards.

END OF SECTION

SECTION 07 41 50
EXTERIOR WALL PANELS & SYSTEMS

GENERAL

Section Includes:
The extent of panel system work is indicated on the drawings and in these specifications. Panel system requirements include the following components: Aluminum or high pressure laminate faced composite panels with mounting system. Panel mounting system including anchorages, shims, furring, fasteners, gaskets and sealants, related flashing adapters, and masking (as required) for a complete watertight installation. Parapet coping, column covers, soffits, sills, border, and filler items indicated as integral components of the panel system or as designed.

RELATED DOCUMENTS
Drawings and general provisions of the Contract, including General and Supplementary Conditions, Division 1 Specification Sections, and Technical Specification Divisions 2 through 16 apply to this Section.

RELATED WORK SPECIFIED ELSEWHERE
Section 05 50 00: Miscellaneous Steel
Section 06 10 00: Rough Carpentry
Section 07 21 00: Thermal Insulation
Section 07 92 00: Joints and Sealants

QUALITY ASSURANCE

Composite Panel Manufacturer shall have a minimum of 5 years experience in the manufacturing of this product. Composite Panel Manufacturer shall be solely responsible for panel manufacture and application of the finish. Fabricator/installer shall be acceptable to the composite panel manufacturer. Fabricator/Installer shall have a minimum 5 years experience of metal panel work similar in scope and size to this project. Field measurements should be taken prior to the completion of shop fabrication whenever possible. However, coordinate fabrication schedule with construction progress as directed by the Contractor to avoid delay of work.

Field fabrication may be allowed to ensure proper fit. However, field fabrication shall be kept to an absolute minimum with the majority of the fabrication being done under controlled shop conditions.

Shop drawings shall show the preferred joint details providing a watertight and structurally sound wall panel system that allows no uncontrolled water penetration on the inside face of the panel system as determined by ASTM E 331. Systems not utilizing a construction sealant at the panel joints (i.e. Rout and Return Dry and Rear Ventilated System) shall provide a means of concealed drainage with baffles and weeps for water which may accumulate in members of the system. Maximum deviation from vertical and horizontal alignment of erected panels: 6mm (1/4") in 6m (20') non-accumulative.

Panel fabricator/installer shall assume undivided responsibility for all components of the exterior panel system including, but not limited to attachment to sub-construction, panel to panel joinery, panel to dissimilar material joinery, and joint seal associated with the panel system.
Composite panel manufacturer shall have established a Certification Program acceptable to the local Code Authorities.

SUBMITTALS

Submittals shall be in conformance with Section 01 33 00 Submittals.

1. Samples

Panel System Assembly: Two samples of each type of assembly. 304mm (12") x 304mm (12") minimum. Two samples of each color or finish selected, 76mm (3") x 102mm (4") minimum.

2. Shop Drawings

Submit shop drawings showing project layout and elevations; fastening and anchoring methods; detail and location of joints, sealants, and gaskets, including joints necessary to accommodate thermal movement; trim; flashing; and accessories.Affidavit certifying material meets requirements specified. Two copies of manufacturer's literature for panel material.

3. Code Compliance

Documents showing product compliance with the national and local building code shall be submitted prior to the bid. These documents shall include, but not be limited to, appropriate Evaluation Reports and/or test reports supporting the use of the product.

DELIVERY, STORAGE AND HANDLING

Protect finish and edges in accordance with panel manufacturer's recommendations.
Store material in accordance with panel manufacturer's recommendations.

PRODUCTS

Composite Panels

ALUCOBOND by Alcan Composites USA, Inc., MEG exterior panels by Abet Laminati, or Panel 20® by Citadel Architectural Products, Inc.

Product Performance
Bond Integrity

When tested for bond integrity, in accordance with ASTM D1781 (simulating resistance to panel delamination), there shall be no adhesive failure of the bond a) between the core and the skin nor b) cohesive failure of the core itself below the following values:

Peel Strength: 115 N mm/mm (22.5 in lb/in) as manufactured
115 N mm/mm (22.5 in lb/in) after 21 days soaking in water at 70°F

Fire Performance
ASTM E 84 Flame Spread Index must be less than 25, Smoke Developed Index must be less than 450.

ASTM D 1929 A self ignition temperature of 650^{o}F or greater
ASTM D-635 Requires a CC1 classification

Finishes

Coil coated KYNAR 500®
Color: Standard color as selected by the owner / architect from manufacturer's standard colors.

PANEL FABRICATION

1. Composition:
Two sheets of aluminum sandwiching a solid core of extruded thermoplastic material formed in a continuous process with no glues or adhesives between dissimilar materials or layers of cellulose fibers that are impregnated with thermosetting resins and bonded under high pressures. The core material shall be free of voids and/or air spaces and not contain foamed insulation material. Products laminated sheet by sheet in a batch process using glues or adhesives between materials shall not be acceptable.

2. System Characteristics

Plans, elevations, details, characteristics, and other requirements indicated are based upon standards by one manufacturer. It is intended that other manufacturers, receiving prior approval, may be acceptable, provided their details and characteristics comply with size and profile requirements, and material/performance standards.

System must not generally have any visible fasteners, telegraphing or fastening on the panel faces or any other compromise of a neat and flat appearance.

Fabricate panel system to dimension, size, and profile indicated on the drawings based on a design temperature of 70°F.

Fabricate panel system so that no restraints can be placed on the panel, which might result in compressive skin stresses. The installation detailing shall be such that the panels remain flat regardless of temperature change and at all times remain air and water tight.

The finish side of the panel shall have a removable plastic film applied prior to fabrication, which shall remain on the panel during fabrication, shipping, and erection to protect the surface from damage.

3. System Performance

Composite panels shall be capable of withstanding building movements and weather exposures

Panels shall be designed to withstand the Design Wind Load based upon the local building code, but in no case less than 20 pounds per square foot (psf) and 30 psf on parapet and corner panels.

ACCESSORIES

Extrusions, formed members, sheet, and plate shall conform with ASTM B209 and the recommendations of the manufacturer.

Panel stiffeners, if required, shall be structurally fastened or restrained at the ends and shall be secured to the rear face of the composite panel with silicone of sufficient size and strength to maintain panel flatness. Stiffener material and/or finish shall be compatible with the silicone.

Sealants and gaskets within the panel system shall be as per manufacturer's standards to meet performance requirements.

Fabricate flashing materials from 0.030" minimum thickness aluminum sheet painted to match the adjacent curtain wall / panel system where exposed. Provide a lap strap under the flashing at abutted conditions and seal lapped surfaces with a full bed of non-hardening sealant.

Fasteners (concealed/exposed/non-corrosive): Fasteners as recommended by panel manufacturer. Do not expose fasteners except where unavoidable and then match finish of adjoining metal.

EXECUTION

1. Inspection

Surfaces to receive panels shall be even, smooth, sound, clean, dry and free from defects detrimental to work. Notify contractor in writing of conditions detrimental to proper and timely completion of the work. Do not proceed with erection until unsatisfactory conditions have been corrected.

Surfaces to receive panels shall be structurally sound as determined by a registered Architect/Engineer.

2. Installation

Erect panels plumb, level, and true.

Attachment system shall allow for the free and noiseless vertical and horizontal thermal movement due to expansion and contraction for a material temperature range of -20°F to +180°F.

Buckling of panels, opening of joints, undue stress on fasteners, failure of sealants or any other detrimental effects due to thermal movement will not be permitted.

Fabrication, assembly, and erection procedure shall account for the ambient temperature at the time of the respective operation.

Panels shall be erected in accordance with an approved set of shop drawings.

Anchor panels securely per engineering recommendations and in accordance with approved shop drawings to allow for necessary thermal movement and structural support.

Conform to panel fabricator's instructions for installation of concealed fasteners.
Do not install component parts that are observed to be defective, including warped, bowed, dented, abraised, and broken members.

Do not cut, trim, weld, or braze component parts during erection in a manner which would damage the finish, decrease strength, or result in visual imperfection or a failure in performance.

Return component parts which require alteration to shop for refabrication, if possible, or for replacement with new parts.

Separate dissimilar metals and use gasketed fasteners where needed to eliminate the possibility of corrosive or electrolytic action between metals.

ADJUSTING AND CLEANING

Remove and replace panels damaged beyond repair as a direct result of the panel installation. After installation, panel repair and replacement shall become the responsibility of the General Contractor.

Repair panels with minor damage.

Remove masking (if used) as soon as possible after installation. Masking intentionally left in place after panel installation on an elevation, shall become the responsibility of the General Contractor.

Any additional protection, after installation, shall be the responsibility of the General Contractor. Make sure weep holes and drainage channels are unobstructed and free of dirt and sealants.

Final cleaning shall not be part of the work of this section.

END OF SECTION

SECTION 07 46 60
SIDING

PART 1 GENERAL

1.1 SECTION INCLUDES
- A. Siding panels.
- B. Accessories and trim.

1.2 RELATED SECTIONS
- A. Section 06 10 00 - Rough Carpentry: Framing and Sheathing.
- B. Section 07 92 00 - Joint Sealers.
- C. Section 09 91 00 - Paints and Coatings: Field painting.

1.3 REFERENCES
- A. ASTM C 920 - Standard Specification for Elastomeric Joint Sealants; 1998.
- B. ASTM C 1185 - Standard Test Methods for Sampling and Testing Non-Asbestos Fiber-Cement Flat Sheet, Roofing and Siding Shingles, and Clapboards; 1999.
- C. ASTM C 1186 - Standard Specification for Flat Non-Asbestos Fiber Cement Sheets; 1999.
- D. ASTM E 72 - Standard Test Methods of Conducting Strength Tests of Panels for Building Construction; 1998.
- E. ASTM E 84 -- Standard Test Method for Surface Burning Characteristics of Building Materials; 1999.
- F. ASTM E 96 - Standard Test Methods for Water Vapor Transmission of Materials; 1995.
- G. ASTM E 136 - Standard Test Method for Behavior of Materials in a Vertical Tube Furnace At 750 Degrees C; 1999.
- H. ASTM E 228 - Standard Test Method for Linear Thermal Expansion of Solid Materials With a Vitreous Silica Dilatometer; 1995.
- I. ASTM G 26 - Standard Practice for Operating Light-Exposure Apparatus (Xenon-Arc Type) With and Without Water for Exposure of Nonmetallic Materials; 1996.

1.4 SUBMITTALS
- A. Make submittals under provisions of Section 01 33 00.
- B. Product Data: Manufacturer's data sheets on each product to be used, including:
    1. Preparation instructions and recommendations.
    2. Storage and handling requirements and recommendations.
    3. Installation methods, including nailing patterns.
    4. Applicable model code authority evaluation report (ICBO, BOCA, CCMC, etc.)
- C. Siding manufacturer's requirements for vapor retarders, primer, paint, etc., to be installed by others.
- D. Maintenance and periodic inspection recommendations.

1.5 QUALITY ASSURANCE
- A. Installer: Provide installer with not less than three years of experience with products similar to those specified.

1.6 DELIVERY, STORAGE, AND HANDLING

- A. Store products off the ground, on a flat surface, and under a roof or separate waterproof covering.

1.7 WARRANTY

- A. Register manufacturer's warranty, made out in Owner's name, with copy to Owner.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. CertainTeed Corporation, Siding Products Group, James Hardie Building Products,

2.2 PANELS

A. Fiber Cement Board Panels - General: Cement and cellulose fiber formed under high pressure into boards with integral surface texture; complying with ASTM C 1186 Type A Grade II; machined edges; for nail attachment.
    1. Surface Burning Characteristics: Flame spread index of 0, smoke developed index of 6, maximum; when tested in accordance with ASTM E 84 (Class I/A).
    2. Flammability: Noncombustible, when tested in accordance with ASTM E 136.
    3. Flexural Strength: At least 1450 psi (10 MPa) when in equilibrium condition, and at least 1015 psi (7 MPa) when in wet condition, tested in accordance with ASTM C 1185.
    4. Coefficient of Thermal Expansion: Less than 1 x 10^-5/inch/inch/degree F (0.5 x 10^- 5/degree C), when tested in accordance with ASTM E 228.
    5. Water Vapor Transmission: Less than 7.0 perm-inch (10 ng/(Pa s m), when tested in accordance with ASTM E 96.
    6. Freeze Thaw Resistance: At least 80 percent flexural strength retained, when tested in accordance with ASTM C 1185.
    7. UV Resistance: No cracking, checking, or erosion, when tested for 2000 hours in accordance with ASTM G 26.
    8. Water Tightness: No water droplets on underside, when tested in accordance with ASTM C 1185.

B. Vertical Siding:
    1. Style: Smooth panel.

2.3 ACCESSORIES

A. Trim: Fiber cement board, cut from siding material; cut edges primed.

B. Trim: Western red cedar lumber, without knotholes, checks, or cracks; 1 inch (25 mm) nominal thickness.

C. Trim: Pressure preservative treated southern pine, without knotholes, checks, or cracks, No.1 grade or better; 1 inch (25 mm) nominal thickness.

D. Trim: PVC, composite and aluminum trim shapes suitable for trim conditions.

E. Provide the following trim:
    1. Starter strip for lap siding.
    2. Outside corners, butted to siding.
    3. Outside corners, overlapping siding.
    4. Fascia board.
    5. _____.

E. Sealant: Paintable, 100 percent acrylic latex caulk complying with ASTM C 920.

F. Sheet Metal Flashing: Minimum 26 gauge hot-dipped galvanized steel sheet, or aluminum.

G. Nails: Length as required to penetrate minimum 1-1/4 inch (32mm) into solid backing; hot-dipped galvanized or stainless steel.

PART 3 EXECUTION

3.1 EXAMINATION

A. Prior to commencing installation, verify governing dimensions of building and condition of substrate.

3.2 PREPARATION

A. Examine, clean, and repair as necessary any substrate conditions that would be detrimental to proper installation.
B. Do not begin installation until unacceptable conditions have been corrected.

3.3 INSTALLATION

A. Install in accordance with manufacturer's instructions and drawing details.
    1. Read warranty and comply with all terms necessary to maintain warranty coverage.
    2. Install in accordance with conditions stated in model code evaluation report applicable to location of project.
    3. Use trim details indicated on drawings.
    4. Touch up all field cut edges before installing.
    5. Pre-drill nail holes if necessary to prevent breakage.
B. Over Wood and Wood-Composite Sheathing: Fasten siding through sheathing into studs.
C. Allow space between both ends of siding panels that butt against trim for thermal movement; seal joint between panel and trim with exterior grade sealant.
D. Joints in Vertical Siding: Install Z-flashing in horizontal joints between successive courses of vertical siding.
E. Install sheet metal flashing above door and window casings and horizontal trim in field of siding.
F. Do not install siding less than 6 inches (150 mm) from surface of ground nor closer than 1 inch (25 mm) to roofs, patios, porches, and other surfaces where water may collect.
G. After installation, seal all joints except lap joints of lap siding. Seal around all penetrations. Paint all exposed cut edges.

3.4 CLEANING

A. At completion of work, remove debris caused by siding installation from project site.
B. Touch-up, repair or replace damaged products before Substantial Completion.

END OF SECTION

SECTION 07 54 00
THERMOPLASTIC OLEFIN (TPO) ROOFING SYSTEM

PART 1 GENERAL

1.01 GENERAL NOTES

A. Preceding job start up, contractor shall decide to his satisfaction that all specifications contained herein are workable.
B. Contractor will perform all work by competent, trained, and properly equipped personnel in strict accordance with good roofing practices and applicable industry standards.
C. Contractor will observe all published safety prevention policies and practices relating to application of roofing system and related work. All federal, state, and local codes shall be followed.
D. Contractor will follow application, safety, etc. information as published in the most current edition of the manufacturer's TPO roofing system technical specification.

1.02 WORK INCLUDED

A. Work under this section covers the installation of a new Fully Adhered TPO roofing system. In addition, contractor shall include all related items of work as noted herein or indicated on the drawings or otherwise required to complete the specified elements of work and provide the necessary warranties for this work.

1.03 SECTION INCLUDES

A. Substrate preparation.
B. Wood nailer installation.
C. Membrane installation.
D. Membrane flashing installation.

1.04 SYSTEM DESCRIPTION

A. Reinforced THERMOPLASTIC OLEFIN sheet roofing that is adhered to 3.25" Polyiso Roof Insulation (R38) with TPO bonding adhesive.
B. Polyiso Roof Insulation to be mechanically fastened to wood decking with HD Fasteners per manufacturers requirements.

1.05 SUBMITTALS

A. Product Data:
Submit copies of Manufacturer's technical information sheets for primary products used including roof membrane, splice tape, fasteners, and batten strip.
B. Samples:
Submit samples of roof membrane, fasteners, and walkway pads
C. Application Information:
Submit copy of manufacturer's application specification.
Submit copy of job related manufacturer's details including flashings, base tie-ins, roof edges, terminations, expansion joints, penetrations, drains, and any other relevant details.
D. Letter attesting that manufacturer's currently licenses roofing contractor.
E. Warranty: Submit warranty sample.

1.06 QUALIFICATIONS

A. Applicator: License by manufacturer's to install specified system and provide specific warranty. Submit letter of certification from manufacturers representative.

1.07 REGULATORY REQUIREMENTS

A. Conform to applicable local building code requirements.

1.08 QUALITY INSPECTION/OBSERVATION

A. Inspection by manufacturer: Provide a final inspection of the roofing system by a Technical Representative employed by roofing system manufacturer.
1. Technical Representative shall not perform any sales functions.
2. Contractor shall complete any necessary repairs required for issuance of warranty.

1.09 ENVIRONMENTAL REQUIREMENTS

A. Install roofing membrane only when surfaces are clean, dry, smooth and free of snow or ice.
B. Do not apply roofing membrane during inclement weather or when ambient conditions will not allow proper application. Consult manufacturer's technical specifications on cold weather application.

1.10 WARRANTY

A. Type/Term:
Provide 20 year manufacturer's limited warranty . Warranty shall include membrane, roof insulation, and membrane accessories.
Provide a separate manufacturer's ISO 95+ insulation warranty

PART 2 PRODUCTS

2.01 NAILERS FOR FLANGES AND ROOF ACCESSORIES

A. Description: Structural Grade No. 2 or better Southern Pine, Douglas Fir, or Exterior Grade plywood. All wood shall be pressure treated for rot resistance.
1. Nailer width: Minimum 3 in. (nominal) wide or as wide as the nailing flange of each roof accessory.
2. Nailer thickness: Thickness of roof insulation.
B. Reference Standards:
1. Southern Pines: PS 20; SPIB Grading Rules.
2. Western Woods: PS 20; WWPA Grading Rules.
3. Plywood: PS 1; APA Grade Stamps.
4. Pressure preservative treatment: AWPB LP2.

2.02 MANUFACTURERS - MEMBRANE MATERIALS

A. Manufacturer's adhered single-ply membrane system:
Reinforced TPO sheet roofing that is adhered to ISO 95+ with TPO bonding adhesive.

2.03 TPO SHEET ROOFING AND FLASHING MEMBRANE

A. Description: Reinforced, TPO synthetic single-ply membrane composed of Thermoplastic

Polyolefin polymer, and Ethylene Propylene Rubber.
Membrane Type: 60 mil

2.04 ROOF INSULATION COMPONENTS

CELLULOSE INSULATION

A. Description: . Provide stabilized GreenFiber Cocoon Insulation for spray-applied application in any exterior or interior wall cavity or open attic space.

INSULATION FASTENERS

A. Description: Heavy-duty threaded fastener with 3-coat waterborne fluorocarbon polymer coating and drill point tip capable of penetrating 20-gauge steel. Fastener shall meet minimum thread size of .260" and 13 threads per inch. Length shall be sufficient to penetrate deck a minimum of ¾" for steel and 1" for wood and concrete. Structural concrete decks must be pre-drilled with a 7/32" carbide drill bit to a depth ½" deeper than the fastener engagement.
B. Reference Standard: SAE 1022, Heat Treated
C. Product/Producer:
1. Heavy-Duty (HD) fasteners by manufacturer's .

2.05 TPO SHEET ROOFING SYSTEM COMPONENTS

A. Roof Flashing:
1. Description: .045 TPO membrane
B. TPO Flashing:
1. Description: Non-reinforced, TPO, single-ply flashing composed of Thermoplastic Polyolefin polymer, and Ethylene Propylene Rubber.
a. Nominal Thickness: .045 inch
C. Bonding Adhesive:
1. Description: SBR-based, formulated for compatibility with the TPO membrane & a wide variety of substrate materials, including masonry, wood, and insulation facings.
D. Pourable Sealer:
1. Description: 2-Part urethane, 2-color for reliable mixing.
E. Seam Plates:
1. Description: Steel with barbs and a Galvalume coating.
2. Reference Standard: Corrosion-resistant to meet FM-4470 criteria.
F. Termination Bar:
1. Description: 1.3" X 0.10" thick aluminum bar with integral caulk ledge.
G. Membrane Fasteners:
1. Description: Standard duty threaded fastener with fluorocarbon polymer coating and drill point tip capable of penetrating 20-gauge steel. Length shall be sufficient to penetrate deck a minimum of ¾" for steel and 1" for wood.
2. Reference Standard: SAE 1022, Heat Treated
H. TPO Cut Edge Sealant:
1. Polymeric sealant for use where exposed reinforcement is encountered.
I. TPO General Purpose Sealant:
1. Polymeric one part general purpose sealant
J. TPO Coated Metal:
1. Galvanized Steel with Manufacturers bonded TPO Coating.
K. TPO Molded Flashing Accessories:
1. Unreinforced TPO membrane Pre-Molded for a variety of flashing details (i.e. Pipe Boots, Inside-Outside corners, etc.)

2.06 METAL FLASHING

A. Edge Metal and/or Coping
1. Description: Provide prefabricated (.040, .050, .063 aluminum or 24 gauge steel) with (Kynar, Mill, Anodized) finish in manufacturers standard colors to be selected by specifier.

2.07 MISCELLANEOUS

A. Roof Walkway Pads:
1. Description: Reinforced ULTRAPLY TPO Walkway Pads, .130" X 30" X 50' with Patterned traffic bearing surface.
B. TPO molded corners and pipe boots.

PART 3 INSTALLATION

3.01 EXAMINATION

A. Examine roof deck to determine that it is sufficiently rigid to support roofers and their mechanical equipment and that deflection will not strain or rupture roof components or deform deck.
B. Verify that surfaces and site conditions are ready to receive work. Correct defects in the substrate before commencing with roofing work.
C. Examine roof substrate to verify that it is properly sloped to drains.
D. Start work with sealants and adhesives at 60° - 80° F.
E. Fumes from adhesive solvents may be drawn into the building during installation through rooftop intakes. Appropriate measures must be taken to assure that fumes from adhesive solvents are not drawn into the building through air intakes.
F. For reroofing applications only: remove existing roof system components as specified
G. All surface voids of the immediate substrate greater than 1/4" wide must be properly filled with an acceptable insulation or suitable fill material.

3.02 PROTECTION OF OTHER WORK

A. Protect metal, glass, plastic, and painted surfaces from adhesives and sealants.
B. Protect neighboring work, property, cars, and persons from spills and overspray from adhesives, sealants and coatings and from damage related to roofing work.
C. Protect finished areas of the roofing system from roofing related work traffic and traffic by other trades.

3.03 MATERIAL STORAGE AND HANDLING

A. Keep all adhesives, sealants, primers and cleaning materials away from all sources of ignition.
B. Consult container labels and Material Safety Data Sheets (MSDS) for specific safety instructions.
C. Deliver materials to job site in their original containers as labeled by the manufacturer.

3.04 WOOD NAILER LOCATION AND INSTALLATION

A. Total wood nailer height shall match the total thickness of insulation being used and shall be installed with a 1/8" gap between each length and at each change of direction.
B. Wood nailers shall be firmly fastened to the deck. Mechanically fasten wood nailers to

resist a force of 200 lbs. per lineal foot.

3.05 VAPOR RETARDER

None

3.06 ROOF INSULATION APPLICATION: GENERAL

A. Install only as much insulation as can be covered with the completed roofing system before the end of the day's work or before the onset of inclement weather.
B. Lay roof insulation in courses parallel to roof edges.
C. Neatly fit insulation to all penetrations, projections, and nailers. Insulation shall be fit tightly, with gaps not greater than ¼". All gaps greater that ¼" shall be filled with acceptable insulation. Under no circumstances shall the roofing membrane be left unsupported over a space greater than ¼".

3.07 INSULATION ATTACHMENT

Mechanically Fasten insulation to wood deck with HD Fasteners. Provide proper penetration through decking.

3.08 MEMBRANE INSTALLATION

A. Place membrane panel, over the substrate in its final position.
B. After making sure the sheet is placed in its final position allowing for a 3" lap, fold it back evenly onto itself so as to expose the underside.
    a. Where TPO membrane has been cut to expose reinforcing membrane, TPO cut edge sealant or TPO general purpose sealant must be used to encapsulate exposed edge.
C. Sweep the mating surface of the membrane with a stiff broom to remove any dirt that may have accumulated.
D. Apply TPO bonding adhesive at about the same time to both the exposed underside of the sheet and the substrate to which it will be adhered so as to allow approximately the same drying time.
E. Do not apply bonding adhesive over an area that is to be later heat welded to another sheet or flashing.
F. Allow bonding adhesive to flash off until tacky. Touch the bonding adhesive surface with a clean, dry finger to be certain that the adhesive film is dry to the touch and there is no wet adhesive beneath the top adhesive film. If either motion exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating. Flash off time will vary depending on ambient air conditions.
G. Starting at the fold, roll the previously coated portion of the sheet into the coated substrate slowly and evenly so as to minimize wrinkles.
H. To ensure proper contact, compress the bonded half of the sheet to the substrate with a stiff push broom.
I. Fold the unadhered half of the membrane sheet back onto itself, and repeat the procedure to complete the bonding of the sheet.

3.09 MEMBRANE LAP SPLICING

A. Lap splice areas that have been contaminated must be wiped down with a dry or damp (water only) clean cloth prior to heat welding and allow to completely dry.
B. All field and flashing splices on the horizontal surface shall be completed using an automatic heat welder that has been designed for hot air welding of thermoplastic membranes.

C. Hand held welders are only to be used on vertical welds or where an automatic welder is not practical or cannot be used.
D. Seams made with the automatic welder shall be a minimum of 1-1/2" wide. Seams made with hand welders shall be a minimum of 2" wide. Use 2" wide silicone or silicone coated steel hand rollers to assure proper mating of surfaces as hand heat welding proceeds.
E. Probe all completed welds using a slotted screwdriver or cotter pin puller type tool to verify seam integrity. Do not probe welds until they have had time to cool to ambient conditions. Any welds found to be insufficiently welded need to be repaired on a daily basis.

3.10 MEMBRANE SECUREMENT

A. Secure membrane at all locations where the membrane terminates or goes through an angle change greater than 1" in 12" except for round pipe
B. Penetrations less than 18" in diameter and square penetrations less than 4" square.

3.11 FLASHING - PENETRATIONS

A. General:
1. Flash all penetrations passing through the membrane.
3. The flashing seal must be made directly to the penetration.
B. Pipes, Round Supports, etc.:
1. Flash with pre-molded pipe flashings where practical.
2. Flash using membrane when pre-molded flashing is not practical.
C. Structural Steel Tubing:
1. Use a field fabricated pipe flashing detail provided that the minimum corner radius is greater than 1/4" and the longest side of the tube does not exceed 12". When the tube exceeds 12" use a standard curb detail.
D. Roof Drains:
1. Provide a clean even finish on the mating surfaces between the clamping ring and the drain bowl.
2. Taper insulation around the drain to provide a smooth transition from the roof surface to the drain. Use pre-manufactured tapered insulation with facer or suitable bonding surface to achieve slope. Slope shall not exceed manufacturer's recommendations.
4. Position the TPO membrane, then cut a hole for the roof drain to allow 1/2" -3/4" of membrane extending inside the clamping ring past the drain bolts.
5. Make round holes in the TPO membrane to align with clamping bolts. Do not cut the membrane back to the bolt holes.
6. Place Water Block Seal on top of drain bowl where the clamping ring seats below the membrane
7. Install the roof drain clamping ring and clamping bolts. Tighten the clamping bolts to achieve constant compression.
E. Pipe Clusters and Unusual Shaped Penetrations:
1. Fabricate penetration pockets to allow a minimum clearance of 1" between the penetration and all sides.
2. Secure penetration pockets per manufacturer's details
3. Fill penetration pockets with Pourable Sealer, so as to shed water. Pourable Sealer shall be a minimum of 2" deep.
F. Hot Pipes:
1. Protect the TPO components from direct contact with steam or heat sources when the in-service temperature is in excess of 140° F. In all such cases flash to an intermediate insulated "cool" sleeve per manufacturer's details.
G. Flexible Penetrations:
1. Provide a weather tight gooseneck set in Water Block Seal and secured to the deck.

2. Flash in accordance with Manufacturer's Details

3.12 FLASHING - WALLS, PARAPETS, MECHANICAL EQUIPMENT CURBS, SKYLIGHTS, etc.

A. General:
Using the longest pieces practical, flash all walls, parapets, curbs, etc., a minimum of 8" high per manufacturer's details.
B. Evaluate Substrate:
Evaluate the substrate and overlay per manufacturer's specifications as necessary.
C. If project is a Retrofit or Tear-Off remove all flashings.
D. Remove excessive asphalt to provide a smooth, sound surface for new flashings.
E. Apply TPO bonding adhesive at about the same time to both the membrane flashing and the surface to which it is being bonded so as to allow approximately the same drying time. Apply TPO bonding adhesive by rolling the adhesive on to the mating surfaces evenly, avoiding globs or puddles.
F. Allow TPO bonding adhesive to flash off until tacky. Touch the TPO bonding adhesive surface with a clean, dry finger to be certain that the adhesive does not stick or string. As you are touching the adhesive, pushing straight down to check for stringing, also push forward on the adhesive at an angle to ensure that the adhesive is ready throughout its thickness. If either motion exposes wet or stringy adhesive when the finger is lifted, then it is not ready for mating. Flash off time will vary depending on ambient air conditions.
G. Roll the flashing into the adhesive evenly and carefully so as to minimize wrinkles.
H. To ensure proper contact, compress the flashing to the substrate with a stiff push broom.
I. Complete the splice between membrane flashing and the main roof sheet by hot air welding. Provide lap splices in accordance with manufacturer's details.
J. Provide termination directly to the vertical substrate as shown in manufacturer's Details.
K. Install TPO-Joint covers at field and flashing splice intersections as required by manufacturer.
L. Install intermediate flashing attachment as required by manufacturer's specifications and details

3.13 FLASHING - GRAVEL STOPS OR ROOF EDGE METALS

A. Flash all gravel stops or roof edges as outlined in manufacturer's Details.

3.14 FIELD QUALITY CONTROL

A. Field inspection and testing will be performed as required by the manufacturer
B. Correct identified defects or irregularities.

3.15 CLEAN-UP

A. Clean all contaminants from building and surrounding areas.
B. Remove trash, debris, equipment from project site and surrounding areas.
C. Repair or replace damaged building components or surrounding areas to the satisfaction of the building owner.

END OF SECTION

SECTION 07 60 00
FLASHING AND SHEET METAL

PART 9 - SCOPE

a. Conform with "Architectural Sheet Metal Manual" by SMACNA, for each general category of work required.
   1) Metal flashing and counter flashing.
   2) Gutters and downspouts (rain drainage).

PART 10 - MATERIALS

a. Aluminum Sheet:
   1) ASTM B 209, alloy 3003-H14; 0.032 inch (20 gage); C22A41 pre-finished in color as selected by Architect.

b. Rain Carrying Equipment:
   1) Provide and install a rain carrying equipment system to consist of gutters, downspouts, anchors, etc., as required for a complete and successful installation, size and location indicated on drawings. Gutters shall be of seamless construction.

PART 11 - INSTALLATION

a. Fabricate sheet metal with flat-lock seams; solder with type solder and flux recommended by manufacturer, except seal aluminum seams with epoxy metal seam cement and, where required for strength, rivet seams and joints.

b. Provide for thermal expansion of running sheet metal work, by overlaps of expansion joints in fabricated work. Where required for watertight construction, provide hooked flanges filled with polyisobutylene mastic for 1-inch embedment of flanges. Space joints at intervals of not more than 30 feet for aluminum. Conceal expansion provisions where possible.

c. Anchor work in place with non-corrosive fasteners, adhesives, setting compounds, tapes and other materials and devices as recommended by manufacturer of each material or system. Provide for thermal expansion and building movements. Comply with recommendations of "Architectural Sheet Metal Manual" by SMACNA.

d. Vinyl Masonry Flashing: PVC with plasticizers and modifiers, formed into a 20-mil flexible sheet.

e. Provide: flashing and counter-flashing at all roof to wall intersections and penetrations through roof.

END OF SECTION 07 60 00

SECTION 07 61 00
METAL ROOFING

General:

Scope: install metal roofing on all roof areas of building “A”. Contractor to field verify all dimensions prior to beginning work.

Submittals: Provide two 24” x 24” square panels in proper color, gauge and configuration. Provide shop drawings of roofing layout.

Manufacturer:

Vincent Metals, AEP-Span. Comply with Manufacturer's Specifications.

Alternate manufacturers are McNichols or Grace.

Materials:

24 Gauge Galvanized Steel, formed panels seamed during construction

Finish to be "ColorKlad" color selected architect.

Fasteners: shall be as recommended by manufacturer

Seams 16" O.C.

Gutters, Flashings, Trim, Closures etc: Fabricate of same material, gauge and finish as roof

Installation: Comply with panel fabricator's and material manufacturers' instructions and recommendations for installation, as applicable to project conditions and supporting substrates. Anchor panels and other components of the work securely in place, with provisions for thermal/structural movement.

Seaming: Complete seaming of panel joints by operation of portable power-driven equipment of type recommended by panel manufacturer.

Joint Sealers: Install gaskets, joint fillers and sealants where indicated and where required for weatherproof performance of panel systems. Provide types of gaskets and sealants/fillers indicated or, if not otherwise indicated, types recommended by panel manufacturer.

Workmanship:

Conform to SMACNA architectural sheet metal manual standards.

Cleaning and Protection:

Damaged Units: Replace panels and other components of the work, which have been damaged or have deteriorated beyond successful repair by means of finish touch-up or similar minor repair procedures.

Cleaning: Remove temporary protective coverings and strippable films (if any) as each panel is installed. Upon completion of panel installation, clean finished surfaces as recommended by panel manufacturer, and maintain in a clean condition during construction.

END OF SECTION

SECTION 07 72 00
ROOF ACCESSORIES

I. PART ONE - GENERAL

1.01 SUMMARY

A. Work included: Furnishing and installing factory fabricated roof hatches

B. Related Work:

1. Section 05 50 00 Miscellaneous Steel
2. Section 07 54 00 Thermoplastic Olefin (TPO) Roofing System
3. Section 07 92 00 Joints and Sealants

1.02 REFERENCES

A. American Society for Testing and Materials (ASTM), 100 Bar Harbor Drive, West Conshocken, PA 19428-2959; (610) 832-9585, fax (610) 832-9555

1. ASTM A 36-93a: Standard Specification for Structural Steel

1.03 SUBMITTALS

A. Product Data: Provide manufacturer's product data for all materials in this specification.

B. Shop Drawings: Show profiles, accessories, location, and dimensions.

C. Samples: Manufacturer to provide upon request; sized to represent material adequately.

D. Contract Closeout: Roof hatch manufacturer shall provide the manufacturer's Warranty prior to the contract closeout.

1.04 PRODUCT HANDLING

A. All materials shall be delivered in manufacturer's original packaging.

B. Store materials in a dry, protected, well-vented area. The contractor shall thoroughly inspect product upon receipt and report damaged material immediately to delivering carrier and note such damage on the carrier's freight bill of lading.

1.05 SUBSTITUTIONS

A. Proposals for substitution products shall be accepted only from bidding contractors and not less than (10) working days before bid due date. Contractor guarantees that proposed substitution shall meet the performance and quality standards of this specification.

1.06 JOB CONDITIONS

A. Verify that other trades with related work are complete before installing roof hatch(s).

B. Mounting surfaces shall be straight and secure; substrates shall be of proper width.

C. Refer to the construction documents, shop drawings, and manufacturer's installation instructions.

D. Coordinate installation with roof membrane and roof insulation manufacturer's instructions before starting.

E. Observe all appropriate OSHA safety guidelines for this work.

1.07 WARRANTY/GUARANTEE

A. Manufacturer's standard warranty: Materials shall be free of defects in material and workmanship for a period of five years from the date of purchase. Should a part fail to function in normal use within this period, manufacturer shall furnish a new part at no charge. Electrical motors, special finishes, and other special equipment (if applicable) shall be warranted separately by the manufacturers of those products.

II. PART TWO - PRODUCTS

2.01 MANUFACTURER

A. The BILCO Company, P.O. Box 1203, New Haven, CT 06505, 1-203-934-6363, Fax: 1-203-933-8478, Web: www.bilco.com

2.02 ROOF HATCH

A. Furnish and install where indicated on plans metal roof hatch Type F, size width: 4'0" (1219mm) x length: 4'0" (1219mm). Length denotes hinge side. The roof hatch shall be single leaf. The roof hatch shall be pre-assembled from the manufacturer.

B. Performance characteristics:

1. Cover shall be reinforced to support a minimum live load of 40 psf (195kg/m2) with a maximum deflection of 1/150th of the span or 20 psf wind uplift.
2. Operation of the cover shall be smooth and easy with controlled operation throughout the entire arc of opening and closing.
3. Operation of the cover shall not be affected by temperature.
4. Entire hatch shall be weathertight with fully welded corner joints on cover and curb.

C. Cover: Shall be 11 gauge aluminum with a 3” (76mm) beaded flange with formed reinforcing members. Cover shall have a heavy extruded EPDM rubber gasket that is bonded to the cover interior to assure a continuous seal when compressed to the top surface of the curb.

D. Cover insulation: Shall be fiberglass of 1” (25.4mm) thickness, fully covered and protected by an 18 gauge aluminum liner.

E. Curb: Shall be 12” (305mm) in height and of 11 gauge aluminum. The curb shall be formed with a 3-1/2” (89mm) flange with 7/16” (11.1mm) holes provided for securing to the roof deck. The curb shall be equipped with an integral metal capflashing of the same gauge and material as the curb, fully welded at the corners, that features the Bil-Clip® flashing system, including stamped tabs, 6” (153mm) on center, to be bent inward to hold single ply roofing membrane securely in place.

F. Curb insulation: Shall be rigid, high-density fiberboard of 1” (25.4mm) thickness on outside of curb.

G. Lifting mechanisms: Manufacturer shall provide compression spring operators enclosed in telescopic tubes to provide, smooth, easy, and controlled cover operation throughout the entire arc of opening and closing. The upper tube shall be the outer tube to prevent accumulation of moisture, grit, and debris inside the lower tube assembly. The lower tube shall interlock with a flanged support shoe welded to the curb assembly.

H. Hardware

1. Heavy pintle hinges shall be provided
2. Cover shall be equipped with a spring latch with interior and exterior turn handles
3. Roof hatch shall be equipped with interior and exterior padlock hasps.
4. The latch strike shall be a stamped component bolted to the curb assembly.
5. Cover shall automatically lock in the open position with a rigid hold open arm equipped with a 1” (25.4mm) diameter red vinyl grip handle to permit easy release for closing.
6. Compression spring tubes shall be an anti-corrosive composite material and all other hardware shall be zinc plated and chromate sealed. Springs shall have an electrocoated acrylic finish for corrosion resistance.
7. Cover hardware shall be bolted into heavy gauge channel reinforcing welded to the underside of the cover and concealed within the insulation space.

I. Finishes: Factory finish shall be mill finish aluminum.

III. PART THREE - EXECUTION

3.01 INSPECTION

A. Verify that roof hatch installation will not disrupt other trades. Verify that the substrate is dry, clean, and free of foreign matter. Report and correct defects prior to any installation.

3.02 INSTALLATION

A. Submit product design drawings for review and approval to the architect or specifier before fabrication.

B. The installer shall check as-built conditions and verify the manufacturer’s roof hatch details for accuracy to fit the application prior to fabrication. The installer shall comply with the roof hatch Manufacturer's installation instructions.

C. The installer shall furnish mechanical fasteners consistent with the roof requirements.

END OF SECTION

SECTION 07 92 00
JOINT SEALANTS

GENERAL

1. Scope: Provide and install waterproofing and caulking and sealants as detailed and noted hereunder and in Division 1. Provide continuous waterproofing at foundation.

MATERIALS

Caulking materials match adjoining material color for exterior. Light colored for interior, non-staining, non-corrosive elastic compound. Manufacturer's to be A C. Horn or Sornneborn.

EXECUTION

A. Seal the bottom of the bottom plate with butyl caulk or polymeric foam seal and seal around windows and doors with "Sonofoam Backer-Rod" to prevent air infiltration. Seal all openings made by electrical and plumbing pipes in the sheathing.

B. Caulking

I . Clean all areas to be caulked. Pack deep joint with oakum or PVC rods to within 3/8" of the face and fill remainder with caulking compound.

2. Fill caulking flush with adjacent material except as detailed or directed by Architect.

3. Tool the surfaces and prevent or completely remove smears and excess material.

4. Caulk at all exterior change of material locations when necessary to produce a weather tight building.

END OF SECTION
07 92 00

SECTION 08 11 13
HOLLOW METAL DOORS AND FRAMES

PART 12 - GENERAL

1. SUMMARY

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

b. Steel frames for wood doors.

c. Fire-rated steel doors and frames.

d. Thermally insulated steel doors.

e. Steel glazing frames.

f. Accessories, including glazing.

2. 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. ASTM C 1363 - Standard Test Method for Thermal Performance of Building Assemblies by Means of a Hot Box Apparatus; 2005.

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

g. DHI A115 Series - Specifications for Steel Doors and Frame Preparation for Hardware; Door and Hardware Institute; 2000 (ANSI/DHI A115 Series).

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

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

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

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

3. SUBMITTALS

a. See Section 01 33 00 - Administrative Requirements for submittal procedures.

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

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

d. Installation Instructions: Manufacturer's published instructions, including any special installation instructions relating to this project.

e. Manufacturer's Certificate: Certification that products meet or exceed specified requirements.

4. 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.

5. 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 13 - PRODUCTS

1. MANUFACTURERS

a. Steel Doors and Frames:
   1) Assa Abloy Ceco, Curries, or Fleming: www.assaabloydss.com.
   2) Windsor Republic Doors: www.republicdoor.com.
   3) Steelcraft: www.steelcraft.com.

2. 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: 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.

3. STEEL DOORS

a. A. Exterior Doors:
1) 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) Texture: Smooth faces.
5) Insulating Value: U-value of 8.0, when tested in accordance with ASTM C 1363.
6) Weatherstripping: Separate, see Section 08 71 12.

END OF SECTION
08 11 13

SECTION 08 14 16
FLUSH WOOD DOORS

PART 14 - 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) Solid-core birch doors paint grade with wood veneer faces at apartment entry.
   2) Five panel doors painted inside apartment units.
   3) Factory fitting flush wood doors to frames and factory machining for hardware.

b. Related Sections include the following:
   1) Division 8 Section “Hollow Metal Doors and Frames” for standard steel door frames.

3. SUBMITTALS

a. Product Data: For each type of door. Include details of core and edge construction and factory-finishing specifications.

b. Shop Drawings: Indicate location, size, and hand of each door; elevation of each kind of door; construction details not covered in Product Data; location and extent of hardware blocking; and other pertinent data.
   1) Indicate dimensions and locations of mortises and holes for hardware.
   2) Indicate dimensions and locations of cutouts.
   3) Indicate requirements for veneer matching.
   4) Indicate doors to be factory finished and finish requirements.

c. Samples for Verification:
   1) Factory finishes applied to actual door face materials, approximately 8 by 10 inches, for each material and finish. For each wood species and transparent finish, provide set of three samples showing typical range of color and grain to be expected in the finished work.
   2) Corner sections of doors, approximately 8 by 10 inches, with door faces and edgings representing typical range of color and grain for each species of veneer and solid lumber required. Finish sample with same materials proposed for factory-finished doors.

4. QUALITY ASSURANCE

a. Source Limitations: Obtain flush wood doors through one source from a single manufacturer.

b. Quality Standard: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated."
   1) Provide AWI Quality Certification Labels or an AWI letter of licensing for Project indicating that doors comply with requirements of grades specified.

5. DELIVERY, STORAGE, AND HANDLING

a. Comply with requirements of referenced standard and manufacturer's written instructions.

b. Package doors individually in plastic bags or cardboard cartons.

c. Mark each door on top and bottom rail with opening number used on Shop Drawings.

6. PROJECT CONDITIONS

a. Environmental Limitations: Do not deliver or install doors until building is enclosed, wet work is complete, and HVAC system is operating and will maintain temperature and relative humidity at occupancy levels during the remainder of the construction period.

7. WARRANTY

a. Special Warranty: Manufacturer's standard form, signed by manufacturer, Installer, and Contractor, in which manufacturer agrees to repair or replace doors that are defective in materials or workmanship, have warped (bow, cup, or twist) more than 1/4 inch in a 42-by-84-inch section, or show telegraphing of core construction in face veneers exceeding 0.01 inch in a 3-inch span.
   1) Warranty shall also include installation and finishing that may be required due to repair or replacement of defective doors.
   2) Warranty shall be in effect during the following period of time from date of Substantial Completion:
      a) Solid-Core Interior Doors: Life of installation.

PART 15 - PRODUCTS

1. MATERIALS

a. INTERIOR APARTMENT DOORS: All doors shall be sized as shown on plans and shall be constructed in accordance with NWMA Specifications. Doors shall be 1 3/8" thick, five panel, solid doors with smooth surface, painted all six sides and modified cove and bead sticking.

b. APARTMENT ENTRY DOORS: Solid-core birch doors paint grade with wood veneer faces at apartment entry. All new doors shall be sized as shown on plans and shall be constructed in accordance with NWMA Specifications. Doors shall be 20 minute rated (unless otherwise noted), 1 3/4" thick as scheduled. Each entry door to have a view hole and an apartment number. All rated doors to have label attached.

c. EXISTING DOORS: All existing doors shall be refurbished and made operational where necessary.
   1) Provide new panic hardware at existing egress doors.

2. MANUFACTURERS

a. Manufacturers: Subject to compliance with requirements.

3. DOOR CONSTRUCTION, GENERAL

a. Adhesives: Do not use adhesives containing urea formaldehyde.

4. SOLID-CORE DOORS

a. Particleboard Cores: Comply with the following requirements:
   1) Particleboard: ANSI A208.1, Grade LD-2.
      a) Use particleboard made with binder containing no urea-formaldehyde resin.
   2) Blocking: Provide wood blocking in particleboard-core doors as follows:
      a) 5-inch top-rail blocking, in doors indicated to have closers.
      b) 5-inch bottom-rail blocking, in exterior doors and doors indicated to have kick, mop, or armor plates.
      c) 5-inch midrail blocking, in doors indicated to have exit devices.

b. Interior Veneer-Faced Doors:
   1) Core: Particleboard core.
   2) Construction: Five or seven plies with stiles and rails bonded to core, then entire unit abrasive planed before veneering.

5. FABRICATION

a. Factory fit doors to suit frame-opening sizes indicated, with the following uniform clearances and bevels, unless otherwise indicated:
   1) Comply with clearance requirements of referenced quality standard for fitting.

b. Factory machine doors for hardware that is not surface applied. Locate hardware to comply with hardware schedules, door frame Shop Drawings
   1) Coordinate measurements of hardware mortises in metal frames to verify dimensions and alignment before factory machining.

6. FACTORY FINISHING

a. General: Comply with AWI's "Architectural Woodwork Quality Standards Illustrated" for factory finishing.

b. Finish doors at factory.

c. Finish doors at factory that are indicated to receive transparent finish. Field finish doors indicated to receive opaque finish.

d. Finish doors at factory where indicated in schedules or on Drawings as factory finished.

e. Transparent Finish:
   1) Grade: Premium.
   2) Finish: AWI System TR-6 catalyzed polyurethane or manufacturer's standard finish with performance comparable to AWI System TR-6 catalyzed polyurethane.
   3) Staining: Match Architect's control sample. Finish stain will match transparent finish for existing door staining in the Administration Building (Building Standard).
   4) Effect: Filled finish.
   5) Sheen: Satin.

PART 16 - EXECUTION

1. EXAMINATION

a. Examine doors and installed door frames before hanging doors.
   1) Verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with level heads, plumb jambs and clearances above finish floor surfaces.
   2) Reject doors with defects.

b. Proceed with installation only after unsatisfactory conditions have been corrected.

2. INSTALLATION

a. Hardware: For installation, see Division 8 Section "Door Hardware."

b. Manufacturer's Written Instructions: Install doors to comply with manufacturer's written instructions, referenced quality standard, and as indicated.

c. Factory-Fitted Doors: Align in frames for uniform clearance at each edge.

d. Wood frames shall be secured to framing with (4) 3 inch No.10 coarse thread wood screws on each side, spaced equally.

e. Place fire-rated doors with clearances as specified in NFPA Standard No. 80.

3. ADJUSTING

a. Operation: Rehang or replace doors that do not swing or operate freely.

b. Finished Doors: Replace doors that are damaged or do not comply with requirements. Doors may be repaired or refinished if work complies with requirements and shows no evidence of repair or refinishing.

END OF SECTION
08 14 16

SECTION 08 33 23
OVERHEAD COILING DOORS

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes: Electric operated overhead rolling doors.

B. Related Sections:
1. 05 50 00 Miscellaneous Metal. Door opening jamb and head members.
2. 06 10 00 Rough Carpentry. Door opening jamb and head members.
3. 08 71 00 Door Hardware. Padlocks. Masterkeyed cylinder.
5. 09 91 00 Painting. Field painting.

C. Products That May Be Supplied, But Are Not Installed Under This Section:
1. Control Station

1.2 SYSTEM DESCRIPTION

A. Design Requirements:
1. Wind Loading: Supply doors to withstand up to __ psf design wind load.
2. Cycle Life:
a. Design doors of special construction for high cycle use. Expected cycles of up to 200 per day.

1.3 SUBMITTALS

A. Reference Section 01 33 00 Submittals; submit the following items:
1. Product Data.
2. Shop Drawings: Include special conditions not detailed in Product Data. Show interface with adjacent work.
3. Quality Assurance/Control Submittals:
a. Provide proof of manufacturer ISO 9001:2000 registration.
b. Provide proof of manufacturer and installer qualifications - see below.
c. Provide manufacturer's installation instructions.
4. Closeout Submittals:
a. Operation and Maintenance Manual.
b. Certificate stating that installed materials comply with this specification.

1.4 QUALITY ASSURANCE

A. Qualifications:
1. Manufacturer Qualifications: ISO 9001:2000 registered and a minimum of five years experience in producing doors of the type specified.
2. Installer Qualifications: Manufacturer's approval.

1.5 DELIVERY STORAGE AND HANDLING

A. Reference Section 01 66 00 Product Storage and Handling Requirements.

B. Follow manufacturer's instructions.

1.6 WARRANTY

A. Standard Warranty: Two years from date of shipment against defects in material and workmanship.

B. Maintenance: Submit for owner’s consideration and acceptance of a maintenance service agreement for installed products.

PART 2 PRODUCTS

2.1 MANUFACTURER

A. Manufacturer: Cornell Iron Works, Inc. or The Cookson Company, Inc.

2.2 MATERIALS

A. Curtain:
1. Slats: No. 5P, 20 gauge, Grade 40 steel, ASTM A 653 galvanized steel zinc coating perforated with 0.062 inch (1.6 mm) diameter openings at 0.094 inch (2.4 mm) staggered centers, approximately 22 percent free area.
2. Bottom Bar: Two 2x2x1/8 inch (50x50x3.2 mm) structural steel angles.
3. Fabricate interlocking sections with high strength [nylon] [cast iron] endlocks on alternate slats each secured with two ¼” (6.35 mm) rivets. Provide windlocks as required to meet specified wind load.
4. Slat Finish:
a. GalvaNex Coating System to include an ASTM A 653 galvanized base coating treated with dual process rinsing agents in preparation of a chemical bonding, light gray baked-on polyester base coat and a light gray baked-on polyester finish coat. The scientific organic material composition and chemical bonding process of GalvaNex produces a superior finish against corrosion and abrasion. GalvaNex components include a limited two year finish warranty.
5. Bottom Bar Finish:
a. Steel: ASTM A 123, Grade 85 zinc coating, hot-dip galvanized after fabrication.

B. Guides: Fabricate with structural steel angles. Provide windlock bars of same material when windlocks are required to meet specified wind load. Top of inner and outer guide angles to be flared outwards to form bellmouth for smooth entry of curtain into guides. Provide removable guide stoppers to prevent over travel of curtain and bottom bar. Top 16 ½” (419.10 mm) of coil side guide angles to be removable for ease of curtain installation and as needed for future curtain service.
1. Finish:
a. Steel: ASTM A 123, Grade 85 zinc coating, hot-dip galvanized after fabrication.

C. Counterbalance Shaft Assembly:
1. Barrel: Steel pipe capable of supporting curtain load with maximum deflection of 0.03 inches per foot (2.5 mm per meter) of width.
2. Spring Balance: Oil-tempered, heat-treated steel helical torsion spring assembly designed for proper balance of door to ensure that maximum effort to operate will not exceed 25 lbs (110 N). Provide wheel for applying and adjusting

spring torque.

D. Brackets: Fabricate from minimum 3/16 inch (5 mm) steel plate with permanently lubricated ball or roller bearings at rotating support points to support counterbalance shaft assembly and form end closures.
   1. Finish:
      a. ASTM A 123, Grade 85 zinc coating, hot-dip galvanized after fabrication.

E. Hood: 24 gauge galvanized steel with reinforced top and bottom edges. Provide minimum 1/4 inch (6.35 mm) steel intermediate support brackets as required to prevent excessive sag.
   1. Finish:
      a. Aluminum: Mill finish

F. Weatherstripping:
   1. Bottom Bar: Replaceable, bulb-style, compressible EDPM gasket extending into guides.

2.3 ACCESSORIES

A. Locking:
   1. Masterkeyable cylinder operable from coil side of bottom bar. Provide interlock switches on motor operated units.

B. Operator and Bracket Mechanism Cover: Provide 24 gauge galvanized steel sheet metal cover to provide weather resistance to enclose exposed moving operating components at coil area of unit. Finish to match door hood.

2.4 OPERATION

A. Manual Chain Hoist: Provide chain hoist operator with endless steel chain, chain pocket wheel and guard, geared reduction unit, and chain keeper secured to guide.
   1. Control Station: Surface mounted, "Open/Close" key switch with "Stop" push button; NEMA 3R.

B. Weather/Sensing Edge: Provide automatic reversing control by an automatic sensing switch within neoprene or rubber astragal extending full width of door bottom bar.
   1. Provide an electric sensing edge device. Contact before door fully closes shall cause door to immediately stop downward travel and reverse direction to the fully opened position. Provide a self-monitoring wireless sensing edge connection to motor operator eliminating the need for a physical traveling electric cord connection between bottom bar sensing edge device and motor operator. Supervised system alters normal door operation preventing damage, injury or death due to an inoperable sensing edge system.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates upon which work will be installed and verify conditions are in accordance with approved shop drawings.

B. Coordinate with responsible entity to perform corrective work on unsatisfactory

substrates.

C. Commencement of work by installer is acceptance of substrate.

3.2 INSTALLATION

A. General: Install door and operating equipment with necessary hardware, anchors, inserts, hangers and supports.

B. Follow manufacturer's installation instructions.

3.3 ADJUSTING

A. Following completion of installation, including related work by others, lubricate, test, and adjust doors for ease of operation, free from warp, twist, or distortion.

3.4 CLEANING

A. Clean surfaces soiled by work as recommended by manufacturer.

B. Remove surplus materials and debris from the site.

3.5 DEMONSTRATION

A. Demonstrate proper operation to Owner's Representative.

B. Instruct Owner's Representative in maintenance procedures.

END OF SECTION

SECTION 08 41 00
ALUMINUM ENTRANCES AND STOREFRONTS

GENERAL

Aluminum entrance and storefront types required for the project include:

Exterior entrance doors.
Interior doors.
Frames for exterior entrances.
Frames for interior doors.
Storefront type framing system.

Lock cylinders are specified in the Division-08 71 00 hardware section.

SUBMITTALS:

Product Data: Submit manufacturer's product specifications, technical product data, standard details, and installation recommendations for each type of entrance and storefront product required. Include the following information:

Fabrication methods.
Finishing.
Hardware.
Accessories.

Shop Drawings: Submit shop drawings for fabrication and installation of entrances and storefronts, including the following:

Elevations.
Detail sections of typical composite members.
Hardware, mounting heights.
Anchorages and reinforcements.
Expansion provisions.
Glazing details.

Samples: Submit pairs of samples of each type and color of aluminum finish, on 12" long sections of extrusions or formed shapes and on 6" square sheets. Where color or texture variations are anticipated, include 2 or more units in each set of samples indicating extreme limits of variations.

Certification: Provide certified test results showing that entrance and storefront systems have been tested by a recognized testing laboratory or agency and comply with specified performance characteristics.

QUALITY ASSURANCE:

Manufacturer's Qualifications: Provide entrances and storefront produced by a single manufacturer with not less than 5 years successful experience in the fabrication of assemblies of the type and quality required.
Installer's Qualifications: Entrances and storefront shall be installed by a firm that has not less than 5-years successful experience in the installation of systems similar to those required.

Design Criteria: Drawings indicate sizes, spacing of members, profiles and dimensional requirements of entrance and storefront work. Minor deviations will be accepted in order to utilize manufacturer's standard products when, in the Architect's sole judgment, such deviations do not materially detract from the design concept or intended performances.

PROJECT CONDITIONS:

Field Measurements: Check openings by field measurement before fabrication to ensure proper fitting of work; show measurements on final shop drawings. Coordinate fabrication schedule with construction progress to avoid delay in the work. Where necessary, proceed with fabrication without field measurements, and coordinate fabrication tolerances to ensure proper fit.

WARRANTY:
Warranty period for aluminum entrances and storefront is 3 years after the date of substantial completion.

PART 2 - PRODUCTS

MANUFACTURERS:

Manufacturer: All Aluminum Entrance and framing systems shall be Amarlite Express Set System (double glaze) as manufactured by Amarlite Architectural Products, Atlanta, GA, or similar system by Kawneer or Efco Corp.

MATERIALS:

All door and frame sections shall be extruded AA–6063–T5 alloy, aluminum sheet used to complement the framing system shall be of proper alloy to receive anodic treatment and match the job finish. All glazing materials shall be neoprene.

CONSTRUCTION AND DESIGN:

All intermediate mullions shall be designed for interior glazing. Sill and head members shall be of a one–piece channel construction. Vertical framing members shall be held in place by slipping into the continuous head and sill channels.

Lateral spacing and retainage of the mullions shall be by use of the horizontal snap–in stops in the head and sill channels. Vertical mullions and jambs shall be a one-piece member. The two–piece members shall consist of a basic mullion and a removable stop to facilitate glazing.

Horizontal expansion joints shall utilize one–piece extruded splice sleeves.

All doors shall be (narrow and reinforced corner construction, assembled with 3/8" (9.5 mm) diameter steel tension rods for maximum strength. The frame jambs and headers shall be 1–3/4" (44.4 mm) x (114.3 pivoted and butt hung doors shall have a 1–3/4" (44.4 mm) x 4–1/2"(114.3 mm) tubular transom bar. The center-pivoted doors shall have a 1–13/16" (46.037 mm) x 4–1/2" (114.300 mm) transom bar.

Pull and push bars shall have concealed mechanical fasteners.
All vertical and horizontal door sections shall be installed so a to receive infill thickness as dictated in the glass and glazing sections of the specifications. Square, aluminum horizontal snap–in glass stops and sloping, aluminum vertical snap–in glass stops, with a lock–in vinyl system, shall be provided to accommodate specified infill thicknesses.

FINISHES:

All exposed surfaces shall be smooth and free of distracting scratches and blemishes. Color shall be clear anodic coating and shall conform to Aluminum Association Standards and shall be designated as #04 Clear.

HARDWARE:

Door Stop: Provide floor or wall mounted doorstop, as appropriate, with integral rubber bumper. Comply with ANSI A156.16, Grade 1.

Hinges: All doors to have continuous hinges.

PART 3 - EXECUTION

INSTALLATION:

Comply with manufacturer's instructions and recommendations for installation.

Set units plumb, level, and true to line, without warp or rack of framing members, doors, or panels. Provide proper support and anchor securely in place.

Separate aluminum and other corrodible metal surfaces from sources of corrosion of electrolytic action at points of contact with other materials. Comply with requirements specified under paragraph "Dissimilar Materials" in the Appendix to AAMA 101-85.

ADJUSTING:

Adjust operating hardware to function properly, for smooth operation without binding, and for weather tight closure.

CLEANING:

Clean the completed system, inside and out, promptly after installation, exercising care to avoid damage to coatings.

Clean glass surfaces after installation, complying with requirements contained in the "Glass and Glazing" section for cleaning and maintenance. Remove excess glazing and sealant compounds, dirt and other substances from aluminum surfaces.

PROTECTION:

Institute protective measures required throughout the remainder of the construction period to ensure that aluminum entrances and storefronts will be without damage or deterioration, other than normal weathering, at time of acceptance.

END OF SECTION

SECTION 08 51 13
ALUMINUM ARCHITECTURAL WINDOWS

GENERAL

SUMMARY:

Install aluminum architectural window units in new openings, indicated in drawings.

Types of architectural window units required include the following:

Single-hung windows with removable top sash.
Fixed sash windows.

Application of architectural windows on the project includes individual units set in conventional wall construction.

SYSTEM DESCRIPTION:

Performance Requirements: Comply with performance requirements indicated.

Air infiltration rate of single-hung architectural windows shall not be more than 0.10 cfm per ft. of operable sash joint for an inward test pressure of 6.24 lbf per sq. ft., when tested in accordance ASTM E 283.

Air infiltration rate shall not be more than 0.30 cfm per ft. of operable sash joint for an inward test pressure of 6.24 lbf per sq. ft., when tested in accordance ASTM E 283.

Water Penetration: When tested in accordance with ASTM E 331 at an inward test pressure of 8.00 lbf per sq.ft, there shall be no water penetration as defined in ASTM E 331.

All exterior windows shall be thermally-broken.

Structural Performance:

Uniform Load Deflection: When tested in accordance with ASTM E 330 at a static air pressure difference of 30 lbf per sq.ft. with ventilators closed and locked and with the pressure applied first on one side of the unit then on the other, there shall be no permanent deflection in any window member greater than 1/175 of its span.

Window Component Structural Performance: When tested in accordance with the test procedures described in AAMA publication GS-001, Chart "C", window components shall comply with performance requirements indicated in AAMA publication GS-001, Chart "C".

Condensation resistance factor (CRF) of architectural windows of "thermal-break construction" shall not be less than 50 when tested for thermal performance in accordance with AAMA publication 1502.

SUBMITTALS:

Shop Drawings: Submit shop drawings for each type of window including information not fully detailed in manufacturer's standard product data and the following:

Typical unit elevations at 3/4" scale.
Full size section details of every typical composite member.
Anchors.
Hardware.
Operators.
Accessories.
Glazing details.

Product Data: Submit manufacturer's product specifications, technical product data, recommendations and standard details for each type of architectural window unit required. Include the following information:

Fabrication methods.
Finishing.
Hardware.
Accessories.

Test Reports:

Laboratory Test Reports: Provide test reports from a testing laboratory certifying performance of architectural window units.

QUALITY ASSURANCE:

Single Source Responsibility: Provide windows produced by a single manufacturer capable of showing prior production of units similar to those required.

PROJECT CONDITIONS:

Field Measurements: Coordinate fabrication schedule with construction progress to avoid delay of work. Check actual window openings in construction work by accurate field measurement before fabrication; show recorded measurements on final shop drawings.

WARRANTY:

Warranty period is 3 years after the date of substantial completion.

PRODUCTS

MANUFACTURERS:

Manufacturers: Provide products by Jeld-Wen, Crystal Window & Door Systems, Milgard Windows and Doors, or Boyd Aluminum Manufacturing.

MATERIALS:

Aluminum Extrusions: Provide alloy and temper recommended by the window manufacturer for the strength, corrosion-resistance, and application of required finish, but not less than 22,000-psi ultimate tensile strength and not less than 0.062" thickness at any location for mainframe and sash members.

Fasteners: Provide aluminum, nonmagnetic stainless steel, epoxy adhesive, or other materials

warranted by the manufacturer to be non-corrosive and compatible with window members, trim, hardware, anchors and other components of window units.

Reinforcement: Where fasteners screw-anchor into aluminum less than 0.125" thick, reinforce the interior with aluminum or nonmagnetic stainless steel to receive screw threads, or provide standard noncorrosive, pressed-in, splined grommet nuts.

Exposed Fasteners: Do not use exposed fasteners, except where unavoidable for application of hardware. For application of hardware, use fasteners that match the finish of the member or hardware being fastened, as appropriate.

Anchors, Clips and Window Accessories: Depending on strength and corrosion-inhibiting requirements, fabricate anchors, clips and window accessories of aluminum or nonmagnetic stainless steel. Anchors, clips and window accessories fabricated of hot-dip zinc coated steel or iron complying with ASTM A 386 may be used for concealed work.

Compression Type Weather-stripping: Provide compressible molded expanded EPDM or neoprene weather-stripping gaskets complying with ASTM C 509.

Sealant: For sealants required within fabricated window units, provide type recommended by the window manufacturer for joint size and movement. Sealant shall remain permanently elastic, non-shrinking, and non-migrating. Unless otherwise indicated, comply with Division-7 "Joint Sealants" section for selection and installation of sealants.

Glass Fiber Mesh Insect Screen: Provide 18 x 16 or 18 x 14 mesh of plastic-coated glass fiber threads, woven and fused to form a fabric mesh that is resistant to corrosion, shrinkage, stretch, impact damage and weather deterioration. Comply with requirements of FS L-S125.

Double Glazing: Provide pivoting unit for double-glazing, constructed of one sheet of glass in a removable sash for access to the interior of the unit, installed with nominally airtight gaskets.

HARDWARE:

General: Except to the extent that more specific or stringent requirements are indicated, provide the manufacturer's standard hardware fabricated from aluminum, stainless steel, or other corrosion-resistant material compatible with aluminum and of sufficient strength to perform its intended function.

ACCESSORIES:

Insect Screens: Provide insect screens for each operable sash or vent. Locate screens on outside of the sash, depending upon window type and location shown. Design window units and hardware to accommodate screens in a tight-fitting removable arrangement, with a minimum of exposed fasteners and latches, and without wickets for hardware access, if possible.

FABRICATION:

General: Fabricate aluminum architectural window units to comply with indicated standards. Units shall be reglazable without dismantling sash framing. Include a complete system for assembly of components and anchorage; prepare sash for glazing except where preglazing at the factory is indicated.

Provide baffled weepholes and internal water passages to conduct infiltrating water to the

exterior.

Preglazed Fabrication: Preglaze units at the factory. Comply with requirements of the "Glass and Glazing" sections of these specifications.

FINISHES:

Finish Appearance: Variations in appearance of butting or adjacent elements are acceptable if within 1/2” the range indicated in approved samples. Noticeable variation in the same element is not acceptable.

High Performance Coating: Provide shop-applied high performance fluorocarbon coating, color to be black, and tested and certified by the window manufacturer to comply with AAMA 605.

EXECUTION

INSPECTION:

Inspect openings before beginning installation. Verify that rough or masonry opening is correct and the sill plate is level.

Masonry surfaces shall be visibly dry and free of excess mortar, sand and other construction debris.

Wood frame walls shall be dry, clean, sound and well nailed, free of voids and without offsets at joints. Ensure that nail heads are driven flush with surfaces in the opening and within 3 inches of the opening.

Metal surfaces shall be dry, clean, free of grease, oil, dirt, rust and corrosion, and welding slag, without sharp edges or offsets at joints.

ADJUSTING:

Adjust operating sash and hardware to provide a tight fit at contact points and at weather-stripping, for smooth operation and a weather tight closure.

CLEANING:

Clean aluminum surfaces promptly after installation. Exercise care to avoid damage to protective coatings and finishes. Remove excess glazing and sealant compounds, dirt and other substances. Lubricate hardware and other moving parts.

Clean glass of preglazed units promptly after installation; comply with requirements of the "Glass and Glazing" section for cleaning and maintenance.

PROTECTION:

Initiate and maintain protection and other precautions required through the remainder of the construction period, to ensure that, except for normal weathering, window units will be free of damage or deterioration at the time of substantial completion.

END OF SECTION

SECTION 08 71 00
DOOR HARDWARE

1. SCOPE: The work of this section includes the furnishings of all finish hardware in this contract.

2. PACKAGING: Hardware shall be packed in individual containers complete with all mounting devices and templates. Mark each container to correspond with the unit type.

3. KEYING: All locks shall be master keyed in one group. Provide 6 master keys delivered to the Owner or the Owner's representative via registered mail. All locks in each individual dwelling unit shall be keyed alike. Furnish 2 keys for each keyed alike group and 2 keys for all other locks.

4. FINISH HARDWARE: Passage sets and privacy sets shall be Kwikset or Schlage. Furnish and install passage set, cylinder lock and door chime with viewer at all entrance doors.

5. FINISHES: The finish shall be brushed chrome or stainless steel.

6. SCHEDULE.: The successful hardware supplier shall prepare and submit to the Architect through the Contractor four (4) copies of a hardware schedule showing each door, its location, swing, and the hardware proposed. The finish hardware shall not be ordered until the schedule has been approved.

a. All apartment entry doors shall have peepholes, kickplates, silencers, privacy handles and deadbolts.
b. No hinge mounted door stops will be allowed. All doors to have wall or floor mounted stops.
c. Handsets shall be lever style.

7. No double keyed cylinders are allowed. All deadbolts (including those in storefront) to have thumb turns on interior face.

END OF SECTION

SECTION 08 71 12
WEATHER-STRIPPING AND METAL THRESHOLDS

1. SCOPE: The Contractor shall furnish and install weather-stripping and metal thresholds for all exterior doors, rendering them completely weather tight.

2. MATERIALS

a. Weatherstripping shall be on head, lock and bun jambs, "Accurate" series 600 for in swinging doors; "Accurate" series 119 for out swinging doors. Door bottoms shall be weather-stripped with "Accurate" series 137, spring bronze friction type.

b. Meeting jambs of all double doors shall be equipped with "Accurate" #153 recessed aluminum and neoprene astragal device. Install according to manufacturer's details.

c. Thresholds to be "Zero", as detailed and called for on Plans.

3. INSTALLATION: All items to be tight fitting properly aligned, not interfering with door operation and airtight. Thresholds set in bed of silicon.

END OF SECTION

SECTION 08 80 00
GLAZING

PART 17 - 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 glazing for the following products and applications, including those specified in other Sections where glazing requirements are specified by reference to this Section.
   1) Tempered glass at door sidelights.
   2) Laminated (acoustical) glass at interior glazed entrances.
   3) Acoustical sound gaskets in open glass joints.
   4) Transom Glass at apartments
   5) Glass railings at fitness center

3. DEFINITIONS

a. Manufacturer: A firm that produces primary glass or fabricated glass as defined in referenced glazing publications.

b. Deterioration of Laminated Glass: Defects developed from normal use that are attributed to the manufacturing process and not to causes other than glass breakage and practices for maintaining and cleaning laminated glass contrary to manufacturer's written instructions. Defects include edge separation, delamination materially obstructing vision through glass, and blemishes exceeding those allowed by referenced laminated-glass standard.

4. SYSTEM PERFORMANCE REQUIREMENTS

a. General: Provide exterior glazing systems capable of withstanding normal thermal movement, wind and impact loads (where applicable) without failure, including loss or glass breakage attributable to the following: defective manufacture, fabrication, and installation; failure of sealants or gaskets to remain watertight and airtight; deterioration of glazing materials; or other defects in construction.

b. Glass Design: Glass thicknesses indicated are minimums and are for detailing only. Confirm glass thicknesses by analyzing Project loads and in-service conditions. Provide glass lites for various size openings in nominal thicknesses indicated, but not less than thicknesses and in strengths (annealed or heat treated) required to meet or exceed the following criteria:
   1) Glass Thicknesses: Select minimum glass thicknesses to comply with ASTM E 1300.

5. SUBMITTALS

a. General: Submit the following according to Conditions of Contract and Division 1 Specification Sections.

b. Product data for each glass product and glazing material indicated.

c. Samples: For the following products, in the form of 12-inch- square Samples for glass.
   1) Each type of laminated glass with interlayer.

d. Glazing Schedule: Use same designations indicated on Drawings for glazed openings in preparing a schedule listing glass types and thicknesses for each size opening and location. Verify openings before fabrication.

e. Quality Assurance Submittals
   1) Product Certificates: Signed by manufacturers of glass and glazing products certifying that products furnished comply with requirements.
   2) Adhesion and Compatibility Test Report: From glazing sealant manufacturer indicating glazing sealants were tested for adhesion to glass and glazing channel substrates and for compatibility with glass and other glazing materials.
      a) Compatibility test report from manufacturer of insulating glass edge sealant indicating that glass edge sealants were tested for compatibility with other glazing materials including sealants, glazing tape, gaskets, setting blocks, and edge blocks.
   3) Product Test Reports: From a qualified testing agency indicating the following products comply with requirements, based on comprehensive testing of current products:
      a) Glazing sealants.
      b) Glazing gaskets.

f. Closeout Submittals:
   1) Maintenance data for glass and other glazing materials to include in Operating and Maintenance Manual specified in Division 1.
   2) Warranties.

6. QUALITY ASSURANCE

a. Installer Qualifications: An experienced installer who has completed glazing similar in material, design, and extent to that indicated for Project and whose work has resulted in construction with a record of successful in-service performance.

b. Source Limitations for Clear Glass: Obtain clear float glass from one primary-glass manufacturer.

c. Source Limitations for Laminated Glass: Obtain laminated-glass units from one manufacturer using the same type of glass lites and interlayers for each type of unit indicated.

d. Source Limitations for Glazing Accessories: Obtain glazing accessories from one source for each product and installation method indicated.

e. Glass Product Testing: Obtain glass test results for product test reports in "Submittals" Article from a qualified testing agency based on testing glass products.
   1) Glass Testing Agency Qualifications: An independent testing agency with the experience and capability to conduct the testing indicated, as documented according to ASTM E 548.

f. Elastomeric Glazing Sealant Product Testing: Obtain sealant test results for product test reports in "Submittals" Article from a qualified testing agency based on testing current sealant formulations within a 36-month period.
   1) Sealant Testing Agency Qualifications: An independent testing agency qualified according to ASTM C 1021 to conduct the testing indicated, as documented according to ASTM E 548.
   2) Test elastomeric glazing sealants for compliance with requirements specified by reference to ASTM C 920, and where applicable, to other standard test methods.

g. Preconstruction Adhesion and Compatibility Testing: Submit to elastomeric glazing sealant manufacturers, for testing indicated below, samples of each glass type, tape sealant, gasket, glazing accessory, and glass-framing member that will contact or affect elastomeric glazing sealants.
   1) Use manufacturer's standard test methods to determine whether priming and other specific preparation techniques are required to obtain rapid, optimum adhesion of glazing sealants to glass, tape sealants, gaskets, and glazing channel substrates.
   2) Submit not fewer than nine pieces of each type and finish of glass-framing members and each type, class, kind, condition, and form of glass (monolithic, and laminated units) as well as one sample of each glazing accessory (gaskets, tape sealants, setting blocks, and spacers).
   3) Schedule sufficient time for testing and analyzing results to prevent delaying the Work.
   4) For materials failing tests, obtain sealant manufacturer's written instructions for corrective measures, including the use of specially formulated primers.
   5) Testing will not be required if elastomeric glazing sealant manufacturers submit data based on previous testing of current sealant products for adhesion to, and compatibility with, glazing materials matching those submitted.

h. Glazing Publications: Comply with published recommendations of glass product manufacturers and organizations below, unless more stringent requirements are indicated. Refer to these publications for glazing terms not otherwise defined in this Section or in referenced standards.
   1) GANA Publications: GANA'S "Glazing Manual."
   2) SIGMA Publications: SIGMA TM-3000, "Vertical Glazing Guidelines."

i. Pre-installation Conference: Conduct conference at Project site to comply with requirements in Division 1 Section.

7. DELIVERY, STORAGE, AND HANDLING

a. Protect glazing materials according to manufacturer's written instructions and as needed to prevent damage to glass and glazing materials from condensation, temperature changes, direct exposure to sun, or other causes.

b. For insulating-glass units that will be exposed to substantial altitude changes, comply with insulating-glass manufacturer's written recommendations for venting and sealing to avoid hermetic seal ruptures.

8. PROJECT CONDITIONS

a. Environmental Limitations: Do not proceed with glazing when ambient and substrate temperature conditions are outside limits permitted by glazing material manufacturers and when glazing channel substrates are wet from rain, frost, condensation, or other causes.
   1) Do not install liquid glazing sealants when ambient and substrate temperature conditions are outside limits permitted by glazing sealant manufacturer or below 40 deg F.

9. WARRANTY

a. General Warranty: Special warranties specified in this Article shall not deprive Government of other rights Government may have under other provisions of the Contract Documents and shall be in addition to, and run concurrent with, other warranties made by Contractor under requirements of the Contract Documents.

b. Manufacturer's Special Warranty on Laminated Glass: Written warranty, made out to Government and signed by laminated-glass manufacturer agreeing to furnish replacements for laminated-glass units that deteriorate as defined in "Definitions" Article, f.o.b. the nearest shipping point to Project site, within specified warranty period indicated below.
   1) Warranty Period: Five years from date of Substantial Completion.

PART 18 - PRODUCTS

1. PRODUCTS AND MANUFACTURERS

a. Products: Subject to compliance with requirements, provide one of the products indicated in schedules at the end of Part 3.

2. PRIMARY FLOAT GLASS

a. Float Glass: ASTM C 1036, Type I (transparent glass, flat), Quality q3 (glazing select).

3. HEAT-TREATED FLOAT GLASS

a. Heat-Treated Float Glass: ASTM C 1048; Type I (transparent glass, flat); Quality q3 (glazing select); class, kind, and condition as indicated in schedules at the end of Part 3.

4. LAMINATED GLASS

a. Laminated Glass: Comply with ASTM C 1172 for kinds of laminated glass indicated and other requirements specified, including those in the Laminated-Glass Schedule at the end of Part 3.

b. Laminating Interlayers: Provide materials recommended for laminating panes of glass, compatible with pane materials including differential rates of expansion, with a proven record of showing no tendency to bubble, discolor or lose physical or mechanical properties after laminating and installation, clear and of thickness required.

c. C. Laminating Process: Fabricate laminated glass using laminator's standard heat-plus-, pressure process to produce glass free from foreign substances and air/glass pockets and without any of the following optical defects:
   1) No open or entrapped bubbles, seeds, lint, dirt or other foreign contaminants.
   2) No defect of size or frequency to cause visual focus on them.
   3) No spherical occlusion exceeding 1.6 mm in diameter.
   4) No cylindrical occlusion exceeding 1.6 mm in diameter or 12.7 mm in length.
   5) No occlusions, spherical and cylindrical combined, occurring at a frequency greater than 3 per 0.0929 m2 in major viewing area of assembly.

d. Special Laminated Glass: Multiple panes of annealed glass, heat-treated glass, chemically strengthened glass, in any combination, in thicknesses required to comply with system performance requirements.

e. Manufacturing Requirements: Comply with the following:
   1) Maintain length and width tolerances of +/- 1/16 inch.
   2) Warping or bowing may not exceed 1/32 inch in 12 feet at any location.
   3) Trim edges square with maximum differential extension of piles not greater than 1/8 inch.
   4) Apply seal to edges acceptable to Architect.

5. ELASTOMERIC GLAZING SEALANTS

a. General: Provide products of type indicated, complying with the following requirements:
   1) Compatibility: Select glazing sealants and tapes of proven compatibility with other materials they will contact, including glass products, seals of insulating glass units, and glazing channel substrates, under conditions of installation and service, as demonstrated by testing and field experience.
   2) Suitability: Comply with sealant and glass manufacturer's recommendations for selecting glazing sealants and tapes that are suitable for applications indicated and conditions existing at time of installation.
   3) Colors of Exposed Glazing Sealants: As selected by Architect from manufacturer's full range for this characteristic.

b. Elastomeric Glazing Sealant Standard: Provide manufacturer's standard chemically curing, elastomeric sealants of base polymer indicated that comply with ASTM C 920 requirements indicated on each Elastomeric Glazing Sealant Product Data Sheet at the end of this Section, including those referencing ASTM classifications for Type, Grade, Class and Uses.

6. GLAZING TAPES

1) Back-Bedding Mastic Glazing Tape: Preformed, butyl-based elastomeric tape with a solids content of 100 percent, nonstaining and nonmigrating in contact with nonporous surfaces, with or without spacer rod as recommended by tape and glass manufacturers for application indicated, packaged on rolls with a release paper backing, and complying with AAMA 800.

b. Expanded Cellular Glazing Tape: Closed-cell, polyvinyl chloride foam tape, factory coated with adhesive on both surfaces, packaged on rolls with release liner protecting adhesive, and complying with AAMA 800.

7. GLAZING GASKETS

a. Dense Compression Gaskets: Molded or extruded gaskets complying with standards and of profile and hardness required to maintain watertight seal:

b. Soft Compression Gaskets: Extruded or molded closed-cell, integral-skinned gaskets complying with ASTM C 509, Type II, black, and of profile and hardness required to maintain watertight seal:

c. Acoustical Sound Gasket: Provide clear, pre-formed silicone gaskets for butt joints in interior glass as indicated to control sound transfer through open glass joint.

8. MISCELLANEOUS GLAZING MATERIALS

a. General: Provide products of material, size, and shape complying with referenced glazing standard, requirements of manufacturers of glass and other glazing materials involved for glazing application indicated, and with a proven record of compatibility with surfaces contacted in installation.

b. Cleaners, Primers and Sealers: Type recommended by sealant or gasket manufacturer.

c. Setting Blocks: Elastomeric material with a Shore A durometer hardness of 85 plus or minus 5.

d. Spacers: Elastomeric blocks or continuous extrusions with a Shore A durometer hardness required by glass manufacturer to maintain glass lites in place for installation indicated.

9. FABRICATION OF GLASS AND OTHER GLAZING PRODUCTS

a. Fabricate glass and other glazing products in sizes required to glaze openings indicated for Project, with edge and face clearances, edge and surface conditions, and bite complying with recommendations of product manufacturer and referenced glazing standard as required to comply with system performance requirements.

PART 19 - EXECUTION

1. EXAMINATION

a. Examine glass framing, with glazier present, for compliance with the following:
   1) Manufacturing and installation tolerances, including those for size, squareness, offsets at corners.
   2) Presence and functioning of weep system.
   3) Minimum required face or edge clearances.
   4) Effective sealing between joints of glass-framing members.

b. Do not proceed with glazing until unsatisfactory conditions have been corrected.

2. PREPARATION

a. Clean glazing channels and other framing members receiving glass immediately before glazing. Remove coatings that are not firmly bonded to substrates.

3. GLAZING, GENERAL

a. Comply with combined recommendations of manufacturers of glass, sealants, gaskets, and other glazing materials, except where more stringent requirements are indicated, including those in referenced glazing publications.

b. Glass supplier is responsible for appropriate thickness of glass. Where transom wall exceeds standard glass dimensions, multiple panels of glass are acceptable. All panels must be equal in size. Butt glaze all joints with clear silicone. Refer to architectural drawings for transom locations.

c. Glazing channel dimensions as indicated on Drawings provide necessary bite on glass, minimum edge and face clearances, and adequate sealant thicknesses, with reasonable tolerances. Adjust as required by Project conditions during installation.

d. Protect glass from edge damage during handling and installation.

e. Apply primers to joint surfaces where required for adhesion of sealants, as determined by preconstruction sealant-substrate testing.

f. Install elastomeric setting blocks in sill rabbets, sized and located to comply with referenced glazing standard, unless otherwise required by glass manufacturer. Set blocks in thin course of compatible sealant suitable for heel bead.

g. Do not exceed edge pressures stipulated by glass manufacturers for installing glass lites.

4. TAPE GLAZING

a. Position tapes on fixed stops so that when compressed by glass their exposed edges are flush with or protrude slightly above sightline of stops.

b. Install tapes continuously but not in one continuous length. Do not stretch tapes to make them fit opening.

c. Where framing joints are vertical, cover these joints by applying tapes to heads and sills first and then to jambs. Where framing joints are horizontal, cover these joints by applying tapes to jambs and then to heads and sills.

d. Place joints in tapes at corners of opening with adjoining lengths butted together, not lapped. Seal joints in tapes with compatible sealant approved by tape manufacturer.

e. Do not remove release paper from tape until just before each lite is installed.

f. Apply cap bead of elastomeric sealant over exposed edge of tape.

5. GASKET GLAZING (DRY)

a. Fabricate compression gaskets in lengths recommended by gasket manufacturer to fit openings exactly, with stretch allowance during installation.

b. Secure compression gaskets in place with joints located at corners to compress gaskets producing a weathertight seal without developing bending stresses in glass. Seal gasket joints with sealant recommended by gasket manufacturer.

c. Install gaskets so they protrude past face of glazing stops, unless indicated otherwise.

6. PROTECTION AND CLEANING

a. Protect exterior glass from breakage immediately after installation by attaching crossed streamers to framing held away from glass. Do not apply markers to glass surface. Remove nonpermanent labels, and clean surfaces.

b. Protect glass from contact with contaminating substances resulting from construction operations including weld splatter. If, despite such protection, contaminating substances do come into contact with glass, remove them immediately as recommended by glass manufacturer.

c. Examine glass surfaces adjacent to or below exterior concrete and other masonry surfaces at frequent intervals during construction, but not less than once a month, for build-up of dirt, scum, alkali deposits, or stains, and remove as recommended by glass manufacturer.

d. Remove and replace glass that is broken, chipped, cracked, abraded, or damaged in any way, including natural causes, accidents and vandalism, during construction period.

e. Wash glass on both faces in each area of Project not more than 4 days prior to date scheduled for inspections that establish date of Substantial Completion. Wash glass as recommended by glass manufacturer.

7. MONOLITHIC FLOAT-GLASS SCHEDULE

a. Uncoated Clear Float Glass: Where glass designated as Tempered Glass Type A is indicated, provide Type I (transparent glass, flat), Class 1 (clear) glass lites

b. Uncoated Clear Fully Tempered Float Glass: Kind FT (fully tempered) where indicated and to comply with safety glazing requirement including, but not limited to sidelites adjacent to doors.

8. LAMINATED GLASS SCHEDULE

a. Patterned (Acoustical) Glass: Where glass designated as Laminated Glass Type B (088000) is indicated, provide acoustical laminated glass units complying with the following:

END OF SECTION 08 80 00

SECTION 08 8300
MIRRORS

GENERAL

1. Agreement: The Contractor and any contact change orders, the drawings and this section of the specifications will all addenda, together with Division 1; General Requirements, are all incorporated to form the contact documents and the entire basis for agreement between contractor and subcontractor. No allowance will subsequently be made on behalf of the Subcontractor for errors due to his negligence in failing to acquaint himself with the contact documents and the site conditions or for his failure to determine the Owner's desired meaning and intentions of these contract documents before starting work.

2. Scope: Furnish all labor, materials and equipment necessary and proper to complete the mirror work shown on the drawings and specified herein or reasonably implied by same. Unless otherwise noted on the drawings or specified, the mirror work shall include the following:

A. Mirrors
B. Clips and accessories
C. Warranty
D. Clean up

3. Installation shall be in conformance with all manufacturers' recommendations.

MATERIALS

1. All mirrors to be 3/16" thick sheet glass with ground and polished edges.

2. Sized as detailed on the architectural drawings and field measured. Vanity mirrors to be full width of vanity.

EXECUTION

I. All mirrors shall be securely fastened by means of mirror clips secured to the gypsum wallboard. Mirrors shall, in addition to the clips, be set to gypsum wallboard with approved mastic.

2. All mirrors shall be installed flush and level to all surrounding g walls and cabinets.

3. This Subcontractor shall warranty all items furnished and installed for a period of one(l)year following the date of final completion.

4. Cleanup all debris caused by work of this section keeping site and buildings neat at all times. Debris is to be removed from job site. Paragraph 0112 of General Requirements will be strictly adhered to.

END OF SECTION

SECTION 09 20 00
GYPSUM DRYWALL

1. SCOPE

Furnish all labor, materials and equipment to surface all interior walls and ceilings with gypsum wallboard, in accordance with Specifications and Drawings. Gypsum Wall Board must be installed behind all cabinetwork and furnishings.

2. GENERAL PROVISIONS

Gypsum wallboard shall comply with ASTM C-36 or F.S. 55-L-30C.

3. MATERIALS AND LOCATIONS

a. Unrated Gypsum Board.

(l) All non-bearing walls within apartments units.

b. Rated Gypsum Board.

(l) Walls separating apartment units.
(2) All exterior walls and floor and ceiling assemblies.

c. Water resistant Gypsum Board.

(l) Install 1/2" thick on walls enclosing tub areas. Caulk joints and edges.

4. APPLICATION

a. UL Assemblies follow application directions of each UL description

b. Walls - Single Ply: Apply gypsum wallboard horizontally with vertical joints on studs. Exterior comers to have stock metal reinforcement. Nail with special coated nails for gypsum wallboard. Nail 6" o.c. at bearing and 8" o.c. elsewhere. Depress nails. Cement all joints and comers and tape as per mfg. recommendations. Float all nail depressing and joints with floating cement at least 6" wide. All surfaces shall be even and true. All comers straight and plumb.

c. Ceilings - Single Ply - on wood joists: Apply gypsum wallboard to wood joists and nail with special coated nails for gypsum wallboard. Nail 5" o.c. at bearing and 7" o.c. elsewhere. Taping, floating and finishing to be same as for walls. All surfaces to be even and true.

d. Use metal comer clips, zip bead, “J” bead as shown on drawings.

e. This Subcontractor shall remove all debris off the job site from work of this section. Building and site shall be left neat and clean at all times. Paragraph of General Requirements shall be strictly adhered to.

END OF SECTION

SECTION 09 21 16.23
GYPSUM BOARD SHAFT WALL ASSEMBLIES

PART 20 - GENERAL

1. SECTION INCLUDES

a. Tested and rated gypsum board/steel stud enclosures for stairways, vertical and horizontal shaft ways and soffits.

2. REFERENCES

3. DEFINITIONS

a. Shaft Wall: An assembly of steel framing, gypsum boards, and other materials used to enclose stairways, elevator shaftways, shaftways used for air supply and return, and shaftways housing mechanical and electrical components.
   1) Shaft wall assemblies must have passed successfully fire and sound tests performed by recognized testing laboratories.
   2) When utilizing additional layers of the same gypsum boards used in the fire and sound tests, a shaft wall assembly may be estimated to have a higher fire resistance rating than that of the basic test.

b. Adhere: Fasten with adhesive.

c. Attach: Fasten with steel screws, power-driven or non-power-driven.

d. Ductside - That side of a shaft wall that used as a duct or vent in which pressurized air flows.

e. Floorside: That side of a shaft wall that has a floor upon which people may stand.

f. Horizontal: Long dimension of board perpendicular to studs.

g. Inside: That space between studs and between inside faces of inner board faces.

h. Position: Place without attaching or adhering.

i. Roomside: That surface of a duct or shaft which is in a room or space.

j. Shaftside: That side of shaft wall that does not have floor upon which people may stand (such as an elevator shaft, airway, and the like), but which may contain a landing(s) (such as a stairway).

k. Vertical: Long dimension of board parallel with studs.

l. Abbreviations:

4. SYSTEM DESCRIPTION

a. Vertical Shaft Wall Assembly; System B
   1) UL Design U415, 2 hr, Gypsum panels, with beveled, square or tapered edges, nom 1/2 in. or 5/8 in. thick, 48 in. or 1200 mm wide, applied vertically or horizontally in two layers. Inner or base layer attached to studs with 1 in. long Type S steel screws spaced 24 in. OC when installed vertically or 16 in. OC when installed horizontally. Outer or face layer attached to studs with 1 5/8 in. long Type S steel screws spaced 12 in. OC when installed vertically and staggered 12 in. from base layer screws or 8 in. OC when installed horizontally and staggered 8 in. from base layer screws. Horizontal joints between inner and outer layers staggered a min of 12 in. Horizontal joints need not be backed by steel framing. Vertical joints centered over studs and staggered 24 in.

5. SYSTEM ASSEMBLIES

a. The shaft wall assembly for system(s) shown must have following additional attributes:
   1) Must be UL Classified.
   2) Must be listed in National Evaluation Report NER-258.
   3) Must have been used in successful tests of all major elevator manufacturers' frames and doors at Underwriters Laboratories.
   4) Must be a component in the successful ASTM E152 test in which the door frames specified for this project were used.
   5) Must have undergone successful testing of penetration details for elevator call boxes and position indicators.
   6) Must have undergone successful testing of smoke and fire dampers.
   7) Must have been successfully tested to at least 1,000,000 positive-negative pressure cycles.
   8) Must contain studs which give continuous edge support for liner boards to achieve airtight, smoke-tight, and rattle-free performance.
   9) Must be free from projecting, bendable tabs.
   10) Must have been used in the construction industry in the United States at least 20 years.

b. Refer to UL description for further details.

6. SUBMITTALS

a. Follow Section 01 33 00-Product Data, Shop Drawings, and Samples.

b. Product Data: Submit manufacturer's product specifications and installation instructions for systems shown.

c. Shop Drawings: Submit installation drawings which:
   1) Show shaft wall dimensions relative to other work.
   2) Locate all openings in shaft wall with details indicating special construction for work of other Sections and conformance with requirements of fire rated construction.

d. Certificates: Submit manufacturer's certification of compliance with fire and sound requirements for each system shown. Include name of manufacturer and complete

description of door frames, elevator door frames, electrical boxes, and other penetrations included in each tested assembly for each system shown.

e. Additional Certificates: Submit manufacturer's certification of -
   1) Fire test verification of shaft wall damper penetration conformance to applicable code requirements.
   2) Fire test verification of horizontal shaft wall assembly conformance to applicable code requirements.
   3) For each system enclosing elevators, successful completion of fatigue failure resistance of shaft walls through 1,000,000 cycles at a pressure of 7.5 psf with a maximum deflection of L/240.
   4) Compliance of shaft wall assembly or assemblies with applicable code.

f. NESC Report: Submit National Evaluation Service Committee of the Council of American Building Officials Report No. NER-258 as evidence of compliance of systems shown with codes of council members.

7. QUALITY ASSURANCE

a. Single Source Responsibility: Provide steel framing, gypsum boards, insulation, fasteners, joint treatments, and other materials in the assembly or assemblies from the single manufacturer which has utilized these materials in recognized fire containment and sound tests.

8. DELIVERY, STORAGE, AND HANDLING

a. Follow Section 01 61 00-Delivery, Storage, and Handling.

9. PROJECT CONDITIONS

a. Do no joint finishing when temperature in space being finished is less than 55oF (13oC). Ventilation must be adequate to carry off excess moisture.

PART 21 - PRODUCTS

1. MATERIALS

a. Floor, Side and Ceiling Runners — "J" - shaped runner, min 2-1/2 in. deep (min 4 in. deep when System C is used), with unequal legs of 1 in. and 2 in., fabricated from min 24 MSG galv steel. Runners positioned with short leg toward finished side of wall. Runners attached to structural supports with steel fasteners located not greater than 2 in. from ends and not greater than 24 in. OC. "E" - shaped studs may be used as side runners in place of "J" - shaped runners.

b. Steel Studs — "C-H" - shaped studs, min 2-1/2 in. deep (min 4 in. deep when System C is used), fabricated from min 25 MSG galv steel. Cut to lengths 3/8 to 1/2 in. less than floor-to-ceiling height and spaced 24 in. or 600 mm OC.

1) Steel Studs —"E" - shaped studs installed back to back in place of "C-H" - shaped studs (Item 2) "E" - shaped studs secured together with steel screws spaced a maximum 12 in. OC. Fabricated from min 25 MSG galv steel, min 2-1/2 in. deep (min 4 in. deep when System C is used), with one leg 1 in. long and two legs 3/4 in. long. Shorter legs 1 in. apart to engage gypsum liner panels. Cut to lengths 3/8 to 1/2 in. less than floor to ceiling heights.
2) Furring Channels — (Optional) — For use with single or double layer systems. Resilient furring channels fabricated from min 25MSG corrosion protected steel, installed horizontally, and spaced vertically a max 24 in. OC. Flange portion of channel attached to each intersecting "C-H" or "E" stud on side of stud opposite the 1 in. liner panels with 1/2 in. long Type S or S-12 pan-head steel screws. When furring channels are used, wallboard to be installed vertically only. Not to be used with Type FRX or FRX-G gypsum wallboard or cementitious backer units.
3) Steel Framing Members — (Optional) — For use with single or double layer systems. Furring channels and Steel Framing Members as described below. Not to be used with Type FRX or FRX-G gypsum wallboard or cementitious backer units:
    a) Furring Channels — Formed of No. 25 MSG galv steel. 2-3/8 in. wide by 7/8 in. deep, spaced max. 24 in. OC perpendicular to studs. Channels secured to studs as described in Item 2. Gypsum board installed vertically only and attached to furring channels as described in Item C.
    b) Steel Framing Members — Used to attach furring channels to studs. Clips spaced max. 24 in. OC., and secured to studs with No. 8 x 1-1/2 in. minimum self-drilling, S-12 steel screw through the center grommet. Furring channels are friction fitted into clips.

c. Gypsum Board — Gypsum liner panels, nom 1 in. thick, 24 in. or 600 mm (for metric spacing) wide. Panels cut 1 in. less in length than floor to ceiling height. Vertical edges inserted in "H" portion of "C-H" studs or the gap between the two 3/4 in. legs of the "E" studs. Free edge of end panels attached to long leg of vertical "J" - runners with 1-5/8 in. long Type S steel screws spaced not greater than 12 in. OC. When wall height exceeds liner panel length, liner panel may be butted to extend to the full height of the wall. Horizontal joints need not be backed by steel framing. Butt joints backed with 6 in. by 22 in. strips of 3/4 in. thick gypsum wallboard. Wallboard strips centered over butt joints and secured to liner panels with six 1-1/2 in. long Type G steel screws, three screws along the 22 in. dimension at the top and bottom of the strips.

2. OTHER MATERIALS

a. Joint Treatment:
    1) Tape: High-strength fiber, 1-31/32 in. wide; ASTM C475; SHEETROCK Brand Joint Tape.
    2) Taping compound: Vinyl based, without asbestos; ASTM C475; SHEETROCK Brand Taping Joint Compound Ready-Mixed (ready-mixed drying type).
    3) Finishing compound: Vinyl based, without asbestos; ASTM C475; SHEETROCK Brand All Purpose Joint Compound (powder-mixed drying type).
    4) Optional joint treatment materials: Other tapes, taping compounds, and finishing compounds may be used pursuant to gypsum board manufacturer's published recommendations.

3. MANUFACTURER:

a. United States Gypsum Company.

4. SUBSTITUTIONS

a. Products of other manufacturers will not be considered.

PART 22 - EXECUTION

a. EXAMINATION
   1) Examine locations to receive materials for conditions which will affect adversely installation. Do not start materials installation until unsatisfactory conditions have been corrected.

b. PREPARATION
   1) Field Dimensions: Verify location and dimensions where materials are to be installed.
   2) Review shop drawings and coordinate work of other Sections which is integral with shaft wall installation.

c. FRAMING INSTALLATION
   1) Comply with gypsum products manufacturer's published instructions.

d. GYPSUM BOARD APPLICATION
   1) Comply with gypsum products manufacturer's published instructions.

e. GYPSUM BOARD FINISHING
   1) Comply with gypsum products manufacturer's published instructions.

f. CLEANING
   1) Follow Section 01 00 00.

g. PROTECTION
   1) Protect the work from damage; repair to Architect's satisfaction or replace damaged materials.

END OF SECTION 09 21 16.23

SECTION 09 31 00
CERAMIC TILE

PART 1 - GENERAL

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

PART 2 - PRODUCTS

Size

A.Tile Size Varies, see finish schedule.

A. Manufacturer: Varies, see finish schedule.

B. Job Condition: Maintain environmental conditions and protect work during and after installation in accordance with referenced standards and manufacturer's printed recommendations.

C. Tile: See finish schedule.

D. Mortar and Grout: 1/8" grout. See finish schedule.

1. Mortar: Latex - Portland cement mortar conform to ANSI A118.4.
2. Grout: Commercial Portland cement grout as selected by the Architect from the manufacturer's standard color selections (conform with ANSI A118.6). 1/8" Grout line.

PART 3 - EXECUTION

INSTALLATION

A. Install: Install ceramic tile over 1/2" "Durrock" backer board. Board to be screwed to wood framing and glued to concrete substrates.

B. Comply with manufacturer's instructions for mixing and installation of proprietary material sand TCA installation method F118-90 at concrete floors.

C. Extend tile toward to form a complete covering without interruptions, except as otherwise shown. Terminate work neatly as obstructions, edges and corners without disrupting pattern or joint alignments.

D. Accurately form intersections and returns. Perform cutting and drilling of tile without marring visible surfaces. Carefully grind cut edges of tile abutting trim, finish or built-in items for straight aligned joints. Fit tile closely to electrical outlets, piping, fixtures and other penetrations so that plates, collars, or covers overlap tile.

E. Expansion and Control Joints: Provide openings for joints to comply with recommendations in TCA "Handbook for Ceramic Tile Installation: Sealant work is specified in Division 7.

F. Edge Strips: Provide at exposed edge of tile meeting carpet, wood, or resilient flooring, unless

otherwise indicated.

3.2 CLEANING AND PROTECTION

A. Cleaning: Clean per tile and grout manufacturer's printed instructions.

B. Finished Tile Work: Leave finished installation clean and free of cracked, chipped, broken, unbonded, or otherwise defective tile work.

END OF SECTION

SECTION 09 51 13
ACOUSTICAL PANEL CEILINGS

PART 1 - GENERAL

SUMMARY:

Extent of exposed suspension of acoustical ceiling is shown and scheduled on drawings.

SUBMITTALS:

Product Data: Submit manufacturer's technical data for each type of acoustical ceiling unit and suspension system required.

Samples for Initial Selection Purposes: Submit manufacturers' standard size samples of acoustical units, but not less than 6" square, and of exposed ceiling suspension members including wall and special moldings. Provide samples showing full range of colors, textures and patterns available for each type of component required.

Certificates: Submit certificates from manufacturers of acoustical ceiling units and suspension systems attesting that their products comply with specification requirements.

QUALITY ASSURANCE:

Coordination of Work: Coordinate layout and installation of acoustical ceiling units and suspension system components with other work supported by, or penetrating through, ceilings, including light fixtures, HVAC equipment, fire-suppression system components (if any), and partition system (if any).

DELIVERY, STORAGE AND HANDLING:

Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination or other causes.

Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

Handle acoustical ceiling units carefully to avoid chipping edges or damaging units in any way.

PROJECT CONDITIONS:

Space Enclosure: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

EXTRA MATERIALS:

Deliver extra materials to Owner. Furnish extra materials described below matching products installed, packaged with protective covering for storage and identified with appropriate labels.

Acoustical Ceiling Units: Furnish quantity of full size units equal to 2.0% of amount installed.

PART 2 - PRODUCTS

ACOUSTICAL CEILING UNITS, GENERAL:

Standard for Acoustical Ceiling Units: Provide manufacturer's standard units of configuration indicated which are prepared for mounting method designated and which comply with FS SS-S-118 requirements, including those indicated by reference to type, form, pattern, grade (NRC or NIC' as applicable), light reflectance coefficient (LR), edge detail, and joint detail (if any).

Mounting Method for Measuring NRC: No. 7 (mechanically mounted on special metal support), FS SS-S-118; or Type E-400 mounting as per ASTM E 795.

ACOUSTICAL PANELS:

24" x 24" x 3/4" Beveled Tegular lay in tile with 9/16" EXPOSED TEE. White "Cirrus" by armstrong Contract Interior.

Mineral Composition Panels - Nodulated, Cast or Molded; with Standard Washable Painted Finish: Provide Type III, Form 1 units per FS SS-S-118 and complying with the following requirements:

Grade: NRC 65.

STC Range: 35–34.

METAL SUSPENSION SYSTEMS, GENERAL:

Standard for Metal Suspension Systems: Provide metal suspension systems of type, structural classification and finish indicated which comply with applicable ASTM C 635 requirements.

Finishes and Colors: Provide white finish on 9/16" "suprafine"

Attachment Devices: Size for 5 times design load indicated in ASTM C 635, Table 1, Direct Hung.

Hanger Wire: Galvanized carbon steel wire, ASTM A 641, soft temper, prestretched, Class 1 coating, sized so that stress at 3-times hanger design load (ASTM C 635, Table 1, Direct Hung), will be less than yield stress of wire, but provide not less than 12 gage.

PART 3 - EXECUTION

PREPARATION:

Coordination: Furnish layouts for inserts, clips, or other supports required to be installed by other trades for support of acoustical ceilings.

Measure each ceiling area and establish layout of acoustical units to balance border widths at opposite edges of each ceiling. Avoid use of less-than-half width units at borders, and comply with reflected ceiling plans wherever possible.

INSTALLATION:

General: Install materials in accordance with manufacturer's printed instructions, and to comply with governing regulations, fire-resistance rating requirements as indicated, and CISCA standards applicable to work.

Arrange acoustical units and orient directionally-patterned units (if any) in manner shown by reflected ceiling plans.

Install suspension systems to comply with ASTM C 636, with hangers supported only from building structural members. Locate hangers not less than 6" from each end and spaced 4'-0" along each carrying channel or direct-hung runner, unless otherwise indicated, leveling to tolerance of 1/8" in 12'-0".

Secure wire hangers by looping and wire-tying, either directly to structures or to inserts, eye-screws, or other devices which are secure and appropriate for substrate, and which will not deteriorate or fail with age or elevated temperatures.

Install hangers plumb and free from contact with insulation or other objects within ceiling plenum which are not part of supporting structural or ceiling suspension system. Splay hangers only where required to miss obstructions and offset resulting horizontal force by bracing, countersplaying or other equally effective means.

Install edge moldings of type indicated at perimeter of acoustical ceiling area and at locations where necessary to conceal edges of acoustical units.

Sealant Bed: Apply continuous ribbon of acoustical sealant, concealed on back of vertical leg before installing moldings.

Screw-attach moldings to substrate at intervals not over 16" o.c. and not more than 3" from ends, leveling with ceiling suspension system to tolerance of 1/8" in 12'-0". Miter corners accurately and connect securely.

CLEANING:
Clean exposed surfaces of acoustical ceilings, including trim, edge moldings, and suspension members; comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work which cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION

SECTION 09 64 00
WOOD FLOORING

Prefinished StrandwovenTM Bamboo Flooring

QUALITY ASSURANCE

A. Qualifications:

1. Manufacturer Qualifications:

a. Manufacturer must have legal right to the patented process used in the production of specified StrandwovenTM Bamboo flooring.

2. Installer Qualifications:

a. Minimum three years experience in hardwood flooring installation.

b. Installer must be a member of the National Wood Flooring Association.

DELIVERY, STORAGE, AND HANDLING

Deliver flooring to project site in original boxes not less than 10 days prior to start of installation.

PROJECT/SITE CONDITIONS

Environmental Requirements: Installation spaces, flooring and adhesive (if used) must be maintained at normal occupancy temperature and humidity levels for minimum 10 days prior to installation. Hardwood flooring functions best when the room temperature ranges from 60-70 Fahrenheit, and the room relative humidity stays between 40-60%. Important Note: Room temperatures must remain between 50-80 Fahrenheit, and room relative humidity must remain between 35-65% both prior to installation and year-round, or warranty will be voided. A humidifier or dehumidifier may be needed to remedy these conditions, which not only will ensure a healthy Strandwoven floor, but also help ensure a healthy indoor air quality. Note: In extremely dry conditions, care should be taken to avoid shrinkage by allowing flooring to acclimate under actual use conditions. Remove the planks from the box and expose to local conditions for several days

WARRANTY

A. Warranty:

1. Structural Warranty: 20 years against delamination or separation as a result of a manufacturing defect when installed and maintained in accordance with manufacturer's installation instructions.

PRODUCTS

MANUFACTURER

Green Choice Flooring

StrandwovenTM Bamboo Plank Flooring:

1. Color as selected from list below
a. Nutmeg

* Slight color variations are expected, and are considered normal within the manufacturing operations. Please inquire as to the availability of further differentiated color shades.

Substitutions: None Permitted.

MATERIALS

A. Bamboo Flooring:

1. Species: Mao Tsu (Hairy Bamboo).

2. Size: 96mm x 15mm x 1830mm (approx. 3-3/4" wide x 5/8" thick x 72" long).

3. Edge: Tongue and groove with micro-bevel edge.

4. Back: Channeled.

5. Chemical Treatment: Natural borate solution to eliminate pests and mildew.

6. Finish: 7 layers total - Five base coats of 100 percent solids, non off-gassing, water-based system with aluminum oxide, followed with two top coats of scratch-resistant polyurethane.

7. Physical Property Performance Requirements:

a. Hardness: ASTM D 1037, Janka Ball: 2600 psi (avg.)

b. Dimensional Stability: ASTM D 1037-99: less than 0.00144.

c. Flammability: ASTM E 648: Class I Interior Floor Finish rating per NFPA 101.

d. Smoke Density: ASTM E 622: Maximum 270 in flaming mode; 330 in non-flaming mode.

e. Compressive Strength: ASTM D 3501: Minimum 7,600 psi (52 MPa) parallel to grain; 2,624 psi (18 MPa) perpendicular to grain.

f. Tensile Strength: ASTM D 3500: Minimum 15,300 psi (105 MPa) parallel to grain.

g. Slip Resistance: ASTM D 2394: Static Friction Coefficient 0.562; Sliding Friction Coefficient 0.497.

h. Abrasion Resistance: ASTM D 4060, CS-17 Taber abrasive wheels: Final wear-through: Minimum 12,600 cycles.

i. Moisture Content: ASTM D 4442, Oven Dry Method: 5.47 percent average

(varies based on distribution point).

j. Formaldehyde Emissions: ASTM E 1333: 0.02 ppm Phenol avg.

B. Installation Adhesive: One-part moisture-cured urethane premium wood floor adhesive.

C. Nails or Staples:

1. 1-1/2 Inch (38 mm)Thick Subfloor: 2 inch nails or staples.

2. 3/4 Inch (19 mm) Thick Subfloor: 1-1/2 inch nails or staples.

3. 1 inch Thick Plywood Subfloor Over Concrete: 1-1/4 inch (32 mm) nails or staples.

ACCESSORIES

A. Stair Treads : 298mm x 25mm x 1220mm (approx. 48” x 1” x 11-3/4 “). Color to match floor.

B. Stair Riser (painted) : 190mm x 15mm x 1220mm (approx. 48” x 5/8” x 7.5”). Color to be chosen by Architect.

C. Stair Nosing: 1830mm x 92mm x 14mm (approx. 72” x 5/8”-1” x 3-5/8”). Color to match floor.

D. Reducer: 1830mm x 50mm x 15mm (approx. 72” x 2” x 5/8”). Color to be selected by Architect.

E. T-mold: 1830mm x 54mm x 22mm (approx. 72” x 2-1/8” x 7/8”). Color to be selected by Architect.

EXECUTION

EXAMINATION

A. Examine substrates upon which flooring will be installed.

1. Verify that subfloor is clean, dry, and free of contaminates that would interfere with adhesive bond.

2. When installing on concrete: Test concrete floors for moisture content using a Calcium Chloride test or Tramex Moisture Encounter meter. Do not install flooring if vapor pressure exceeds 3 lbs per 1,000 sf (15 g per m2) in 24 hours, as under these conditions “urethane” adhesives tend to fail.

a. Mark test location(s) on As-Built Drawings.

3. When installing on Wooden Sub-floor: The moisture content between the flooring and wood subfloor must not exceed a 3% difference.

a. In multiple story buildings, test each floor level where bamboo flooring will be installed.

b. Mark test location(s) on As-Built Drawings.

B. Verify that HVAC system is operating and maintaining occupancy level temperature and humidity conditions.

PREPARATION

A. Acclimatization: Open all bundles, and let acclimate for a minimum of 10 days.

B. Fix the substrate to ensure bumps and depressions are less than 1/8” over 8 feet.

INSTALLATION

A. Bamboo Flooring: Install in accordance with manufacturer's installation instructions by either: (nailing or stapling to substrate) [or] (gluing to substrate) [or] (nailing or stapling and gluing to substrate). Lay flooring in the direction(s)/pattern(s) as directed by Architect. Inquire for StrandwovenTM Installation Guidelines.

B. Accessories: Install using methods appropriate to the accessory and flooring system.

CLEANING

A. Clean in accordance to Manufacturer’s Maintenance Recommendations. Inquire for StrandwovenTM Maintenance Guidelines.

PROTECTION

A. Cover installed flooring with heavy kraft-paper or other suitable covering. Do not use non-breathable sheet or film that could cause condensation to form. Maintain covering throughout remainder of construction period.

END OF SECTION

SECTION 09 65 00
RUBBER FLOORING

SCOPE

Install rubber flooring as directed in the plans and finish schedules.

SUBMITTALS

Provide two 24” x 24” square panels in proper color, thickness and style. Provide two pieces of vinyl base in proper color, thickness and style.

INSTALLER QUALIFICATIONS

Specialized flooring firm with not less than 3 years successful experience in installation of flooring types specified.
Install flooring and accessories after other finishing operations, including painting, have been completed. Do not install flooring over concrete slabs until the latter have been cured and are sufficiently dry to achieve bond with adhesive as determined by flooring manufacturer's recommended bond and moisture test.

MATERIALS

EXPANKO REZTEC recycled rubber flooring. 58” wide roll goods.
Thickness: 6.0 mm thick
Density $\geq$ 78 lbs/ft2
Adhesive/Mastic: Per manufacturers recommendations

WALL BASE

4” tall .080” vinyl wall base by Johnsonite or architect approved equal. (Any equal most have similar color range to Johnsonite to be considered.) Standard cove.

EXECUTION

Examine substrates on which flooring will be installed and conditions under which work will be performed. Do not proceed with work until unsatisfactory conditions have been corrected in manner acceptable to Installer.

Apply concrete slab primer, if recommended by flooring manufacturer, prior to application of adhesive. Apply in compliance with manufacturer's directions.

Scribe, cut, and fit resilient flooring to permanent fixtures, built-in furniture and cabinets, pipes, outlets and permanent columns, walls and partitions.

Adhere flooring to substrates using method approved by flooring manufacturer for type of flooring and substrate condition indicated without open cracks, voids, raising and puckering at joints, telegraphing of adhesive spreader marks, or other surface imperfections.

Apply wall base to walls, pilasters, and other permanent fixtures in rooms or areas where base is required. Install base in lengths as long as practicable, with preformed corner units, or fabricated from base materials with mitered or coped inside corners. Tightly bond base to substrate throughout length of each piece, with continuous contact at horizontal and vertical surfaces.

Protect completed flooring during remainder of construction period with heavy Kraft paper or other suitable covering, so that flooring and finish will be without damage or deterioration at time of acceptance.

END OF SECTION 09 65 00

SECTION 09 66 00
RESILIENT TILE FLOORING

PART 1 GENERAL

1.04 QUALITY ASSURANCE AND REGULATORY REQUIREMENTS

A. Select an installer who is competent in the installation of Armstrong resilient tile flooring.

B. If required, provide types of flooring and accessories supplied by one manufacturer, including leveling and patching compounds, and adhesives.

C. If required, provide flooring material to meet the following fire test performance criteria as tested by a recognized independent testing laboratory:

a. ASTM E 648 Critical Radiant Flux of 0.45 watts per sq. cm. or greater, Class I.

b. ASTM E 662 (Smoke Generation) Maximum Specific Optical Density of 450 or less.

1.05 SUBMITTALS

A. Submit shop drawings, seaming plan, coving details, and manufacturer's technical data, installation and maintenance instructions (latest edition of "Armstrong Guaranteed Installation System," F-5061) for flooring and accessories.

B. Submit the manufacturer's standard samples showing the required colors for flooring and applicable accessories.

C. If required, submit the manufacturer's certification that the flooring has been tested by an independent laboratory and complies with the required fire tests.

1.06 ENVIRONMENTAL CONDITIONS

A. Deliver materials in good condition to the jobsite in the manufacturer's original unopened containers that bear the name and brand of the manufacturer, project identification, and shipping and handling instructions.

B. Store materials in a clean, dry, enclosed space off the ground, and protected from the weather and from extremes of heat and cold. Protect adhesives from freezing. Store flooring, adhesives and accessories in the spaces where they will be installed for at least 48 hours before beginning installation.

C. Maintain a minimum temperature in the spaces to receive the flooring and accessories of 65ºF (18ºC) and a maximum temperature of 100ºF (38ºC) for at least 48 hours before, during, and for not less than 48 hours after installation. Thereafter, maintain a minimum temperature of 55ºF (13ºC) in areas where work is completed. Protect all materials from the direct flow of heat from hot-air registers, radiators, or other heating fixtures and appliances.

D. Install flooring and accessories after the other finishing operations, including painting, have been completed. Close spaces to traffic during the installation of the flooring. Do not install flooring over concrete slabs until they are sufficiently dry to achieve a bond with the adhesive, in accordance with the manufacturer's recommended bond and moisture tests.

PART 2 PRODUCTS

2.01 RESILIENT TILE FLOORING MATERIALS

A. Provide Migrations with BioStride Biobased Tile Flooring manufactured by Armstrong

World Industries, Inc., in color selected from the range currently available from Armstrong World Industries, Inc., having a nominal total thickness of 1/8"/0.125in. (3.2mm), 12 in. x 12 in. (305 mm x 305 mm), composed of polyester resin binder, fillers and pigments with colors and texture dispersed uniformly throughout its thickness. Migrations with BioStride Tile shall conform to the size, squareness, thickness, indentation, impact, deflection, resistance to chemicals and resistance to heat requirements of ASTM F 1066, Class 2 – through pattern. Note: As Migration's unique binder system does not contain polyvinyl chloride resins, plasticizers and stabilizers, it does not meet the F 1066 specification's Materials requirements.

2.02 WALL BASE MATERIALS

A. Provide [1/8 in. (3.2 mm)] thick, [4 in. (10.16 cm)] high Armstrong Color-Integrated Wall Base with a matte finish, conforming to ASTM F 1861, [Type TP - Rubber, Thermoplastic], Group 2 - Layered, [Style A – Straight].

2.03 ADHESIVES

A. For Tile Installation System, Full Spread: Provide Armstrong Resilient Tile Adhesive under the tile and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer.

B. For Tile Installation System, Tile On: Provide Armstrong S-515 Resilient Tile Adhesive under the tile over smooth, completely bonded existing resilient flooring and Armstrong S-725 Wall Base Adhesive at the wall base as recommended by the flooring manufacturer.

2.04 ACCESSORIES

A. For patching, smoothing, and leveling monolithic subfloors (concrete, terrazzo, quarry tile, ceramic tile, and certain metals), provide [S-183 Fast-Setting Cement-Based Underlayment cement based underlayment as recommended by flooring manufacturer.

B. For sealing joints between the top of wall base or integral cove cap and irregular wall surfaces such as masonry, provide plastic filler applied according to the manufacturer's recommendations.

C. Provide transition/reducing strips tapered to meet abutting materials.

D. Provide threshold of thickness and width as shown on the drawings.

E. Provide resilient edge strips of width shown on the drawings, of equal gauge to the flooring, homogeneous vinyl or rubber composition, tapered or bullnose edge, with color to match or contrast with the flooring, or as selected by the Architect from standard colors available.

F. Provide metal edge strips of width shown on the drawings and of required thickness to protect exposed edges of the flooring. Provide units of maximum available length to minimize the number of joints. Use butt-type metal edge strips for concealed anchorage, or overlap-type metal edge strips for exposed anchorage. Unless otherwise shown, provide strips made of extruded aluminum with a mill finish.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine subfloors prior to installation to determine that surfaces are smooth and free from cracks, holes, ridges, and other defects that might prevent adhesive bond or impair durability or appearance of the flooring material.

B. Inspect subfloors prior to installation to determine that surfaces are free from curing, sealing, parting and hardening compounds; residual adhesives; adhesive removers; and other foreign materials that might prevent adhesive bond. Visually inspect for evidence of moisture, alkaline salts, carbonation, dusting, mold, or mildew.

C. Report conditions contrary to contract requirements that would prevent a proper installation. Do not proceed with the installation until unsatisfactory conditions have been corrected.

D. Failure to call attention to defects or imperfections will be construed as acceptance and approval of the subfloor. Installation indicates acceptance of substrates with regard to conditions existing at the time of installation.

3.02 PREPARATION

A. Smooth concrete surfaces, removing rough areas, projections, ridges, and bumps, and filling low spots, control or construction joints, and other defects with Cement-Based Underlayment as recommended by the flooring manufacturer.

B. Remove paint, varnish, oils, release agents, sealers, and waxes. Remove residual adhesives as recommended by the flooring manufacturer. Remove curing and hardening compounds not compatible with the adhesives used, as indicated by a bond test or by the compound manufacturer's recommendations for flooring. Avoid organic solvents.

C. Perform subfloor moisture testing (Relative Humidity In-situ Probe and Calcium Chloride Tests) and Bond Tests as described in publication F-5061, "Armstrong Guaranteed Installation System," to determine if surfaces are dry; free of curing and hardening compounds, old adhesive, and other coatings; and ready to receive flooring.

D. Vacuum or broom-clean surfaces to be covered immediately before the application of flooring. Make subfloor free from dust, dirt, grease, and all foreign materials.

3.03 INSTALLATION OF TILE FLOORING

A. Install flooring in strict accordance with the latest edition of "Armstrong Guaranteed Installation System", F-5061.

B. Install flooring wall to wall before the installation of floor-set cabinets, casework, furniture, equipment, movable partitions, etc. Extend flooring into toe spaces, door recesses, closets, and similar openings as shown on the drawings.

C. If required, install flooring on pan-type floor access covers. Maintain continuity of color and pattern within pieces of flooring installed on these covers. Adhere flooring to the subfloor around covers and to covers.

D. Scribe, cut, and fit to permanent fixtures, columns, walls, partitions, pipes, outlets, and built-in furniture and cabinets.

E. Install flooring with adhesives, tools, and procedures in strict accordance with the manufacturer's written instructions. Observe the recommended adhesive trowel notching, open times, and working times.

3.04 INSTALLATION OF ACCESSORIES

A. Apply top set wall base to walls, columns, casework, and other permanent fixtures in areas where top-set base is required. Install base in lengths as long as practical, with inside corners fabricated from base materials that are mitered or coped. Tightly bond base to vertical substrate with continuous contact at horizontal and vertical surfaces.

B. Fill voids with plastic filler along the top edge of the resilient wall base or integral cove cap on masonry surfaces or other similar irregular substrates.

C. Place resilient edge strips tightly butted to flooring, and secure with adhesive recommended by the edge strip manufacturer. Install edge strips at edges of flooring that would otherwise be exposed.

D. Apply [butt-type] [overlap] metal edge strips where shown on the drawings, [before] [after] flooring installation. Secure units to the substrate, complying with the edge strip manufacturer's recommendations.

3.05 CLEANING AND PROTECTION

A. Perform initial maintenance according to the latest edition of "Armstrong Guaranteed Installation System," F-5061.

B. Protect installed flooring as recommended by the flooring manufacturer against damage from rolling loads, other trades, or the placement of fixtures and furnishings. (See Finishing The Job in "Armstrong Guaranteed Installation System," F-5061.)

END OF SECTION 09 66 00

SECTION 09 68 13
TILE CARPET

1.1 Description of Work

1. Provide and install all modular carpet and installation work as required by contract documents.

1.2 Quality Assurance

1. Manufacturer –
    1. The carpet manufacturer shall have no less than fifteen years of production experience with modular carpet similar to type specified. Published product literature of carpet manufacturer must clearly indicate compliance of products with requirements of this section.

    2. Commitment to quality - carpet manufacturer must provide verification of its registration to the ISO 9001/9002 Quality Management System.

    3. Commitment to sustainability - carpet manufacturer must demonstrate environmental responsibility through programs of source reduction, recycling, reuse and conservation and registration to the ISO 14001 Environmental Management System.

2. Installation Provider –

    1. The installation provider must be directly responsible for the quality of the completed floor covering installation, including both the quality of the materials and labor used in the installation. The installation provider must directly warrant to owner that all products, materials and services related to the floor covering installation (including any floor covering(s), adhesive(s) and/or other products or materials used in the installation) will meet specifications set forth herein. The product warranty required herein must be provided directly by the carpet manufacturer.

    2. The installation provider must have successful carpet installation experience similar to the work of this Section.

1.3 Submittals – Please submit each of the following with your bid (unless otherwise noted):

1. Manufacturer's Data - Two (2) copies of carpet manufacturer's specifications and installation instructions for carpet and related items specified.

2. Fiber Verification – Certification from the fiber producer verifying use of the premium branded, type 6,6 or type 6 fiber in the submitted carpet product. Premium branded fibers are identified as Invista, Soulutia, BASF or Aquafil. Fibers extruded by carpet mills will be considered "unbranded" for purposes of this specification.

3. All applicable product warranties provided by manufacturer.

4. Installation provider's proof of insurance, copy of contractor's license and

worker's compensation certificate.

5. Five (5) current project references for installation provider, with scope, date and customer contact with phone number in compliance letter.

6. Samples - Standard size carpet samples of each type of carpet, in each specified pattern, color and construction. See finish schedule.

7. Any alternatives to specified product(s) or approved manufacturers must be submitted for approval at least ten (10) working days prior to bid or proposal.

8. Maintenance Instructions - Two (2) copies of the manufacturer's carpet maintenance instructions.

9. Green House Gas Status of Product – The average quantity of green house gas emissions associated with the life cycle of the product, a description of the green house offsets used to make the product green house gas neutral, and the name of the 3rd party organization certifying such offsets.

1.4 Warranty

1. Provide the following written warranties by carpet manufacturer for a period of not less than 15 years:

1. Wear - Surface fiber wear shall not be more than 10% by weight in 15 years. (Note: Wear warranty shall not require use of chair pads)

2. Static - Static generation at less than 3.0 kV at 70º F, and 20% R.H.

3. No de-lamination

4. No edge ravel

5. No dimensional instability (i.e., shrinkage, curling and doming) which adversely affect the ability of the tile to lay flat

6. Mergeability – Carpet that is of the same style/color, but from different dye lots and/or manufacturing dates, may be merged and used interchangeably, both at initial installation and at later selective replacement, to create a continuous carpeted surface with no tile appearing out of place

2. Submit manufacturer's NVLAP certified test results to show that carpet meets or exceeds product performance specification criteria for carpet testing requirements under Section 2.1 hereof.

3. Installation provider shall warrant for (1) year following substantial completion that all installation services have been performed in a workmanlike manner, and shall promptly re-perform all services not meeting this warranty.

Part 2 PRODUCTS

1. Modular Carpet Tile Performance Standards. Modular carpet tile shall meet the following performance standards:

0.1	Carpet Flammability	
	.1 Pill Test (ASTM D2859 or CPSC FF-1-70)	Passes
	.2 Radiant Panel Test (ASTM E648)	> 0.45 watts/cm^2, Class 1
0.2	Smoke Density (ASTM E662)	< 450 Flaming Mode
0.3	Dimensional Stability (Aachen Method Din 54318)	< 0.1% change
0.4	Static Generation at 70º F (AATCC 134 w/ neolite)	< 2.5 kV at 20% R.H.
0.5	Lightfastness (AATCC 16E)	4.0 after 60 hours
0.6	Gas Fade (AATCC 23)	4
0.7	Ozone Fade (AATCC 109)	4
0.8	Antimicrobial (AATCC 174, Part II)	> 95.0% reduction
0.9	Fungicidal (AATCC 174, Part III)	No growth
0.10	Soil/Stain Protection (AATCC 175-1991)	> 8.0 on the Red 40 Stain Scale
0.11	California 01350	Passes

2.2 Product Specification. Modular carpet tile shall meet the following specifications:

1. Yarn System: 100% Invista Type 6,6, Solutia Type 6,6 BASF Type 6 or Aquafil Type 6 Nylon (Note: Bidder may propose yarn with a % of bio-based material with satisfactory explanation of modification)

2. Dye Method: 100% Solution Dyed

3. Mergeability: Carpet that is of the same style/color, but from different dye lots and/or manufacturing dates, may be merged and used interchangeably, both at initial installation and at later selective replacement, to create a continuous carpeted surface with no tile appearing out of place

4. Construction: Tufted

5. Patterning: Integrated (topical application or wet patterning not allowed)

6. Texture: Pattern Loop

7. Gauge/Stitch: Minimum 1/10

8. Pile Height: Minimum .148

9. Pile Weight: Maximum 20 oz per yard (lower face weights are preferable if equal or superior performance can be substantiated by Appearance Retention Testing)

10. Primary Backing: EcoWorx. Must be non-woven. Woven primary backings not allowed.

11. Secondary Backing: Fiberglass Reinforced Thermoplastic Composite containing not less than 39% post consumer and/or postindustrial material content. Secondary backing must be 100% recyclable at the end of its useful life.

12. Soil/Stain Resistance: Application by fiber producer and manufacturer required.

13. Antimicrobial: (AATCC 171 Washed) (AATCC 174 Parts 2&3). Must pass both Part 2 and Part 3 of AATCC 174 with a minimum of 90% reduction both gram negative and gram-positive bacteria and no macroscopic growth against the fungi.

14. Random Installation Method: All product must be designed for random installation, meaning that each and every tile can be installed in any of the four possible directions without regard to pile direction, pattern or orientation of any adjacent tiles while still creating a finished carpet tile assembly that appears to be a visually continuous carpeted surface with no tile appearing out of place or improperly positioned.

2.3 Minimum Construction Standards in Addition to Product Specifications

1. Nylon Specification - All nylon fiber shall be branded (premium) type 6,6 or type 6 nylon from Invista, Solutia, BASF or Aquafil with performance certification from the fiber manufacturer.

2. Any and all products must pass Carpet and Rug Institute “Green Label +” certification.

3. Antimicrobial, registered by the EPA for use in carpeting, with broad-spectrum efficacy against the growth of bacteria and fungi for a minimum of 15 years, assuming proper maintenance. The antimicrobial ingredient shall meet standards set by the U.S. General Services Administration (GSA) for Antimicrobial Carpet as supported by independent lab testing less than six months old.

    2. Manufacturer must provide a stamped EPA technical data sheet for carpet. Antimicrobial must contain no arsenic, formaldehyde or heavy metals (tin, lead, mercury, silver, copper or zinc), be non-halogenated (no fluorine, chlorine, bromine or iodine) and non-phenolic. Blends of amine neutralized phosphated esters are preferable. Antimicrobial must have low water solubility (30ppm), a vapor pressure of 12mm Hg at 27º C, and an oral LD_{50} toxicity rate less than 2.4 grams/kg.

    2. The preservative should be incorporated into the primary latex coating of the product during the manufacturing process, not topically applied to the carpet fibers.

    3. The antimicrobial treated carpet when new must pass GSA parameters for treated carpets via AATCC method 174 parts II and III. Initial performance must be 90% reduction of the microorganisms (Staphylococcus aureus 6538 and Klebsiella pneumoniae 4352) and no fungal growth on either the primary backing or fibers both on washed (AATCC method 174) and non-washed samples.

4. The antimicrobial treated carpet must maintain, for the warranted life of the carpet, a minimum of 90% reduction of the microorganisms (Staphylococcus aureus 6538 and Klebsiella pneumoniae 4352) listed in AATCC method 171 part II, provided the carpet is maintained as specified. Additionally, the antimicrobial treated carpet must maintain a "no macroscopic growth" rating against Aspergillus niger 6275 at the primary backing in accordance with AATCC 171 part III.

5. The preservative must be environmentally responsible i.e. (biodegradable and not toxic to non-target species).

6. Efficacy of the preservative should be documented in professional peer reviewed scientific publications.

2.4 Related Carpet Materials

1. Leveling compound - Latex type as recommended by carpet manufacturer. Must be compatible with carpet adhesive and curing/sealing compound on concrete.

2. Releasable pressure sensitive type adhesive – Adhesive must be water-based and allow for removal of carpet tile at any time without damage to carpet or substrate. Adhesive must contain antimicrobial preservative and have “zero” calculated VOC’s.

3. Carpet edge guard, non-metallic - Extruded or molded heavy duty vinyl or rubber carpet edge guard of size and profile indicated, and with minimum two inch wide anchorage flange; colors selected by architect/designer from among standard colors available within the industry.

4. Miscellaneous materials - As recommended by manufacturer of carpet. Other carpeting products to be selected by installation provider to meet project requirements.

5. Electrostatic (Dissipation low-generation)

    1. Surface Resistivity - Across face of carpet ($< 2.0 \times 10^9$ and $>1.5 \times 10^5$) or (0.15 to 2000 megaohms)

    2. Transverse or Volume Resistivity - Through face of carpet ($<2.0 \times 10^{10}$ and $> 1.5 \times 10^5$ ohms) or (0.15 to 2000 megaohms) PART 3 EXECUTION

3.1 Installation

1. General

    1. Comply with manufacturer’s instructions and recommendations. A “no-glue” method of installation is preferred if feasible.

    2. Install carpet under open-bottom obstructions and under removable flanges and furnishings, and into alcoves and closets of each space.

    3. Provide cut outs where required. Conceal cut edges with protective edge

guards or overlapping flanges.

4. Run carpet under open bottom items such as heating convectors and install tight against walls, columns and cabinets so that the entire floor area is covered with carpet. Cover over all floor type door closures.

5. Install edging guard at all openings and doors wherever carpet terminates, unless indicated otherwise.

6. Cutting shall be done in accordance with the manufacturer's recommendation, using the tools designed for the carpet being installed.

7. Use leveling compound where necessary. Any floor filling or leveling shall have a minimum of 4'0" of feather.

8. Expansion joints - Do not bridge building expansion joints with continuous carpeting.

2. Installation

1. Install carpet according to carpet manufacturer's printed instructions and in accordance with the Carpet and Rug Institute's Installation Standard.

2. "Chair Pads" shall not be recommended or required within installation instructions.

3.2 Cleaning and Protection

1. On completion of the installation in each area, all dirt, carpet scraps, etc. must be removed from the surface of the carpet.

2. Remove debris, and sort pieces to be saved from scraps to be redirected and recycled.

3. Construction manager shall protect carpeting against damage during construction.

4. At the completion of the work and when directed by the construction manager, vacuum carpet using commercial dual motor vacuum of type recommended by carpet manufacturer. Remove spots and replace carpet where spots cannot be removed. Remove rejected carpeting and replace with new carpeting. Remove any protruding yarns with shears or sharp scissors.

3.3 Inspection

1. Upon completion of the installation, verify that work is complete, properly installed and acceptable.

2. Preliminary Acceptance - Upon completion of the carpet installation of each floor, it shall be inspected by architect, the construction manager and installation provider.

END OF SECTION

SECTION 09 72 00
WALL COVERINGS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes:
1. Vinyl Wall Covering
a. Furnished by Owner, installed by Contractor
2. Prime Coat on Walls
3. Adhesives and Cleaning of Adjacent Surfaces
4. All accessories for complete installation

B. Related Sections:
1. Section 09 20 00 - Gypsum Board Assemblies
2. Section 09 90 00 - Painting

1.02 SYSTEM DESCRIPTION

A. Contractor is responsible for receiving and handling on site and installing wall covering material furnished by Owner and will fill out and process all receiving reports furnished by Owner.

B. Provide strippable adhesive and primer for all wall covering.

C. Contractor shall provide wall covering quantity take-offs to the Owner within 45 days of award of the contract.

1.03 SUBMITTALS

A. Product Data: Submit “Letter of Conformance” in accordance with Section 013300 (01330) with the following supporting data:
1. Provide certification by the manufacturer that products supplied comply with local regulations controlling use of volatile organic compounds (VOC's).
2. Provide maintenance data including methods for maintaining wallcovering as well as precautions for use of cleaning materials and methods that could be detrimental to finishes and performance.

1.04 QUALITY ASSURANCE

A. Installer Qualifications: Engage an experienced installer who has completed five projects similar in material, design, and extent to that indicated for this Project and with a record of successful in-service performance.

B. Single Source Responsibility: Provide adhesives and primers produced by the same manufacturer.

C. Coordination of Work: Review Sections in which primers are provided to ensure compatibility of the total systems for various substrates.
1. Notify the Owner’s Representative of problems anticipated using the materials specified.

D. Mockups: Provide a sample application in one Guest Room for acceptance by the Owner's representative and to serve as a sample standard of quality for the balance of the work. Rework sample room if necessary to obtain Owner's acceptance.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store wall-covering in clean and dry area where temperatures are maintained at minimum 40 degrees F. with normal humidity. Do not store in upright position.

B. Take precautionary measures to prevent fire hazards with adhesives and solvents.

C. Where toxic materials and both toxic and explosive solvents and adhesives are used, appropriate precautions and proper ventilation must be provided.

D. Handle and store materials at the project site in original packages or containers clearly labeled to identify manufacturer, brand name, quality or grade, and fire hazard classifications.

E. Contractor is responsible for theft or damage to stored materials. Exercise care to prevent damage during delivery, handling and storage.

1.06 PROJECT CONDITIONS

A. Space Enclosure and Environmental Limitations: Do not install wall covering until space is enclosed and weatherproof, wet-work in space is completed and nominally dry, work above ceilings is complete, and ambient temperature and humidity conditions are and will be continuously maintained at values near those indicated for final occupancy.

1. Maintain surfaces and materials at constant minimum temperature of 60 degrees F and max temperature of 90 degrees F in areas of installation for at least 72 hours before and 48 hours after the application of materials.
2. Install only when humidity conditions approximate building design humidity.

B. Lighting: Do not install wall covering until a lighting level of not less than 15 foot-candles (160 lux) is provided on the surfaces to receive wall covering.

C. Ventilation: Provide continuous ventilation during installation and for not less than the time recommended by the wall covering manufacturer for full drying or curing.

D. Remove wall covering from its packaging and allow to acclimatize to the area of installation 24 hours.

E. Ensure maximum surface moisture conforms to wallcovering manufacturer's requirements and surface exhibits negative alkalinity.

1.07 EXTRA MATERIALS

A. Refer to Section 017843 (01790) for requirements.

PART 2 MATERIALS

2.01 MATERIALS

A. Wallcovering: Refer to Interior Finish Index.

2.02 FIRE HAZARD CLASSIFICATION

A. Provide materials bearing the UL label and marking, indicating the fire hazard classification of the wall covering as determined by ASTM E84.

2.03 PRIMER/ADHESIVE

A. Manufacturer's recommended adhesive, primer, and sealer manufactured expressly for use with the selected wallcovering. Provide materials that contain mildew inhibitors that are nonstaining to the wall-covering.

1. Approved Manufacturers:

1) Primer: “UltraPrime 977”
2) Adhesive: “Ultra Pro 880” or “Clear Strippable Pro 870” for use with pasting machine.

PART 3 EXECUTION

3.01 INSPECTION

A. Examine substrates for compliance with requirements for moisture content and other conditions affecting performance of Work of this Section. Do not proceed with installation until unsatisfactory conditions have been corrected.

B. Ensure surfaces to receive all covering are clean, true, and free to irregularities. Inspect surfaces before commencing work and report defects in writing to the Owner's representative.

C. Ensure wall surface flatness tolerances do not vary more than 1/8" in 10 feet, nor vary at a rate greater than 1/16" per running foot.

D. Schedule installation of wallcovering as late as possible in the construction schedule to prevent damage during construction and movement of materials.

E. Inspect wall covering for defects. Do not install defective wall covering. Notify Owner's representative of any defects immediately.

1. Notify the Owner's Representative of variations in color or pattern match. Do not continue with work until instructed by Owner's Representative.

3.02 PREPARATION

A. Comply with manufacturers written instructions for surface preparation.

B. Test surfaces to receive wallcovering with a moisture meter. Do not install wallcovering on surfaces with a moisture content exceeding 4%.

C. Clean substrates of substances that could impair wall covering's bond, including mold, mildew, oil, grease, incompatible primers, and dirt.

D. Prepare substrates to achieve a smooth, dry, clean surface free of flaking, unsound coatings, cracks, and defects.

1. Painted Surfaces: Treat areas susceptible to pigment bleeding.
2. Metals: If not factory primed, clean and apply rust-inhibitive zinc primer.
3. Moisture Content: Maximum of 5 percent on new plaster, concrete, and concrete masonry units when tested with an electric moisture meter.

4. Prime new gypsum board with primer recommended by wall covering manufacturer at bath walls only, or at all moisture resistant gypsum board (green board type MR) locations.

E. Check painted surfaces for pigment bleeding. Sand gloss, semigloss, and eggshell finishes with fine sandpaper.

F. Acclimatize wall-covering materials by removing them from packaging in the installation areas not less than 24 hours before installation.

3.03 INSTALLATION, GENERAL

A. General: Comply with wall-coverings manufacturers' written installation instructions applicable to products and applications indicated, except where more stringent requirements apply.

B. Cut wall-covering panels in roll number sequence. Change run numbers at partition breaks and corners only. Install wall covering with no gaps or overlaps. Match pattern 72 inches above finish floor. Install seams vertical and plumb at least 6 inches from outside corners and 3 inches from inside corners. No horizontal seams. Remove air bubbles, wrinkles, blisters, and other defects. Trim edges for color uniformity, pattern match, and tight closure at seams and edges. Double cut seams.

C. Install wallcovering prior to installation of all wall mounted plumbing, cabinets, molding and electrical fixtures.

D. Refer to Joint Sealants Section 079200 (07920) for sealant application at edges of wallcoverings where the wallcovering meets other materials.

3.04 INSTALLATION - PRIMER

A. Walls shall be primed prior to installing wallcovering.
1. Bath Walls shall be primed, other spaces do not require priming unless water resistant gypsum board (green board) is used. Where water resistant gypsum board (green board) occurs, the entire wall shall be primed, corner to corner.

3.05 CLEANING

A. Remove all excess adhesive from joints, wall mounted equipment, door frames, and other similar items. Use cleaning methods recommended by the wall-covering manufacturer. Replace strips that can not be cleaned.

END OF SECTION

SECTION 09 90 00
PAINTING

GENERAL

1. Agreement: The contract and any contract change orders, the drawings and this section of the specifications with all addenda together with Division 1: General Requirements, are incorporated to form the contract documents and the entire basis for agreement between Contractor and Subcontractor. No allowance will subsequently be made on behalf of the Subcontractor for errors due to his negligence in failing to acquaint himself with the contract documents and the site conditions or for his failure to determine the Owner's desired meaning and intention of these contract documents before starting work.

2. Scope: Furnish all labor, material, and equipment necessary and proper to complete the exterior and interior painting shown or implied on the drawings and specified herein. In general, the painting work shall include the following:

A. Interior paint
B. Caulking
C. Warranty
D. Cleanup

3. It is intended that all surfaces be presented to the painter ready for final preparation and painting. However, it shall be the responsibility of the painter to notify the general contractor of any defects prior to his work. Having once started the painting, the painter shall be responsible for the final appearance of the work.

4. Colors shall be selected by the Architect. Contractor will furnish Subcontractor with color selections and finish schedule indicating where various colors shall be used. Subcontractor shall submit to general contractor brand of paint to be used for approval. Subcontractor shall prepare panels if requested for color matching.

5. All painted or stained finishes, both exterior and interior, shall comply with the Virginia Statewide Code flame spread code requirements.

EXECUTION

1. All surfaces to be painted or stained shall be cleaned of loose dirt and dust before commencing work.

2. Interior Paint: All unfinished surfaces and materials are to be painted unless noted otherwise

A. Interior wood doors (paint all 6 surfaces)

B. Base, casing and miscellaneous trim.

C. Gypsum board walls and ceilings

D. Steel: All unfinished steel are to be painted unless noted otherwise

3. Caulk: Areas to receive caulk include but not necessarily limited to the work of finish carpentry, which shall include all joints between door casings and wall, base mold and walls, and generally all joints in woodwork to receive painted finish, gypsum drywall, flooring, plumbing, and electrical

trades. Caulk between base or shoe and resilient and/or hard flooring. Provide all exterior caulking and paint where required and as directed by project superintendent to ensure waterproof condition.

4. Touch up:

A Before carpet: Touch up missed and weak areas, rerolling walls where needed. Touch up all window sills, enameled areas, ceilings, etc., where needed. Touch up any damaged areas and remove all paint where it has been spilled, splashed, splattered or over sprayed.

B. Before final clean: Touch up all areas, latex and enamel to ensure consistency and shadow-free. Touch up all base, trim, doors and any areas where needed.

C. Exterior: Touch up any defects and missed areas after all trades are finished.

D. All touch up work will be to the satisfaction of the general contractor.

5. Warranty: This Subcontractor shall warranty the entire exterior and interior paint for one (1) year following the date of final completion of all units against defects in material and workmanship.

6. Cleanup:

A. Clean up all debris caused by work of this section, keeping site and buildings neat at all times. All debris are to be removed from job site as buildings are completed, floors will be scraped of paint and left broom clean after all painting is completed.

B. The finished work surfaces of other trades shall be protected during painting and those surfaces must be cleaned where damaged by paint. Where it is impossible to satisfactorily clean these surfaces, they shall be replaced by the applicable trade and charged to this subcontractor.

7. Refer to color schedule supplied by Architect.

MATERIALS

1. All materials used shall be new and quality specified.

2. All paints shall be Devoe, Sherwin-Williams, Benjamin Moore or Duron.

3. Paint brand shall remain the same during the entire job. No substitutions will be allowed without prior approval by the Architect.

4. Exterior Paint: Exterior paint color shall be as scheduled by the Architect. Exterior doors and trim shall receive two coats of exterior enamel on all six sides as scheduled.

5. Interior Paint: Interior paint colors: Refer to paint schedule.

A. Interior wood doors and frames shall receive one coat enamel undercoaters, one coat semi gloss enamel. Prior to painting, nail holes must be puttied and sanded smooth.

B. Base and miscellaneous trim shall receive primer and one finish coat of semigloss enamel. Prior to paint, nail holes must be puttied and sanded smooth.

C. Walls and ceilings shall receive one sealer prior to one (1) finish coat, except the following: The kitchens,wall surrounding range and sink shall receive one coat of enamel.

6. Caulk: All caulking materials shall be single or double component, latex, primer less, non sagging and in neutral or matching color where exposed to view.

7. Coverage: In every instance, the covering shall be complete regardless of the number of coats applied.

END OF SECTION

SECTION 09 91 13
EXTERIOR PAINTS AND COATINGS

PART 23 - GENERAL

1. SUMMARY

a. All surfaces that are painted should be repainted. Do not paint unpainted masonry or concrete.
   1) Metal panels
   2) Metal windows
   3) Doors
   4) Trim
   5) Handrails

2. SUBMITTALS

a. Product Data: Manufacturer's data sheets on each paint and coating product should include:
   1) Product characteristics
   2) Surface preparation instructions and recommendations
   3) Primer requirements and finish specification
   4) Storage and handling requirements and recommendations
   5) Application methods
   6) Cautions

b. Selection Samples: Submit a complete set of color chips that represent the full range of manufacture's color samples available.

c. Verification Samples: For each finish product specified, submit samples of each type of coating, color and substrate, applied where directed.

d. Extra Material: Deliver to owner 1 gallon of each color and type of finish coat paint used on Project, in containers, properly labeled and sealed.

3. PROJECT CONDITIONS

a. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

PART 24 - PRODUCTS

1. MANUFACTURERS

a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1) Sherwin-Williams

b. Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 016000 Product Requirements.

c. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2. MATERIALS - GENERAL REQUIREMENTS

a. PAINTS AND COATINGS:
   1) Unless otherwise indicated, provide factory-mixed coatings where required Mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such a procedure is specifically described in manufacturer's product instructions. VOC numbers used in this document need to be confirmed by using the products MSDS sheets.

   2) VOCs. The VOC concentrations of the product shall not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24 (Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coatings), Code of Federal Regulations Title 40, Part 60, Appendix A.

   3) The calculation of VOC shall exclude water and tinting color added at the point of sale.

Exterior Coatings:

Coating Type	VOC weight in grams/liter of product minus water
Non-flat[4]	200
Flat	100

b. PRIMERS:
   1) Where the manufacturer specifies primes, sealers, or block fillers, the VOC limits follow the Flat/Non-Flat, rules per GS-11. 2.1 Paints: Liquid, liquefiable or mastic composition that is converted to a solid protective, decorative, or functional adherent film after application as a thin layer. These coatings are intended for on-site application to interior or exterior surfaces of residential, commercial, institutional or industrial buildings.

c. ACCESSORIES:
   1) Coating Application Accessories:

a) Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufacture's specifications.

PART 25 - EXECUTION

1. EXAMINATION

a. Do not begin application of coatings until substrates have been properly prepared. Notify Architect of unsatisfactory conditions before proceeding

b. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

c. Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

2. SURFACE PREPARATION:

a. The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.

b. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes; however, do not allow the solution to dry on the surface. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the solution that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution

c. No exterior painting should be done immediately after a rain, during foggy weather, when rain is predicted, or when the temperature is below 50°F, unless the product is specifically designed to be applied at lower temperatures.

3. METHODS:

a. Aluminum - Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.

b. Block (Cinder and Concrete) - Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75°F.The pH of the surface should be between 6 and 9,unless the products to be used are designed to be used in high pH environments such as Loxon. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a cement patching compound.

c. Concrete, SSPC-SP13 or NACE 6 - This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.

d. Cement Composition Siding/Panels - Remove all surface contamination by washing with an appropriate cleaner, rinse thoroughly and allow to dry. Existing peeled or checked paint should be scraped and sanded to a sound surface. Pressure clean, if needed, with a minimum of 2100 psi pressure to remove all dirt, dust, grease, oil, loose particles, laitance, foreign material, and peeling or defective coatings. Allow the surface to dry thoroughly. The pH of the surface should be between 6 and 9,unless the products to be used are designed to be used in high pH environments such as Loxon.

e. Galvanized Metal - Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.

f. Steel: Structural, Plate, etc. - Should be cleaned by one or more of the surface preparations described below. These methods were originally established by the Steel Structures Painting Council in 1952, and are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Steel Structures Painting Council; ask for SSPC-VIS 1-89. A brief description of these standards together with numbers by which they can be specified follow.

g. Water Blasting, NACE Standard RP-01-72 - Removal of oil grease dirt, loose rust, loose mill scale, and loose paint by water at pressures of 2,000 to 2,500 psi at a flow of 4 to 14 gallons per minute.

h. Wood—Exterior - Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

4. INSTALLATION

a. Apply all coatings and materials with manufacture’s specifications in mind. Mix and thin coatings according to manufacture’s recommendation.

b. Do not apply to wet or damp surfaces.

c. Apply coatings using methods recommended by manufacturer.

d. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

e. Apply coatings at spreading rate required to achieve the manufacturer’s recommended dry film thickness.

f. Regardless of number of coats specified, apply as many coats as necessary for complete hide and uniform appearance.

g. Inspection: The coated surface may be inspected and approved by the architect or engineer just prior to each coat.

5. PROTECTION

a. Protect finished coatings from damage until completion of project.

b. Touch-up damaged coatings after substantial completion; following manufactures recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION 09 91 13

SECTION 09 91 23
INTERIOR PAINTS AND COATINGS

PART 26 - GENERAL

1. SUMMARY

a. Scrape, paint all concrete columns and ceilings. Paint all drywall, steel and wood as specified. Do not paint exposed brick.

2. SUBMITTALS

a. Product Data: Manufacturer's data sheets on each paint and coating product should include:
   1) Product characteristics
   2) Surface preparation instructions and recommendations
   3) Primer requirements and finish specification
   4) Storage and handling requirements and recommendations
   5) Application method
   6) Cautions, VOC’s

b. Selection Samples: Submit a complete set of color chips that represent the full range of manufactures color samples available.

c. Verification Samples: For each finish product specified, submit samples that represent actual product, color, and sheen.

3. PROJECT CONDITIONS

a. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not apply coatings under environmental conditions outside manufacturer's absolute limits.

PART 27 - PRODUCTS

1. MANUFACTURERS

a. Available Manufacturers: Subject to compliance with requirements, manufacturers offering products that may be incorporated into the Work include, but are not limited to the following:
   1) Sherwin-Williams

b. Substitutions: Requests for substitutions will be considered in accordance with provisions of Section 01 60 00 Product Requirements. When submitting request for substitution, provide complete product data specified above under Submittals, for each substitute product.

2. MATERIALS - GENERAL REQUIREMENTS

a. PAINTS AND COATINGS:

1) Unless otherwise indicated, provide factory-mixed coatings. When required, mix coatings to correct consistency in accordance with manufacturer's instructions before application. Do not reduce, thin, or dilute coatings or add materials to coatings unless such a procedure is specifically described in manufacturer's product instructions. VOC numbers used in this document need to be confirmed by using the products MSDS sheets.

2. 4.1.1 VOCs. The VOC concentrations of the product shall not exceed those listed below as determined by U. S. Environmental Protection Agency (EPA) Reference Test Method 24 (Determination of Volatile Matter Content, Water Content, Density Volume Solids, and Weight Solids of Surface Coatings), Code of Federal Regulations Title 40, Part 60, Appendix A.
The calculation of VOC shall exclude water and tinting color added at the point of sale.

Interior Coatings:

Coating Type	VOC weight in grams/liter of product minus water
Non-flat[3]	150
Flat	50

b. PRIMERS:

1) Where the manufacturer specifies primes, sealers, or block fillers, the VOC limits follow the Flat/Non-Flat, rules per GS-11. 2.1 Paints: Liquid, liquefiable or mastic composition that is converted to a solid protective, decorative, or functional adherent film after application as a thin layer. These coatings are intended for on-site application to interior or exterior surfaces of residential, commercial, institutional or industrial buildings.

c. ACCESSORIES

1) Provide all primers, sealers, cleaning agents, cleaning cloths, sanding materials, and clean-up materials required per manufactures specifications.

3. EXAMINATION

a. Do not begin application of coatings until substrates have been properly prepared. Notify Architect of unsatisfactory conditions before proceeding

b. If substrate preparation is the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

c. Proceed with work only after conditions have been corrected, and approved by all parties, otherwise application of coatings will be considered as an acceptance of surface conditions.

4. SURFACE PREPARATION:

a. Proper product selection, surface preparation, and application affect coating performance. Coating integrity and service life will be reduced because of improperly prepared surfaces. Selection and implementation of proper surface preparation ensures coating adhesion to the substrate and prolongs the service life of the coating system.

b. Selection of the proper method of surface preparation depends on the substrate, the environment, and the expected service life of the coating system. Economics, surface contamination, and the effect on the substrate will also influence the selection of surface preparation methods.

c. The surface must be dry and in sound condition. Remove oil, dust, dirt, loose rust, peeling paint or other contamination to ensure good adhesion.

d. Remove mildew before painting by washing with a solution of 1 part liquid household bleach and 3 parts of warm water. Apply the solution and scrub the mildewed area. Allow the solution to remain on the surface for 10 minutes; however, do not allow the solution to dry on the surface. Rinse thoroughly with clean water and allow the surface to dry 48 hours before painting. Wear protective glasses or goggles, waterproof gloves, and protective clothing. Quickly wash off any of the mixture that comes in contact with your skin. Do not add detergents or ammonia to the bleach/water solution.

e. No painting should take place when the interior temperature is below 50°F unless the specified product is designed for the marginal conditions.

f. Methods
   1) Aluminum - Remove all oil, grease, dirt, oxide and other foreign material by cleaning per SSPC-SP1, Solvent Cleaning.
   2) Block - Remove all loose mortar and foreign material. Surface must be free of laitance, concrete dust, dirt, form release agents, moisture curing membranes, loose cement, and hardeners. Concrete and mortar must be cured at least 30 days at 75°F.The pH of the surface should be between 6 and 9, unless the products to be used are designed to be used in high pH environments such as Loxon. On tilt-up and poured-in-place concrete, commercial detergents and abrasive blasting may be necessary to prepare the surface. Fill bug holes, air pockets, and other voids with a cement patching compound.
   3) Concrete, SSPC-SP13 or NACE 6 - This standard gives requirements for surface preparation of concrete by mechanical, chemical, or thermal methods prior to the application of bonded protective coating or lining systems. The requirements of this standard are applicable to all types of cementitious surfaces including cast-in-place concrete floors and walls, precast slabs, masonry walls, and shotcrete surfaces. An acceptable prepared concrete surface should be free of contaminants, laitance, loosely adhering concrete, and dust, and should provide a sound, uniform substrate suitable for the application of protective coating or lining systems.
   4) Drywall -Interior Must be clean and dry. All nail heads must be set and spackled. Joints must be taped and covered with a joint compound. Spackled nail heads and tape joints must be sanded smooth and all dust removed prior to painting.

5) Galvanized Metal -Clean per SSPC-SP1 using detergent and water or a degreasing cleaner to remove greases and oils. Apply a test area, priming as required. Allow the coating to dry at least one week before testing. If adhesion is poor, Brush Blast per SSPC-SP7 is necessary to remove these treatments.
6) Plaster - Must be allowed to dry thoroughly for at least 30 days before painting. Room must be ventilated while drying; in cold, damp weather, rooms must be heated. Damaged areas must be repaired with an appropriate patching material. Bare plaster must be cured and hard. Textured, soft, porous, or powdery plaster should be treated with a solution of 1-pint household vinegar to 1 gallon of water. Repeat until the surface is hard, rinse with clear water and allow to dry.
7) Steel: Structural, Plate, etc.- Should be cleaned by one or more of the nine surface preparations described below. These methods were originally established by the Steel Structures Painting Council in 1952, and are used throughout the world for describing methods for cleaning structural steel. Visual standards are available through the Steel Structures Painting Council; ask for SSPC-VIS 1.

g. Solvent Cleaning, SSPC-SP1 - Solvent cleaning is a method for removing all visible oil, grease, soil, drawing and cutting compounds, and other soluble contaminants. Solvent cleaning does not remove rust or mill scale. Change rags and cleaning solution frequently so that deposits of oil and grease are not spread over additional areas in the cleaning process. Be sure to allow adequate ventilation.
1) Wood -Must be clean and dry. Prime and paint as soon as possible. Knots and pitch streaks must be scraped, sanded, and spot primed before a full priming coat is applied. Patch all nail holes and imperfections with a wood filler or putty and sand smooth.

5. INSTALLATION

a. Apply all coatings and materials with manufacture specifications in mind. Mix and thin coatings according to manufacture's recommendation.

b. Do not apply to wet or damp surfaces.
1) Wait at least 30 days before applying to new concrete or masonry. Or follow manufacture's procedures to apply appropriate coatings prior to 30 days.
2) Test new concrete for moisture content.
3) Wait until wood is fully dry after rain or morning fog or dew.

c. Apply coatings using methods recommended by manufacturer.

d. Uniformly apply coatings without runs, drips, or sags, without brush marks, and with consistent sheen.

e. Apply coatings at spreading rate required to achieve the manufacturer's recommended dry film thickness.

f. Dark Colors and Deep Clear Colors: Regardless of number of coats specified, apply as many coats as necessary for complete hide.

g. Inspection: The coated surface must be inspected and approved by the architect or engineer just prior to each coat.

6. PROTECTION

a. Protect finished coatings from damage until completion of project.

b. Touch-up damaged coatings after substantial completion, following manufacture's recommendation for touch up or repair of damaged coatings. Repair any defects that will hinder the performance of the coatings.

END OF SECTION 09 91 23

SECTION 09 93 00
STAINING AND TRANSPARENT FINISHING

SCOPE

Stain concrete floor areas indicated in the finish schedule. Provide 10' x 10' sample floor for approval.

SUBMITTALS

Provide 3 copies of manufacturers color chips showing full line of available colors.

MATERIALS

Moisture cure Polyurethane by Tennant. Provide tints from same manufacturer

EXECUTION

Provide 2 coats. Comply with manufacturers recommendations for substrate temperature, moisture content, humidity, and ventilation requirements. Verify that the base slabs meet manufacturers requirements prior to applying stains.
Protect work from other trades.

Installer to have at least three years of experience in the application of Concrete Stains.

END OF SECTION

SECTION 10 14 00
SIGNAGE

PART 28 - GENERAL

1. SUMMARY

a. This Section includes the following:
   1) Apartment numbers
   2) Sprinkler riser rooms
   3) Mechanical Closets
   4) Elevators
   5) Trash Chutes
   6) Offices
   7) Bathrooms
   8) Handicap accessibility
   9) Stairwells (indicate floors and exits)
   10) Use group, code information, occupancy and construction type for each building. Post sign in lobby.
   11) Salvage existing sign at front lawn, repair, refinish and relight. Verify with owner new signage name. Refer to architectural drawings.

2. DEFINITIONS

a. ADA-ABA Accessibility Guidelines: U.S. Architectural & Transportation Barriers Compliance Board's "Americans with Disabilities Act (ADA) Accessibility Guidelines for Buildings and Facilities; Architectural Barriers Act (ABA) Accessibility Guidelines."

3. SUBMITTALS

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

b. Shop Drawings: Show fabrication and installation details for signs.
   1) Show sign mounting heights, locations of supplementary supports to be provided by others, and accessories.
   2) Provide message list, typestyles, graphic elements, including tactile characters and Braille, and layout for each sign.

c. Samples for Initial Selection: Manufacturer's color charts consisting of actual units or sections of units showing the full range of colors available.

d. Samples for Verification: For each products and for the full range of color, texture, and sign material indicated.

e. Qualification Data: For Installer.

f. Maintenance Data: For signs to include in maintenance manuals.

g. Warranty: Special warranty specified in this Section.

4. QUALITY ASSURANCE

a. Fabricator Qualifications: Shop that employs skilled workers who custom-fabricate products similar to those required for this Project and whose products have a record of successful in-service performance.

b. Source Limitations for Signs: Obtain each sign type indicated from one source from a single manufacturer.

c. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

d. Regulatory Requirements: Comply with applicable provisions in ADA-ABA Accessibility Guidelines.

5. PROJECT CONDITIONS

a. Field Measurements: Verify recess openings by field measurements before fabrication and indicate measurements on Shop Drawings.

6. COORDINATION

a. Coordinate placement of anchorage devices with templates for installing signs.

7. WARRANTY

a. Special Warranty: Manufacturer's standard form in which manufacturer agrees to repair or replace components of signs that fail in materials or workmanship within specified warranty period.
   1) Failures include, but are not limited to, the following:
      a) Deterioration of metal and polymer finishes beyond normal weathering.
      b) Deterioration of embedded graphic image colors and sign lamination.
   2) Warranty Period: Five years from date of Substantial Completion.

PART 29 - PRODUCTS

1. GENERAL

a. Accessibility Compliance: All signs are required to comply with ADAAG and ANSI/ICC A 117.1 and applicable building codes, unless otherwise indicated; in the event of conflicting requirements, comply with the most comprehensive and specific requirements.

b. Room and Door Signs: Provide a sign for every doorway, whether it has a door or not, not including corridors, lobbies, and similar open areas.

1) Provide aluminum numbers at apartment entrances. Numbers to be 3" tall Brushed Aluminum numerals, see plans for unit numbers. Install on door at 56” AFF, centered. Font shall be Helvetica.
2) Provide "tactile" signage, with letters raised minimum 1/32 inch and Grade II braille. Font to be Helvetica, black.
3) Use brushed aluminum engraved panel signs
4) Character Height: 1 inch.
5) Sign Height: 2 inches, unless otherwise indicated.
6) Offices, mechanical closets, stairwells, elevators and trash chute: Identify with room numbers to be determined later, not the numbers shown on the drawings..
7) Rest Rooms: Identify with pictograms, the names "MEN" and "WOMEN", room numbers to be determined later, and braille.

c. Interior Directional and Informational Signs:
1) Type: Same as room and door signs.

2. FINISHES, GENERAL

a. Comply with NAAMM's "Metal Finishes Manual for Architectural and Metal Products" for recommendations for applying and designating finishes.

b. Protect mechanical finishes on exposed surfaces from damage by applying a strippable, temporary protective covering before shipping.

c. Appearance of Finished Work: Variations in appearance of abutting or adjacent pieces are acceptable if they are within one-half of the range of approved Samples. Noticeable variations in the same piece are not acceptable. Variations in appearance of other components are acceptable if they are within the range of approved Samples and are assembled or installed to minimize contrast.

PART 30 - EXECUTION

1. EXAMINATION

a. Examine substrates, areas, and conditions, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance of work.

b. Verify that items, including anchor inserts, and electrical power are sized and located to accommodate signs.

c. Proceed with installation only after unsatisfactory conditions have been corrected.

2. INSTALLATION

a. Locate signs and accessories where indicated, using mounting methods of types described and complying with manufacturer's written instructions.
1) Install signs level, plumb, and at heights indicated, with sign surfaces free of distortion and other defects in appearance.

2) Interior Wall Signs: Install signs on walls adjacent to latch side of door where applicable. Where not indicated or possible, such as double doors, install signs on nearest adjacent walls. Locate to allow approach within 3 inches (75 mm) of sign without encountering protruding objects or standing within swing of door.

b. Carpentry subcontractor to install signage on doors per manufacturers recommendations. Fasteners to match finish of numerals.

c. Wall-Mounted Signs: Comply with sign manufacturer's written instructions except where more stringent requirements apply.
   1) Mechanical Fasteners: Use non removable mechanical fasteners placed through predrilled holes. Attach signs with fasteners and anchors suitable for secure attachment to substrate as recommended in writing by sign manufacturer.

3. CLEANING AND PROTECTION

a. After installation, clean soiled sign surfaces according to manufacturer's written instructions. Protect signs from damage until acceptance by Owner.

END OF SECTION 10 14 00

SECTION 10 28 00
TOILET, BATH, & LAUNDRY ACCESSORIES

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

SCOPE: Furnish and install accessories in all bathrooms.

MATERIALS: Provided by American Standard, Creative Specialties, Gatco, Nutone.

Each bathroom to contain the following: See drawings for quantities and locations.

1. 18" and 24" towel bars, American Standard, 2064.018.295, 2064.024.295
2. One soap dish and grab (at built-in tubs)
3. One toilet paper holder, American Standard, 2064.730.295
4. Provide required grab bars in all handicap units.
5. Provide fully recessed medicine cabinets. Cabinet door to have frameless mirror with 4 adjustable glass shelves.
6. Shower rod – curved, Creative Specialties, Moen – 2-102-5BS w/ 66-f BS
7. Glass Shelf – Gatco, Latitude4206
8. Robe Hook – American Standard 2064.210.295 – located on back of bathroom door

Each public bathroom to contain the following (all to have brushed stainless finish):

1. One paper towel dispenser- #B-262 (Surface mounted)
2. One toilet paper holder- #B-685
3. Grab bars as in lengths as indicated on drawings.
4. Toilet paper dispenser.
5. Paper towel dispenser.

INSTALLATION:
Install toilet accessories in accordance with state and local codes.

END OF SECTION

SECTION 10 55 00
POSTAL SPECIALTIES

SCOPE

Provide front loaded, handicap accessible, metal mailboxes approved by the U.S. Postal service. See plans for location.

MANUFACTURERS

Postal Products Unlimited, Inc., Florence Manufacturing, or Postal Products Unlimited

MATERIALS

4C Horizontal Mailbox Suite F-1 Recessed, anodized. See plans for quantity. Provide directory and outgoing mail slot at each location. Units shall be individually locked with a clear aluminum finish. See drawings.

EXECUTION

Install as per manufacturers recommendations in the locations indicated.

END OF SECTION

SECTION 10 67 00
WIRE STORAGE SHELVING

SCOPE

Heavy-duty ventilated wire shelving with baked on epoxy finish.

PRODUCTS

Provide products by the Schulte Corporation, Space Saver Corporation, or Bradley.

Provide fasteners, hardware, and accessories for complete installation.

EXECUTION

Height of shelves to be 5’-8” AFF. At all bedrooms with two pairs of closet doors, closet on left has double rods one at 3’-4” and one at 7’-0”. Closet on right has one shelf rod at 5’-8”.

Erect shelving level. Braces plumb and rigid, as per manufacturer's recommendations.

Provide additional field bracing as necessary for rigid installation. Screw back clips and braces into wood blocking.

END OF SECTION

SECTION 11 17 50
TRASH CHUTE / WITH ADA COMPLIANT INTAKE DOORS

PART 31 - GENERAL

1. RELATED DOCUMENTS

a. The general provisions of the contract, including General and Supplementary Conditions and Division 1, General Requirements, apply to the work specified in this section.

2. SYSTEM OPERATION

a. Furnish and install ADA Compliant 18” x 18” bottom hinged, self closing positive latching, pneumatically operated chute intake doors with palm button control mechanism designed to preclude the need to grasp, twist, or pinch the control mechanism in order to operate the intake doors. Doors shall be powered by a suitable 4 gallon capacity compressor fitted with a blow off solenoid to prevent operation of the doors n the event of a general building alarm. Doors must close when power is interrupted. Compressor shall also be disabled for maintenance. Additionally, if a compressor is used, chute intake doors on each floor shall be disabled when the compactor receives one or more of the following signals: Emergency Stop activation, Compactor Hopper Time Out Cycle, Charging Chamber Full, and Motor Overload, providing the compactor has these circuits.

3. DESCRIPTION OF WORK

a. Work Included: Furnish and install where shown on plans 28” diameter trash chute as specified below. Provide complete system based upon specifications and existing conditions.

4. SUBMITTALS

a. Catalog Cuts: Before the trash chute is delivered to the job site, submit catalog cuts to the Architect in accordance with these specifications, showing all details of installation and assembly and all requirements for work by other trades.

b. Product Data: Manufacturer’s product specifications, standard details and recommendations for project conditions; indicate selected sizes and installation details specific to the project.

c. Shop Drawings:
   1) Plans: Scale 1/4 inch to 1 foot; indicate locations, dimensions, and required associated construction activities.
   2) Elevations/Sections: Scale 1/4 inch to 1 foot; indicate locations, dimensions, and required associated required construction activities.
   3) Details: Scale 1/4 inch to 1 foot; indicate:
      a) Shop drawings specific to project conditions

b) Interface with adjacent construction
c) Dimensions and tolerances
d) Products required for installation of the trash chute, but not supplied by trash chute manufacturer.

d. Close-out Submittals:
1) Operation and Maintenance Data.
2) Warranty Documents: Issued and executed by the manufacturer and installer of the system.

5. QUALITY ASSURANCE

a. Qualifications:
1) Manufacturer: Minimum five (5) years-documented experience producing products specified in this section.
2) Installer: Approved by the Manufacture, and having a minimum of five (5) years experience.

b. Pre-Installation Meetings:
1) Convene at job site a minimum of seven (7) calendar days prior to scheduled beginning of construction activities of this section to review requirements of this section.
2) Require attendance by representatives of the following:
a) Trash chutes manufacturer or designated representative
b) Installer of this section
c) Other entities directly affecting, or affected by, construction activities of this section.
d) Notify Architect four (4) calendar days in advance of scheduled meeting date.

6. RELATED WORK BY OTHERS SPECIFIED ELSEWHERE

a. The following work is excluded from the scope of work in this section 11175 and is included in other divisions of the specifications for inclusion in the scope of work of others.
1) Flashing at the roof
2) Water supply and valves to flushing and fire sprinkler heads
3) Switch assembly, conduit and/or wiring to solenoid valve for the disinfecting and sanitation unit located behind a plumbing access door directly above the highest intake door.
4) The following electrical circuits with disconnects are required and are to be installed by others.
a) 110VAC, 20 amp, 1-phase, 60 Hz Circuits, for the Compressor. Local disconnect box to be NEMA 13.
b) Flexible conduit, ½" diameter installed from compressor area to each new door installation for connecting air tubing from self contained compressor to chute intake doors.
5) ADA required Braille signage provided by others.

7. WARRANTY

a. Manufacturer's warranty: Furnish manufacturer's standard one (1) year warranty from date of temporary certificate of occupancy or similar, locally mandated permission to use the project common areas for their intended use. Warranty shall apply to defects in product workmanship and materials.

PART 32 - PRODUCTS

1. MANUFACTURERS

a. Components:
   1) The chute shall be 28" diameter of U.S. #16 gauge aluminized.
   2) The replacement Wilkinson ADA Compliant Chute Intake Doors: 18 inches wide x 18 inches high self-closing, bottom hinged, push-button operated self-closing positive latching doors. The door and operating mechanism are a UL® approved, "B" Label, 1-1/2 hour assembly. The trash chute door carries an additional UL rating designating it to have a maximum temperature rise over 30-minute period of not more than 250°F. The chute intake door is stainless steel as are the trim for the door and the operating mechanism. The door trim is embossed with top hinged rubber baffles located just inside the intake.
   3) Discharge: U.S. #16 gauge aluminized steel type "A" open end chute discharge rolling steel door with 165°F. fusible link hold open on an inclined steel track at the bottom of the chute to close automatically when the ambient temperature reaches 165°F. as required by city or state building and/or fire codes.
   4) Vent: Chute shall extend full diameter through roof to metal top vent cap 4'-0" above roof level with counter flashing and insect screen. A roof curb (44"x 44" x minimum of 8" high) is required for flat roof conditions and is to be provided by others.
   5) Accessories: 3/4 inch IPS flushing spray head and 1/2 inch sprinkler head above highest intake. Additional 1/2-inch sprinkler heads at every second intake (counting from the top) or as required by local code.
   6) Provide Disinfecting & Sanitizing unit for installation in line to the flushing spray head. Connection to flushing spray head, back flow prevention valve and electric control switch by others.
   7) Provide 12 inches wide x 12 inches high right side hinged, hand operated, self closing, positive latching, UL 1 1/2-hour. "B" labeled, stainless steel plumbing access door having stainless steel door trim for installation by forces erecting enclosing shaft wall. Door to have master keyed lock. Cylinder provided by others. Door for access to disinfecting & sanitizing unit above the highest intake door of the chute.
   8) Offsets (bends) in the chute, if required, shall be made the same diameter as the chute of #16 US gauge aluminized steel and have an additional layer of # 13 US gauge aluminized steel reinforcing the impact area. Offsets are not to deviate more than 15^{o} off the vertical axis of the chute.
   9) Provide Daubert 934 sound coat (or equal) vibration dampening compound to the exterior of the chute only. Include Korfund sound isolator pads at each floor support frame.
   10) Sprinkler System: Chute shall be protected internally by automatic sprinklers. This requires a sprinkler at or above the top intake door of the chute, and in addition, a sprinkler shall be installed within the chute at alternate floor levels in

building over two stories in height with mandatory sprinkler located at the lowest service level.

2.2 FABRICATION

A. The trash chute shall be fully factory assembled and all joints, except those required to separate the sections for shipment and installation shall be welded or lock-seamed tight. The floor intake doors shall be bolted in place on throats formed into the chute. All chute sections shall flash inside the sections below and there shall be no bolts, clips, or other projections inside the chute to snag the flow of material. Pre-positioned support frames shall assure proper intake levels and there shall be an expansion joint in the chute between all support joints. Discharge hoppers and offsets, where required, shall be reinforced and separately supported in the impact area.

PART 33 - EXECUTION

1. EXAMINATION

a. Verification of conditions:
   1) Area in which system is to be located is correct size and location, and is prepared for installation of trash chute and components.

b. Installer's examination:
   1) Have installer of this section examine conditions under which construction activities of this section are to be performed, then submit written notification if conditions under which construction activities of this section are to be performed are unacceptable.
   2) Beginning construction activities of this section before unacceptable conditions have been corrected is prohibited.
   3) General Contractor shall verify and record chute alignment with installer immediately following installation.

2. INSTALLATION

a. Install trash chute in accordance with shop drawings and manufacturer's printed installation instructions.

3. DEMONSTRATION

a. Arrange demonstration of system operation, conducted by manufacturer's representative, to Owner's maintenance personnel.

END OF SECTION 11 17 50

SECTION 11 31 00
RESIDENTIAL APPLIANCES

PART 34 - GENERAL

1. SUMMARY

a. This Section includes the following:
   1) Electric Range
   2) Refrigerator with icemaker
   3) Dishwasher
   4) Garbage disposal
   5) Vent/Hood Microwave Oven
   6) Washer/Dryer

2. SUBMITTALS

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

b. Samples: For each exposed finish.

c. Appliance Schedule: Use same designations indicated on Drawings.

d. Maintenance data.

3. QUALITY ASSURANCE

a. Installer Qualifications: An employer of workers trained and approved by manufacturer for installation and maintenance of units required for this Project.

b. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.

c. Residential Appliances: Comply with NAECA standards.

d. Energy Ratings: Provide appliances that qualify for the EPA/DOE ENERGY STAR product labeling program.

e. Comply with VHDA guidelines

f. Supplier responsible for providing all parts necessary for installation. Installation is the responsibility of the Contractor. All equipment shall be installed as per manufacturers recommendations. Equipment by Frigidaire unless otherwise noted.

4. WARRANTY

a. Special Warranty: Manufacturer's standard form in which manufacturer of each appliance specified agrees to repair or replace residential appliances or components that fail in materials or workmanship within specified warranty period.

PART 35 - PRODUCTS

1. MANUFACTURERS

a. The following requirements apply to product selection:
   1) Available Products: Subject to compliance with requirements, products that may be incorporated into the Work include, but are not limited to, products specified.
   2) Products: Subject to compliance with requirements, provide one of the products specified.
   3) Basis-of-Design Product: The design for each residential appliance is based on the product named. Subject to compliance with requirements, provide either the named product or a comparable product by one of the other manufacturers specified.

2. APPLIANCES

a. Appliances specified by E.A. Holsten Inc. Provide energy star appliances to meet VHDA standards.
   1) Electric Range: Black door, coil burners, manual clean, front controls, provide 4 prong range cord. Model # FEF326FB
   2) ADA Electric Slide in Range: Black door, self clean oven, glass cooktop, front controls, provide 4 prong range cord. Model Frigidaire FES355EB
   3) ADA Refrigerator: Black 25.8 CuFt, ice and water through door, 36” wide. Please leave room for doors to open properly. Model Frigidaire FRS6HR5JW
   4) Refrigerator with icemaker: Black 18.2 CuFt, wire shelves, energy star. Model Frigidaire FRT18HB5JB: Icemaker IM115
   5) Dishwasher: black, 24 inches wide, energy star. Model Frigidaire FDB700BFB
   6) Over the Range Microwave: Vent free, black. Model Frigidaire FMV157GB
   7) ADA Microwave: black. Model Frigidaire GLMB209DB
   8) ADA Rangehood: Broan, vent free, black. Provide wall switch. Model 4130-23
   9) Garbage disposal: 1/3 HP
   10) Washer/Dryer: frontload washer, vent free dryer, stackable. Energy star, white. Washer Model LG WM133HW Dryer Model LG DLEC733W. Place washer/dryer side by side at accessible units.

PART 36 - EXECUTION

1. INSTALLATION GENERAL

a. Built-in Equipment: Securely anchor units to supporting cabinets or countertops with concealed fasteners. Verify that clearances are adequate for proper functioning and rough openings are completely concealed.

b. Freestanding Equipment: Place units in final locations after finishes have been completed in each area. Verify that clearances are adequate to properly operate equipment.

c. Utilities: Refer to Divisions 15 and 16 for plumbing and electrical requirements.

d. Uncrating of appliance, setting in place, install anti-tip devices for ranges, hookup of icemaker, cleaning of appliances and haul away trash.

END OF SECTION 11 31 00

SECTION 12 21 13
HORIZONTAL LOUVER BLINDS

PART 37 - GENERAL

1. RELATED DOCUMENTS

a. The contract and any contract change orders, the drawings and this section of the specifications with all addenda, together with Division 1: General Requirements, are incorporated to form the contract documents and the entire basis for agreement between Contractor and Subcontractor. No allowance will subsequently be made on behalf of the Subcontractor for the contract documents and the site conditions or for his failure to determine the Owner's desired meaning and intentions of these contract documents before starting work.

2. SUMMARY

a. Furnish all labor, materials and equipment necessary and properly complete the mini-blind work specified or implied herein. Unless otherwise noted on the drawings or specified, the work shall include the following:

3. SECTION INCLUDES

a. 2” Aluminum horizontal louver blinds.

b. Operating hardware.

4. REFERENCE STANDARDS

a. WCMA A100.1 - Safety of Corded Window Covering Products; Window Covering Manufacturers Association; 2007. (ANSI/WCMA A101.1)

5. SUBMITTALS

a. Product Data: Provide data indicating physical and dimensional characteristics.

b. Shop Drawings: Indicate opening sizes, tolerances required, method of attachment, clearances, and operation.

c. Manufacturer's Installation Instructions: Indicate special procedures.

PART 38 - PRODUCTS

1. GENERAL

a. Mini-blinds shall be 2" Riviera Dustguard by Levolor. Provide brackets at 2' – 6" O.C. or less.

2. HORIZONTAL LOUVER BLINDS:

a. Blinds: Horizontal 2" slat louvers hung from full-width headrail with full-width bottom rail; manual control of raising and lowering by cord with full range locking; blade angle adjustable by control wand; complying with WCMA A100.1.

b. Metal Slats: Spring tempered pre-finished aluminum; radiused slat corners, with manufacturing burrs removed.
   1) Width: 2 inch.
   2) Color: White

c. Slat Support: Woven polypropylene cord, ladder configuration.

d. Head Rail: Pre-finished, formed aluminum box, with end caps; internally fitted with hardware, pulleys, and bearings for operation; same depth as width of slats

e. Bottom Rail: Pre-finished, formed steel with top side shaped to match slat curvature; with end caps. Color: Same as headrail.

f. Lift Cord: Braided nylon; continuous loop.

g. Control Wand: Extruded hollow plastic; hexagonal shape.

h. Headrail Attachment: Wall brackets.

i. Accessory Hardware: Type recommended by blind manufacturer.

3. FABRICATION

a. Determine sizes by field measurement.

b. Fabricate blinds to fit within openings with uniform edge clearance of 1/8 inch.

PART 39 - EXECUTION

1. GENERAL

a. Verify that openings are ready to receive the work.

b. Ensure structural blocking and supports are correctly placed.

c. The Subcontractor shall warrant the work of this section for a period of one (1) year following the date of final completion and acceptance.

d. The Subcontractor shall remove all debris off the job site from work of this section. Building and site shall be left neat and clean at all times. Paragraph of General Requirements shall be strictly adhered to.

2. INSTALLATION

a. Install blinds in accordance with manufacturer's instructions.

b. Wood screws shall be used to fasten brackets and supports or molly bolts and wall-anchors if attached to hollow walls. Secure in place with flush countersunk fasteners.

c. Install blinds level and plumb. Blinds must fit window width and height. Comply with installation instructions provided by manufacturer

3. INSTALLATION TOLERANCES

a. Maximum Variation of Gap at Window Opening Perimeter: 1/4 inch.

4. ADJUSTING

a. Adjust blinds for smooth operation.

5. CLEANING

a. Clean blind surfaces just prior to occupancy.

END OF SECTION 12 21 13

SECTION 12 36 40
STONE COUNTERTOPS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes:
    1. Stone Countertops

B. Related Sections:
    1. Division 05 Section " Metal Fabrications" for steel countertop supports.

1.2 REFERENCES

A. ASTM C 119-04: Terminology Relating to Dimension Stone
B. ASTM C 170-90 (1999): Test Method for Compressive Strength of Dimension Stone
C. ASTM C 615-03: Specification for Granite Dimension Stone
D. ASTM C 880-98: Test Method for Flexural Strength of Dimensional Stone

1.3 SUBMITTALS

A. Product Data: For each granite, stone accessory, and other manufactured products.
    1. Each stone type: Physical properties
B. Shop Drawings: Include plans, sections, details, and attachments to other work. Show fabrication and installation details for dimension stone cladding:
    1. Include dimensions and profiles of stone units.
    2. Show locations and details of joints.
    3. Show locations and details of anchors and supports.
C. Stone Samples: (2) Sets for each stone required, exhibiting the full range of color characteristics expected; not less than 12" square.
    1. Grout Samples: Full range of exposed color and texture.
    2. Sealant Samples: Fore each type and color of joint sealant required.
D. Sealant Compatibility Test Report: Submit test report from sealant manufacturer, in accordance with Division 07 Section " Joint Sealants" Stating that sealants will not stain stone.
E. Maintenance Data: Provide maintenance manuals for stone countertops. Include stone-care products recommended by stone source.

1.4 QUALITY ASSURANCE

A. Fabricator Qualifications: Skilled works who custom-fabricate stone countertops similar to work of this project.
B. Source Limitation for Stone: Obtain each variety of stone from a single quarry.
    1. Obtain each variety of stone from a sing quarry, whether specified in this Section or in another Section of the Specifications.
C. Mockup: Build mockup to demonstrate aesthetic effects and set quality standards for materials and execution.
    1. Build mockup of typical countertop as shown on Drawings.
    2. Approved mockup may become part of the completed work.

1.5 PROJECT CONDITIONS

B. Field measurements: Verify dimensions of construction to receive stone countertops by field measurements before fabrication.

PART 2 – PRODUCTS

2.1 STONE SOURCE

A. Varieties and Source:
    1. Stone: To be selected by Architect

2.2 STONE MATERIAL

A. Granite: ASTM C 615
B. Cut stone from one block or contiguous, matched blocks in which natural marking occur.
C. Match Architect's samples.
D. Granite Type: to be selected by architect.
    1. Stone Variety: to be selected by architect
    2. Location: Countertops
    3. Finish: polished
    4. Thickness: 1 3/16" (3 cm)

2.3 STONE ACCESSORIES

A. General: Use only adhesives formulated for stone and recommended by manufacturer for the application shown on Drawings.
B. Water-Cleanable Epoxy Adhesive: ANSI A118.3, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
C. Water-Cleanable Epoxy Grout: ANSI A118.3, chemical resistant, water-cleanable, tile-setting and –grouting epoxy, with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
D. Stone Adhesive: 2-part epoxy or polyester adhesive, formulated specifically for bonding stone to stone, with an initial set time of not more than 2 hours at 70 deg F, and with a VOC content of 65 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
    1. Color: match stone.
E. Sealant for Countertops: Manufacturer's standard sealant of characteristics indicated belo that comply with applicable requirements in Division 07 Section "Joint Sealants" and will not stain the stone it is applied to.
    1. Single-component, neutral-curing silicone sealant.
    2. Color: to be selected by architect.
    3. Use sealants that have a VOC content of 250 g/L or less when calculated according to 40 CFR 59, Subpart D (EPA Method 24).
F. Stone Cleaner: Cleaner specifically formulated for stone types, finishes, and applications indicated, as recommended by stone producer. Do not use cleaning compounds containing acids, caustics, harsh fillers, or abrasives.
G. Stone Sealer: Colorless, stain-resistant sealer that does not affect color or physical properties of stone surfaces, as recommended by stone producer for application indicated.

2.4 STONE FABRICATION, GENERAL

A. General: Fabricate stone per requirements, including Drawings and Shop Drawings.

1. Granite: NBGQA's "Specifications for Architectural Granite."

B. Select stone for intended use to prevent fabricated units from containing cracks, seams, and starts that could impair structural integrity or function.
    1. Repairs that are characteristic of the varieties specified are acceptable provided they do not impair structural integrity or function and are not aesthetically unpleasing, as judged by Architect.
C. Grade and mark stone for final locations to produce assembled countertop units with an overall uniform appearance.
D. Fabricate stone countertops in sizes and shapes required to comply with requirements indicated, including details on Drawings and Shop Drawings.
    1. Clean sawed backs of stones to remove rust stains and iron particles.
    2. Dress joints straight and at right angle to face, unless otherwise indicated.
    3. Cut and drill sinkages and holes in stone for anchors, supports, and attachments.
    4. Provide openings, reveals, and similar features as needed to accommodate adjacent work.
    5. Fabricate molded edges with machines having abrasive shaping wheels made to reverse contour of edge profile to produce uniform shape throughout entire length of edge and with precisely formed arris slightly eased to prevent snipping, and matched at joints between units. From corners of molded edges as indicated with outside corners slightly eased, unless otherwise indicated.
    6. Finish exposed faces of stone to comply with requirements indicated for finish of each type of stone required and to match approved Samples and mockups. Provide matching finish on exposed edges of countertops, splashes, and cutouts.
E. Carefully inspect finished stone units at fabrication plant for compliance with requirements for appearance, material, and fabrication. Replace defective units.

2.5 STONE COUNTERTOPS

A. General: Comply with recommendations in MIA's "Dimension Stone – Design Manual."
B. Nominal Thickness: Gage backs to provide units of identical thickness.
    1. 1 3/16" (3 cm)
C. Edge: Eased: All exposed surfaces polished
D. Splashes: Provide 13/16 inch thick backsplashes and side splashes.
    1. Height: As shown on drawings.
    2. Top-Edge Detail: As shown on details.
E. Joints: Fabricate countertops in section for joining in field, with joints at locations shown on Drawings and as follows:
    1. Joints: 1/16 inch in width.
F. Cutouts and Holes:
    1. Under counter Fixtures: Make cutouts for under counter fixtures in shop using template or pattern furnished by fixture manufacturer. Form cutouts to smooth, even curves.
    2. Counter-Mounted Fixtures: Prepare countertops in shop for field cutting openings for counter-mounted fixtures. Mark tops for cutouts and drill holes at corners of cut out locations.
    3. Fittings: Drill countertops in shop for plumbing fittings, counter mounted soap dispensers, and similar items.

PART 2 – EXECUTION

3.1 EXAMINATION

A. Examine substrates indicated to receive stone countertops and conditions under which stone countertops will be installed, with Installer present, for compliance with requirements for installation tolerances and other conditions affecting performance.
    1. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 PREPARATION

A. Clean dirty or stained stone surfaces by removing soil, stains, and foreign materials before setting. Clean stone by thoroughly scrubbing with fiber brushes and then drenching with clear water. Use only mild cleaning compounds that contain no caustic or harsh materials or abrasives. Allow stone to dry before installing.

3.3 CONSTRUCTION TOLERANCES

A. Variation from Plumb: For vertical lines and surfaces, do not exceed 1/16 inch in 48 inches.
B. Variation from Level: Do not exceed 1/8 inch in 96 inches, ¼ inch maximum.
C. Variation in Joint Width: Do not vary joint thickness more than ¼ of nominal joint width.
D. Variation in Plane at Joints (Lipping): Do not exceed 1/64 inch difference between planes of adjacent units.
E. Variation in Line of Edge at Joints (Lipping): Do not exceed 1/64 inch difference between edges of adjacent units, where edge line continues across joint.

3.4 INSTALLATION OF COUTNERTOPS

A. Install countertops over plywood subtops with full spread of water-cleanable epoxy adhesive.
B. Do not cut stone in field. If stone countertops or splashes require additional fabrication not specified to be performed at Project site, return to fabrication shop for adjustment.
C. Set stone to comply with requirements shown on Drawings and Shop Drawings. Shim and adjust stone to location shown. Install countertops with uniform joints of widths shown and with edges and faces aligned.
D. Bond joints with stone adhesive and draw tight as countertops are set. Mask areas of counter tops adjacent to joints to prevent adhesive smears.
E. Space joints with 1/16inch gap for filling with sealant. Use temporary shims to ensure uniform spacing.
F. Install backsplash and end splash by adhering to wall with water-cleanable epoxy adhesive. Leave 1/16 inch gap between countertop and splash for filling with sealant. Use temporary shims to ensure uniform spacing.
G. Apply sealant to joints; comply with Division 07 Section “Joint Sealants.” Remove temporary shims before applying sealant.

3.5 ADJUSTING AND CLEANING

A. In-Progress Cleaning: Clean countertops as work progresses. Remove adhesive, grout, mortar, and sealant smears immediately.
B. Remove and replace stone countertops of the following description”

1. Broken, chipped, stained, or otherwise damaged stone. Stone may be repaired if methods and results are approved by architect.
2. Defective countertops.
3. Defective joints, including misaligned joints.
4. Interior stone countertops and joints not matching approved Samples and mockups.
5. Interior stone countertops and not complying with other requirements indicated.

C. Replace in a manner that results in stone countertops matching approved Samples and mockups, complying with other requirements, and showing no evidence of replacement.
D. Following installation and after sealants are cured, clean stone countertops using clean water and soft rags.
E. Sealer Application: Apply stone sealer to comply with stone producer's and sealer manufacturer's instructions.

END OF SECTION
12 36 40

SECTION 14 24 00
HYDRAULIC ELEVATOR

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

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

1.2 QUALITY ASSURANCE

A. All work shall be performed in accordance with the latest revised edition (as of the date bids are taken) of the American National Standard Safety Code for Elevators, Dumbwaiters, Escalators and Moving Walks (ASME A-17.1), the National Electrical Code, IBC 2000, American's Disability Act and/or such state and local codes as may be applicable.

B. Bidder’s Qualifications: The elevator contractor shall be one regularly engaged in the business of manufacturing, installing and servicing elevators of the type and character required by these specifications.

1.3 SUBMITTALS

A. Shop Drawings: Submit plans, elevations and details of car enclosures and hoist way entrances. Prepare elevator diagrams to show service to each level. Show excavation requirements for jack. Show locations of guide rail brackets, which require welding plates, and/or wall inserts.

B. Samples: Submit samples of finishes for car enclosures, hoist way entrances, and signal equipment.

C. Maintenance Manuals: Submit bound manual for each elevator or group of elevators, with operating and maintenance instructions, parts listing, recommended parts inventory listing, purchase source listing for major and critical components, emergency instructions, and similar information.

1.4 INITIAL MAINTENANCE AND WARRANTY

A. Maintenance Service: Provide full maintenance service by skilled, competent employees of the elevator installer for period of 3 months following date of substantial completion. Include monthly preventive maintenance, performed during normal working hours. Include repair/replacement of worn or defective parts or components and lubrication, cleaning and adjusting as required for proper elevator operation in conformation with specified requirements. Include 24 hour/day, 7-days/week emergency call back service. Exclude only repair/replacement due to misuse, abuse, accidents or neglect caused by persons other than installer's personnel.

B. Warranties: Provide l2 month full warranty on all parts and workmanship.

PART 2 - PRODUCTS

2.1 MANUFACTURER:

A. Subject to compliance with requirements, provide products of the following:

1. Vertex, Vertical Express

2.2 DESCRIPTION OF EQUIPMENT

A. Number of elevators: Two (2)
B. Capacity: 2500 lbs.
C. Speed: 125 feet per minute full load up & 150 fpm down.
D. Operation: Automatic Selective Collective.
E. Clear inside cab: 6'-8" x 4'-3" (net clear inside)
F. Travel: 41'-6 3/4" (field verify)
G. Power Supply: Match Building Voltage, 3 phase, 60 cycles.
H. Machine location: 1st Floor, across to hoist way.
I. Stops and openings: 5 stops 5 openings (5 front)

2.3 HYDRAULIC MACHINES AND ELEVATOR EQUIPMENT

A. Provide manufacturer's standard hydraulic plunger-cylinder unit with electric pump-tank-control system equipment in machine room.

B. Automatic Guide Rail Lubricators: Lubricators shall be provided and mounted on top of upper guide shoes. Wool felt wiper shall apply an even, uniform flow of oil, which shall thoroughly lubricate faces of guide rail from a leak-proof oil reservoir.

C. Piping: Provide size, type and weight piping recommended by manufacturer and provide isolation couplings to prevent sound/vibration transmissions from power unit.

D. Mainline Strainer: A mainline strainer of the self-cleaning type, equipped with a 40-mesh element shall be furnished and installed in the oil line.

2.4 CAR FRAME AND PLATFORM:

Manufacturer's standard welded steel units.

2.5 BUFFERS:

Substantial buffers under car shall be furnished and installed in the elevator pit. They shall be mounted on continuous channels fastened to the elevator guide rail or securely anchored to the pit floor and substantial extensions will be provided, if required. Buffers shall comply with ASME A-17.1 code requirements.

2.6 CONTROL SYSTEMS:

A. Except as otherwise indicated, provide solid-state "Selective Collective Automatic Operation", as defined in ASME A17.l. Provide firemen's return operation to operate as defined in ASME A17.l. Provide solid-state variable voltage starting to limit current inrush on motor starting.

NOTE: For elevator microprocessor control system, provide maintenance diagnostic tools, electrical schematic wiring diagrams, and any access codes or passwords required for all maintenance functions, including diagnostics, adjustments and parameter reprogramming. Tools may be hand-held or built into the control system and shall function for the life of the equipment.

Tools that require recharging or reprogramming or are proprietary shall not be used. Provide complete operations and maintenance manuals including diagnostic instructions for troubleshooting the system. NO PROPRIETARY EQUIPMENT SHALL BE USED.

B. Failure Protection: The electrical control circuit shall be designed so that if a malfunction should occur, due to motor starter failure, oil becoming low in the system, or the car failing to reach a landing in the up direction within a pre-determined time, the elevator car will automatically descent to the lowest terminal landing. The doors will automatically open when the car reaches that landing to allow passengers to depart. The doors will then automatically close and all control buttons, except the "Door Open" button in the car station, shall be made inoperative.

C. Automatic Terminal Limits: Electric limit switches shall be placed in the hatchway near the terminal landings and be designed to cut off the electric current and stop the car should it run beyond either terminal landing.

D. Automatic Self-Leveling: The elevator shall be provided with a self-leveling feature that will automatically bring the car to the floor landings. This self-leveling shall, within its zone, be entirely automatic and independent of the operating divide and shall correct for over-travel or under-travel. The car shall also be maintained approximately level with the landing irrespective of the load.

E. Car Top Inspection Station: A car top inspection station with an "emergency stop" switch and with constant pressure "up-down" direction buttons shall make the normal operating devices inoperative and give the inspector complete control of the elevator as described by ASME A17.1.

F. Door Operation: A direct current motor driven heavy-duty operator shall be furnished and installed designed to operate the car and hoist way doors simultaneously. Door movements shall be electrically cushioned at both Limits of travel and the door operating mechanism shall be arranged for manual operation in the event of power failure. The leading edge of the car door shall be provided with a retractable reversal edge arranged to automatically return car and hoist way doors to the open position in the event the doors are obstructed during closing cycle. Doors will then resume closing cycle. Door shall automatically open as the car arrives as the landing and shall automatically close after an adjustable time interval or when the car is dispatched to another landing. Direct drive geared operators, A.C. controlled units with oil checks, or other deviations from the above are not acceptable.

2.7 SIGNAL EQUIPMENT:

A. General: Except as otherwise indicated, provide manufacturer's standard signal equipment for each elevator or group of elevators. Provide car control station and car position indicator in each car, hall push button station on each landing and other units as indicated. Provide illuminated buttons and signals, which light up when activated and remain lighted until call or other function has been fulfilled; fabricate of acrylic or other permanent translucent plastic. Except for buttons and illuminated signal elements, fabricate signal equipment with exposed surfaces of stainless steel with manufacturer's standard directional polish.

B. Car Control Stations: Provide flush-mounted metal faceplates, containing call button for each landing served, and containing operation and control switches. Mount at height complying with all applicable codes, mount in return panel to the right of car door and provide markings and Braille for the handicapped at all stations and indicators. Provide operating device symbols as required by code. Mark other buttons and switches with manufacturer's standard identification for required use or function.

C. Car Position Indicator: Provide illuminated signal type located near top of car. Provide car direction lantern with visual signals and vocal announcement "elevator up" or "elevator down".

D. Hall Push-Button Station: Locate as indicated by hoist way door. Provide type with flat faceplate mounting on wall finish (body of unit recessed). Provide 2-button station where passengers can travel either direction; l button station when only one direction of travel is available and indicate which direction that is.

E. Telephone: Provide flush cabinet with hinged door and integral part of car station with full ADA compliant hands free speaker phone as described: vandal resistant, voice message tells emergency service location and nature, caller can speak if desired, red light on front of phone blinks to let caller know emergency message is received, phone can be programmed to shut off automatically or be shut off remotely by called party. Built in automatic dialer with programmable memory and ringer, provide all Braille and raised lettering to describe operation of equipment.

F. Alarm System: Provide emergency alarm bell properly located within building and audible outside hoist ways, equipped to sound automatically in response to emergency stops and in response to “alarm" button at each car control station.

G. Emergency Lighting: Provide emergency lighting with lens as integral part of car operating station to function as required by code.

H. Certificate Frame: Provide stainless steel frame with tamper proof screws and plastic protection lens of standard design for elevator use.

2.8 PASSENGER ELEVATOR CAR ENCLOSURES:

A. Material: Best quality cold rolled steel. Laminated plastic equal to exceeding performance standards set by NEMA LD-l-1964. Stainless steel, type 302, #4 finish. All materials to meet standards set by ASME A17.l.

B. Walls: Wood-core with vertically applied plastic laminate panels complying with all applicable codes. Color to be selected by architect from standard products available in the industry.

C. Canopy: #12 gauge steel, substantially reinforced with emergency exit.

D. Entrance Columns: #14 gauge cold rolled steel. #4 brushed finish,

E. Transom: #4 brushed finish stainless steel

F. Handrail: 2" stainless steel on sidewalls.

G. Lighting: Standard suspended down light ceiling, with panels finished in #4 brushed stainless

H. Doors: #18 gauge steel 1-1/4” thick, flush design both sides. Sound deadened, reinforced for hangers and operating mechanism. Each door panel with adjustable nylon guides. Doors to be faced with stainless steel, brushed finish

I. Ventilation: Single speed exhaust fan.

J. Sound Deadening: Exterior to be sound deadened.

K. Cutouts: All necessary cutouts for control and signal fixtures.

L. Sill: Extruded aluminum.

M. Flooring: Provided under another section.

N. Door Edge Protective Device: Provide infrared door screen device with multiple beams covering entire opening. Upon detecting an obstruction in the entrance causes the doors to stop and reopen. Should obstruction be detected for more than 20 seconds, detector should cause doors to go into nudging feature as described by Code and sound an alarm causing the doors to close at reduce speed and torque.

O. Protection Pads and Pad Buttons: Protection pads and pad buttons are to be provided.

2.9 HOISTWAY ENTRANCES:

A. General: Except as otherwise indicated, provide manufacturer's standard, pre-engineered, hollow metal type, sliding, door and frame hoist way entrances; complete with track system, hardware, safeties, sills and accessories. Match car enclosure doors for size, number of door panels and door panel movement. Provide frame-section size and profile to coordinate with hoist way wall construction as indicated. (36"wide x 84" tall, single speed Elevator #1) (42" clear opening x 84" tall, single slide Elevator #2)

B. Materials and Fabrication: Provide selections indicated; manufacturer's standards, but not less than the following:

1. Steel Frames: #4 brushed stainless.
2. Hoist way Door Panels: flush steel construction with #4 brushed stainless finish.
3. Aluminum Sills: cast of extruded aluminum, with grooved surface ¼" thickness, mill finish.

2.10 PIT LADDER:

Provide steel pit ladder, with rungs 3/4 inches in diameter uniformly spaced at 12 inches o.c. maximum welded to sidebars. Anchor to concrete wall. Paint to match elevator shaft way equipment.

2.11 PIT LIGHT:

Provide pit light, switch and receptacle at proper elevations.

2.12 FIRE EXTINGUISHER:

Provide proper class fire extinguisher mounted permanently in elevator equipment room.

PART 3 - EXECUTION

3.1 PREPARATION

Prior to commencing elevator installation, inspect hoist ways, hoist way openings, pits and machine rooms, as constructed, verify all critical dimensions and examine supporting structure and all other conditions under which elevator work is to be installed. Notify contractor in writing of any dimensional discrepancies or other conditions detrimental to the proper installation or performance of elevator work. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

3.2 INSTALLATION OF ELEVATOR SYSTEM

A. General: Comply with manufacturer's instructions and recommendations for work required during installation.

B. Install plunger-cylinder units plumb and accurately centered for elevator car position and travel; anchor securely in place.

C. Sound Isolation: Mount rotating and vibrating elevator equipment and components on vibration absorption mounts, designed to effectively prevent transmission of vibrations to structure, and thereby eliminate sources of structure-born noise from elevator system.

D. Lubricate operating parts of systems, including ropes, if any, as recommended by manufacturer.

E. Alignment: Coordinate installation of hoist way entrances with installation of elevator guide rails, for accurate alignment of entrances with cars. Where possible, delay final adjustment of sills and doors until car is operable in shaft. Reduce clearances to minimum, safe workable dimension at each landing.

F. Leveling Tolerance: ½", up or down, regardless of load and direction of travel.

G. Grout sills with non-staining, non- shrinking grout. Set units accurately aligned with and slightly above finished floor at landings.

H. Paint all surfaces of the cab and hoist way components which will be exposed to view as well as all equipment and material which is attached to the inside face of the hoist way wall. Color to be selected by architect.

3.3 ACCEPTANCE TESTING

Before permitting use of elevator (either temporary or permanent), perform acceptance tests as required and recommended by code and by governing regulations or agencies.

3.4 PROTECTION

At time of substantial completion of elevator work (or portion hereof),provide suitable protective coverings, barrier, devices, signs or such other methods or procedures to protect elevator work from damage or deterioration. Maintain protective measure throughout remainder of construction period.

3.5 INSTRUCTION AND MAINTENANCE

A. Instruct owner's personnel in proper use, operations and daily maintenance of elevators.

Review emergency provisions, including emergency access and procedure to be followed at time of failure in operation and other building emergencies. Train owner's personnel in normal procedures to be followed in checking for sources of operational failures or malfunctions. Confer with owner on requirements for a complete elevator maintenance program.

B. Make a final check of each elevator operation, with owner's personnel present and just prior to date of substantial completion. Determine that control systems and operating devices are functioning properly

C. Continuing Maintenance: Installer shall provide a continuing maintenance proposal to owner, in the form of a standard yearly (or other period) maintenance agreement, starting on date construction contract maintenance requirements are concluded. State services, obligations, conditions and terms for agreement period, and for renewal options.

END OF SECTION 14200

SECTION 21 20 00
FIRE EXTINGUISHERS, CABINETS AND ACCESSORIES

PART 1 - GENERAL

1.1 SCOPE

A. "Fire extinguishers" as used in this section refers to units, which can be hand-carried.

B. Obtain products in this section from one manufacturer.

C. Coordination: Verify that fire extinguisher cabinets are sized to accommodate fire extinguishers.

D. Provide new portable fire extinguishers, which bear UL "Listing Mark" for type, rating, and classification of extinguisher indicated.

1.2 SUBMITTALS:

Product Data: Submit product data for each type of product included in this section. For fire extinguisher cabinets include roughing-in dimensions and details showing mounting methods, relationships of box and trim to surrounding construction, door hardware, cabinet type and materials, trim style and door construction, and panel style and materials.

1.3 ACCEPTABLE MANUFACTURERS:

Available Manufacturers: Subject to compliance with requirements, manufacturers offering products, which may be incorporated in the work to include, but are not limited to, the following:

J.L. Industries.
Larsen's Mfg. Co.
Johnson-Lee, Division of W.F. Lee Corp.
Muckle Manufacturing, Division of Technico, Inc.
Watrous, Inc.

PART 2 - PRODUCTS

2.1 FIRE EXTINGUISHERS

A. General: Provide fire extinguishers for each extinguisher cabinet and other locations indicated, in colors and finishes selected by Architect from manufacturer's standard, which comply, with requirements of governing authorities.

B. Fill and service extinguishers to comply with requirements of governing authorities and manufacturer's requirements.

2.2 FIRE EXTINGUISHER CABINETS

A. General: Provide fire extinguisher cabinets where indicated, of suitable size for housing fire extinguishers of types and capacities indicated.

B. Construction: Manufacturer's standard enameled steel box, with trim, frame, door and hardware to suit cabinet type, trim style, and door style indicated. Weld all joints and grind smooth. Miter and weld perimeter doorframes.

C. Cabinet Type: Suitable for mounting conditions indicated, of the following types:

D. Fully Recessed: Cabinet box (tub) fully recessed in wall.

E. Trim Style: Fabricate trim in one piece with corners mitered, welded and ground smooth.

F. Trimless with Hidden Flange: Of design where trim consists of perimeter flange of same metal and finish as box (tub) which overlaps surrounding wall finish and which, in turn is concealed from view by an overlapping door.

G. Door Material and Construction: Manufacturer's standard door construction, of material indicated, coordinated with cabinet types and trim styles selected.

H. Stainless Steel: Manufacturer's standard door construction, fabricated from austenitic stainless steel complying with ASTM A 167, for AISI Type 302/304 alloy.

I. Door Glazing: Clear glass, class 1 (transparent) Tempered float glass complying with FS DD-G-1403, grade B, style I, type I, quality q3.

J. Door Hardware: Provide manufacturer's standard door operating hardware of proper type for cabinet type, trim style, and door material and style indicated. Provide either lever handle with cam action latch, or door pull, exposed or concealed, and friction latch. Provide concealed or continuous type hinge permitting door to open 180 deg.

2.3 FACTORY FINISHING OF FIRE EXTINGUISHER CABINETS

A. General: Comply with NAAMM "Metal Finishes Manual" for finish designations and application recommendations except as otherwise indicated. Apply finishes in factory after products are assembled. Protect cabinets with plastic or paper covering, prior to shipment.

B. Stainless Steel Finish: AISI No. 4 polished finish. Furnish with paper masking to protect finish.

PART 3 - EXECUTION

3.1 INSTALLATION

A. Install items included in this section in location indicated at a height to comply with regulations of governing authorities.

B. Prepare recesses in walls for fire extinguisher cabinets as required by type and

size of cabinet and style of trim and to comply with manufacturer's instructions.

C. Securely fasten mounting brackets and fire extinguisher cabinets to structure, square and plumb, to comply with manufacturer's instructions.

3.2 IDENTIFICATION

A. Identify existence of fire extinguisher in cabinet with lettering spelling "FIRE EXTINGUISHER" applied to door by silkscreen process. Lettering to be 1" high white "Helvetica" Bold, reading vertically – spacing to align with glass height.

END OF SECTION 21 20 00

SECTION 22 40 00
PLUMBING

Pipe and pipe fittings:
A. Domestic (potable) water (cw/hw) piping: system design pressure = 80 psig. Piping 2" and smaller shall be schedule 40 CPVC tubing.
B. Domestic (potable) water (cw/hw) piping: system design pressure = 80 psig. Piping 2-1/2" and larger shall be schedule 80 CPVC tubing.
C. Sanitary (w) and vent (v) piping: all piping shall be schedule 40 PVC and foam core above ground.
D. Condensate drain (d) piping: system design pressure = 10 psig. Provide schedule 40 PVC.
E. Storm water (sw) and rail leaders (rl): system design pressure = 10 psig. All piping shall be schedule 40 PVC.

Valves:
A. Ball valves: potable water service sizes 1/2" - 2" shall be glue type suitable for use in schedule 40 CPVC piping systems. For piping systems over 2" use glue type fittings suitable for use in schedule 80 CPVC systems. All main shut off valves shall be full open port type valves.
B. Drain valves: potable water service sizes 1/2" and 3/4" shall be glue type suitable for use in schedule 40 CPVC systems.
C. Backflow presenters specifications are based on watts 909 series with 909ag air gap. Provide at locations in which the public water supply system must be protected. Materials of construction - epoxy coated cast iron body, bronze test cocks, rubber discs, bronze seat and disc holder, double check assembly with relief drain assembly. Pipe relief to either a floor drain sized to twice the backflow size or pipe outdoors to area that will not cause a hazard (ie onto sidewalks, parking spaces, etc.)
D. Combination thermal expansion valves: potable water services size 3/4" shall include built-in relief protection from water pressure that exceeds 125 psi. Each valve shall be full port construction, bronze ASTM b-684 body, electrolyses nickel plated ASTM b-16 or b124 brass ball, blowout proof ASTM b-16 brass stem, virgin ptfe seats, ptfe stem packing and stem thrust bearing. Viton relief ball and 302 stainless steel relief spring. Valves specifications are based on watts series brv.

Pipe insulation:
A. Closed cell elastomeric (pipe sizes up to 5 inches): flexible elastomeric, closed cellular, tubular molded to accommodate piping, smooth outer surface suitable for painting with vinyl lacquer type coating, water resistant, nonabsorbent, ozone resistant, minimum density of 4 lb/cf, maximum conductivity per 1" thickness of 0.27 at 75 f mean temperature

Applications:
1. Domestic hot and cold water (all sizes) on all exterior wall piping or in unconditioned spaces only: provide 1/2" closed cell elastomeric.
2. Floor drains or open site drains receiving AHU condensate: insulate p-trap with 1/2" closed cell elastomeric insulation.

Heat trace: provide heat tracing at 5 watts per foot in all areas where piping is subject to freezing.

Plumbing fixtures: all plumbing fixtures and trim shall be new as manufactured by firms regularly engaged in the manufacture of plumbing fixtures, and trim of type, style and configuration required, whose products have been in satisfactory use and similar service.

B. Provide protection of all fixtures during construction from damage. Each water supply connection serving a fixture shall be equipped with an accessible stop valve. Caulk all gaps in

around walls/floors and the plumbing fixtures. Specifications for the plumbing fixtures are based on the following types.

C. Fixtures: provide indicated types and quantities of fixtures.
P-1: water closet (residential area) - Vortens model 3208-3436 dual flush round front high-efficiency toilet. High-gloss vitreous china-durable, nonporous construction. 1.6/1.1 gallons per flush capacity. Meets ANSI/ASM a112.19.2-2003. Provide with Centoco molded wood seat (white).
P-1a (ADA): water closet (residential area) - Vortens model 3123-3436 dual flush elongated front high-efficiency toilet. High-gloss vitreous china-durable, nonporous construction. 1.6/1.1 gallons per flush capacity. Meets ANSI/asme a112.19.2-2003. Provide with centoco molded wood seat (white).
P-1b (ADA): water closet (commercial area) - American Standard model 2898.012 cadet elongated toilet, vitreous china, white, 1.6 gallons per flush, with Church model 295c solid plastic seat.
P-2: lavatory - Vortens model 3521 oval drop-in lavatory, with 4" basin. Provide with American Standard model 2175.200 Colony single control lavatory faucet with pop-up drain.
P-2a (ADA): lavatory - Vortens model 3521 oval drop-in lavatory, with 4" basin. Provide with American Standard model 2175.200 Colony single control lavatory faucet with pop-up drain. Provide with trap wrap.
P-2b: lavatory - American standard model 0321.026 Declyn wall hung lavatory, 6" deep bowl. Provide with American standard model 2175.200 Colony single control lavatory faucet with pop-up drain.
P-2c (ADA): lavatory - American standard model 0321.026 Declyn wall hung lavatory, 6" deep bowl. Provide with American standard model 2175.200 Colony single control lavatory faucet with pop-up drain. Provide with trap wrap.
P-3: tub/shower - Maax Aker model ts-3060 smooth wall tub/shower with 16" apron, wall surround, textured floor patter, one-piece, gel-coated fiberglass and above floor rough-in. Provide with temptrol ii tub and shower system model bp-56-2. Tub/shower shall be suitable for use with wall reinforcement for possible future grab bars. Reinforcement to be by general contractor within wall.
P-3a (ADA): Maax Aker model bfts-3360/rf with factory-installed reinforcement with both horizontal and vertical grab bars and above floor rough-in. Provide with folding seat package. Single piece with gelcoated fiberglass. Provide with temptrol ii shower system with hand spray model bp-56-300b30-v.
P-3b: shower - Maax Aker model s-36, 36x36 single piece shower with wall surround, textured floor patter, gelocated fiberglass. Provide with temptrol ii tub and shower system model bp-56-1.
P-3c: shower (ADA) - 36"x60" barrier free roll-in type shower compartment, single piece, gelcoated, with both horizontal and vertical grab bars. Provide with folding seat. Provide with temptrol ii shower system with hand spray model bp-56-300b30-v.
P-4: kitchen sink - Dayton Kingsford model k23322 double bowl stainless steel sink, 6" bowl depth, formed of #23 gauge stainless steel, top mount, raised faucet deck. Provide with american standard colony single control faucet, model 4175.203 with handspray. Provide with tailpiece for dishwasher connection and disposal. Disposal to be equal to sink guard model se150, 1/3 hp, corrosion resistant composite hopper with cast stainless steel anti-jam swivel impellers.
P-4a (ADA): kitchen sink - Dayton model ge23321 double bowl stainless steel sink, 5-3/8" bowl depth, formed of #23 gauge stainless steel, top mount, raised faucet deck. Provide with american standard colony single control faucet, model 4175.203 with handspray. Provide with tailpiece for dishwasher connection and disposal. Disposal to be equal to sink guard model se150, 1/3 hp, corrosion resistant composite hopper with cast stainless steel anti-jam swivel impellers.

P-4b (ADA): kitchen sink - Dayton model ge23321 double bowl stainless steel sink, 5-3/8" bowl depth, formed of #23 gauge stainless steel, top mount, raised faucet deck. Provide with american

standard colony single control faucet, model 4175.203 with handspray. Provide with tailpiece for dishwasher connection and disposal. Disposal to be equal to sink guard model se150, 1/3 hp, corrosion resistant composite hopper with cast stainless steel anti-jam swivel impellers.
P-5 (ADA): Elkay high/low model ezstl8c barrier-free water cooler. Self-contained, wall hung, electric refrigerated water cooler. Self-closing, easy touch controls on front, left and right of each unit. Galvanized steel chassis, stainless steel basin, upper and lower shroud.
P-6 (ADA): mop sink - fiat products molded stone laundry tubs model fl-1. Floor mounted on white baked enamel steel angle legs. Provide with chrome plated faucet, deck mounted.

Electric water heater - fully insulated baked enamel steel jacket, insulated in conformance with ASHRAI 90a-1980 standard for electric domestic water heater, glass lining, relief valve tap, heat traps, rated for 150 psi. Plated copper element, low watt density, replaceable immersion type. Provide with relief valve and factory packaged control wiring.
Ewh-1 - 40 gallon 4.5 kw dual element water heater. Heater shall be "short" construction. Provide with 3/4" temperature and pressure relief valve. Specification based on ruud model pe2s-40-2.
Ewh-2 - 20 gallon 4.5 kw dual element water heater. Heater shall be "short" construction. Provide with 3/4" temperature and pressure relief valve. Specification based on ruud model pe2s-20-2.
Ewh-3 - 10 gallon 4.5 kw single element water heater.provide with 3/4" temperature and pressure relief valve. Specification based on ruud model
Pep-10-1.

Booster pump (BP) - packaged domestic water booster system with structural base, pumps, motors, pressure reducing valves, check and isolation valves, suction and discharge headers, control panel, and all necessary interconnecting piping. Provide with single point power connection, type l copper headers, and centrifugal, close-coupled, single-stage, end suction pumps. Booster system specification based on bell and gossett model 70e-2bb series dual booster system. System to maintain a leaving pressure of 80 psi.

Trench drain system - pre-engineered surface drainage system - fabricated of polyester polymer concrete, 6" wide, pre-sloped radius channels, interlocking joints, slotted steel grate suitable for vehicle traffic, provide with outlet piece and PVC adapter. Based on abt incorporated polydrain drainage system.

FD: floor drains - provide floor drain sizes as indicated on drawings. Floor drains shall be supplied with nickel bronze adjustable tops. Specification based on Sioux Chief Finish Line series 834 floor drains. Provide drains subject to evaporation with a trap primer.
FCO: provide sizing as indicated on the drawings. Specification
Based on Sioux Chief finish line series cleanouts with nickel bronze adjustable tops. Match materials of construction for body type.
WCO: provide chrome plated cover for sanitary test tee at all indicated locations.
WB-1: washing machine box (plastic): recessed double drain field installed air admittance valve. Specification based on ips water-tight washing machine boxes.
IM-1: refrigerator box (plastic) recessed outlet box with integral water hammer arrestor.
IM-2: fire rated refrigerator box (plast) recessed outlet box with integral water hammer arrestor.

HB: hose bib - wall faucet with anti-siphon vacuum breaker, EPDM packing, and adjustable brass nut. Specification based on woodford model 24.

WH-1: wall hydrant - specification based on Woodford model 65, freezeless wall hydrant, with integral anti-siphon vacuum breaker, tee key, wall clamp, and valve. Provide drain connection under hydrant to drain supply line down during periods of very cold weather.

SP: sump pump - submersible type, basin mounted, corrosion resistant, stainless steel motor

casing and fasteners, heavy duty ball bearing construction, stainless steel shaft, built-in vertical float style switch, and 1-1/2" discharge connection. Specification based on goulds pumps model sp025v.

On SP-2 provide with recessed sump basin and lid.

AWB: automatic air vent wall box - wall box specification is based on Studor model #39010, with metal grille face for air ventilation, recessed plastic wall box. Install required AAV within AWB.

BWV: backwater valve - specification based on model b05, schedule 40 PVC with threaded access cover, flapper and cover with elastomeric gasket for water tight seal.

Oil minder system: provide each sump pump with a Stancor oil-minder system. Each system to have a NEMA 4x weather tight corrosion resistant enclosure, SS sensor probe, direct plug-in power source, alarm, light, and remote monitoring circuit. Provide with 50 ft of cable for ease of installation. Coordinate location of system with electrical engineer and installer. Plumbing subcontractor to provide system and install pump. Electrical subcontractor to install all wiring and remote control box. Plumbing contractor to submit code modification form to city for use of oil minder system.

Miscellaneous plumbing items:
1. Water hammer arrestors (WHA): pre-charged hard drawn copper shock absorber with brass piston. Designed to operate up to 150 psi working pressure.
2. Trap primer (TP): provide a trap primer at all opensite and floor drains subject to evaporation. Trap primer specifications are based on mifab m-500 pressure drop activated trap seal primer.
3. Automatic air vents (AAV): all AAVs used with WB's shall be by
Oatey (substitution by approval only due to installation instructions of materials used). All other AAVs may be either Oatey or Studor.
4. All apartment domestic water shut off valves will be located in an easily accessible location. Preferred location is just inside mechanical room door within arms reach of an average height person.
5. Identify all main shut off valves by tagging each.
6. Contractor to run all piping (domestic water, sanitary, and storm) concealed within apartments. Piping to be run within either wall cavities, dropped ceiling spaces, or within floor joist.
7. All branch connections to main shall be 10 pipe diameters down stream of any stack connection to main.
8. Provide WHA’S on all connections serving dishwashers.

END OF SECTION

SECTION 23 08 00
HVAC

Welding, cutting or burning: the contractor shall provide the owner a minimum of 72 hours advance notice prior to performing any welding, cutting or burning within the building. No welding, cutting or burning shall occur without general contractor approval. Where welding, cutting or burning is necessary, non-combustible shields shall be used and suitable fire extinguishing equipment shall be maintained nearby.

Fabrication of steel supports: fabricate from steel angles, channels or plates in accordance with ASTM.

A. Ductwork:
1. All rectangular low velocity ductwork shall be hot rolled steel continuously annealed and hot dipped galvanized sheet or coil, minimum g-90, 0.90 oz/sf coating suitable for forming without flaking or peeling, suitable for welding or soldering. Zinc coating shall not be impaired from double seaming, breaking or roll forming. 14 ga. And lighter conforming to ASTM a 527. 13 ga and heavier conforming to ASTM a 526.
2. All duct sizes shown on plans are inside clear (airflow) dimensions.
3. All 90 elbows shall be hard ducted.
4. Insulated round flexible ductwork shall be suitable for low pressure applications of not less than 3" w.c., factory fabricated. Maintain a low velocity through ductwork.
5. Provide all hangers and supports as required.
6. Round low velocity supply air ductwork shall be beaded snaplock galvanized steel.
7. Round bathroom exhaust air run within floor joist shall be aluminized flexible ductwork except where penetrations through fire rated partitions occur. The ductwork at the penetration shall be beaded aluminum ductwork.
8. Round dryer exhaust ductwork shall be beaded snaplock. From dryer to dryer box connection the contractor may use aluminum flexible ductwork.

Schedule:

System	Section	Max. Pressure
Supply	AHU t0 grille	2" pos.
Return	all return	2" neg.
Exhaust	all exhaust	2" neg.

B. Insulation:

1. Blanket fiberglass: flexible fibrous glass, flame retardant factory laminated foil- skrim-kraft (fsk) vapor barrier, 2" stapling flange, maximum vapor permeance of .02 perm/in., minimum density of 1.0 lb/cf, maximum conductivity per 1" thickness of .28 at 75°f mean temperature. Based on Knauf duct wrap.

2. Rigid fiberglass: resin bonded fibrous glass, flame retardant, facotry applied all service jacket vapor barrier, maximum vapor permeance of 0.02 perm/in and puncture resistance of 50 units, minmum desnity 3 lb/cf maximum conducitivity per 1" thickness of 0.23 at 75°f mean termperature.

3. Closed cell elastomeric (small pipe sizes up to 5 inches): flexible, elastomeric, closed cellular, tubular molded to accommodate piping, smooth outer surface suitable for painting with vinyl lacquer type coating, water resistant, non- absorbent, ozone resistant, minimum density of 4 lb/cf, maximum conductivity per 1" thickness of .27 at 75°f mean temperature. Based on armstrong ap armaflex and self-seal armaflex 2000.

Supply ductwork:

concealed	1-1/2" 1# density blanket.
outdoor	2" 1# density blanket w/ weatherproof jacket

Return ductwork:

concealed	1-1/2" 1# density blanket.
outdoor	2" 1# density blanket w/ weatherproof jacket

Outside air

outdoor	2" 1# density blanket w/ weatherproof jacket

Exhaust ductwork: no insulation required
Insulation: (based on Knauf)

C. Pipe insulation:

1. Refrigerant: closed cell elastomeric or foamglass for suction lines on all hp's and cu's.

D. Pipe and pipe fittings:

1. Refrigerant piping (rs/rl): system design pressure - 300 psig. Piping 2" and smaller use type acr hand drawn copper tubing ASTM b88, ANSI h23.1 or manufactured line sets.
2. Condensate drain piping (d): schedule 40 PVC.

E. Electrical heaters:

1. Unit heaters - wall/ceiling mounted electric unit heater: horizontal mounting from either ceiling or wall. Finned tubular heating elements with built-in thermal cutouts. Provide with thermostat. Disconnect by div 16 electrical contractor.

2. Wall heaters - heavy duty, finned tubular heating elements and tamper proof grille with built-in overheat protection disconnect and thermotsat. Provide with surface mounting sleeve.

F. Fans:

1. Ceiling mounted exhaust fans (bathrooms): fans shall have steel fan construction with galvanized steel housing. Provide with backdraft damper and eggcrate ceiling grille.

2. Inline centrifigal exhaust fans: constructed of galvanized steel housing with aluminum wheel, service panels, inlet and outlet collars, hanging vibration isolators, and backdraft damper. Disconnect and motor started provided by electrical. Fans mounted in the garage with no duct attached shall include screened outlets.

3. Roof mounted exhaust fans: constructed of spun aluminum hood, aluminum wheel and galvanized steel frame, non-overloading backward inclined wheel, belt driven, 12" high roof curb, and backdraft damper. Disconnect and motor started provided by electrical.

4. Dryer booster fan (dbf): inline booster fan, prewired and supplied with mounting bracket, ul listed, suitable for airstream temperatures up to 140°f. Provide with db10 pressre switch, which senses positive pressure within dryer exhaust and activates fan. Provide independant circuit for booster fan, do not connect to dryer circuit. Booster fan provided withi integral delay-on-breaker timer in the switdh which will cycle the fan on for intervals of 10 minutes when positive pressure is detected in the ductwork. All fans to be provided with dryer lint trap due to installation of fans within 15 feet of dryer.

a. Dryer lint trap - secondary lint trap flush mounted within wall cavity at all locations in which dryer booster fans are provided.

5. Propellar supply fans: fan panels shall be galvanized steel, aluminum blade propeller. Provide with wall housing, galvanized weather hood with bird screen, closure angles, tefc motor,

direct drive, and 1-way diffuser. Fans to be mounted flush to exterior with the fans on the inside of the building.

G. Louvers:

1. Galvanized steel epoxy painted (coordinate color with owner) louvers with drainable blades and birdscreen. Frame depth shall be 4 inches. Max intake velocity shall not exceed 600 fpm, outlet velocity shall not exceed 750 fpm. Specification based on ruskin model elf375dx 4" deep with 54% free area. Provide with birdscreen and integral flange.

H. Smoke dampers:

1. Provide smoke dampers at locations indicated. Dampers to meet NFPA standards 90a, 92a, 92b, and 101. Specification based on Greenheck model smd-23 with steel blades, galvanized steel frame and blades, damper actuator. Damper to be tied into building smoke alarm system (by fire alarm).

I. Split systems:

a. Indoor air handling unit (AHU): compact and sturdy cabinet is protected with a durable finish and insulated to prevent sweating. Provide with aluminum fin coils and electric heaters. Provide float switch on condensate overflow connection. Provide with non-programable digital room thermostat. For units mounted in apartments provide a supply and return plenum. Line with 1" insulation for sound dampening.

B. Outdoor heat pump (hp): constructed of pre-painted steel, internally protected hermetic compressor with internal discharge line solid core filter drier, crankcase heater, and hardstart kits (for units with refrigerant line lengths over 100 ft). Condenser coils constructed of copper tubing and enhaced aluminum coils. Compressor to be internally protected against high pressure, temperature, and externally by a factory installed high pressure switch. Provide removable access panel to electrical box. Furnish fully charged and factory wired. Unit shall operate with r-410a. Provide with 5-year limited parts warrantee and 5-year limited compressor warrantee.

C. Outdoor condensing units (cu): constructed of pre-painted steel, internally protected hermetic compressor with internal discharge line solid core filter drier, crankcase heater, and hardstart kits (for units with refrigerant line lengths over 100 ft). Condenser coils constructed of copper tubing and enhaced aluminum coils. Compressor to be internally protected against high pressure, temperature, and externally by a factory installed high pressure switch. Provide removable access panel to electrical box. Furnish fully charged and factory wired. Unit shall operate with r-410a. Provide with 5-year limited parts warrantee and 5-year limited compressor warrantee. If indoor units are not ul listed with internal coils then provide an externally mounted coil section.

d. Mount roof mounted outdoor units on 4x4 pressure treated boards with 1/2" neoprene pads. Support refrigeration pipe every 5 ft.

J. Fire dampers: curtain type with blades out of the airstream (high hat type) with 1-1/2" hour ul ratings approved for use in 2 or 3 hour rated walls as indicated. Provide with fusible link and closure spring for use in vertical ductwork (horizontally mounted). Dampers mounted in the horizontal position to be dynamic type.

K. Dryer vent boxes: all dryer exhaust hook ups shall be within a dryer vent box. Vent box specification based on In-o-vate Technologies model 350. 22 gauge aluminized steel and oval top port.

L. Packaged rooftop units (RTU): packaged roof mounted heat pump, factory-assembled, horizontal discharge, constructed of g90 galvanized steel, with exterior surfaces coated with non-

chalking, powered paint finish, condenser coil guard, double inlet forward curved type evaporator fan with 5 speed design, outdoor fan shall be direct-driven propeller type with aluminum blades, full perimeter base rails, a minimum of 3/4" thick, aluminum, foil faced insulation. Compressors shall be fully hermetic type, direct drive, internally protected with internal high-pressure relief and over temperature protection and shall have internal isolation and sound muffling. Evaporator and condenser coils shall have aluminum plate fins, direct expansion, draw-thru design. Refrigerant circuit and safety components shall include: TXV's, solid-core filter dryer, accessible service gauge connections, provide at least 10°f of liquid sub-cooling, suction line accumulator and automatic reversing valve. Provide units with electric heating section, wired for single point power supply, manual outdoor air damper, non-programmable thermostat, low ambient kit, and roof curb.

M: ductless split: indoor unit - wall mounted, automatic fan speed, quiet operation, cool ambient cooling, auto restart, auto changeover.
Outdoor unit - six year warranty on compressor. Specification based on Mitsubishi Mr. Slim.

Ductless split units require independent power wiring routing from other conduits.

N. Grilles, diffuser, registers: provide make and models that match the performance characteristics of the types indicated on the schedule. GC to cut openings in doors for door grilles. Provide GC grilles to GC for a template.

O. Roof mounted inlet/outlets: gravity intake/relief ventilator, aluminum construction, provide with roof curb and gravity damper.

END OF SECTION

SECTION 26 00 00
GENERAL PROVISIONS, ELECTRICAL

RELATED DOCUMENTS:

Drawings and general provisions of the contract, including General Conditions and Supplementary Conditions and Division I specification sections, apply to the work specified in this section.

CODES:

All work shall be done in strict accordance with all rules and regulations of the 2002 National Electrical Code.

INTENT:

It is the intent of the specifications and drawings to call for complete and finished work, tested and ready for operation.

Any apparatus, appliance, material or work not shown on drawings but mentioned in the specifications, or vice versa, or any incidental accessories necessary to make the work complete in all respects and ready for operation, even if not particularly specified, shall be furnished, delivered and installed by the Trade without additional expense to the Owner.

Minor details not usually shown or specified, but necessary for proper operation, shall be included.

INSTRUCTIONS TO BIDDERS:

Bidders are expected to examine drawings relating to work of all trades and become fully informed as to the extent of work required and its relation to all other work of other trades.

Bidders shall visit the site of the proposed work to familiarize themselves with existing conditions. Claims as the result of failure to do so will not be considered by the Owner.

SHOP DRAWINGS AND LISTS OF MATERIALS:

As soon as practicable after award of contract, the Trade shall submit to the Architect for approval six (6) copies of a list giving the brand or make of all materials to be used on the project. In addition, six (6) copies of shop drawings, manufacturer's descriptive literature, catalog data or such other data as will clearly show that the equipment offered will meet the requirements of the specifications shall be submitted for the equipment items and systems as called for hereinafter.

Approval of the above shall in no way be construed as relieving the Trade of complying with the drawings and specifications.

If material or equipment is installed before it is approved, the Trade shall be liable for its removal and replacement at no extra charge to the Owner, if, in the opinion of the Architect, the material or equipment does not meet the intent of the drawings and specifications.

SUBSTITUTIONS:

Any change in any phase of the work of this or other trades created by substitutions in any piece of equipment for that specified shall be the financial responsibility of this Trade. The Owner will not

consider any claim for extra compensation as a result, direct or indirect, of said substitution. See Architect's General Conditions regarding substitu-tions.

PRICE BREAKDOWN:

Within 30 days after award of Contract, the Trade shall submit a breakdown of his contract price to the Architect to facilitate checking of requisitions for payment.

DRAWINGS AND LAYOUT OF THE WORK:

The drawings are diagrammatic only and do not necessarily show all offsets and connections, but show in general, runs and locations only. The Trade shall make all necessary field measurements and assume responsibility for their accuracy.

In laying out the work, reference shall be made to drawings of other trades in order to avoid interferences. If this requirement is not fulfilled and any conflicts develop concerning allocation of space, the Architect reserves the right to order rearrangement of the work of other trades or for proper execution of the work.

If directed by the Architect, the Trade shall, without extra charge, make reasonable modifications in the layout as needed to prevent conflict with work of other trades or for proper execution of the work.
AS-BUILT DRAWINGS:

This Trade shall keep a record of any revisions made from the contract drawing and at completion of the job provide the Architect with a set of marked-up "as-built" prints indicating these revisions. See Architectural specifications.

INSERTS AND OPENINGS:

The layout for such items as chases, sleeves, openings and inserts shall be arranged for in advance of construction of the work and shall be directed and superintended to see that same is carried out without unnecessary cutting of the building. Any damage that may be done to the building by the Trade's failure to provide the necessary chases, openings, sleeves and inserts in advance shall be repaired and made good at the Trade's expense so that the completed job will be uniform in appearance and will not show patching.

Where any work pierces waterproofing, including waterproof concrete and vapor barriers, the method of installation shall be as approved by the Architect before work is done. The Trade shall furnish all necessary sleeves.

INSTRUCTIONS:

Upon completion of all work and of all tests, the Trade shall furnish the necessary skilled labor and helpers for operating his system and equipment for a period of 24 hours or as otherwise specified. During this period, instruct the Owner or his representative fully in the operation, adjustment and maintenance of all equipment furnished. Give at least 48 hours notice to the Owner in advance of this period.

The Trade shall furnish the Architect four (4) complete bound sets of typewritten or blueprinted instructions including wiring diagrams for operating and maintaining all systems and equipment included in the contract. All instructions shall be submitted in draft, for approval, prior to final issue. Manufacturer's advertising literature or catalogs will not be acceptable for operating and maintenance instructions.

The Trade, in the above mentioned instructions, shall include the maintenance schedule for the principal items of equipment furnished under his contract. All shall be submitted 30 days prior to completion of work.

PERMITS AND INSPECTION:

This Trade shall be responsible for obtaining permits and arranging for all inspection by authorities having jurisdiction over the job.

MATERIAL AND WORKMANSHIP:

All materials and apparatus required for the work shall be new, of first class quality, bear Underwriter's Label, and shall be furnished, delivered, erected, connected and finished in every detail, and shall be so selected and arranged as to fit properly into the building spaces. Where no specific kind or quality of material is given, a first class standard article as approved by the Architect shall be furnished.

Each Trade shall furnish the services of an experienced superintendent who shall be constantly in charge of the installation of his work together with all skilled workmen, helpers and labor required to unload, transfer, erect, connect-up, adjust, start, operate and test and balance each system.

Unless otherwise specifically indicated on the drawings or specifications, all equipment and materials shall be applied with the approval of the Architect in accordance with the recommendations of the manufacturer. This includes the performance of such tests as the manufacturer recommends.

ACCESSIBILITY:

This Trade shall locate all equipment which must be serviced, operated or maintained in fully accessible positions. Equipment shall include, but not be limited to panels, controllers, switchgear, contactors, etc. If required for better accessibility, furnish access panels for this purpose.

CUTTING AND PATCHING:

All cutting of walls, floors, etc., for the passage and accommodation of pipes, conduits, ducts, flues, etc., and closing up of superfluous openings that may be caused by any work under this contract and the removing of debris, caused by said work, shall be performed by this Trade. No cutting of any walls, floors, roofs, or structural members shall be done until the condition of such cutting has been approved by the Architect and Superintendent of the General Contractor on the premises.

All material used for any patching, mending or finishing must conform to the class of material installed by the General Contractor.

All patching, mending and finishing must be done by this Trade, and if not performed satisfactorily, may be done by the General Contractor at the Trade's expense.

EXCAVATING AND BACKFILLING:

Mass excavation to approximate building levels will be carried out under the general specifications. The Trade shall, however, do all trench and pit excavating and backfilling required for his work inside and outside the building, including all required shoring, bracing, pumping, and all protection for safety of persons and property.

Excavation is unclassified and shall include the removal of earth as well as rock and all other obstructions where work is to be installed.

Underground conduit shall be supported for its entire length. Blocking up will not be permitted.

Contractor shall not disturb building foundations at any time.
After all items to be buried have been tested, inspected and approved, backfill with clean materials. Backfill material shall be free from trash and debris and shall contain sufficient moisture for proper compaction. Backfill shall be made in layers 8" deep and tamped well before covering with successive layers of material. Allow for shrinkage of fill by mounding earth over excavated area.

Secure any additional material required for backfilling operations.

DAMAGE TO OTHER WORK:

This Trade will be held responsible for all damage to other work caused by his work, or through the neglect of his workmen. All patching and repairing of damaged work shall be done by the Trade who installed the work, as directed by the Architect, but the cost of same shall be paid by this Trade.

FIELD MEASUREMENTS:

This Trade shall take all field measurements necessary for his work and shall assume responsibility for their accuracy.

PAINTING:

All surfaces of metal and other equipment shall be thoroughly cleaned of all scale, dirt and other refuse and left ready for painting by the General Contractor.

WEATHERPROOFING:

All equipment, switches, conduits, etc., exposed to the weather shall be completely weatherproof. This Trade shall furnish all gaskets, caulking, coverings, adhesives, etc., necessary to accomplish this end.

FIRESTOPS:

Conduits which pass between floors, or through firewalls and not enclosed within approved shaftways, shall be firestopped. Where such items pass through floors or walls in sleeves, the space between the items and the sleeves shall be firestopped.

GUARANTEE:

The Contractor guarantees, by his acceptance of the Contract, that all work installed will be free from any and all defects in workmanship and/or materials and that all apparatus will develop capacities and characteristics specified and that, if, during the period of one year, or as otherwise specified, from date of certificate of completion and acceptance of work, any such defects in workmanship, material or performance appear, he will, without cost to the Owner, remedy such defects within a reasonable time to be specified in notice from the Architect. In default thereof, Owner may have such work done and charge the cost to the Contractor.

END OF SECTION

SECTION 26 20 00
BASIC MATERIALS AND METHODS, ELECTRICAL

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of the contract, including General Conditions and Supplementary Conditions and Division I specification sections, apply to the work specified in this Section.

DESCRIPTION OF WORK:

The work covered by this section includes the furnishing of all labor, materials, equipment and services necessary for the installation of all electrical work together with all related items for the proper completion of the work and successful operation of the entire system, to the full intent and meaning of the plans and specifications.

The work shall include but not be limited to:

Complete lighting and power system and other systems.

Power wiring for heating, ventilating and cooling units and other equipment furnished by other trades and owner-furnished equipment.

SHOP DRAWINGS:

Furnish shop drawings, etc., as set forth in Section 01 33 00.

PART 2 - PRODUCTS

CONDUITS:

Electric metallic tubing shall be Thinwall conduit. Each length shall bear manufacturer's and underwriter's label.

Rigid conduit shall be heavy-wall hot-dipped galvanized of standard thickness and threaded ends. Each length shall bear the manufacturer's and underwriter's label.

Flexible conduit shall be approved type. Flexible conduit installed outdoors, in sump pits, mechanical equipment rooms, and other wet locations shall have a liquid-tight synthetic jacket over the flexible metal.

OUTLET AND JUNCTION BOXES:

Ceiling outlet boxes where conduit system is concealed shall be not less than 4" x 1-1/2" deep and shall have plaster covers. Boxes, where conduit is exposed shall be of such size as to provide a seat for fixture canopy. Boxes shall have only the holes necessary to accommodate the required conduits. Boxes for surface wiring in rigid conduit shall be S.E. series condulet, with cover plates to suit outlet.
Outlet boxes for receptacles and switches shall be standard gauge one-piece, of size required for the number of devices and wires to be installed, and shall have covers with rectangular openings of proper size and shape. Boxes and covers shall be galvanized and equal to those made by National Electrical Products, Appleton, RACO or Steel City.

Pull boxes shall be of code thickness sheet steel with surface or flush mounting trim as required.

CONDUIT FITTINGS:

All locknuts, bushings, straps and clamps shall be. Toggle bolts, expansion bolts, anchors, etc., shall be galvanized. Bushings shall be insulated type when required by N.E.C.

Conduit fittings for liquid-tight flexible conduit shall be liquid-tight connectors forming a perfect seal on plastic and sheathed conduit by means of plastic rings and integral tapered fitting body wedges.

Fittings for EMT shall be steel set screw or compression type.

CABINETS:

Cabinets used for pull-boxes, etc., shall be hinged cover.

CONDUCTORS:

All wiring shall be copper THW or THWN of the sizes shown on the drawings, and/or shall be so sized to equal or exceed the minimum requirements of the N.E.C. All conductors No. 8 and larger shall be multiple stranded.

Other conductors requiring special heat resistant insulation shall be provided as required.

Conductors shall be continuous from outlet to outlet with splices made only in pullboxes, junction and outlet boxes.

Wiring shall be color coded in accordance with the requirements of the National Electric Code.

Splices in conductors No. 10 and smaller shall be made with Ideal Wing-nut connectors. Splices in conductors No. 8 and larger shall be made with high compression fittings, utilizing a hydraulic press. All joints shall be taped to comply with the original insulation.

Ideal wire lubricant only may be used as lubricant where required for pulling wires and cables.

No wire smaller than No. 12 AWG shall be used except on control circuit.

Aluminum conductors of equivalent ampere capacity and joined with aluminum connectors may be substituted for copper conductors of size #1/0 and larger. Conduits must be sized as per National Electrical Code

WIRING DEVICES:

120 volt, 20 amp. duplex receptacle - Commercial grade.

Ground fault receptacle - Wiring devices to be specification grade by Hubbell, Leviton, Bryant, P&S, or Eagle. Cover plates to be satin finish stainless steel or as directed by architect.

Single-pole switch - Leviton #1201-2I (15 amp.), #5521-2I (20 amp.)

Three-pole switch - Leviton #1203-2I

Cover plates: satin finish stainless steel or as directed by architect.

SAFETY SWITCHES:

Furnish and install safety switches where shown on drawings and any other location if required by the National Electrical Code.

All safety switches shall be heavy duty, NEMA Type I enclosure with interlocking cover of size and fused as noted on drawings. Switches located outdoors shall be weatherproof.

PANELBOARDS:

Panelboards shall be Square "D", Eaton, Siemens, Cutlet Hammer, or G.E. and for flush or surface mounting type, voltage and size mains as shown on drawings. Panelboards shall contain the number of circuit breakers of capacity frame and poles as shown on drawings. Circuit breakers shall be quick-made, quick-break trip indicating and common trip on all multi-pole breakers. Trip indication shall be clearly shown on breaker handle taking a position midway between "on" and "off." Panelboards shall have distributed phase bussing throughout and each circuit and the bus to which it is connected shall be clearly and permanently identified by means of letters. Sides and end gutters shall be 4" minimum.

Cabinet box shall be made of code gauge commercial hot galvanized sheet steel, 14 gauge minimum. Front with door shall be made of sheet steel finish with light gray lacquer over rust inhibiting primer. Cabinet front shall have chromium plated flush pin type cylinder lock and catch. Directory with plastic shield and typewritten designation of circuits shall be fastened inside the door.

PART 3 - EXECUTION

GROUNDING:

Conduits and utilization equipment shall be permanently and effectively grounded in accordance with the standards prescribed by the latest rules of the National Fire Protection Association. A separate equipment ground wire shall be installed in all conduits.

WIRING METHODS:

All wiring shall be in conduit.

Type "MC" cable may be used for lighting and receptacles branch circuits when concealed in walls or above lay-in ceilings.

“NM” may be used with-in dwelling units.

E.M.T. shall be used for all other interior wiring.

Flexible metal conduit shall be used for short connections to equipment.

Rigid steel conduit shall be used where exposed to the weather.

Schedule 40 PVC or rigid steel shall be used below grade.

Circuiting on plans is diagrammatic and shall not be construed as actual routing of conduits.

All wiring shall be concealed except it may be exposed in Mechanical Equipment Rooms and Electrical Rooms or as noted on drawings.

WIRING FOR EQUIPMENT BY OTHERS:

Power wiring for equipment to be furnished and installed under other sections of the specifications shall be by this Trade.

Magnetic motor starters and control equipment, unless otherwise noted or a part of motor starter panelboards, will be furnished by the Trade furnishing the motor. All wiring between the starter and the motor shall be as shown on drawings.

Power for equipment furnished by Owner shall be by this Trade.

INSTALLATION OF CONDUITS AND BOXES:

Conduits shall be bent with an approved conduit hickey or by a conduit bending machine of approved design and by no other means. Factory made ells shall be used for all PVC conduit. Radii of bends shall conform to the National Electrical Code. No crushed or deformed conduit shall be used. Grouped conduits shall be parallel throughout the length of the run. Conducts shall be terminated securely at boxes, panel enclosures, runways, etc., with approved locknuts and bushings. All conduits and concrete boxes must be plugged and kept dry and clean. Conduits shall be supported securely at adequate intervals with approved clamps and hangers. Conduits, where stubbed through floors, shall be vertical and true so that floor tile may be fitted neatly around conduit and properly waterproofed.

Conduit sizes for branch circuits shall be as required by the National Electrical Code. Conduit sizes for feeders shall be as noted on the drawings.

All conduit shall be checked for cleanliness and obstructions before pulling in conductors. No oil, grease or soaps may be used for pulling in conductors.
Fish wires shall be installed and left in all empty conduits.

Boxes for ceiling and interior bracket light fixtures shall have fixture studs where required, which shall be centered in boxes and strongly secured.

All boxes shall rigidly attached to the building structure and shall be so set, except on unfinished ceilings and walls or where conduits run exposed, that the front edge of the box be flush with finished ceiling or wall line. Boxes, when located on columns or over doors, shall be set symmetrically.

The Trade's attention is called to outlets in block, brick or tile wall. Block, brick or tile shall be neatly fitted around boxes so cover plates will cover entire opening.

Outlet boxes shall be located where shown on drawings.

Where conductors No. 4 or larger enter a conduit in a pull-box, junction box or cabinet, the conductors shall be protected by an insulated bushing. If bushing is constructed wholly of insulation material, locknuts must be installed on both sides of enclosure.

CHARTS AND TESTS:

The electrical trade shall furnish the architect with a chart or layout showing routing of conduits as

installed with size of conductors and conduits used.

All systems shall test free from short circuits and grounds, shall be free from mechanical and electrical defects, and shall show an insulation resistance between phase conductors and ground of not less than that required by the National Electrical Code. Test all circuits for proper neutral connections.

NAMEPLATES:

Furnish and install nameplates of engraved laminated plastic having white letter on a black background. Nameplates shall be installed with chrome plated self-tapping screw on all starters, panelboards, contactors, safety switches, motor switches and push-button stations remote from starters. The size of the letters shall be not less than 1/4" for panelboards and 3/16" high for all other equipment.

PLACING IN SERVICE AND TESTS:

This Trade shall make all necessary tests, trial operation, etc., required and as directed by the Owner, to prove that all of the systems, equipment, etc., installed under these plans and specifications are in proper serviceable condition, and will function as intended. All costs of tests shall be borne by the Contractor.

When operating system and equipment for testing or any other purposes, the Trade shall be responsible for proper operation and damages resulting from improper operation.

This Trade shall cooperate fully with all factory representatives, service engineers and the Owner in making necessary changes for placing all of the apparatus, specialties, etc., in proper condition and operation shall bear the cost of such assistance.

MOUNTING HEIGHTS:

Switches - 4'0" above floor

Convenience Outlets - 18" above floor unless otherwise noted

Telephone Outlet Boxes - 18" above floor unless otherwise noted

Panelboards - 6'3" to top, where possible

END OF SECTION

SECTION 26 51 00
LIGHTING SYSTEM

PART 1 - GENERAL

RELATED DOCUMENTS:

Drawings and general provisions of the contract, including General Conditions and Supplementary Conditions and Division I specification sections, apply to the work specified in this section.

DESCRIPTION OF WORK:

Provide complete new lighting system.

SHOP DRAWINGS:

Furnish shop drawings, etc., as set forth in Section 16100.

PART 2 - PRODUCTS

LIGHTING FIXTURES:

Fixtures as listed in the schedule on drawings or approved equal shall be furnished and installed, including incandescent, H.I.D. or fluorescent lamps of wattage shown. The quantities and type shall be taken from the electrical plans. Where plans fail to set up the type, the Contractor shall furnish the required fixtures of the type set up in similar locations.

Fixtures shall bear Underwriter's labels and shall be wired with heat resistant approved wire.

Fluorescent fixtures shall be equipped with energy-efficient, ETL certified HPF Class "P" electronic ballast. All fluorescent lamps shall be energy-efficient, cool white, or warm white as selected by Architect,rapid start.

Hanging accessories shall include all channels, angles, rods, etc., as required to properly support the fixtures from the building structure. Fixtures shall be securely supported as per article 410-D of the National Electrical Code.

All ballasts shall be individually fused or internally protected.

The Electrical Subcontractor shall verify with the General Contractor the type of ceiling which will be used before ordering
all fixtures to insure compatibility with the ceiling types to be actually installed, including all trim and accessories.

All plastic lens specified for fluorescent troffers shall be of 100% virgin acrylic material of minimum 1/8" thickness, clear prismatic type.

All recessed fixtures installed in lay-in tile ceiling shall be provided with T-Bar lock clips.

PART 3 - EXECUTION

Install all lighting fixtures complete and ready for service in accordance with the fixture schedule.

Provide lighting fixtures connected to wiring system of building. Equip fixtures with glassware, reflectors, lamps, plaster rings, supports, hangers, and other accessories as required for installation in or on type of ceilings as supplied under other section of specifications and/or as necessary to complete installation ready for service.

Install all lighting fixtures, including those mounted in continuous rows, so that the weight of the fixtures is supported, either directly or indirectly, by a sound and safe structural member of the building, using adequate number and type of fastenings to ensure a safe installation. Screwed fastenings and toggle bolts through ceiling material or wall paneling are not acceptable.

Drawings show general location of all outlets as near as possible, but no outlet shall be installed until such locations have been coordinated with the General Contractor. Outlets must be fitted with approved supports for fixtures. Contractor shall provide any channels required to support fixtures between suspended ceiling structural components. All outlet boxes must be flush with finished surfaces where finished surfaces occur. Outlet box flush device covers shall be used to bring boxes flush with finished surface.

Fixtures shall be cleaned and relamped as needed at the time the building is turned over to the Owner.

END OF SECTION

SECTION 031 10 00
EARTHWORK

PART 40 - GENERAL

PART 2 - SUMMARY

PART 3 - This Section includes the following:

1. Preparing sub-grades.
2. Excavating and backfilling.
3. Drainage course for slabs-on-grade.
4. Sub-base course for concrete walks and pavements.
5. Base course for asphalt paving.

PART 4 - DEFINITIONS

PART 5 - Backfill: Soil materials used to fill an excavation.

PART 6 - Base Course: Layer placed between the sub-base course and asphalt paving.

PART 7 - Bedding Course: Layer placed over the excavated sub-grade in a trench before laying pipe.

PART 8 - Borrow: Satisfactory soil imported from off-site for use as fill or backfill.

PART 9 - Capillary Water Barrier: Layer supporting slab-on-grade used to minimize capillary flow of pore water.

PART 10 - Excavation: Removal of material encountered above sub-grade elevations.

6. Additional Excavation: Excavation below sub-grade elevations as directed by Architect. Additional excavation and replacement material will be paid for according to Contract provisions for changes in the Work.
7. Unauthorized Excavation: Excavation below sub-grade elevations or beyond indicated dimensions without direction by Architect. Unauthorized excavation, as well as remedial work directed by Architect, shall be without additional compensation.

PART 11 - Fill: Soil materials used to raise existing grades.

PART 12 - Structures: Buildings, footings, foundations, retaining walls, slabs, tanks, curbs, mechanical and electrical appurtenances, or other man-made stationary features constructed above or below the ground surface.

PART 13 - Sub-base Course: Layer placed between the sub-grade and base course for asphalt paving, or layer placed between the sub-grade and a concrete pavement or walk.

PART 14 - Sub-grade: Surface or elevation remaining after completing excavation, or top surface of a fill or backfill immediately below sub-base, drainage fill, or topsoil materials.

PART 15 - Utilities include on-site underground pipes, conduits, ducts, and cables, as well

as underground services within buildings.

PART 41 - PRODUCTS

PART 16 - SOIL MATERIALS

PART 17 - General: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.

PART 18 - Satisfactory Soils: ASTM D 2487 Soil Classification Groups [GW, GP, GM, SW, SP, and SM], or a combination of these group symbols; free of rock or gravel larger than [3 inches (75 mm)] in any dimension, debris, waste, frozen materials, vegetation, and other deleterious matter.

PART 19 - Unsatisfactory Soils: ASTM D 2487 Soil Classification Groups [GC, SC, ML, MH, CL, CH, OL, OH, and PT], or a combination of these group symbols.

PART 20 - Backfill and Fill: Satisfactory soil materials.

PART 21 - Sub-base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 90 percent passing a 1-1/2- inch (38-mm) sieve and not more than 12 percent passing a No. 200 (0.075-mm) sieve.

PART 22 - Base: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; with at least 95 percent passing a 1-1/2-inch (38-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

PART 23 - Bedding: Naturally or artificially graded mixture of natural or crushed gravel, crushed stone, and natural or crushed sand; ASTM D 2940; except with 100 percent passing a 1-inch (25-mm) sieve and not more than 8 percent passing a No. 200 (0.075-mm) sieve.

PART 24 - Drainage Fill: Washed, narrowly graded mixture of crushed stone, or crushed or uncrushed gravel; ASTMD 448; coarse-aggregate grading Size 57; with 100 percent passing a 1-1/2- inch (38-mm) sieve and 0 to 5 percent passing a No. 8 (2.36-mm) sieve.

PART 25 - Detectable Warning Tape: Polyethylene film warning tape encasing a metallic core, minimum 6 inches (150 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of the utility.

PART 42 - EXECUTION

PART 26 - PREPARATION

PART 27 - Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, freezing temperatures or frost, and other hazards created by earthwork operations. Provide protective insulating materials as necessary.

PART 28 - Provide erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways.

PART 29 - Prevent surface water and ground water from entering excavations, from ponding on prepared sub-grades, and from flooding Project site and surrounding area.

PART 30 - Protect sub-grades from softening, undermining, washout, and damage by rain or water accumulation.

PART 31 - EXCAVATION

PART 32 - Excavate to sub-grade elevations regardless of the character of surface and subsurface conditions encountered, including rock, soil materials, and obstructions.

1. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials.

PART 33 - Excavate for structures, pavements, and walks to indicated elevations and dimensions. Extend excavations for placing and removing concrete formwork, for installing services and other construction, and for inspections. Trim bottoms to required lines and grades to leave solid base to receive other work.

PART 34 - Excavate utility trenches to indicated gradients, lines, depths, and invert elevations of uniform widths to provide a working clearance on each side of pipe or conduit. Excavate trench walls vertically from trench bottom to 12 inches (300 mm) higher than top of pipe or conduit.

2. Excavate trenches deeper than bottom of pipe elevation, 6 inches (150 mm) deeper in rock, 4 inches (100 mm) deeper elsewhere, to allow for bedding course. Hand excavate for bell of pipe.

PART 35 - Proof roll sub-grades, before filling or placing aggregate courses, with heavy pneumatic-tired equipment to identify soft pockets and areas of excess yielding. Do not proof roll wet or saturated sub-grades.

PART 36 - Reconstruct sub-grades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities.

PART 37 - Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill may be used when approved by Architect.

3. Fill unauthorized excavations under other construction or utility pipe as directed by Architect.

PART 38 - Stockpile borrow materials and satisfactory soil materials, without intermixing, in shaped, graded, drained, and covered stockpiles. Stockpile soil materials away from edge of excavations and outside drip line of remaining trees.

PART 39 - BACKFILLS AND FILLS

PART 40 - Utility Trench Backfill: Place, compact, and shape bedding course to provide continuous support for pipes and conduits over rock and other unyielding bearing surfaces and to fill unauthorized excavations.

4. Place and compact initial backfill of satisfactory soil material or sub-base

material, free of particles larger than 1 inch (25 mm), to a height of 12 inches (300 mm) over the utility pipe or conduit. Place and compact final backfill of satisfactory soil material to final sub-grade.

5. Install warning tape directly above utilities, 12 inches (300 mm) below finished grade, except 6 inches (150 mm) below sub-grade under pavements and slabs.

PART 41 - Fill: Place and compact fill material in layers to required elevations.

PART 42 - Uniformly moisten or aerate sub-grade and each subsequent fill or backfill layer before compaction to within 3 percent of optimum moisture content.

6. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry unit weight.

PART 43 - Compaction: Place backfill and fill materials in layers not more than 12 inches (200 mm) in loose depth for material compacted by heavy compaction equipment, and not more than 4 inches (100 mm) in loose depth for material compacted by hand-operated tampers.

PART 44 - Compact soil to not less than the following percentages of maximum dry density according to ASTM D 698:

7. Under structures, building slabs, steps, and pavements, scarify and re-compact top 12 inches (300 mm) of existing sub-grade and each layer of backfill or fill material at 95 percent.
8. Under walkways, scarify and re-compact top 6 inches (150 mm) below sub-grade and compact each layer of backfill or fill material at 95 percent.
9. Under lawn or unpaved areas, scarify and re-compact top 6 inches (150 mm) below sub-grade and compact each layer of backfill or fill material at 90 percent.

PART 45 - Grading: Uniformly grade areas to a smooth surface, free from irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Grade lawns, walks, and unpaved sub-grades to tolerances of plus or minus 1 inch (25 mm) and pavements and areas within building lines to plus or minus 1/2 inch (13 mm).

PART 46 - Sub-base and Base Courses: Under pavements and walks, place sub-base course on prepared sub-grade. Place base course material over sub-base. Compact to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698

PART 47 - Under slabs-on-grade, place drainage course on prepared sub-grade. Compact to required cross sections and thickness to not less than 95 percent of maximum dry unit weight according to ASTM D 698.

PART 48 - FIELD QUALITY CONTROL

PART 49 - Testing Agency: Owner will engage a qualified independent testing and inspecting agency to perform field tests and inspections and to prepare test reports.

PART 50 - Allow testing agency to test and inspect sub-grades and each fill or backfill layer. Proceed with subsequent earthwork only after test results for previously completed work comply with requirements.

PART 51 - When testing agency reports that sub-grades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil to depth required; re-compact and retest until specified compaction is obtained.

PART 52 - PROTECTION AND DISPOSAL

PART 53 - Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris.

PART 54 - Repair and re-establish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction.

PART 55 - Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing.

PART 56 - Disposal: Remove surplus satisfactory soil and waste material, including unsatisfactory soil, trash, and debris, and legally dispose of it off Owner's property.

END OF SECTION

SECTION 31 20 00
EARTH MOVING

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

SCOPE: Provide all Top Soil and Fine Grading as specified herein.

REFERENCE STANDARDS: Comply with all applicable Federal, State and Local codes, safety regulation, and other referred to herein. In any conflict between referenced standards, the more stringent requirements shall govern.

GENERAL

a. Agreement: The contract and any contract change orders, the drawings and this section of the specifications with all addenda, together with Division 1: General Requirements, are all incorporated to form the contract documents and the Entire bases for agreement between Contractor and Contractor. No allowance will be subsequently made on behalf of the Contractor for errors due to his negligence in failing to acquaint himself with the contract documents and the site conditions or for his failure to determine the Owner's desired meaning and intentions on these contract documents before starting work.

b. Scope: Furnish all labor and equipment necessary and proper to complete spreading the top soil when shown on plane in planting areas and to bring the entire site including planting areas to finished grades and ready to receive landscaping. This Contractor will also find grade around all buildings for drainage purposes. This Contractor will also backfill and firmly compact behind all curbs on the project. All the top soil used for spreading will be available at the job site but only good soil free of all foreign matter, vegetation, debris, etc., will be used for spreading as approved by Architect. All remaining unusable material will be disposed of off the site by this Contractor.

c. Unit Price: Quote unit price based on dollars per cubic yard or usable top soil if it has to be brought in from outside to perform all or part of above work.

END OF SECTION

SECTION 03 21 00
PAVING

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

SCOPE: Complete all Paving Work as shown on civil engineering drawings and as specified herein.

MATERIALS: See Civil Engineering drawings for pavement specifications

END OF SECTION

SECTION 33 41 00
STORM UTILITY DRAINAGE PIPING

CONDITIONS OF THE CONTRACT and DIVISION 1, as indexed, apply to this Section.

SCOPE: Complete all Site Drainage and Utility Work as shown on civil engineering drawings and as specified here-in.

CONDITIONS AT SITE: Visit the site. Examine and note all conditions as to the character and extent of the Work involved.

PERMITS. ORDINANCES: Procure and pay for all necessary permits or certificates required by local authorities having jurisdiction over the Work. Comply with all Federal, State and Local ordinances applicable to the work.

GUARANTEE: Per GENERAL CONDITIONS.

COORDINATION: Coordinate the Work with the Various subcontractors whose work might be affected by operations.

GENERAL REQUIREMENTS: Generally, all requirements for laying out, shoring and or bracing, excavating, filling and protection of adjacent areas that are applicable to this Work shall be as specified in civil engineering drawings.

PUMPING: Provide and operate, at own cost, pumps or other equipment necessary to dram or deep excavations, pits and trenches free of water under all circumstances.

CLEAN-UP: A Conduct work in an orderly manner and so as not to create nuisance. Dirt shall not be permitted to accumulate on streets or sidewalks nor to be washed into sewers. B. On completion of Work, promptly remove from the site all excess material, and all equipment, leaving the site in a neat condition per GENERAL CONDITIONS.

END OF SECTION