PROPOSED
FIREHOUSE ADDITION & ALTERATION
HARRISON FIRE DISTRICT
206 HARRISON AVENUE
HARRISON, NY 10528

PREPARED FOR:

HARRISON FIRE DISTRICT
TOWN/VILLAGE OF HARRISON
206 HARRISON AVENUE
HARRISON, NY 10528

ARCHITECT:

SENDLEWSKI ARCHITECTS PC.
215 ROANOKE AVENUE
RIVERHEAD, NEW YORK 11901
(631) 727-5352
(845) 275-8859

GENERAL CONSTRUCTION
CONTRACT 20-04 GC

ISSUED FOR BIDDING: April 1, 2021

SPECIFICATIONS

DIVISION 2 – SITEWORK

SECTION 02060 - BUILDING DEMOLITION 1-4
SECTION 02150 - EXCAVATION & GRADING FOR BUILDING CONSTRUCTION 1-8
SECTION 02170 - BITUMINOUS PAVING 1

DIVISION 3 – CONCRETE

SECTION 03300 - CONCRETE & CEMENT WORK 1-15
SECTION 03400 – PRECAST CONCRETE PLANK 1-4

DIVISION 4 - MASONRY

SECTION 04200 - UNIT MASONRY 1-14

DIVISION 5 - METALS

SECTION 05120 - STRUCTURAL STEEL 1-4
SECTION 05210 - STEEL JOISTS 1-3
SECTION 05311 - STEEL FLOOR & ROOF DECKING 1-4
SECTION 05400 - COLD FORMED METAL FRAMING & DETAILS 1-15
SECTION 05510 - METAL STAIRS 1-4
SECTION 05521 - PIPE & TUBE RAILINGS 1-2

DIVISION 6 - WOODS AND PLASTICS

SECTION 06100 - ROUGH CARPENTRY 1-4
SECTION 06124 - NAILABLE FIRESTALL ROOF DECK 1-3
SECTION 06200 - FINISH CARPENTRY 1-3
SECTION 06400 - ARCHITECTURAL WOODWORK & PLASTIC LAMINATE WORK 1-3

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07160 - BITUMINOUS DAMPPROOFING 1-3
SECTION 07190 - MASONRY SEALANTS 1-2
SECTION 07213 - BOARD INSULATION AND BATT INSULATION 1-2
SECTION 07225 - EPS BOARD AND ROOF DECK INSULATION 1-3
SECTION 07270 - FIRE STOPPING 1-9
SECTION 07300 - ROOF SHINGLES 1-2
SECTION 07500 – MODIFIED BUTUMINOUS MEMBRANE ROOFING 1-12
SECTION 07620 - SHEET METAL FLASHING AND TRIM 1-4
SECTION 07715 - ALUMINUM GUTTER AND LEADER 1-3

SECTION 07900 - CAULKING AND SEALANTS 1-4

DIVISION 8 - DOORS AND WINDOWS

SECTION 08100 - METAL DOORS AND FRAMES 1-3
SECTION 08200 - FLUSH WOOD DOORS 1-2
SECTION 08305 - ACCESS PANELS 1-2
SECTION 08360 - UPWARD ACTING SECTIONAL DOORS 1-4
SECTION 08700 - FINISHING HARDWARE 1-3
SECTION 08730 - WEATHERSTRIPPING AND THRESHOLDS 1

DIVISION 9 - FINISHES

SECTION 09260 - GYPSUM BOARD SYSTEMS 1-6
SECTION 09311 - CERAMIC TILE FLOOR FINISH 1-4
SECTION 09312 - CERAMIC TILE WALL FINISH 1-3
SECTION 09330 - QUARRY TILE 1-4
SECTION 09400 – EPOXY FLOOR SYSTEM 1-6
SECTION 09500 - SUSPENDED ACOUSTICAL CEILINGS 1-4
SECTION 09650 - RESILIENT FLOORING 1-4
SECTION 09688 - CARPETING 1-4
SECTION 09900 - PAINTING 1-9

DIVISION 10 - SPECIALTIES

SECTION 10155 - TOILET COMPARTMENTS 1-5
SECTION 10200 - LOUVERS AND VENTS 1-5
SECTION 10520 - FIRE EXTINQUISHER 1
SECTION 10800 - TOILET ACCESSORIES 2

DIVISION 11 – EQUIPMENT

SECTION 11132 - PROJECT SCREENS 1-2

DIVISION 14 – CONVEYING SYSTEMS

SECTION 14200 - ELEVATORS 1-12

DIVISION 2 - SITEWORK

SECTION 02060
STAGING & BUILDING DEMOLITION

PART 1 GENERAL

1.01 WORK INCLUDED

1. Provide temporary fencing around work area and secure.
2. Sawcut and remove portions of west parking lot and install all drainage control devices.
3. Provide temporary support of any and all adjacent areas affected or unsupported as a result of demolition operations until new installations and support are completed.
4. Locate and protect any utilities and or building services and coordinate work with other trades prior to commencement.
5. Coordinate demolition operations as required for owner to occupy areas of the existing facility during construction.
6. Provide dust and security protection and partitions throughout during construction operations.

Note: Removal and or abatement of hazardous materials shall not be included in the bid. Any and all abatement work shall be performed by an independent contractor and any and all cost associated with said work shall be paid for by the owner.

1.02 RELATED WORK

A. Section 01500 – Construction Facilities and Temporary Controls. Section 01530 Barriers and Enclosures: Barricades, fences, and landscape protection.

B. Section 01700 - Contract Closeout: Project record documents. 01720 - Project Record Documents.

C. Section 02150 – Excavation and Grading.

1.03 SUBMITTALS

A. Submit demolition and removal procedures and comprehensive work schedule for all work.

B. Submit record documents under provisions of Section 01700.

1.04 EXISTING CONDITIONS

A. Conduct demolition to minimize interference with adjacent structures and properties.

B. Provide, erect, and maintain temporary barriers and security devices.

C. Conduct operations with minimum interference to public or private thoroughfares. Maintain protected egress and provide access at all times.

D. Do not close or obstruct roadways and sidewalks without permits.

PART 2 PRODUCTS

Not Used.

PART 3 EXECUTION

3.01 PREPARATION

A. Prevent movement or settlement of adjacent structures. Provide bracing and shoring.

B. Protect existing landscaping materials, appurtenances, structures which are not to be demolished.

C. Disconnect, remove, and cap designated utility lines in their entirety and a

D. Mark location of disconnected utilities. Identify utilities and indicate capping locations on Project Record Documents.

3.02 EXECUTION

A. Demolish indicated structures and appurtenances in an orderly and careful manner.

B. Cease operations and notify Architect/Engineer immediately if adjacent structures appear to be endangered. Do not resume operations until corrective measures have been taken.

C. Except where noted otherwise, immediately remove demolished material from site.

D. Relics, antiques, and similar objects remain the property of the Owner. Notify Architect/Engineer prior to removal and obtain acceptance regarding method of removal. Relocate designated items to new facility.

E. Remove materials to be re-installed or retained in manner to prevent damage. Store and protect under provisions of Section 01600.

F. Remove concrete apron, walks and curbs.

G. Remove and promptly dispose of all materials.

H. Do not burn or bury materials on site.

I. Remove all foundation walls and footings below finished grade.

J. Remove concrete slabs on grade.

K. Buried oil tanks, if any, located within demolition area shall be removed by owner and are not included as part of this contract.

M. Keep work sprinkled to minimize dust. Provide hoses and water main or hydrant connections for this purpose. Water by Owner.

N. Backfill areas excavated, open pits and holes caused as a result of demolition. Use approved subsoil specified in Section 02150.

O. Rough grade and compact areas affected by demolition to maintain site grades and contours. Provide compacted 6" RC base for parking lot.

P. Remove demolished materials from site as work progresses. Leave site in clean condition.

END OF SECTION

DIVISION 2 - SITEWORK

SECTION 02150 - EXCAVATION & GRADING FOR BUILDING CONSTRUCTION

02150.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", the "Contract Forms", and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

02150.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the execution of excavation and grading for building construction and improvements, complete, in strict accordance with the Contract Drawings and as herein specified and required by conditions at the site.

   a. General site excavation and grading for building construction. Excavation, backfilling and grading generally to a point for a distance of not less than 5 feet around the entire perimeter of the building construction to a level of 6" below finished grades in accordance with the contours and elevations and grading contract limits shown on the Drawings.

   b. Clearing and grubbing and removal of unwanted material.

   c. Porous fill.

   d. Temporary shoring, bracing, sheet piling, etc. as required for construction of new addition without exception including shoring and/or underpinning of existing building.

   e. Disposal of rubbish and objectionable excavated materials. Excavation and demolition and removal of existing material of every name and nature which may be required for the installation of work under this contract unless otherwise noted on drawings and specifications.

   f. Temporary protection barricades, enclosure, etc., required by Local Authorities including complete fence enclosure of site as directed by Architect.

   g. Subgrade preparation.

   h. Finish grading.

   i. Trench excavation for all General Construction site work, trenching for underground utilities will be by respective prime contractor.

j. Bituminous (asphalt) paving for driveways and parking and roads including striping.

02150.0300 RELATED WORK SPECIFIED ELSEWHERE

Division 3 Concrete

02150.0400 INSPECTION OF SITE

1. Before submitting bid, visit the site and check all existing conditions. If, in the opinion of the Bidder and conditions exist which might effect the completion of the work as planned, he shall report them in writing to the Architect before submitting his bid. No consideration will be given to claims made because of possible existing adverse conditions not mentioned in these specifications.

02150.0500 SUBSURFACE CONDITIONS

1. Subsurface conditions have been investigated and information is shown on site plan. Borings were performed by Soil Mechanics. Additional borings shall be issued via addendum.

2. Data and information thereby obtained and conveyed is not guaranteed to be accurate for entire site by the Owner, Architect or any of its agents or Contractors.

3. Such data and information is offered in good faith for purpose of placing Contractor in receipt of all information available to Architect. Although reasonable care was used in determination of this data and information, there is no warranty, express or implied as to accuracy of such data and information and Architect and the Owner assume no liability for any inaccuracies; Contractor alone shall assume responsibility for any conditions which may in fact exist and which are not reflected in data and information. Contractor must interpret such data and information according to his own judgment and acknowledge that he is not relying upon same as accurately describing conditions which may be found to exist.

4. Contractor further acknowledges that he assumes all risks contingent upon nature of subsurface conditions to be actually encountered by him in performing work covered by his contract, even though such actual conditions may result in his performing more or less work than originally anticipated. It shall be further understood that actual excavation shall be unclassified, that Contractor is responsible for all materials encountered during excavation and that the Contractor shall report any unsatisfactory conditions and perform any additional excavation required at no additional cost to Owner.

02150.0600 COOPERATION

1. Properly coordinate the work of this Section with work of contiguous trades and/or Contracts.

02150.0700 PROTECTION

1. Execute the work in such manner that no damage or injury shall occur to persons, existing curbs, roads and walks, and any and all other property. Any damage or injury resulting from work under this Division shall be the responsibility of the Contractor, who shall make good such damage and assume all responsibility for such injury, without additional cost to the Owner. Notify all individuals, municipal agencies and service utility companies having jurisdiction over any affected above surface or subsurface utilities and protect or remove and/or relocate these services as required in accordance with their requirements.

2. Temporarily support and maintain the sides of excavations until permanent support is provided. Shore and brace all work, wherever required to prevent injurious caving or sliding, and to protect existing work. Provide sheet piling, adequately braced, where other means are insufficient to maintain excavations in stable conditions. Install work so as not to interfere with the proper placing and compacting of backfill. Remove all temporary work as the work progresses and necessity for same ceases to exist.

02150.0800 CLEARING AND GRUBBING

1. General: Under this item, the Contractor shall clear and grub the entire area within the limits of the work of this contract and remove all structures to the extent shown or as determined by the Architect.

2. The Contractor shall use every precaution to prevent injury to roads, curbs, walks, pipes, conduits, poles and other structures above and below ground that are adjoining or included in the area under contract, and shall repair or replace at his own expense any material or work damaged or destroyed by his forces, while clearing the site.

3. No burning at the site will be permitted. Contractor shall assume that it will be necessary to remove all cleared material to public disposal areas and that on site burning will not be permitted.

4. Material removed under this item, unless otherwise specified or noted on the drawings, shall become the property of the Contractor and shall be legally disposed of.

02150.0900 LINES AND GRADES

1. Establish and maintain all lines and grades for the work with required batter boards and elevation points.

2. A competent Engineer shall be employed by the Contractor to establish all lines and grades. Should the services of a licensed land surveyor be required, he shall be retained and paid for by the Contractor.

3. Prior to any construction, notify the Architect should any discrepancy occur.

5. Drainage: Conduct operations so as to prevent the accumulation of surface water in the vicinity of excavated and graded areas and provide all necessary ditches as required. Any water which accumulates in excavations shall be promptly remedied by pumping or other effective means.

02150.1000 GENERAL EXCAVATION

1. Include the satisfactory removal of all materials of every nature and description which are encountered in obtaining the lines, grades and elevations shown on the drawings. Suitable materials from the excavation shall be utilized for filling. Excavated materials which, in the opinion of the Architect, are not suitable for fill or embankment and excess materials not needed for filling shall be removed and legally disposed of outside the site.

02150.1100 TRENCH EXCAVATION

1. Trenches shall be open cuts of the necessary width, to the correct alignment, for the proper installation of underground lines, with banks as nearly vertical as possible. Provide sheeting and/or shoring as may be necessary to protect life and the excavation it. Width or excavation at the bottom shall not exceed 20" plus the external diameter of the pipe, equally divided on each side of the pipe.

2. Bottom of trench shall be accurately graded and shaped to provide uniform bearing and support for the bottom quadrant of the pipe barrel on undisturbed soil at every point along its entire length. Excavation shall not be completely plowed, scraped or dug by machinery to finished grade. The last several inches shall be trimmed by hand to exact line and grade and shaped to support the pipe just prior to placing the pipe. In the event excavation is carried too deep in error, refill trench with suitable material compacted properly in accordance with other portions of this Section and excavate to proper elevation by hand. Ample provision shall be allowed for making up joints.

3. Trenches shall not be opened farther in advance of the pipe laying than is necessary. No pipe laying in wet trench will be permitted. Excavation must be kept free from water. In accordance with other portions of this Division, backfill and compact.

02150.1200 BUILDING EXCAVATION, FILLING AND BACKFILLING

1. Excavation:

a. Excavation shall be carried to elevations, depths and dimensions indicated. The footing elevations noted are intended to carry all bearings to the same strata of earth. No extra compensation will be allowed for any additional excavation required to insure uniform quality of bearing. All bearings shall be on undisturbed earth. If excavations for walls or footings are carried too deep by error, they shall be backfilled, but shall be brought to proper elevation with concrete mixed and places as specified under Division 3 - CONCRETE, at no additional cost to the Owner. Minimum bearing soil shall be one and one half (1 1/2) tons per sq. ft. Remove materials of every nature and description encountered in obtaining indicated lines and grades.

b. Excavate outside of building walls and foundations, etc., not less than one foot and more if necessary to allow for inspection work.

c. Bottom of all excavations shall be leveled or otherwise properly trimmed to lines and grades as required.

d. Slabs on grade shall be placed upon approved (by the Architect) compact granular fill, except as otherwise specified or shown on the drawings.

1. Where natural subsoil directly under slabs on grade is of clay or silt, excavate to 6" below bottom of slab and backfill with compacted gravel. This does not exclude the placing of compacted gravel to a greater depth where shown on the drawings and/or herein specified.

e. As the basis of the Contract, it shall be assumed that the material to be excavated is earth.

f. Provide and operate all pumps, hose and drainage lines required to keep excavations free from water at all times, until after concrete has been placed for all footings and foundation walls. In the event that overtime labor is necessary to preform this work, it shall be done without additional cost to the Owner.

2. Filling and Backfilling:

a. Promptly backfill excavations as work permits, but not before concrete walls and footings have attained adequate strength (min. 60% design) and piping and other items below backfill have been tested and approved.

b. For backfilling, use earth free from waste, objectionable matter, loan, wood rubbish, debris or stones other 1/2 cubic foot. Do not use frozen material. Objectionable backfilling material shall be legally disposed of away from the site.

1. All excess excavation not required as backfill for work under this Contract

shall be removed and legally disposed of outside the site.

c. Backfill and fill to new surface grades as required. If sufficient sound and approved fill materials are not on hand to complete filling operations to required grades, provide same at no extra cost to the Owner.

d. Backfill around building walls, and under any slabs on grade, shall be with compacted clean sand and gravel.

e. All filling and backfilling shall be deposited 12" in layers: Each layer to be compacted to not less than 95% of the maximum density obtained at optimum moisture contents as determined by AASHO T-180, Method "D". Final compaction tests must indicate a minimum of 95% compaction for the total fill.

f. All rough grading shall be brought up to grades, required as shown on Site Plan. Unless otherwise indicated, the following depths shall be allowed for finished grading:

1. Concrete Walls 5 Inches
2. Bituminous Paving As Required by Drawings
3. Grass Areas 6 Inches
4. Other Areas As Required by Drawings

g. Compaction shall be by Contractor using mechanical tampers.

02150.1300 SUBGRADE PREPARATION

1. Subgrades shall be shaped to the required line, grade, and cross-section, and shall be rolled with approved equipment until thoroughly compacted. In paved areas, the full depth of subgrade in fill areas and the top 6" of the subgrade in cut areas shall be compacted to not less than 95% of the maximum density obtained at optimum moisture content as determined by AASHO-T-180, Method "D". In other areas, compact to not less than 90%. All soft or otherwise unsuitable subgrade material shall be removed and replaced with suitable materials as directed by the Architect. Low areas, holes, and depressions shall be brought to the required grade with approved material thoroughly compacted as herein provided. All roadway and parking area paving shall be installed on a subbase of a mixture of sand, gravel or other acceptable material compacted as described above for paved areas.

02150.1400 POROUS FILL

1. Stone or gravel: Pass through a 2" ring and be retained by a 1" mesh.

2. The subgrade below fill shall be brought to a true and even plane and compacted to a solid bearing. Porous fill shall be installed to a minimum compacted depth of 6" and

leveled to a reasonably true and even surface. All piping, etc., installed below porous fill shall have been tested and approved before installation of fill. After placing porous fill, stones larger than 3" in any dimension shall be hand removed or broken up.

02150.1500 FINISHED GRADING

1. All areas shall be uniformly graded. The finished surface shall be reasonably smooth, compacted, and free from irregular surface changes. The degree of finish shall be that ordinarily obtainable from either blade-grader or scraper operations, except as otherwise specified. The finished surface shall be not more than 0.15 foot above or below the established grade or approved cross section. Ditches shall be finished so as to permit adequate drainage. The surface of areas to be turfed shall be finished to smoothness suitable for the application of turfing materials. The surface of the pavement subgrade shall not vary more than 0.50 foot from the established grade and approved cross-section.

02150.1600 PROTECTION

1. Newly graded areas shall be protected from traffic and from erosion, and any settlement or washing away that may occur from any cause, prior to acceptance, shall be repaired and grades re-established to the required elevations and slopes, at no additional cost to the Owner. The finished subgrade shall be protected and maintained in a satisfactory condition until the stone base course is placed.

SECTION 02170 - BITUMINOUS PAVING

1. General: Take special precautions when installing bituminous pavements to prevent the bituminous materials from staining the exposed parts of building, curbs, or structures above finished grade. Any stains or markings caused by paving work shall be removed by the Contractor, at his own expense, to the satisfaction of the Owner.

2. Heavy Duty Bituminous pavements shall consist of a 2" New York State type 1A Asphaltic Concrete Surface Course placed on a 4" Penetration Macadam Base Course, over a fully compacted 6" Loam/RCA mix base in accordance with the plans and sections on the drawings and as herein specified.

3. Penetration Macadam Base Course for Heavy Duty Pavements (minimum 4" compacted thickness):

   A. The base course shall conform in all respects to the requirements of the State of New York, Dept. of Public Works, Division of Construction, "Public Works Specifications for "Item 45SN - Base Course - Bituminous - Macadam Penetration Method Asphalt", with the following modifications:

   Use Size 3 Stone.
   Bituminous material shall be asphalt cement.
   Penetration grade 85 - 100%.

4. Asphaltic Concrete Surface Course: (minimum 2" thickness after compaction)

   a. The asphaltic concrete surface shall conform to the requirements of State of New York, Dept. of Public Works, Division of Construction, and "Public Works Specifications as amended. References herein to "Standard Specifications" shall be to that document.

   b. Thickness shall be compacted depth as indicated on the drawings.

   c. The surface course shall conform to the requirements of the "Standard Specifications" for Item 51 - Asphalt Concrete - Type 1A (Mixing Method - Hot Mix - Two Course)"

5. All paving at roads shall comply with NYS DPW standard street and public improvement construction specifications and details.

DIVISION 3 - CONCRETE

SECTION 03300 - CONCRETE & CEMENT WORK

03300.0100 GENERAL

1. Include all labor, materials, equipment and appliances and perform all operations in connection with the installation of concrete and cement work as shown on the drawings and specified herein, and generally include the following:

   a. Concrete work for all foundations, footings, piers, walls, floor slabs, and all other items of concrete as required to make the work of this section complete, and as detailed on the drawings hereinafter specified.

   b. All required formwork.

   c. Reinforcing steel and wire mesh, including chairs, spacers and tie wires.

   d. Installing and/or building in of all items embedded in the concrete such as anchor bolts, inserts, sleeves, blocking, etc., as required by this and other trades under this and other contracts.

   e. Cement mortar protection for pipes and conduits in slabs.

   f. Vapor barrier under slabs on grade.

   g. Premoulded joint fillers.

   h. Finishes of all concrete and concrete slabs.

   i. Concrete walks, platforms, terraces and curbs.

   j. Testing and inspecting concrete work.

   k. Concrete foundations for all motors, pumps, tanks and other items of equipment provided under Mechanical and Electrical Contracts.

   l. Construction and expansion joints.

   m. Perimeter insulation.

   n. All other items of concrete and cement and related work to be inferred as needed to make the work of this contract complete.

o. Damp proofing all basement walls below grade.

p. Water stops at basement footings.

q. Set anchor bolts provided by structural steel contractor for all columns and other bearing plate locations as required.

03000.0300 RELATED WORK SPECIFIED ELSEWHERE

1. Waterproofing - Division 7.

2. Miscellaneous bolts, anchors, reglets, inserts, etc., required by other trades and installed under this Section.

03300.0400 CODE REQUIREMENTS AND APPLICABLE STANDARDS

1. Local building codes, laws and regulations govern all work. Adhere to where mandatory, specifications and drawings to the contrary notwithstanding.

2. ACI 318-95.

3. ACI 301-96 (paragraph reference).

   a. Except as modified herein.

   b. Contractor to maintain current copies of ACI-301 manual on site.

03300.0500 SHOP DRAWINGS

1. Submit shop drawings for approval in accordance with the requirements of the Supplementary General Conditions showing locations, size, length and bending of all bars, and also such additional details as may be required to completely cover the furnishing and installing of all reinforcement, chairs and spacers and execution of all concrete work. Allow sufficient time for checking and approval prior to fabrication. Show the location, sizes and forms of all required openings, miscellaneous steel items, inserts, anchor bolts, recesses, etc., as required for work under this and other Contracts.

2. All details shall be in accordance with the current rules and practices of the American Concrete Institute and jurisdictional codes, except where otherwise indicated.

3. Shop drawings shall indicate all slab depressions.

03300.0600 COORDINATION

1. Properly coordinate the work of this Section with work of contiguous trades.

03300.0700 MATERIALS

1. Cement: ASTM-C150 Type I, Type II, or Type III may be used only with written permission of the Architect. Air-entrained concrete where specified shall be obtained by use of approved air-entraining agents, the use of air-entraining, or other type cements is expressly prohibited without prior approval of the Architect. Cement used throughout the project shall not vary in color so as to prejudice appearance of exposed concrete. Only one brand of any type of cement shall be used for exposed concrete surfaces.

2. Aggregate: ASTM C33 except as modified herein.

   a. Fine Aggregate shall conform to the following requirements:

      Not more than 3% shall pass the No. 200 sieve.

      Rational analysis shall conform to Table A as follows:

Table A	By Weight	
Kaolin	Max. %	6
Quartz & Feldspar	Min. %	75
10 Cycle Sodium Sulphate	Max. % loss	6
5 Cycle Magnesium Sulphate	Max. % loss	15

      It shall not show darker than light amber when tested by colorimetric method.

      The graduation of the sand shall be constant and the fineness modulus shall not vary by more than 0.2.

   b. Coarse Aggregate: Shall consist of hard crystalline stone or gravel free from clay, silt, shale, or decomposed or thin laminated pieces. The pieces shall be clear and uncoated, and conforming to Table B below:

TABLE B	GRAVEL OR STONE
Abrasion Test with Los Angeles Machine (ASTM Designation C-131) Max. Permissible percent by weight	40
Soundness Test (ASTM Designation C-88) Max. permissible percent by weight for 10 cycles, magnesium sulphate for 5 cycles, sodium sulphate	7.5

Chemical Test (ASTM Designation C-289) and/or Petrographic Analysis (ASTM Designation C-295) max. permissible percent of following reactive minerals.	12
Opal or Opaline chart	0.25%
Chalcedony	5%
Glassy or crytocrystal lime acidic to intermediate volcanic rocks or tuffs	3%

Test with all aggregate for potential reactivity in accordance with ASTM C295, C289, and C227. Supply certified test reports by an agency satisfactory to the Architect for compliance of the aggregate to the contract documents.

Coarse aggregate where specified for lightweight structural concrete shall conform with the requirements of ASTM C330 - graded to size 3/4" to #4 of Table 1 therein.

3. Admixtures.

   a. Air-entraining admixtures shall be Darex AEA, neutralized Vinsol-Resin, or equivalent as approved by the Architect.

   b. Plasticizer shall be "Pozzolith" as manufactured by Master Builders.

   c. No other admixtures will be permitted without the express approval of the Architect.

4. Reinforcing bars shall be new billet stock unless otherwise specified and shall conform to ASTM 615, Grade 60. The Contractor shall furnish, when requested by the Architect, a certificate from the manufacturer guaranteeing that the present product meets the specification requirements.

5. Wire Mesh for concrete reinforcement shall consist of welded wire fabric conforming to ASTM Designation A185.

6. Mixing water shall be clean and potable. If there is any question as to its suitability, it shall be tested in accordance with AASHO Standard Method of Test T-26.

7. Premolded Joint Material: Celotex Corp. "Flexell" or approved equal. Expansion

joint sealer shall be Sonneborne Building Products, Inc. Sonolastic, one component Paving Joint Sealer or approved equal.

8. Surface Hardener: "Lapidolith" by Sonneborne Building Products, Inc., "Hornlith" by A.C. Horn Co., Inc. or "Saniseal" by the Master Builders Co.

   a. Shall be installed in accordance with the Manufacturer's recommendations.

   b. Provide five (5) year written guarantee by Manufacturer.

9. Vapor Barrier: "Vis Queen" as manufactured by Visking Division of Union Carbide, Polyethylene sheets, .066" thick, or other approved equal.

10. Perimeter Insulation: Shall be "Styrofoam SB" as manufactured by Dow Chemical Company or approved equal. Insulation shall be 2" thick unless otherwise noted on the drawings.

11. Grout under base plates: Fosroc "Conbextra" or approved equal.

12. Other materials as herein specified.

03300.0800 STORAGE OF MATERIALS

1. General: Storage facilities are subject to the approval of the Architect. Afford easy access for inspection and identification of shipments.

2. Cement: Store cement well off the ground in a dry, weather-tight adequately ventilated structure with provision to prevent the absorption of moisture.

3. Aggregates: Store aggregates in a manner to assure good drainage to preclude the inclusion of foreign matter, and to preserve the gradation. Keep each size group separate by means of bulkheads between the piles.

4. Reinforcing Steel: Store reinforcing steel off the ground under cover and protected from rusting, oil, grease and distortion.

03300.0900 FORM WORK

1. Chapter 2 of ACI 301 is included in its entirety except as modified hereinafter.

2. Design form work to be strong, rigid, accurately formed to within 1/4 inch of the lines and dimensions shown on the drawings and strong enough to support the dead weight of the concrete without deflection or leakage.

3. Design form ties so that they may be cut off no less than 1 inch from any concrete surface. Patch all holes left by form ties in a manner satisfactory to the Architect.

4. Coat all wall forms with a form oil. Keep reinforcement clean of form oil.

5. Provide temporary openings in forms to permit inspection, cleaning, and placing concrete.

6. Remove forms so as not to damage concrete. Remove forms in accordance with paragraph 2.3.4.

03300.1000 REINFORCING

1. Accurately fabricate reinforcing steel to the details and dimensions shown on the drawings, maintain bars free from dust, mud, rust, scale, oil, distortion, and structural defects.

2. Bend all bars cold and in a manner which will not injure the bars. Do not use bars with bends or kinks not indicated on the drawings. Fabricate in accordance with ACI315-80 standards.

3. Support all reinforcement rigidly in its design location prior to placing concrete, support reinforcing off the ground on precast concrete blocks.

4. Place all reinforcement within the limits of a days' operation, firmly supported and firmly connected before start of concrete placement. Provide concrete cover as indicated in paragraph 5.5 except as otherwise noted. Correct bent or displaced bars before placing concrete.

5. Prepare bending and placing drawings at a scale deemed suitable by the Architect for the work shown. Submit copies of shop drawings in accordance with the general conditions for review; correct and resubmit as required until approval is obtained. Maintain on the job site, an approved up-to-date set of shop drawings bearing the approved stamp by the Architect. All work shall conform to these drawings.

03300.1100 CONCRETE

1. Proportion all concrete to attain the properties and strength indicated in Table E.

Table E

Description	28 Day Strength
Piers and Footings	4000 psi
Slabs on grade	5000 psi
Foundation Walls	4000 psi
Floor Slabs (on Decking)	3500 psi

2. Submit a mix design, to the Architect, no less than 35 days prior to placement of concrete; for each class of concrete. The mix design consists of:

   a. Mix proportions including admixtures.

   b. Gradation and specific gravities of aggregates.

   c. Test reports of the components quality as outlined in Paragraph 7.

   d. Strength tests of designed mix indicating strength at least 20% higher than job requirements.

   e. Slump, weight, and air content of designed mix.

3. The Architect, may at his discretion, require additional cement or other changes to the mix if the designed mix fails to meet the specification.

4. Produce concrete with a slump not exceeding 4 inches.

5. General Contractor shall arrange for making and testing samples of the concrete as placed. Tests will be in accordance with ASTM Standards. Failure of the concrete to comply with the contract documents as evidenced by these tests is sufficient cause for

rejection of the concrete placed. Cost of all tests shall borne by the Owner.

03300.1200 MIXING

1. Equipment: Machine mix all concrete in a mechanical batch-type mixing plant conforming to acceptable standards. Provide mixers with adequate facilities for the accurate measurements and control of each of the materials entering the mixer. Prepare all batches by weight in automatically controlled batch plants.

2. Mixing: Do not charge mixers in excess of the manufacturers rated capacity for mixing, or operate in excess of the rated speed. Excessive mixing requiring the addition of water to preserve the required consistency will not be permitted. Discharge the entire batch before recharging. Discharge all wash water before recharging. Once initial sets has taken place, do not attempt to temper the concrete by addition of water.

3. Ready-Mixed Concrete: May be used provided that the central plant producing the concrete and the mixing and transporting equipment is suitable for the production, transportation and placing of the specified concrete. Ready-mixed concrete shall conform to the requirements of ASTM Designation C94 except as modified herein. Mixing in transit shall be prohibited.

03300.1300 PREPARATION FOR PLACING CONCRETE

1. Remove water from all areas where concrete is to be placed. Do not permit water to flow over freshly placed concrete. Clean forms and concrete handling equipment thoroughly. All form work, reinforcement, etc., will be inspected and approved prior to placing concrete. Clean earth foundations of mud, water, loose material and debris.

03300.1400 PLACING CONCRETE

1. Place concrete only when the weather conditions are suitable for proper placing, finishing and curing.

2. Mix, transport, and place concrete to maintain proper consistency and avoid segregation. Maintain concrete in a plastic state at all times from mixing to placing in final position.

3. Convey concrete from mixer to final location in a manner which will prohibit segregation. Do not exceed 3 foot fall from mixer conveyance. Do not exceed 6 foot free fall when placing in final position.

4. Vibrate all concrete in place with approved internal vibrators. Do not vibrate after initial set has taken place.

03300.1500 CONSTRUCTION JOINTS & EMBEDDED ITEMS

1. ACI 301, Chapter 5 is included in its entirety except as modified hereinafter.

2. Where not shown, locate construction joints to provide the least impairment to the structure: Location and detail of all construction joints must be approved by the Architect.

3. Location construction joints to produce the following maximum length of concrete placement:

Beams and slabs cast on ground	30 feet each way
Walls	50 feet each way

4. Accurately locate all inserts, sleeves, anchor bolts, etc. Mislocation or embedded items is solely the responsibility of the Contractor.

03300.1600 BONDING AND GROUTING

1. Clean all laitance and loose material from surfaces of set concrete, slush face of joint with neat cement grout. Place new concrete before grout has set.

2. Grout all base plates with a mix of one part cement to two parts sand.

03300.1700 PATCHING

1. Patch all slight honeycomb and other surface defects by chipping out defective material and patching with a 1 part cement to 3 parts sand mortar.

2. Where in the Architect's opinion the defects will impair the structural adequacy of the member, make repairs as directed by the Architect. All costs relating to such repairs will be borne by the Contractor.

3. Where in the Architect's opinion, the defects will impair the finished appearance of the area, make repairs as directed by the Architect. All costs relating to such repairs will be borne by the Contractor.

03300.1800 PROTECTION AND CURING

1. Protect concrete from injury, from any cause for no less than five (5) days after placing. Begin curing immediately after the concrete has attained its initial set. Cure by water spray, saturated burlap or curing compound. Cure in accordance with ACI 301, Chapter 12.

03300.1900 INCLEMENT WEATHER

1. Place concrete only when the ambient temperature is between 40 degrees F and 85 degrees F.

   In order to place concrete at temperatures outside of the above range, special instructions may be issued by the Architect. All costs involved in implementing these special instructions will be borne by the Contractor.

2. In general, the special instructions will be in accordance with the recommendations of ACI 305-82 and ACI 306-88, except that Chapter 6 of ACI 306 will not be utilized.

03300.2000 FINISHING CONCRETE

1. Formed surfaces ACI 301 Chapter 5.3.3 is included in its entirety.

2. Flatwork: ACI 301 Chapter 5.3.4 is included in its entirety except as modified herein.

   a. Finish all flat floors except as noted below with a steel trowel finish suitable for receiving floor finishes. Class A tolerance verify requirements with Architect.

   b. Finish exterior slabs with non-skid broom finish. Class B tolerance.

   c. Do not float or trowel concrete surfaces while the material is wet or sloppy. Delay finishing operations until all surface water has disappeared. Do not dust cement over wet areas to accelerate drying.

3. Surface Hardener: Unless otherwise specified, all exposed interior concrete slab surfaces shall be treated with the specified surface hardener, applied in strict accordance with the manufacturer's printed instructions.

4. Wood Float Finish: Concrete platforms shall be finished by tamping with special tools to force the aggregate away from the surface, then screening with straight edge to bring surface to the required lines. While the concrete is still green, it shall be wood-floated to a true and uniform plane with no coarse aggregate visible.

5. Screeds for All Finished Work: Provide metal screeds as approved by the Architect. Screeds shall be set with instruments to proper elevations.

03300.2100 CONCRETE SIDEWALKS, TERRACES, RAMPS AND CURBS

1. Concrete and the equipment, workmanship, testing, etc., and materials therefore, shall conform to the applicable requirements of Division 3, CONCRETE, of these

specifications except as otherwise specified herein. Concrete shall be air-entrained 4000 psi minimum compressive strength at 28 days. Concrete shall have a slump of not more than 4". Air entrained shall range between 5 and 8%.

2. Subgrade Course:

   a. The subgrade shall be constructed true to grade and cross-section as shown on the drawings and shall be constructed in accordance with the applicable requirements of PARAGRAPH, SUBGRADE PREPARATION. The subgrade for curbs shall extend in all cases at least 1 foot in width beyond the back face of the curb.

3. Forms: Wood or metal, straight, free from warp, of sufficient strength to resist springing during construction, and of a height equal to the full depth of the finished work. Wood forms shall be 2" surfaced plank. Metal forms shall be of approved section with a flat top surface. Benders or thin plank forms may be used for curb returns. Forms shall be set with the upper edge true to line and grade and shall be held rigidly in place by stakes placed on the outside of forms and set flush with the top edge of the form. Clamps, spreaders and braces shall be used where required to insure rigidity in the curb forms.

4. Concrete Placement and Finishing:

   a. Sidewalks & Ramps: Place in forms in a layer of such thickness than when compacted and finished the walk will be of the thickness shown on the drawings. After the concrete has been placed between side forms, a strike-off guided by the side forms shall be used to bring the surface to the proper section to be compacted. The concrete shall then be tamped with a heavy tamper and given a final tamping with a light tamper. The surface shall be finished to grade and cross section with a wooden float at least 10 feet in length, 6 to 8 inches in width, and at least 1 inch in thickness with handles at each end for longitudinally floating along the surface. After float, the surface shall be troweled smooth and then finished with a fine hair push broom drawn over the surface traverse to the line of traffic. If necessary water may be added to the surface immediately in advance of brooming. Before final finish, the surface shall be checked with a 10 foot straight edge, and any irregularities of more than 1/8" in 10 feet shall be eliminated. Divide into rectangles at intervals of approximately five feet by means of contraction joints. The contraction joints shall be formed in the fresh concrete by cutting a groove in the top portion of the slab to a depth of at least 1" by means of a jointer having a radius of 1/8" or a cutting blade not more than 1/8" thick. The completed surface shall be uniform in color and completely free of blemishes and tool marks.

   b. Curbs: Place in the forms to the specified depth in 6" layers and thoroughly consolidate by tamping and spading so that there are no rock pockets at forms,

and mortar entirely covers the top surfaces. Concrete may be compacted by means of mechanical vibrators approved by the Architect. The surface of the top of the curb shall be edged with the proper edging tool and floated and finished with a smooth wood float or a concrete rubbing block until it is true to grade and section and uniform in texture. These surfaces shall then be brushed with a fine hair brush with strokes parallel to the line of the curb. Ample water shall be used during the finishing operations. Immediately after removing the front curb forms, the face of the curb shall be rubbed with a wood or concrete rubbing block and water until all blemishes, form marks, and tool marks have been removed. The surface of the face shall, while still wet, be brushed in the same manner as the curb top. The face of the finished curb shall be true and straight and the top surface of curbs shall be of uniform width, free from humps, sags, or other irregularities. When a straightedge, 10' long is laid on the top of the curb, or on the surface of gutters, the surface shall not vary more than 1/8" from the edge of the straight edge, except at grade changes or curves. All visible surfaces and edges of the finished curb, shall be free of all blemishes and form and tool marks, and shall be uniform in color, shape and appearance.

5. Expansion Joints:

   a. Provide expansion joints in sidewalks, terraces and platforms at all walk intersections and returns, at buildings, steps, structures, and other features against which the slabs abut. In addition, provide expansion joints for sidewalks at intervals of 20 feet. Form joints with expansion joint filler strips, 1/4" thick. The filler strips shall be Phillip Carey "Elastite", Serviceized Products Co. "KorkPak" or approve equivalent joint filler. Joint filler shall be held in place by means of steel pins or other devices to prevent warping of the filler during floating and finishing. After finishing operations are completed, joint edges shall be rounded with an edging tool having a radius of 1/4".

   b. Expansion joints for curbs: Form expansion joints for curbs with joint filler cut and shaped to the cross section of the curb. Provide expansion joints at the ends of all returns and directly opposite the expansion joints of abutting concrete walks and unless otherwise indicated shall be of the same type and thickness as the joints in the sidewalk. Where curbs do not abut concrete walks, expansion joints at least 1/2 inch in width shall be provided at intervals not exceeding 20 feet.

   c. After the concrete has cured and is thoroughly dry, the upper part of all expansion joints shall be cleaned and shall be sealed with joint sealer. Sealer shall be a cold-applied 2 component, polysulfide type sealant conforming as a minimum to ASA Standard 116.1-60. The compound shall be capable of being mixed on-the-job to a consistency appropriate for pressure extrusion. When mixed and applied in accordance with the manufacturer's instructions, the mixture shall completely fill the joints without the formation of air holes and voids.

6. Curing: Immediately after the completion of the finishing operations, the exposed surfaces of concrete shall be cured by one of the following methods, as the Contractor may elect.

   a. The entire exposed surface shall be covered with quilted covers conforming to AASHO Specification M-73. Immediately after placing, they shall be thoroughly wet with water and kept in a saturated condition for not less than 7 days.

   b. The entire exposed surface shall be wetted with a fine spray of water and then covered with waterproof paper conforming to ASTM Standard C-171. Sheets shall be laid directly on the concrete surface and overlapped 12" when a continuous sheet is not used. The curing medium shall be not less than 18" wider than the concrete surface to be cured, and shall be securely weighted down by placing a bank of moist earth on the edges just outside the forms and over the transverse laps to form closed joints. Sheets shall be satisfactorily repaired or replaced if torn or otherwise damaged during curing. The curing medium shall remain on the concrete surface to be cured for not less than 7 days.

7. Protection: After the concrete has been cured, all debris shall be removed, and the areas adjacent to the work shall be backfilled, graded, and compacted in a satisfactory manner in accordance with the lines and grades shown on the drawings. The completed work shall be protected from damage until accepted. The Contractor shall repair and clean, at no additional cost to the Owner, all concrete damaged or discolored during construction. Repair of sidewalks, if required, shall be made by removing and replacing defective portion between the nearest cleavage or expansion joints.

3300.2200 TRENCH DRAIN

1. Provide complete trench drainage systems where indicated on the drawings at wash bay. System shall include but is not necessarily limited to precast trench drains, cast iron heavy duty lock down grate covers, anchors, fittings, hardware, end caps and outlet end with 4” nipple. Coordinate with plumber who will provide and install piping tied into site drainage pools.

2. System shall be ACO S-100 Channel Slope trench drain system with “D” load class ductile iron slotted grate or approved equal.

3. Manufacturer’s product literature and detailed shop drawings indicating the entire installation including all components and details referenced by catalog number and piping to storm drain location.

4. All materials, systems, components, etc. shall be installed in strict compliance

with the manufacturer's printed product system specifications and installation instructions including ACO drainage systems manual and ACO drain technical installation.

5. The ACO Drain System requires a bedding of concrete on both sides and under the channels. An area must be provided for channel placement wide enough and deep enough to accommodate the channel and bedding concrete. Follow ACO installation techniques exist for proper placement of ACO trench. As noted in both the ACO Drain Products Catalog 02725/ACP and ACO Drain Technical Installation. Prescribed methods and systems shall be reviewed with ACO technical services personnel prior to installation.

03300.2300 PERIMETER INSULATION

1. Manufacture: Perimeter insulation shall be "Styrofoam SB" rigid type, as manufactured by Dow Chemical Co., or approved equal. Thickness as shown on Drawings.

2. Preparation: The surfaces to which insulation is to be applied shall be smooth, flat and trim.

3. Foundation Walls: Install on the inside surface of the foundation wall to a minimum depth of 24" below bottom of slab with a thin layer of asphalt emulsion. Apply a layer of roofers felt, cut in strips the thickness of the floor slab, to the insulation to prevent the concrete from bonding to the insulation; cement with asphalt emulsion. Conform with details shown on the drawings.

03300.2400 INSPECTION AND TESTS

1. All concrete operations are subject to inspection and test as ordered by the Architect. All tests will be made in accordance with the appropriate ASTM Standards. The Contractor will provide all required assistance in performing these inspections and tests. The cost of inspection and tests will not be borne by the Contractor. The test performed constitute sufficient cause for rejection should these tests indicate failure to comply with the Contract documents.

03300.2500 TESTING

1. Testing and Inspection which may be performed by the Owner:

    a. The General Contractor shall schedule for the following services:

b. Test cylinders shall be made and stored in accordance with ASTM C-31. The method of sampling fresh concrete shall be in accordance with ASTM C-172. The Contractor shall provide a safe storage box for storage of test cylinders in an undisturbed manner.

c. Two (2) of the specimens shall be tested after seven (7) days and two (2) after twenty-eight (28) days. Two (2) cylinders will be saved for testing at 45 days. 45 Day tests will not be required if the 28 Day tests are satisfactory. The 7 day strength will be assumed to have 70% of the 28 days strength. For Type III cement, the 7 day test shall indicate 90% of 28 day strength.

d. Compression tests shall be conducted in accordance with ASTM C-39.

e. Slump tests shall be made for each truck load of concrete placed, in accordance with ASTM C-143.

* * * * *

Oldcastle Precast®
Building Systems

OR EQUAL

SPECIFICATIONS FOR PRECAST, PRESTRESSED HOLLOW-CORE PLANK
SECTION 03400

1. GENERAL

1.01 Description

A. Work Included:

1. These specifications cover manufacture, transportation and erection of precast, prestressed, concrete, hollow-core plank, including grouting of joints between adjacent units.

B. Related Work Specified Elsewhere:

2. Cast-in-Place Concrete: Section 03300
3. ~~Architectural Precast Concrete: Section~~ _____
4. ~~Precast Structural Concrete: Section~~ _____
5. Underlayments (Floor and/or Roof Leveling): Section _____
6. ~~Caulking and Sealants: Section~~ _____
7. ~~Small Holes for Mechanical/Plumbing: Section~~ _____
8. ~~Cast-in-Place Embedments: Section~~ _____
9. ~~Steel Bearing Lintels: Section~~ _____
10. ~~Insulation in Plank Cores: Section~~ _____

1.02 Quality Assurance

A. Manufacturer Qualifications: The precast concrete manufacturing plant shall be certified by the Prestressed Concrete Institute (PCI) Plant Certification Program prior to the start of production. Manufacturer shall be certified in category C2.

The manufacturer shall retain a registered structural engineer to certify that manufacturing is in accordance with design requirements; or

The manufacturer shall, at his expense, meet the following requirements:

1. The basis of inspection shall be the Prestressed Concrete Institute's *"Manual for Quality Control for Plants and Production of Precast and Prestressed Concrete Products"*, MNL-116, and the criteria for acceptance shall be the same as the Plant Certification Program.

B. Erector Qualifications: PCI Qualified and regularly engaged for at least 5 years in the erection of precast structural concrete similar to the requirements of this project. Retain aregistered structural engineer to certify that erection is in accordance with designrequirements.

C. Welder Qualifications: In accordance with AWS D1.1.

D. Testing: In general compliance with applicable provisions of Prestressed Concrete Institute MNL-116, *"Manual for Quality Control for Plants and Production of Precast Prestressed Concrete Products"*.

E. Requirements of Regulatory Agencies: All local codes plus the following specifications, standards and codes are a part of these specifications:

1. ACI 318 – Building Code Requirements for Reinforced Concrete;
2. AWS D1.1 – Structural Welding Code-Steel;
3. AWS D1.4 – Structural Welding Code-Reinforcing Steel;
4. ASTM Specifications – As referred to in Part 2-Products, of this Specification.

1.03 Submittals and Design

A. Shop Drawings:

1. Erection Drawings

   Plans locating and defining all hollow-core planks furnished by the manufacturer, with all major openings shown.

   a. Sections and details showing connections, weld plates, edge conditions and support conditions of the hollowcore plank units.

   b. All dead, live and other applicable loads used in the design.

   c. Fire rating.

B. Approvals:

1. Submit 6 copies of erection drawings for approval prior to fabrication. Fabrication not to proceed prior to receipt of approved drawings.

C. Product Design Criteria:

1. Loadings for design
   a. Initial handling and erection stresses.
   b. All dead and live loads as specified on the contract documents.
   c. All other loads specified for hollow-core plank where applicable.
2. Fire rating shall be 1 hour(s).
3. Design steel plank support headers when such headers are determined necessary by the manufacturer's engineer.
4. Design calculations shall be performed by an engineer, registered in the state that the project is located in, and experienced in precast prestressed concrete design. Design calculations to be submitted for approval upon request.
5. Design shall be in accordance with ACI 318 and applicable codes.

D. Permissible Design Deviations:

1. Design deviations will be permitted only after the Architect/Engineer's written approval of the manufacturer's proposed design supported by complete design calculations and drawings.
2. Design deviations shall provide an installation equivalent to the basic intent without incurring additional cost to the owner.

E. Test Reports: Test reports on concrete and other materials shall be submitted upon request.

2. PRODUCTS

2.01 Materials

A. Portland Cement:

1. ASTM C150 – Type I or III.

B. Admixtures:

1. Water Reducing, Retarding, Accelerating, High-Range Water Reducing Admixtures: ASTM C494

C. Aggregates:

1. ASTM C33 or C330

D. Water: Potable or free from foreign materials in amounts harmful to concrete and embedded steel.

E. Reinforcing Steel:

1. Bars:

   Deformed Billet Steel: ASTM A615
   Deformed Rail Steel: ASTM A616
   Deformed Axle Steel: ASTM A617
   Deformed Low Alloy Steel: ASTM A706

2. Wire: Cold Drawn Steel: ASTM A82.

F. Prestressing Strand:

1. Uncoated, 7-Wire, Low Lax strand: ASTM A416 (including supplement) – Grade 250K or 270K.

G. Welded Studs: In accordance with AWS D1.1.

H. Structural Steel Plates and Shapes: ASTM A36.

I. Grout:

1. Cement grout: Grout shall be a mixture of not less than one part portland cement to three parts fine sand, and the consistency shall be such that joints can be completely filled but without seepage over adjacent surfaces. The grout shall achieve a minimum 28-day compressive strength of 2,000 psi. Any grout that seeps from the joint shall be completely removed before it hardens.

J. Bearings Strips:

1. Plastic: Multi-monomer plastic strips shall be non-leaching and support construction loads with no visible overall expansion.

2.02 Concrete Mixes

A. 28-day compressive strength: Minimum of 5,000 psi

B. Release strength: Minimum of 3,000 psi

C. Use of calcium chloride or admixtures containing chlorides is not permitted.

2.03 Manufacture

A. Hollow-core plank shall be machine cast in 48-inch widths under the trade name Elematic® as manufactured by Oldcastle Precast Building Systems.

B. Manufacturing procedures and tolerances shall be in general compliance with PCI MNL 116.

C. Openings: Manufacturer shall provide for rectangular openings 10 inches or larger on all sides and as clearly shown on the architectural and structural drawings. They shall be located by the trade requiring them and then field cut. Round and small openings (less than 10 inches) shall be drilled or cut by the respective trades after grouting. Openings requiring cutting of prestressing strand shall be approved by the precast plank manufacturer before drilling or cutting.

D. Finishes: Bottom surface shall be flat and uniform as resulting from an extrusion process, without major chips, spalls and imperfections. Top surface shall be machine troweled.

E. Patching: Will be acceptable providing the structural adequacy of the hollow core unit is not impaired.

3. EXECUTION

3.01 Product Delivery, Storage and Handling

A. Delivery and Handling:

1. Hollow-core plank shall be lifted and supported during manufacturing, stockpiling, transporting and erection operations only at the lifting or supporting points designated by the manufacturer.

2. Transportation, site handling and erection shall be performed by qualified personnel with acceptable equipment and methods.

B. Storage:

1. Store all units off ground on firm, level surfaces with dunnage placed at bearing points.

2. Place stored units so that identification marks are discernible.

3. Separate stacked units by dunnage across full width of each plank.

3.02 Erection

A. Site Access: Erection access suitable for cranes and trucks to move unassisted from public roads to all crane working areas as required by erector, or otherwise indicated herein, will be provided and maintained by the general contractor. Obstructing wires shall be shielded or removed and, when applicable, snow removal and winter heat will be provided by the general contractor.

B. Preparation: The general contractor shall be responsible for:

1. Providing true, level, bearing surfaces on all field-placed bearing walls and other fieldplaced supporting members. Masonry wall bearing surfaces shall be bond beams with properly filled and cured concrete.

2. All pipes, stacks, conduits and other such items shall be stubbed off at a level lower than the bearing plane until after the plank are set. Masonry, concrete or steel shall not be installed above plank-bearing surface until after the plank is in place.

C. Installation: Installation of hollow-core slab units shall be performed by the manufacturer. Members shall be lifted with slings at points determined by the manufacturer. Bearing strips shall be set where required. Grout keys shall be filled.

Openings shall be field cut only after grout has cured, unless authorized by the manufacturer's engineer.

D. Alignment: Members shall be properly aligned. Variations between adjacent members shall be reasonably leveled out by jacking, bolting or any other feasible method as recommended by the manufacturer.

3.03 Field Welding

A. Field welding is to be done by qualified welders using equipment and materials compatible to the base material.

3.04 Attachments and Small Holes

A. Subject to approval of the Architect/Engineer, hollow-core plank units may be drilled or "shot" provided no contact is made with the prestressing steel. Round holes and those less than 8 inches on any side shall be drilled or cut by the respective trades. Should spalling occur, it shall be repaired by the trade doing the drilling, shooting or cutting.

3.05 Clean up

A. Remove rubbish and debris resulting from hollow-core plank work from premises upon completion.

3.06 Safety

A. The general contractor will provide and maintain all safety barricades, rebar caps and opening covers required for plank in accordance with current industry safety standards.

DIVISION 4 - MASONRY

SECTION 04200 - UNIT MASONRY

04200.0100 GENERAL

1. The work under this Section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

0400.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all masonry and related work, complete, in strict accordance with the Contract Drawings and Schedule of Finishes, as specified herein or reasonably implied, in general as follows:

   a. Concrete Masonry Units: For interior and exterior reinforced bearing walls and cavity as shown and detailed on the drawings.

   b. Brick masonry unit veneer including all ties, etc.

   c. All truss type reinforcing and steel rebar reinforcing, bearing plates, anchor bolts, eye and pintle masonry ties, etc. as noted on the drawings.

   d. Expansion joints as shown on the drawings.

   e. Furnishing and building in of anchors, ties, clamps, clips, etc., as required for work of this Section.

   f. Mortar beds and grouting for saddles, windows, doors, louver frames, and similar items as noted on the drawings.

   g. Scaffolding, hoists, centers, shoring, bracing, etc., as required for work under this Section.

   h. Cleaning and pointing.

   i. Clean-up and removal of rubbish, etc.

   j. Do all cutting and patching, etc.

   k. The masonry contractor shall install all necessary items that are required in the work and supplied by others, including: bolts, nailing blocks, inserts, anchors, flashing, lintels, expansion joints, conduits, etc.

0400.0300 QUALITY ASSURANCE

1. Tests:

   Manufacturer or supplier of masonry units shall submit to Architect prior to delivery, certification of compliance of units with specified standards, as determined by an acceptable testing agency conforming to the applicable requirements of ASTM E329. Brick shall be tested in accordance with ASTM C67, and concrete masonry units in accordance with ASTM C140. If tests made after delivery indicate that units do not conform to specified requirements, costs of such tests shall be borne by the supplier.

2. Masonry cements:

   Proprietary masonry cement mixes used in engineered masonry construction shall be subject to laboratory testing to assure compliance with minimum requirements for strength and bond.

3. Sample panels:

   Erect sample panels for each type of masonry required, approximately 4 ft. long by 4 ft. high, showing the proposed color range, texture, bond, mortar, and quality of work. The sample panel, when accepted, shall become the project standard for bond, mortar, quality of work, and appearance. Do not begin work until panel is accepted by Architect.

0400.0400 SUBMITTALS

1. Samples:

   Submit samples of each type of masonry unit and each accessory item required. Provide certification of pull-out strength of all masonry ties and anchors. Submit certification of compliance with required standards for all masonry units.

2. Shop Drawings:

   Provide shop drawings of custom sized and shaped precast Brick as detailed on the drawings.

0400.0500 PRODUCT DELIVERY, STORAGE AND HANDLING

1. Delivery:

   Deliver masonry units to job site in undamaged condition. Deliver and handle units to prevent chipping, breaking, or other damage.

2. Storage:

   Store masonry units off ground and protected from wetting by capillary action, rain, or snow, and protected from mud, dust, or other materials and contaminants likely to cause staining or defects.

0400.0600 JOB CONDITIONS

1. Cold weather construction:

   Masonry construction performed when ambient temperature falls below 40 degrees F. shall conform to the Recommended Practices and Guide Specifications for Cold Weather Masonry Construction published by the International Masonry Industry All-Weather Council.

2. Coverings:

   The Contractor shall construct and maintain temporary protection as required to permit continuous progress of the work. During construction, partially completed walls which are not enclosed or sheltered shall be kept dry by covering at the end of each day and when work is not in progress with strong, weather-resistant material extended a minimum of 2 ft. down each side, and held securely in place.

3. Protections:

   Do not apply uniform floor or roof loads for at least 12 hours or concentrated loads for at least 3 days after building masonry walls or columns.

4. Staining:

   Prevent grout or mortar from staining the face of masonry to be left exposed or to be painted. Remove immediately any grout or mortar in contact with face of such masonry. Protect all sills, ledges, and projections from droppings of mortar. Protect door jambs and corners from damage during construction.

0400.0700 PRODUCTS

1. Materials

a. Portland cement:

ASTM C150, Type II

b. Lime:

Hydrated lime, ASTM C207, Type S.

c. Sand:

ASTM C144.

d. Aggregates:

ASTM C404.

e. Water:

Mixing water must be clean and free of harmful amounts of acids, alkalis, organic materials, or other substances that would adversely affect the quality or appearance of the mortar or the masonry units.

f. Brick and Stone:

1. Veneer Brick shall be ASTM C216, Grade SW, Type 1 wire cut nominal; 4” x 4” x 12’ as manufactured by Watsontown “Franklin – Type 2”, or equal. Submit sample of Brick and Stone. Provide brick similar in color, texture, and physical properties to those available for inspection at the Architect's office. Do not exceed variations in color and texture of samples accepted by the Architect.

2. Stone accents and rockface shall be Rock Cast Stone. or equal color. Provide all samples, sizes and finishes for all interior and exterior stone as indicated and noted in the drawings.

g. Hollow loadbearing CMU:

ASTM C90, Grade N, Type 1, Normal weight.

h. Hollow non-loadbearing CMU:

ASTM C129, Type II, Light weight.

i. Provide bond beams with two (2) #5 3,000 psi concrete where indicated.

j. Reinforcement:

Steel reinforcing shall conform to the following ASTM Specifications:

1. Cold-drawn steel wire, ASTM A82.

2. Welded steel wire fabric, ASTM A185.

3. Billet steel deformed bars, ASTM A615, Grade 60.

k. Material for anchors and ties:

All anchors and ties shall be coated or corrosion-resistant metal meeting or exceeding the following ASTM Specifications:

1. Zinc coating of flat metal, ASTM A153.

2. Zinc coating of wire, ASTM A116, Class 3.

3. Copper-coated wire, ASTM B227, grade 30HS.

4. Stainless steel, ASTM A167, Type 304.

l. Types of anchors and ties:

Provide the following types of anchors and ties for masonry construction:

1. Wire mesh: Minimum 20 gauge, 1/2 in. mesh, galvanized wire, and 1 in. less in width than width of masonry.

2. Corrugated veneer anchors: Minimum 22 gauge, minimum 7/8 in. wide x 6 in. long.

3. Cavity wall ties: Shall be eye & pintle type minimum 3/16 in. wire diameter with drip, rectangular, at least 2 in. wide, or Z-shaped with 2 in. legs, length sufficient to allow 1 in. minimum mortar coverage of ends or legs. At all veneer space 16” vertical & horizontal staggered.

4. Joint reinforcement: Prefabricated welded joint reinforcement, longitudinal

cross tie wire minimum 9-gauge spaced 16 in. on center; ladder or truss-type design.

5. Dovetail flat bar anchors: Minimum 16 gauge, 7/8 in. minimum width, corrugated, turned up 1/4 in. at end, or with 1/2 in. hole within 1/2 in. of end of bar.

6. Wire anchors: Wire anchors shall be minimum 3/16 in. diameter.

7. Rigid anchors for intersecting bearing walls: 1 1/2 in. wide x 1/4 in. thick x 24 in. minimum length; turn up ends minimum 2 in. or provide cross pins.

8. Wire ties for grouted reinforced masonry: Minimum 9-gauge wire bent into rectangular stirrups 4 in. wide and 2 in. shorter than overall wall thickness; form so that tie ends meet in center of one embedded end of stirrup.

2. Mixes

a. Mortar mixes:

Mortar shall comply with the minimum requirements of ASTM C270, Type M for Arriscraft units use a Portland cement-lime based mortar mix, proportioned to a 1:1:6 ratio, where 1 part Portland cement is mixed with 1 part Type S hydrated mason's lime and 6 parts masonry sand. This mixture shall be properly mixed with the appropriate quantity of water to result in a Type N mortar as specified in CSA A179-94; Mortar and Grout for Unit Masonry, and ASTM C270-95a; Standard Specifications for Mortar for Unit Masonry.

b. Admixtures:

No air-entraining admixtures or materials containing air-entraining admixtures shall be used. No antifreeze compounds or other substances shall be added to mortar or grout. No calcium chloride shall be included in mortar or grout in which metal reinforcing or accessories will be embedded. Mortar colors shall consist of inorganic compounds not to exceed 15% of the weight of the cement except that carbon black shall not exceed 3% of the weight on the cement. If mortar colors are used in reinforced masonry, the ultimate compressive strength of the masonry shall be determined by prism tests.

0400.0800 EXECUTION

1. Preparation

a. Inspection:

Inspect surfaces that are to support masonry work to assure completion to proper lines and grades free of all dirt and other deleterious material. Do not begin work until surfaces not properly prepared have been satisfactorily corrected.

2. Field Quality Control

a. Mortar and grout:

Mix mortar and grout in accordance with the proportion requirements of ASTM C270, and ASTM C476 as applicable. Control batching procedure to ensure proper proportions by measuring materials by volume. Amount of mixing water and mortar consistency shall be controlled by mason. Retempering will be permitted only within the first 2 1/2 hours of initial mix. Any mortar or grout that has partially set shall be discarded.

b. Allowable tolerances:

1. Maximum variation from plumb in lines and surfaces of columns, walls, and arises shall not exceed 1/4 in. 10 ft.; 3/8 in. in any story or 20 ft. maximum; or 1/2 in. in 40 ft.

2. Maximum variation from plumb for external corners, expansion joints, and other conspicuous lines shall not exceed 1/4 in. in any story or 20 ft. maximum; or 1/2 in. in 40 ft.

3. Maximum variation from level or grades for exposed lintels, sills, parapets, horizontal grooves, and other conspicuous lines shall not exceed 1/4 in. in any bay or 20 ft. maximum; or 1/2 in. in 40 ft.

4. Maximum variation of linear building line from an established position in plan and related portions of columns, walls, and partitions shall not exceed 1/2 in. in any bay or 20 ft. maximum; or 3/4 in. in 40 ft.

5. Maximum variation of linear building line from an established position in plan and related portions of columns, walls, and partitions shall not exceed 1/2 in. in any bay or 20 ft. maximum; or 3/4 in. in 40 ft.

c. Anchors and ties:

Remove all dirt, ice, loose rust, and scale prior to installation.

d. Protection of work:

Protect sills, ledges, and offsets from mortar droppings or other damage during construction. Remove misplaced mortar or grout immediately. Protect face

materials against staining. Protect door jambs and corners from damage during construction.

2. Installing Masonry

a. Preparation:

Verify that initial absorption rate of clay brick is less than 0.025 oz. /sq. in. per minute. Brick with absorption rates in excess of this amount shall be wetted with clean water 24 hours prior to placement until unit is nearly saturated, and shall be surface dry when laid. During freezing weather, units that require wetting shall be sprinkled with warm or hot water just before laying.
No wetting of concrete unit masonry is permitted.

b. Installation:

Do not install cracked, broken, or chipped masonry units exceeding ASTM allowances. Use masonry saws to cut and fit exposed units. Lay brick plumb, true to line, and with level courses accurately spaced within allowable tolerances. Unless otherwise shown on the drawings, install masonry work using 1/2 running bond. Stop horizontal runs at end of workday by racking back in each course; toothing will not be permitted. Adjust units to final position while mortar is soft and plastic. If units are displaced after mortar has stiffened, remove, clean joints and units of mortar, and re-lay with fresh mortar. Adjust shelf angles to keep work level and at proper elevation. When joining fresh masonry to set or partially set masonry, remove loose unit and mortar, and clean and lightly wet exposed surface of set masonry prior to laying fresh masonry. The mason shall place all accessories and reinforcement in the masonry as the job progresses. Place horizontal joint reinforcement in first bed joint and each successive third joint of concrete masonry walls to prevent cracking. Cooperate with other trades to assure proper location of anchors, inserts, penetrations, etc.

c. Built-in items:

Install bolts, anchors, nailing blocks, inserts, frames, vent flashing, conduit, and other built-in items as masonry work progresses. Avoid cutting and patching. Solidly grout spaces around built-in items. Provide joints around exterior framed openings 1/4 to 3/8 in. wide, raked and tooled smooth to a uniform depth of 3/4 in., ready for caulking by others. Build chases in, do not cut. Install chases minimum of one masonry unit length from jambs.

d. Joints:

Provide nominal joint thickness of 3/8 in. for concrete unit masonry, 3/8 in. for brick masonry. Do not furrow bed joints for solid masonry units. Provide face-

shell bedding for concrete unit masonry except at grouted cells and base course, where full mortar bedding is required. Construct uniform joints. Provide full head and bed joints, shoved tight to prevent penetration of moisture. Provide weather-proof, concave, tooled joints in exposed surfaces when mortar is thumbprint hard, using round jointing tool. Strike joints flush in surfaces to be plastered, stucco, or covered with other material or surface-applied finish other than paint. Concave tool exterior joints below grade. Remove mortar protruding into cells or cavities to be grouted. Do not permit mortar droppings to fall into cavities of multi-wythe walls or to block weep holes. Fill with mortar all horizontal joints between top of masonry partitions and underside of concrete beams. Keep movement joints clean of all mortar and debris. For tuckpointing, rake mortar joints to a depth of 1/2 to 3/4 in., saturate with clean water, fill solidly with pointing mortar, and tool to match existing joints. Cut first course of CMU at each level with wet saw as required for bed joints to align with veneer joints.

e. Flashing & Damp Proofing:

Provide through-wall flashing at base of all cavity walls; at shelf angles; at lintels, heads, and sills of openings in exterior walls; at all locations shown on the drawings; and at any other locations as required to complete the integrity of waterproofed or dampproofed surfaces. Form dams at horizontal termination of all flashing.

Clean surface of masonry smooth and free from projections that might puncture or otherwise damage flashing membrane. Carefully fit flashing around projections and where dampproof membrane abuts columns, walls, etc. Neatly fold and bed in mastic or mortar so as to direct moisture to the outside. Form membrane to required profiles and install in such a manner as to force any moisture entering the wall to the outside. Hold outer edge of membrane to surface with mastic or mortar. Lap joints 4 in. and seal with mastic or embed in mortar. Form membrane to correct profile without wrinkles or buckles, and protect from punctures and tears during installation. Field cut units at 8/12 ratio at straight wall flashing where roofs intersect with masonry veneer.

Prior to installation of veneer brick and thin brick systems, the entire exterior face of CMU shall be damp proofed with Tamms Dehydrate 75 Emulsified Asphalt Damp Proofing Compond or equal, one (1) coat application.

f. Weep holes:

Provide weep holes in head joints in first course immediately above all flashing. Leave head joint free and clean of mortar or install weep hole tube in head joint. Space weep holes 24 in. on center maximum for brick masonry, and 24 in. on center maximum for Arriscraft. Keep weep holes and area above flashing free of mortar droppings. For backfill material behind retaining walls, and for loose fill

insulation in walls, screen cavity side of weep hole against clogging before fill material is placed.

g. Masonry bonding:

Bond facing and backing of multi-wythe walls as shown on the drawings with masonry headers extended a minimum of 3 in. into backing. If single header does not extend through wall, overlap headers from opposite sides of wall at least 3 in. Provide minimum number of wall headers equal to 4% of wall surface, spaced maximum distance of 24 in. on center either vertically or horizontally.

For multi-wythe walls of hollow concrete masonry units, bond inner and outer wythes by transverse lapping of stretcher unit at least 3 in. over units below, spaced maximum 32 in. on center vertically; or lap with stretcher units at least 50% wider than unit below, spaced maximum 16 in. on center vertically. Bond abutting or intersecting walls and partitions with at least 50% of units at the intersection laid in masonry bond. Provide a minimum of 3 in. of bearing of alternate units on unit below. Masonry bonding is not permitted for grouted or reinforced construction.

h. Metal-tie bonding:

Provide metal ties for bonding of multi-wythe walls as shown on the drawings. Stagger ties in alternate courses, and provide minimum of one tie for each 4.5 sq. ft. of wall surface. Maximum distance between adjacent ties not to exceed 18 in. vertically or 24 in. horizontally. Embed ties in horizontal joints of facing and backing. Provide additional ties within 12 in. of openings, spaced maximum 36 in. around perimeter.

In lieu of metal ties, contractor may use continuous prefabricated metal joint reinforcement as specified, spaced not more than 16 in. on center vertically.

For corner intersections of walls carried up separately, provide rigid steel anchors at maximum vertical spacing of 32 in. When intersecting bearing or shear walls are carried up separately, provide rigid steel anchors at a maximum vertical spacing of 2 ft.

Anchor nonbearing partitions abutting or intersecting other walls or partitions with cavity wall ties at vertical spacing not to exceed 4 ft.

i. Anchoring brick veneer:

Attach brick veneer to backing with metal veneer ties spaced maximum 16 in. on center vertically and horizontally with a minimum of one tie for each 2 sq. ft. of wall area. Embed ties at least 2 in. in horizontal joint of facing. Provide additional ties within 12 in. of openings, spaced maximum 36 in. around perimeter.

j. Expansion and contraction:

Provide vertical movement joints where called for on the drawings at intervals of not more than 20 ft. on centers, and at all offsets, returns, openings, and intersections with dissimilar materials. Provide continuous bond break at steel columns and members. Provide pressure-relieving joints by placing a continuous 1/8 in. neoprene pad below shelf angles.

3. Reinforced Masonry

a. Masonry strength:

Provide minimum ultimate compressive strength of 1,500 psi.

b. Reinforcement:

Hold vertical reinforcement firmly in place by means of frames or other suitable devices. Place horizontal reinforcement as masonry work progresses. Provide minimum clear distance between longitudinal bars equal to nominal diameter of bar. Provide minimum clear distance between bars in columns equal to 1 1/2 times bar diameter. Minimum thickness of mortar or grout between masonry and reinforcement shall be 1/4 in., except than 1/4 in. bars may be laid in 1/2 in. horizontal mortar joints, and 6-gauge or smaller wires may be laid in 3/8 in. mortar joints. Collar joints containing both horizontal and vertical reinforcement shall have a minimum width 1/2 in. larger than the sum of the diameters of the horizontal and vertical reinforcement.

c. Low-lift grouting:

For grout spaces less than 2 in. width, place grout at maximum 24-in. intervals in lifts of 6 to 8 in. as the wall is built. Assure that grout core is clean of mortar, mortar droppings, and debris. Agitate grout during and after placement to assure complete filling and coverage of reinforcement. If work is to be stopped for 1 hour or more, hold grout 1 1/2 in. below top of masonry. Continue grouting to top of finished wall.

d. High-lift grouting:

For grout spaces 2 in. or more in width, grout may be placed in lifts not to exceed 4 ft. For running bond, provide one metal tie for each 3 sq. ft. of wall with maximum spacing of 16 in. vertically and 24 or 32 in. horizontally for brick and concrete block respectively. For stack bond, provide one metal tie for each 2 sq. ft. of wall with maximum spacing 12 in. vertically and 24 in. horizontally for brick, or 16 in.

vertically and horizontally for concrete block.

Keep grout core clean. Provide cleanout holes in bottom course as required for inspection and cleaning. Replace cleanout plugs only after area to be grouted has been accepted. Do not place grout until the entire wall has been in place a minimum of 3 days. Place horizontal grout barriers at convenient intervals. If work is to be stopped for 1 hour or more, hold grout 1 1/2 in. below top of masonry. Continue grouting to top of finished wall.

e. Forms and shoring:

Provide substantial and tight forms to prevent leakage of mortar or grout. Brace or shore forms to maintain position and shape. Do not remove forms or shoring until masonry has hardened sufficiently to carry its own weight and any other temporary loads that may be placed on it during construction (10 days for girders and beams, 7 days for masonry slabs).

4. Cold-Weather Masonry Construction

a. Surface conditions:

Ice or snow that has formed on the masonry bed shall be thawed by application of heat. Apply heat carefully until top surface is dry to the touch. Any section of completed masonry work that is deemed frozen and damaged shall be removed before continuing construction of that section.

b. Condition of masonry units:

Use only dry masonry units, except as permitted below. Wet or frozen masonry units shall not be laid. No wetting of concrete masonry units will be permitted.

For brick masonry units used in cold-weather construction, initial rates of absorption may range to a maximum of 1 1/2 oz. When sprinkling is required to achieve proper rates, heated water shall be used. Water shall be above 70 degrees F. when temperature of units is above freezing and above 130 degrees F. when temperature of units is below freezing.

c. Construction requirements:

1. Air temperature 32 to 40 degrees F: Sand or mixing water shall be heated to produce mortar temperatures ranging from 40 to 120 degrees F.

2. Air temperature 25 to 32 degrees F: Sand and mixing water shall be heated to produce mortar temperatures ranging from 40 to 120 degrees F. Maintain temperature of mortar on boards above freezing.

3. Air temperature 20 to 25 degrees F: Sand and mixing water shall be heated to produce mortar temperatures ranging from 40 to 120 degrees F. Maintain mortar temperatures on boards above freezing. Provide sources of heat on both sides of walls under construction. Windbreaks shall be employed when wind is in excess of 15 mph.

4. Air temperature 20 degrees F. and below: Sand and mixing water shall be heated to provide mortar temperatures ranging from 40 to 120 degrees F. Enclosures and auxiliary heat shall be provided to maintain air temperature above freezing. Temperature of units when laid shall be not less than 20 degrees F.

d. Protection of completed work:

1. Mean ambient temperature 32 to 40 degrees F: Masonry completed or not being worked on shall be protected from rain or snow for 24 hours by covering with weather-resistive membrane.

2. Mean ambient temperature 25 to 32 degrees F: Masonry shall be completely covered with weather-resistive membrane for 24 hours.

3. Mean ambient temperature 20 to 25 degrees F: Masonry shall be completely covered with insulating blankets, or equally protected for 24 hours.

4. Mean ambient temperature 20 degrees F and below: Masonry temperature shall be maintained above freezing for 24 hours by enclosure and supplementary heat such as electric heating blankets, infrared heat lamps, or other approved methods.

5. Pointing and Cleaning

a. Pointing:

At final completion of masonry work, cut out any defective joints or holes in exposed masonry and repaint with mortar, tooling to match adjacent joints.

b. Cleaning:

Dry brush masonry surface after mortar has set at end of each workday and after final pointing. Clean exposed, unglazed masonry with stiff brush and clean water. Cleaning agents may be used only with written approval of Architect. Cleaning agents must be tested on sample wall area of 20 sq. ft. Protect adjacent materials from damage due to cleaning operations. Remove efflorescence in accordance with brick manufacturer's recommendations.

For exposed areas to be painted or to remain exposed, any and all defects in excess of 3/16” in depth or width shall be infilled with mortar and brushed smooth. All joints shall be fully tooled and brushed. Any and all mortar droppings, etc. on the face of units shall be removed as required for a smooth final paint finish.

Leave work area and surrounding surfaces clean and free of mortar spots, droppings, and broken masonry.

* * * * *

DIVISION 5 - STRUCTURAL STEEL

SECTION 05120 - STRUCTURAL STEEL

PART 1 GENERAL

1.01 WORK INCLUDED

A. Structural steel framing members, structural steel support members, struts, and with required bracing, welds, and fasteners.

B. Baseplates, shear stud connectors and expansion joint plates.

1.02 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Section 3300.1500: Anchorages cast in concrete.

B. Section 0400.1200: Anchorages embedded in masonry.

1.03 RELATED WORK

A. Section 05210 - Steel Joists.

B. Section 05311 - Steel Roof Deck: Support framing for small openings in metal deck.

C. Section 05313 - Steel Floor Deck: Support framing for small openings in metal deck.

1.04 REFERENCES

A. ASTM A36 - Structural Steel.

B. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.

C. ASTM - A325 - High Strength Bolts for Structural Steel Joints.

D. ASTM A490 - Quenched and Tempered Alloy Steel Bolts for Structural Steel Joints.

E. ASTM - A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.

F. ASTM A501 - Hot-Formed Welded and Seamless Carbon Steel Structural Tubing.

G. ASTM A572 - High Strength Low Alloy Columbium-Vanadium Steel of Structural Quality.

H. ASTM A502 - Steel Structural Rivets.

I. AWS D1.1 - Structural Welding Code.

J. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.

K. FS TT-P-31 - Paint, Oil: Iron Oxide, Ready Mix, Red and Brown.

1.05 SHOP DRAWINGS

A. Submit shop drawings under provisions of the General Conditions.

B. Indicate profiles, sizes, spacing, and locations of structural members, connections, attachments and fasteners.

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

D. Prepare shop drawings under seal of a Professional Structural Engineer registered in State of New York.

PART 2 PRODUCTS

2.01 MATERIALS

A. Structural Steel Members: ASTM A36.

B. Structural Tubing: ASTM A500, Grade B.

C. Bolts, Nuts and Washers: ASTM A325.

D. Welding Materials: AWS D1.1; type required for materials being welded.

E. Primer: FS TT-P-31, brown.

2.02 FABRICATION

A. Fabricate structural steel members in accordance with AISC Specification.

2.03 FINISH

A. Clean, prepare, and shop prime structural steel members.

PART 3 EXECUTION

3.01 ERECTION

A. Erect structural steel in accordance with AISC Specification.

B. Make provision for erection loads, and for sufficient temporary bracing to maintain structure safe, plumb, and in true alignment until completion of erection and installation of permanent bracing.

C. Do not field cut or alter structural members without approval of Architect/Engineer.

D. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete. Use a primer consistent with shop coat.

E. All structural steel installations shall be A-36 steel and shall conform to ASTM Specifications. Affidavit to be filed with Building Department upon request.

F. All structural steel fabrication, erection, and connections shall conform to latest AISC standards and specifications Type 2 construction except as noted.

G. All field connections to be 3/4" diameter machine bolts unless indicated otherwise. Shop connections to be either machine bolted or welded. All bolts to be A-325 friction type. Connections shall be per Type 1 construction per AISC for portal frames and shall be detailed to develop at least full allowable movement and shear capacity. All remaining steel to have Type 2 connections. A-307 bolts may be used for minor connections when acceptable to engineer.

H. Steel encased in concrete shall not be painted. All steel surfaces not in contact with concrete shall receive one shop coat of approved paint, and after erection, one field coat. Omit primer paint at welds and high strength bolts.

I. The structure shall be properly guyed and braced.

J. Grout under column and beam bearing plates shall be non-shrink, propak or equal.

K. Provide loose lintels as required for openings in masonry walls and partitions.

L. Provide holes in shop for bolted blocking, pipe penetrations, etc. Details shall be shown on shop drawings for review by Engineer.

SECTION 05210 - STEEL JOISTS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Open web steel joists, with bridging, attached bearing plates, angles, and anchors.

B. Loose bearing plates and anchor bolts for site placement.

1.02 WORK FURNISHED BUT INSTALLED UNDER OTHER SECTIONS

A. Section 0300.1500: Anchorages cast in concrete.

B. Section 0400.0200: Anchorages embedded in masonry.

1.03 RELATED WORK

A. Section 05120 - Structural Steel.

B. Section 05311 - Steel Roof Deck: Support framing for small openings in metal deck.

C. Section 05313 - Steel Floor Deck: Support framing for small openings in metal deck.

1.04 REFERENCES

A. ASTM A307 - Carbon Steel Threaded Standard Fasteners.

B. ASTM A325 - High Strength Bolts for Structural Steel Joints.

C. AWS D1.1 - Structural Welding Code.

D. FS TT-P-636 - Primer Coating, Alkyd, Wood and Ferrous Metal.

E. SJI - Standard Specifications for Open Web Steel Joists H-Series, and Standard Specifications for Longspan Steel Joists LH- Series and Deep Longspan Steel Joists DLH-Series.

F. SSPC 15 - Red Oxide.

1.05 QUALITY ASSURANCE

A. Conform to SJI Standard Specifications, Load Tables, and Weight Tables.

1.06 SHOP DRAWINGS

A. Submit shop drawings under provisions of the General Conditions.

B. Indicate standard designations, configuration, sizes, spacing, and locations of joists, bridging, connections, and attachments.

C. Prepare shop drawings under seal of a Professional Structural Engineer registered in State of New York.

PART 2 PRODUCTS

2.01 MATERIALS

A. Open Web Joist Members: SJI Type.

B. Anchor Bolts, Nuts and Washers: ASTM A325.

C. Primer: SSPC 15, Type 1 red oxide.

2.02 FABRICATION

A. Fabricate steel joists in accordance with SJI Standard Specifications including headers and other supplementary framing.

B. Provide bottom and top joist chord extensions indicated.

C. Drill holes in top chords necessary for attachment of wood nailers. Weld threaded lugs to top chords for attachment of wood nailers.

D. Prepare and shop prime with two coats of primer.

PART 3 EXECUTION

3.01 ERECTION

A. Erect steel joists in accordance with SJI Standard Specifications.

B. Bear joists on supports in accordance with SJI.

C. During erection, provide temporary bracing for induced loads and stresses.

D. Coordinate placement of anchorages in concrete and masonry construction for securing bearing plates.

E. Field weld joist seat to placed bearing plates after alignment, positioning after installation of bridging.

F. Do not permit erection of decking until joists are braced and bridged.

G. Do not field cut or alter joists without approval of Architect/Engineer.

H. After erection, prime welds, abrasions, and surfaces not primed. Use primer consistent with shop coat.

I. All joists and accessories shall be of the type, size, gage and spacing as shown on the plans.

J. All joists shall receive one shop coat of approved paint, and after erection, touch up paint as necessary.

K. All bridging shall be continuous top and bottom, and shall be welded to joists. Provide "X" bridging where shown.

L. Any field cutout to be made in joists shall be approved by, and reinforced as specified by the engineer. No cutout shall be made prior to approval.

M. End blocking shall be provided where joists are not otherwise restrained against rotation.

N. All joists to be welded or bolted to supporting steel per SJI requirements.

* * * * *

SECTION 05311 - STEEL FLOOR AND ROOF DECKING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Steel roof deck and accessories.

B. Framed openings up to 18 inches (450 mm).

C. Bearing plates and angles.

1.02 RELATED WORK

A. Section 05120 - Structural Steel: 05210 - Steel Joists.

1.03 REFERENCES

A. AISI - Specification for the Design of Cold-Formed Steel Structural Members.

B. ASTM A36 - Structural Steel.

C. ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot- Dip Process, Structural (Physical) Quality.

D. ASTM A525 - Steel Sheet, Zinc-Coated, Galvanized by the Hot- Dip Process.

E. ASTM A611 - Steel, Cold-Rolled Sheet, Carbon, Structural.

F. AWS D1.1 - Structural Welding Code.

G. SDI - Design Manual for Composite Decks, Form Decks, Roof Decks.

1.04 SHOP DRAWINGS

A. Submit shop drawings under provisions of General Requirements.

B. Indicate decking plan, deck profile dimensions, supports, projections, openings, and reinforcement, finishes, pertinent details, and accessories.

1.05 DELIVERY, STORAGE, AND HANDLING

A. Store decking on wood sleepers with slope for positive drainage.

PART 2 PRODUCTS

2.01 MATERIALS

A. Sheet Steel: ASTM A446, Grade B structural quality; with G60 coating; unfinished.

B. Bearing Plates: Angles: ASTM A36 steel.

C. Welding Materials: AWS D1.1.

D. Cell Closures: Closed cell foam rubber, profiled to decking.

E. Metal Closure Strips, Wet Concrete Stops, Cover Plates, and Related Accessories: 22 gage sheet steel; of required profiles and size.

F. Primer: Red oxide type.

G. Touch-up Primer: Red oxide.

2.02 FABRICATION

A. Metal Decking: Minimum gage as noted on plans, sheet steel, high fluted profile to SDI 24 inch sheets; multiple span; lapped joints.

B. Fabricate metal decking in accordance with SDI Design Manual for Composite Decks, Form Decks, Roof Decks to accommodate maximum working stress of 20,000 psi and maximum span deflection of 1/240.

C. Fabricate roof sump pan of 14 gage sheet steel, flat bottom, sloped sides, recessed 1-1/2 inches (38 mm) below roof deck surface, bearing flange 3 inches (75 mm) wide, watertight.

PART 3 EXECUTION

3.01 INSTALLATION

A. Erect metal decking in accordance with SDI Design Manual for Composite Decks, Form Decks, and Roof Decks. Provide welding in accordance with AWS D1.1.

B. On steel support members provide 3 inch minimum bearing. Align and level on supports.

C. Weld male/female side lap at 18 inches oc maximum.

D. Fasten deck to steel support members at ends and intermediate supports with 3/4 inch fusing welds at 12 inches oc maximum.

E. Reinforce deck openings from 6 to 18 inches (150 to 450 mm) in size with 2 x 2 x 1/4 inch (50 x 50 x 6 mm) steel angles. Place angles perpendicular to flutes; extend minimum two flutes each side of opening and weld to deck.

F. Install 6 inch (150 mm) wide sheet steel cover plates where deck changes direction. Spot weld in place 12 inches oc maximum.

G. Install sheet steel strip closures at roof edge upturned to thickness of slab, to contain wet concrete. Provide closures of sufficient strength to remain in place without distortion.

H. Install sheet steel closures and angle flashings to close openings between deck and walls, columns, and openings.

I. Install foam cell closures in locations above walls and partitions.

J. Position roof sump pans with flange bearing on top surface of deck. Weld at each deck flute.

K. Immediately after welding deck in place, touch-up welds, burned areas, and surface coating damage with prime paint.

1. Metal roof deck shall be 1-1/2 inches deep, galvanized, wide rib, equal to United Steel Roof Deck "Type B" or Bowman Roof Deck "Type B".

2. Weld to supports and screw side laps, per manufacturer’s recommendations and specifications.

3. Deck units shall be in lengths to span over three or more supports where possible.

4. Stone concrete topping shall have 28 day, 3000 psi. Closures shall be provided at edges, at perimeter and at openings to serve as concrete stop.

5. Conform to steel deck institute recommendations.

SECTION 05400 - COLD FORMED METAL FRAMING

PART 1 GENERAL

1.01 WORK INCLUDED

A. Non-load bearing formed steel stud interior wall framing including soffits, etc. as shown on the drawings.

1.02 RELATED WORK

A. Section 07213 - Batt and Blanket Insulation: Insulation within framing members.

B. Section 09260 - Gypsum Board Systems.

1.03 REFERENCES

A. ASTM A90 - Test Method for Weight of Coating on Zinc-Coated (Galvanized) Iron or Steel Articles.

B. ASTM A446 - Steel Sheet, Zinc-Coated (Galvanized) by Hot Dip Process, Physical (Structural) Quality.

C. ASTM A570 - Hot-Rolled Carbon Steel Sheet and Strip. Structural Quality.

D. ASTM A611 - Steel, Cold-Rolled Sheet, Carbon, Structural.

E. AWCI (Association of Wall and Ceiling Industries) - Specifications Guide for Cold Formed Steel Structural Members.

F. AWS D1.1 - Structural Welding Code.

G. FS TT-P-645 - Primer, Paint, Zinc-Chromate, Alkyd Type.

1.04 SYSTEM DESCRIPTION

A. Design system to accommodate construction tolerances, deflection of building structural members, and clearances of intended openings.

1.05 QUALITY ASSURANCE

A. Manufacturer: Company specializing in structural framing components with three years minimum experience.

1.06 SUBMITTALS

A. Submit product data under provisions of Section 01300.

B. Provide product data on standard framing members. Describe materials and finish, product criteria and limitations.

C. Submit manufacturer's installation instructions under provisions of Section 01300.

PART 2 PRODUCTS

2.01 FRAMING MATERIALS

A. Studs: ASTM A446 sheet steel.

B. Track: Formed steel; channel shaped; same width as studs, tight fit.

2.02 ACCESSORIES

A. Bracing, Furring, Bridging: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.

B. Plates, Gussets, Clips: Formed sheet steel, thickness determined for conditions encountered, manufacturer's standard shapes, same finish as framing members.

2.03 FASTENERS

A. Self-drilling, Self-tapping Screws, Bolts, Nuts and Washers: ASTM A90, hot dip galvanized.

B. Anchorage Devices: Power driven.

C. Welding: In conformance with AWS D1.1.

2.04 FABRICATION

A. Fabricate assemblies of framed sections of sizes and profiles required; with framing members fitted, reinforced, and braced to suit design requirements.

B. Fit and assemble in largest practical sections for delivery to site, ready for installation.

2.05 FINISHES

A. Galvanizing: G90 coating class.

B. Primer: FS TT-P-645, touch-up for galvanized surfaces.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that substrate surfaces and building framing components are ready to receive work.

B. Beginning of installation means acceptance of existing conditions.

3.02 ERECTION OF STUDDING

A. Install components in accordance with manufacturer's instructions.

B. Align floor and ceiling tracks; locate to partition layout. Secure in place with fasteners or welding at maximum 24 inches o.c.

C. Place studs at 16 inches o.c.; not more than 2 inches from abutting walls and at each side of openings. Connect studs to tracks using fastener method.

D. Construct corners using minimum three studs. Double stud at wall opening, door, and window jambs.

E. Erect load bearing studs one piece full length. Splicing of studs is not permitted.

F. Erect load bearing studs, brace, and reinforce to develop full strength to meet design requirements.

G. Extend stud framing through ceiling to underside of floor or roof structure above.

H. Coordinate placement of insulation in multiple stud spaces made inaccessible after erection.

I. Install intermediate studs above and below openings to match wall stud spacing.

J. Provide deflection allowance in stud track, directly below horizontal building framing for non-load bearing framing.

K. Attach cross studs to studs for attachment of fixtures anchored to walls.

L. Install framing between studs for attachment of mechanical and electrical items, and to prevent stud rotation.

M. Touch-up field welds and damaged galvanized surfaces with primer.

N. Complete framing ready to receive gypsum wall board.

* * * * *

SECTION 05510 - METAL STAIRS

PART 1 GENERAL

1.01 WORK INCLUDED

Provide and install of:

A. Steel stair frame of structural sections, with open and closed risers as called out on plans.

B. Pan to receive concrete fill stair treads and landings.

D. Balusters and handrailing.

E. Steel ladder to roof access hatch.

1.02 REFERENCES

A. ANSI A202.1 - Metal Bar Grating Manual for Steel and Aluminum Gratings and Stair Treads.

B. ASTM A36 - Structural Steel.

C. ASTM A53 - Hot-Dipped, Zinc-coated Welded and Seamless Steel Pipe.

D. ASTM A307 - Low-Carbon Steel Externally and Internally Threaded Fasteners.

E. ASTM A352 - High Strength Bolts for Structural Steel Joints.

F. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.

G. ASTM A446 - Steel Sheet, Zinc Coated (Galvanized) by the Hot- Dip Process, Physical (Structural) Quality.

H. ASTM A500 - Cold-formed Welded and Seamless Carbon Steel Structural Tubing in Rounds and Shapes.

I. ASTM A501 - Hot-formed Welded and Seamless Carbon Steel Structural Tubing.

J. AWS D1.1 - Structural Welding Code.

K. FS TT-P-31 - Paint, Oil: Iron Oxide, Ready Mix, Red and Brown.

L. FS TT-P-641 - Primer Coating, Zinc Dust - Zinc Oxide (for Galvanized Surfaces).

M. FS TT-P-645 - Primer, Paint, Zinc Chromate, Alkyd Type.

1.03 STRUCTURAL REQUIREMENTS

A. Fabricate stair assembly to support live load of 100 lb/sq. ft. with deflection of stringer not to exceed 1/240 of span.

B. Railing assembly, wall rails, and attachments to resist lateral force of 50 lbs. at any point without damage or permanent set.

1.04 SUBMITTALS

A. Submit shop drawings under provisions of Section 01300.

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

C. Include erection drawings, elevations, and details where applicable.

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

E. Prepare shop drawings under seal of a Professional Structural Engineer registered in the State of New York.

F. Submit samples under provisions of Section 01300.

PART 2 PRODUCTS

2.01 MATERIALS

A. Steel Section: ASTM A36.

B. Steel Tubing: ASTM A500, Grade B.

C. Sheet Steel: ASTM A446, Grade B, structural quality with galvanized coating.

D. Bolts, Nuts, and Washers: ASTM A307.

E. Welding Materials: AWS D1.1; type required for materials being welded.

F. Primer: FS TT-P-31, brown; for shop application and field touch-up.

G. Touch-up Primer for Galvanized Surfaces: FS TT-P-641.

H. Exposed Mechanical Fastenings: Flush countersunk screws or bolts; unobtrusively located; consistent with design of structure.

2.02 FABRICATION - GENERAL

A. Verify dimensions on site prior to shop fabrication.

B. Fabricate items with joints tightly fitted and secured.

C. Fit and shop assemble sections in largest practical sizes, for handling through building openings.

D. Grind exposed welds flush and smooth with adjacent finished surface. Ease exposed edges to small uniform radius. At exposed to view locations, place plastic filler between welds; sand flush.

E. Make exposed joints butt tight, flush, and hairline.

F. Accurately form components required for anchorage of stairs, landings and railings to each other and to building structure.

2.03 FABRICATION - PAN STAIRS AND LANDINGS

A. Fabricate stairs with risers and treads of pan construction to receive concrete.

B. Form treads and risers from minimum 16 gage sheet stock.

C. Secure tread pans to stringers' clip angles, welded in place.

D. Form stringers of rolled steel channels, 12 inches deep. Weld fascia plates to channels using 14 gage steel sheet stock across channel toes.

E. Form landings from minimum 20 gage metal decking. Reinforce underside with angles to attain design load requirements.

F. Prime paint components.

2.04 FINISH

A. Clean surfaces of rust, scale, grease, and foreign matter prior to finishing.

B. Do not prime surfaces in direct contact bond with concrete or where field welding is required.

C. Prime paint items specified with one coat.

PART 3 EXECUTION

3.01 ERECTION

A. Erect stairs level and plumb, free from distortion or defects detrimental to appearance or performance.

B. Provide anchors, plates, angles, hangers, and struts required for connecting stairs to structure.

C. Verify alignment with adjacent construction. Coordinate related work.

D. Do not field cut or alter members.

E. Field bolt and weld to match standard of shop bolting and welding. Hide bolts and screws whenever possible. Where not hidden, use flush countersunk fastenings.

F. Mechanically fasten joints butted tight, flush, and hairline. Grind welds smooth and flush.

SECTION 05521 - PIPE AND TUBE RAILINGS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Steel pipe and tube handrails, balusters, and fittings.

1.02 RELATED WORK

A. Section 05510 - Metal Stairs: Handrailing at stairs.

1.03 REFERENCES

A. ASTM A386 - Zinc-Coating (Hot-Dip) on Assembled Steel Products.

B. FS TT-P-31 - Paint, Oil: Iron Oxide, Ready Mix, Red and Brown.

1.04 STRUCTURAL REQUIREMENTS

A. Railing assembly, wall rails, and attachments to resist lateral force of 50 lbs. at any point without damage or permanent set.

1.05 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01300.

B. Indicate component details, materials, finishes, connection and joining methods, and the relationship to adjoining work.

C. Submit manufacturer's installation instructions under provisions of Section 01300.

D. Submit samples under provisions of Section 01300.

PART 2 PRODUCTS

2.01 STEEL RAILING SYSTEM

A. Rails and Posts 1-1/2 inches diameter steel pipe welded jointing.

B. Posts: 12 inches diameter steel pipe welded jointing.

C. Fittings: Elbows, Tee-shapes, wall brackets, escutcheons; cast steel.

D. Mounting: Adjustable brackets and flanges, with steel inserts for casting in concrete where required.

E. Splice Connectors: Steel concealed spigots.

F. Primer: FS TT-P-31, brown; one coat.

2.02 FABRICATION

A. Verify dimensions on site prior to shop fabrication.

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

C. Supply components required for secure anchorage of handrails and railings.

D. Grind exposed welds smooth and flush with adjacent surfaces.

E. Make exposed joint butt tight, flush, and hairline.

F. Accurately form components required for anchorage of railings to each other and to building structure.

PART 3 EXECUTION

3.01 PREPARATION

A. Supply items to be cast into concrete embedded in masonry or placed in partitions with setting templates and erection drawings to appropriate Sections.

3.02 INSTALLATION

A. Install in accordance with shop drawings and manufacturer's instructions.

B. Erect work square and level, free from distortion or defects detrimental to appearance or performance.

C. Anchor handrailings to structure.

D. Weld field connections and grind smooth to complete assembly. Touch-up welds with primer.

SECTION 05540 METAL WHEEL GUARDS

PART 1 GENERAL

1. The work under this Section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

PART 2 PRODUCTS

1. Provide & install McKinley Wheel Guards at each overhead door jamb (2 per door), Model # Type/WG7 Cast Iron.

2. Casting shall be uniform in quality, free from blow holes, porosity, hard spots, shrinkage defects, swells, cracks or other injurious defects.

3. Each unit to be a minimum of 24” x 8” wide wall bracket, 20” high dome to round off corner not to extend more than 6” into opening.

4. Each unit shall be finish painted. Refer to quality assurance.

PART 3 QUALITY ASSURANCE

1. Material used in manufacturer of iron castings shall conform to ASTM specifications A48-64 Class 40 Iron.

2. All cast iron casting shall have one coat of bituminous paint. Casting to be finished painted as per paint section under metals, otherwise verify with Architect. Color selected by Owner.

DIVISION 6 - WOOD AND PLASTICS

SECTION 06100 - ROUGH CARPENTRY

06100.0100 GENERAL

1. The work under this Section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

06100.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all carpentry related work, complete, in strict accordance with the Contract Drawings and as specified herein or reasonably implied.

    a. Blocking, grounds, nailing strips, wedges, centerings, wood curbs for roof openings, wood closures and members to receive flashing, etc., for the work of this Contract.

    b. All other items of carpentry work indicated on the drawings.

    c. All required miscellaneous rough hardware and fasteners as necessary for a complete installation.

06100.0300 RELATED WORK SPECIFIED ELSEWHERE

1. Concrete Work - Division 3.

2. Masonry - Division 4.

3. Doors and Windows - Division 8.

4. Specialties - Division 10.

5. Thermal & Moisture Protection - Division 7.

06100.0400 MATERIALS

1. General: Lumber shall conform to the requirements of the latest edition of the American Lumber Standards Simplified Practice Recommendation R-16. Grades shall conform to the grading rules of the Association having jurisdiction, and shall bear the official grade and trademark of the Inspection Bureau of the Association and a mark of mill identification. Moisture content of lumber shall not exceed 19 percent (19%).

2. Preservative Treatment: Pressure treat all lumber for exterior work, and for all wood furring, screeds and grounds, and all lumber embedded in or in contact with masonry or concrete, against decay with zinc chloride or other approved preservatives, in accordance with the standard specifications of the American Wood Preservers Association; shall be kiln dried after treatment.

3. Lumber:

   a. Defects or blemishes shall not appear in the material used. Lumber shall be D4S, sound, thoroughly seasoned and well manufactured, and free from warp that cannot be corrected in the process of nailing or bolting.

   b. Furring Screeds and Grounds: Western or Northern White Pine, Fir or Spruce which has been prepared and bundled by the manufacturer for those purposes.

06100.0500 VERIFICATION OF DIMENSIONS AND CONDITIONS

1. All dimensions and conditions at the building which affect the size, construction and installation of items or features provided under this Section shall be carefully checked, verified and compared with the drawings. All discrepancies and conflicts including those between different materials or installations shall be reported to the Architect in writing for correctionion and adjustment.

2. Consult and agree with other trades on details of construction of adjoining installations which have not yet been completed.

06100.0600 STORAGE OF LUMBER AND WOODWORK

1. Lumber for rough usage when delivered at the site shall be immediately piled in stacks to insure drainage and free circulation. Stacks shall be supported on skids, placed to give slope of not less than 1/2" per foot, the stacks with a minimum clearance of 6" above grade. Stacks shall be covered with tarpaulins or other watertight covering. Grounds and similar small sized lumber shall be stored inside the building as soon as possible after delivery.

06100.0700 TEMPORARY PROTECTION, ENCLOSURES AND PARTITIONS

1. Provide and maintain protection during the life of the Contract for all materials and work installed under this Section and for other work requiring protection.

2. Provide and maintain all temporary partitions and enclosures for doors, windows, temporary openings, and for openings to exclude rain and snow and to permit maintenance of suitable conditions and temperatures within the building for the work to be actively executed at all times.

3. Provide batten doors, complete with hinges and padlocks at all exterior door openings, and as directed and approved by the Architect.

4. Remove and dispose of, off the site, all temporary protection enclosures.

06100.0800 ROUGH HARDWARE

1. Provide all items of rough hardware of every description including nails, spikes, screws, bolts, anchors, ties, expansion shields and bolts, strap irons and other items which are required to assemble or secure the work shown or specified herein.

2. All nails, driven into the face of exposed exterior woodwork, shall be non-corrosive and such nails shall be set and putty stopped.

06100.0900 FRAMING AND BLOCKING

1. Provide blocking, etc., as shown or as obviously necessary for the various systems and items herein specified, with all bolts or nails and all gusset plates, metal attachments, and miscellaneous steel items or devices shown or necessary for rigid substantial construction and support of work indicated.

2. Conform to details shown on the drawings. Framing shall be accurately done and abutting members shall fit closely and be securely fastened together as approved.

   a. Attaching to Masonry: Except where built-in anchors are shown or specified, members required to be attached to masonry shall be secured to same with expansion bolts extending into masonry not less than 4" or by special bolts or anchors where so shown or specified.

3. Set all members in designated positions, build plumb and true, and brace in position. Frame as shown or directed for the proper assembly of work, both concealed and within enclosed areas.

06100.1000 NAILING STRIPS FOR ROOFING AND SHEETMETAL WORK

1. Materials in general shall be dimension fir lumber or other approved species dressed to required sizes. All material where indicated as bolted, shall be secured with bolts of sizes and spacing as included therein. Furring for soffit finish shall be arranged for solid nailing at all edges and joints.

2. Include required recessing of nuts and washers, as required.

3. Provide all other required bolts and fastenings.

06100.1100 GROUNDS, FURRING AND SCREEDS

1. Provide all wood grounds and/or furring required for the securing in place of all finished carpentry work, interior wood finish and other items furnished by this or other contractors including trim, mouldings, finished carpentry, shelving, frames, covers, stools, aprons, etc.

2. Grounds shall be minimum 3/4" thick and as wide as may be necessary for the required purpose; securely attached with hardened nails, screws, toggle bolts or other fasteners. Grounds shall be carefully plumb, leveled and straightened by means of wood or steel wedges or blocks and where necessary shall be aligned with continuous partitions and wall surfaces.

3. Grounds and screeds shall be of dressed lumber free from wave or knots which would impair its usefulness.

4. The attention of the contractor is called to the fact that the plans do not show all the blocking nor some of the subordinate framing which will be required. This blocking and subordinate framing will be required. This blocking and subordinate framing is nevertheless to be furnished and installed under this Section.

* * * * *

DIVISION 6 - WOOD AND PLASTICS

SECTION 06124 - NAILABLE FIRESTALL ROOF DECK

06124.0100 GENERAL

1. The work under this Section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

06124.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all nailable roof decking and related work, complete, in strict accordance with the Contract Drawings and as specified herein or reasonably implied.

06124.0300 RELATED WORK SPECIFIED ELSEWHERE

1. Metals - Division 5.

2. Thermal & Moisture Protection - Division 7.

06124.0400 MATERIALS

1. All structural Roof Panels shall be 1” thick Firestall Roof Decking as manufactured by the Homasote Company, West Trenton, NJ, made of a composition of Homasote structural board and a face ply of UL Class A NCFR Homasote. All panels shall be installed in accordance with current Homasote Company Instructions.

06124.0500 VERIFICATION OF DIMENSIONS AND CONDITIONS

1. All dimensions and conditions at the building which affect the size, construction and installation of items or features provided under this Section shall be carefully checked, verified and compared with the drawings. All discrepancies and conflicts including those between different materials or installations shall be reported to the Architect in writing for correction and adjustment.

2. Consult and agree with other trades on details of construction of adjoining installations which have not yet been completed.

06124.0600 GENERAL REQUIREMENTS

1. **Packaging, Storage and Protection** Firestall Roof Deck comes to the job site covered in weather resistant plastic, encapsulated units. However, all materials should be stored at job site above ground on wooden pallets and covered by tarpaulins. Packaging material is not intended for exterior job site protection.

2. Install in a dry condition only. Follow immediately with application of roofing felt and finish roofing.
   Panel ends must have a minimum of 3/4" bearing at all times.

3. Panels must have 1/8" expansion and contraction space (running the full thickness of the panel) between all square end joints and 3/4" space at all abutting shear and fire walls and gable ends.

4. The NCFR face ply with V groove must face down towards the interior of the structure.

06124.0700 INTERIOR FINISH

1. Interior face of panel is NCFR Homasote.

2. As panels are applied to framing, a bead of caulking to be placed in the groove of each joint and along the panel ends. After roof is completed, interior surface should be painted with a vapor retardant paint such as Glidden INSUL-AID or equal.

06124.0800 APPLICATION TO STEEL FRAME STRUCTURE

1. Apply metal angle or wood nailer to metal C joists at all eave and rake edges.

2. Starting at low or outside edge of the roof, place the panel on the bar joists with groove edge toward low portion of roof and tongue toward high portion. Fasten using Olympic # 14-10 Heavy Duty All Purpose Screws (or equal) applied 10" o.c. and back 1-1/2" from edges at each bar joist location (3 screws per joist). To install Olympic #14-10 Heavy Duty All Purpose Screws, pre-drill hole through panel into flange of the steel joist using 7/32" high speed drill bit. Place screw in pre-drilled hole and draw fastener head flush with surface of panel; do not over drill. Fasten 12" o.c. at each framing location.

3. Place subsequent panels to fit over the exposed tongue. Drive T&G edges tightly. Place panels in straight alignment and at right angles to framing with all butt joints falling on framing members. Butt joints must be staggered. Leave 1/8" space between all butt joints.

4. The structural framing system shall provide adequate structural support at the perimeter of all openings larger than 8" diameter.

5. All end joints shall be securely fastened to the joists.

6. As Firestall Panels are installed, cover immediately with roofing felt and finish roofing.

06124.0900 ROOFING APPLICATION

1. **ASPHALT/FIBERGLASS SHINGLES**
   Apply roofing felt and asphalt/fiberglass strip shingles directly to the Firestall Roof Deck panels. Use annular threaded galvanized roofing nails with 3/8" diameter head, 1 1/4" long. Use Homasote Nail No. 2125 (3/8" head, 1 1/4" long, annular threaded, galvanized), Bostitch Nail No. CR3DGAL (3/8" head, 1 1/4" long) shot with N12B Roofing Nailer, or Senco Staple No. P178A8 (1" crown, 1 1/2" long, 5562 galvanized wire with Sencoting) shot with the appropriate Senco stapler.

* * * * *

SECTION 06200 - FINISH CARPENTRY

PART 1 GENERAL

1.01 WORK INCLUDED

A. Finish carpentry items, other than shop fabricated work, with hardware and attachment accessories.

B. Any and all Oak chair rails, window trim, wainscot, bars, cabinets, etc.

1.02 WORK INSTALLED BUT FURNISHED UNDER OTHER SECTIONS

A. Section 08700 - Hardware: Supply of cabinet hardware to this Section.

1.03 RELATED WORK

A. Section 06100 - Rough Carpentry.

B. Section 06410 - Custom Casework: Shop fabricated cabinetwork.

C. Section 08210 - Wood Doors.

D. Section 08610 - Wood Windows.

E. Section 08700 - Hardware: Supply of finish carpentry hardware.

F. Section 09900 - Painting: Painting and finishing of finish carpentry items.

1.04 REFERENCES

A. AWI - Quality Standards.

B. FS L-P-508 - Plastic Sheet, Laminated, Decorative and Non- Decorative.

C. FS MM-L-736 - Lumber - Hardwood.

D. FS TT-W-550 - Wood Preservative, Chromated Copper Arsenate Mixture.

E. FS TT-W-568 - Wood Preservative, Creosote-Petroleum Solution.

F. FS TT-W-570 - Wood Preservative, Pentachlorophenol.

G. FS TT-W-571 - Wood Preservation: Treating Practices.

H. FS TT-W-572 - Wood Preservative, Water Repellent.

I. FS MMM-A-130 - Adhesive, Contact.

J. PS 1 - Construction and Industrial Plywood.

K. PS 20 - American Softwood Lumber Standard.

L. PS 51 - Hardwood and Decorative Plywood.

M. PS 58 - Basic Hardwood.

1.05 QUALITY ASSURANCE

A. Perform finish carpentry work in accordance with AWI Quality Standards, Premium grade.

B. Fire retardant treatment to conform to requirements of Underwriters' Laboratories (UL).

1.06 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01300.

B. Indicate materials, component profiles, fastening methods, jointing details, finishes, and accessories.

C. Submit samples under provisions of Section 01300.

1.08 DELIVERY AND STORAGE

A. Deliver wood materials under provisions of Section 01600.

B. Store indoors, in ventilated areas with constant minimum temperature of 60 degrees F and maximum relative humidity of 55 percent.

PART 2 PRODUCTS

2.01 LUMBER MATERIALS

A. Softwood Lumber: PS 20; premium grade in accordance with AWI; maximum moisture content of 6 percent for interior work and 10 percent for exterior work.

B. Hardwood Lumber: PS 58; premium grade in accordance with AWI; maximum moisture content of 6 percent.

C. Facias to be primelock factory primed with Alkyo - oil primer finger jointed Eastern White Pine 5/4" boards with maximum lengths for minimum jointing.

2.05 ACCESSORIES

A. Bolts, Nuts, Washers, Lags, and Screws: Size and type to suit application; non-corrosive for exterior, high humidity, and treated wood locations; plain finish at other interior locations.

PART 3 EXECUTION

3.01 INSTALLATION

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

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

C. Prime paint surfaces of items or assemblies in contact with cementitious materials.

3.02 SITE TREATMENT OF WOOD MATERIALS

A. Brush apply two coats of preservative treatment on exterior located finish carpentry items.

B. Apply preservative treatment in accordance with manufacturer's instructions.

C. Treat site-sawn ends. Allow preservative to cure prior to erecting materials.

D. Prime paint surfaces in contact with cementitious materials.

3.03 PREPARATION FOR FINISHING

A. Sand work smooth and set exposed nails and screws. Apply manufacturer's recommended filler in exposed screw indentations and at joints.

END OF SECTION

SECTION 06400
ARCHITECTURAL WOODWORK & PLASTIC LAMINATE WORK

06400.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

06400.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all related work, complete, in strict accordance with the contract drawings, and as specified herein or reasonably implied.

2. Wood counters and cabinets. The products of "Boise Cascade" Model "Clear Brook" of Berryville, VA or approved equal shall be used as a standard of acceptable workmanship and fabrication.

3. Laminated plastic counter tops and cabinet bases.

4. Wood trim, mouldings, etc. All wood trim profiles are to match existing trim profiles unless otherwise determined by the Architect.

5. All other wood and/or plastic laminated items classified as cabinet work and as called for on the drawings.

6. Shop priming all finished woodwork and millwork which is not required to be stained or varnished or plastic laminate surfaced.

7. All rough hardware, and furnishing and installing finishing hardware where hereinafter specified to be provided under this Section, and as required to be provided under this Section and as required to complete the work of this Section.

8. All cutting and patching of work to permit the installation of new work.

06400.0300 SHOP DRAWINGS

1. Submit shop drawings in accordance with the requirements of the General Conditions based on the Contract Drawing and Specifications showing complete details of construction, size of members, kinds of material, assembly of work, and connections for the proper execution of the work of other divisions. Show the profiles of all profiles of all mouldings and show methods of reinforcement, anchorage and support.

06400.0400 SAMPLES

1. Submit samples for approval in accordance with the general requirements including wood, laminates, hardware, etc. All woods and plastic laminates showing the fraining, texture, color, etc. All finished work shall lie within the range of approved samples of each kind of wood.

06400.0500 MATERIALS

1. All counter tops shall be surfaced with 1/16" thick high pressure laminated plastic sheet; as the Formica Corporation's General Purpose Grade 10, or approved equal. All laminates shall conform to performance standards of NEMA Publication No. LD1-1971. The laminated plastic should be bonded to the core material under recommended bonding pressures and conditions using Koppers Penacolite G-1124 Resorcinol adhesive or approved equal. Colors and patterns of plastic laminates shall be as approved by the Architect.

2. All exposed interior woodwork, millwork, trim and cabinet wood, etc. that is not designated to be surfaced with plastic laminate shall be of selected single botanical variety and all exposed faces shall be clear of all knots and surface blemishes and all lumber used shall be of a quality classified as "first" (FAS). All interior trim, millwork, cabinet work, doors, etc., shall match existing as to graining, profile and color, within a particular area.

3. Unless otherwise specified scribe or closure moulding for painting shall be clear White Pine.

4. Trim: Solid stock, select grade of same species as adjoining work.

5. Drawers: Solid stock, birch or maple.

06400.0600 VERIFICATION OF DIMENSIONS AND CONDITIONS

1. Add dimensions and conditions at the building which affect the size, construction and installation of items or features provided under this Section shall be carefully checked, verified and compared with those given on the drawings. All discrepancies and conflicts shall be reported to the Architect.

06400.0700 GROUNDS, FURRING AND SCREEDS

1. Provide all wood grounds and/or furring required for the securing in place of all finished carpentry work, interior wood finish and other items furnished by this or other contractors including trim, mouldings, shelving, frames, covers, stools, aprons, etc.

06400.0800 ANCHORS, BOLTS AND ATTACHMENTS

1. Furnish all anchors, bolts, wall plates bolted to masonry, corrugated wall plugs, nailing blocks, wood, bricks, etc., which are required for the proper fastening and installation.

06400.0900 HARDWARE

1. Provide all hardware required for cabinets and millwork. All cabinet doors shall be provided with fixed pin butts 2-1/2" x 2-1/2" for doors 18" wide or less and 3" x 3" for wider doors, spring catches, and door pulls all of design approved by the Architect and of brushed stainless steel finish. Provide all necessary channel bases, pilaster strips, etc. Finish of hardware shall match existing finish of hardware, or as directed by the Architect.

2. Assemble all work in conformity with the best cabinet work practice. All plastic laminate work shall conform to the specified plastic laminate manufacturer's standard practices, conditions, procedures and recommendations.

* * * * *

DIVISION 7 - THERMAL & MOISTURE PROTECTION

SECTION 07160 - BITUMINOUS DAMPPROOFING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. Cold applied asphalt bitumen damp/water proofing on all exterior face of foundation walls, as well as all exterior face of CMU prior to installation of cavity insulation and masonry veneer.

1.02 RELATED WORK

A. Section 04200 Masonry

1.03 REFERENCES

A. ANSI/ASTM D41 - Asphalt Primer Used in Roofing, Damp proofing and Waterproofing.

B. ANSI/ASTM D449 - Asphalt Used in Damp proofing and Waterproofing.

C. ANSI/ASTM D450 - Coal-tar Bitumen Used in Roofing, Damp proofing and Waterproofing.

D. ANSI/ASTM D491 - Asphalt Mastic Used in Waterproofing.

E. ASTM D43 - Creosote Primer Used in Roofing, Damp proofing and Waterproofing.

1.04 QUALITY ASSURANCE

A. Applicator: Company specializing in bituminous waterproofing systems with 5 years minimum experience.

1.05 SUBMITTALS

A. Submit product data under provisions of Section 01300.

B. Indicate properties of primer, bitumen and mastic.

C. Submit manufacturer's installation instructions under provisions of Section 01300.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain ambient and surface temperatures above 40 degrees F for 24 hours before application, and continuously until damp proofing has cured.

PART 2 - PRODUCTS

2.01 BITUMEN MATERIALS

A. Asphalt: ANSI/ASTM D449, Type I.

B. Asphalt Primer: ANSI/ASTM D41, compatible with substrate.

C. Asphaltic Sealing Mastic: ANSI/ASTM D491.

D. Coal-tar: ANSI/ASTM D450, Type I.

E. Coal-tar: ASTM D43, creosote type.

F. Coal-tar Sealing Mastic: Coal-tar bitumen filled with mineral dust and mineral fibers, to mastic consistency.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify surfaces are solid, free of frozen matter, loose particles, cracks, pits, rough projections, and foreign matter detrimental to adhesion and application of damp proofing.

B. Do not apply damp proofing to damp, frozen, dirty, dusty or deck surfaces.

C. Verify items which penetrate surfaces to receive dampproofing are securely installed.

D. Beginning of installation means acceptance of substrate.

3.02 PREPARATION

A. Clean and prepare surfaces to receive damp proofing in accordance with manufacturer's instructions.

B. Apply mastic to seal penetrations, small cracks, and honeycomb in

substrate.

3.03 APPLICATION

A. Prime surfaces in accordance with manufacturer's instructions.

B. Apply cold bitumen with mop.

C. Apply one coat, continuous and uniform at a rate.

D. Seal watertight items projecting through damp proofing surface with mastic.

* * * * *

SECTION 07190 – MASONRY SEALANTS

07190.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

07190.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of caulking and all related work, complete, in strict accordance with the Contract Drawings and as specified herein or reasonably implied.

    a. Seal all exterior masonry and precast with TAMMS CHEMSTOP WB HEAVY DUTY WATER REPELLENT

07190.0300 DELIVERY AND STORAGE

1. Deliver, store and handle materials in a manner to prevent the inclusion of foreign materials and damage. Deliver and store packaged materials in original sealed containers until ready for use. Deliver materials in ample time to facilitate inspection and test.

07190.0400 SAMPLES

1. Submit the following samples of material for approval, in accordance with the requirements of the Supplementary General Conditions:

    a Field apply 24” x 24” sample for review

07190.0500 MATERIALS

1. CHEMSTOP WB HD is water based, oligomeric silxoxane/silane, ready to use deep penetrating water repellent. CHEMSTOP WB HD is colorless when dry, non-staining, non-yellowing, and non-film sealer used for protecting concrete and masonry surfaces without altering the appearance or the texture of the treated surface. CHEMSTOP WB is breathable, non-flammable and complies with current federal AIM VOC regulations.

2. USES: CHEMSTOP WB HD repellent is used above grade on vertical surfaces to minimize water penetration, reduce efflorescence, and aid in minimizing spalling due to freeze-thaw cycles. It also protects against ultraviolet degradation, airborne dirt, smog, industrial fumes, acid rain, and most other atmospheric chemicals.

07190.0600 APPLICATION

1. General: Apply in accordance with the manufacturer's instructions as approved by the Architect and as herein specified.

2. Preparatory work:

    1. SURFACE PREPARATION: Cure new concrete 28 days before application. Surface must be structurally sound, clean, dry, free of dust, dirt, paint, efflorescence, laitance, and other contaminants that will prevent the proper penetration of CHEMSTOP WB. Prior to application joints or cracks must be properly sealed or filled. If acid is used for cleaning, neutralize completely before CHEMSTOP WB application. A dry substrate allows better penetration of the sealer.

    2. APPLICATION TECHNIQUES: Low pressure airless spray equipment is the method of application. Application should be from the bottom up to ensure uniform product distribution. Apply a saturation coat with a 6-8” controlled rundown. Two saturation coats of CHEMSTOP WB HD shall be required, applied using a “wet on wet” technique. Apply a test patch to evaluate surface appearance and effectiveness of the coverage rate.

3. CLEAN-UP INSTRUCTIONS: Clean drips, runs, and overspray residue while still wet, using detergent and water. CHEMSTOP WB will not etch common glass and spills and overspray onto glass can be easily removed with a damp cloth. Dried material may require mechanical abrasion for removal. Clean application and spray equipment with detergent and water immediately following use.

****

SECTION 07213 - BOARD INSULATION AND BATT INSULATION

07213.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements" which form a part hereof whether attached hereto or not.

07213.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all rigid insulation and batt insulation and related work, complete, in strict accordance with the Contract Drawings and as herein specified, or reasonably implied.

    a. Blanket and batt, type insulation (R-11 in 4" walls and R-19 in 6" walls at all interior walls within the facility, R-30 at attic roof framing).

    b. 2" rigid insulation at inside face of interior walls between metal furring where indicated on plans.

    c. 2” Rigid insulation at masonry cavity walls.

    d. 2” Rigid insulation at inside face of all foundation walls and extending 24” minimum into interior building area under slabs, typical all areas.

07213.0300 SHOP DRAWINGS

1. Submit product literature for approval of the following items herein specified in accordance with the requirements of the Supplementary General Conditions.

07213.0400 SAMPLES

1. Submit for approval in accordance with the requirements of the Supplementary General Conditions, samples of all materials herein specified as requested by the Architect and as follows:

    a. Insulations.

07213.0500 GUARANTEE

1. The Contractor shall and hereby does guarantee all workmanship and materials entering into this Section of the specifications to be free of all leaks and other defects for a period of five years. Should any defects in the work develop within the five year period, the Contractor shall and hereby does agree to repair such defective work and to make all repairs to work of others damaged in correcting the defective work, and further, he agrees to and shall repair or replace work of others damaged by leaks in his

defective work without additional cost to the Owner. All repairs shall be made within five (5) days after notice to the Contractor. Such guarantee shall be made in writing to the Owner and transmitted to the Architect.

07213.0600 MATERIALS

1. General: Materials shall be delivered in unbroken containers, stored and handled so as to prevent inclusion of foreign substances and damage by water or breakage. All manufactured materials shall bear the manufacturer's labels. All materials shall be the product of one manufacturer.

2. All bat insulation shall be either mineral wool or fiberglass batts with vapor barrier of a width to fit between framing. Vapor barrier to warm side.

3. Rigid insulation shall be 2" thick Dow Styrofoam SM Brand rigid insulation with aged R-value of 10 in accordance with ASTM C518. Insulation board shall meet Physical Property Requirements of Federal Spec. HH-1-524C, Type IV, and ASTM C578, Type IV.

07213.0700 PRELIMINARY INSPECTION

1. Before starting work, carefully examine surfaces on which work of this Section is dependent. Check and verify lines, elevations, contours, and general condition of preliminary work. Any defects in surfaces to which materials of this Section are to be applied must first be corrected. Report any unsatisfactory conditions to the Architect before starting work, and do not commence work until so directed by the Architect. Start of installation will be considered acceptance of preceding work and acceptance of responsibility for correcting defects.

07213.0800 COOPERATION

1. Coordinate work of this section with work of contiguous trades under this and other Contracts. Flashings built into masonry shall be formed in advance so as not to delay work.

* * * * *

SECTION 07225 - EPS BOARD ROOF DECK INSULATION

PART 1 - GENERAL

1.01 SUMMARY

A. Section Includes: Tapered EPS board roof deck insulation system for use as an acceptable and recommended substrate for project roofing system.

1.02 REFERENCES

A. American Society for Testing & Materials (ASTMJ): C578-87a preformed, Cellular Polystyrene Thermal Insulation Spec for.

B. The Society of the Plastics Industry, Inc. (SPI): ACCU-R EPS Program for product quality control and labeling program.

C. Factory Mutual Research Corporation (FMRC)

1. Loss Prevention Data Sheet I-28, current edition.

1.03 SYSTEM DESCRIPTION

A. Description: EPS tapered roof deck insulation product specifically manufactured and recommended by manufacturer for compatibility with project roofing system for R-value and other physical properties indicated herein when tested in accordance with ASTM C578.

1.04 SUBMITTALS

A. Product Date: Submit manufacturer's product data for specific EPS board roof deck insulation proprietary products affirming products do not contain chlorofluorocarbon (CFC) or hydrochlorofluorocarbon (HCFC).

B. Samples: Submit three samples, 12" x 12" x 1" minimum, each specified EPS insulation product, identified with SPI ACCU-R quality assurance program label.

C. Tapered Insulation Shop Drawings: Submit tapered EPS insulation shop drawings indicating layout, minimum and maximum thickness, slope direction, and placement sequence.

1.05 QUALITY ASSURANCE

A. SPI ACCU-R Program: Comply with the quality assurance program of The Society of the Plastics Industry, Inc. (SPI) ACCU-R EPS program for appropriate testing, inspection, and review of product production practices for compliance with ASTM C578 requirements.

B. Insurance Underwriter Requirements: Comply with owner's insurance underwriter's requirements for EPS roof deck insulation product for application with project roofing system.

C. Factory Mutual Research Corporation (FMRC) Requirements: Comply with requirements for EPS roof deck insulation application with project roofing system.

1.06 DELIVERY, STORAGE AND HANDLING

A. Storage: Store and protect EPS roof deck insulation prior to installation from direct sunlight exposure and from weather to ensure insulation is dry when installed.

1.07 WARRANTY

A. Manufacturer's Product Warranty: Submit manufacturer's standard warranty form for EPS board insulation R-value when tested for conformance with ASTM C578. This warranty is in addition to, and not a limitation of other rights Owner may have under Contract Documents.

1. Warranty Period: 20 years from Date of Substantial Completion.

2. Beneficiary: Issue warranty in the legal name of project Owner.

3. Warranty Acceptance: Owner is sole authority who will determine acceptance of warranty document.

PART 2 - PRODUCTS

A. Tapered EPS Board:

1. Thickness 3" Minimum.

2. Slope: 1/8"/LF

2.01 INSULATION MATERIAL

A. Material Standard: Comply with ASTM C578 for EPS board roof insulation.

1. Type II.

2.02 ROOF INSULATION BOARD

A. Molded EPS Board Insulation: Rigid, closed cell, lightweight, thermal insulation formed by the composition of hydrogen and carbon atoms in a closed mold to comply with ASTM C578-87a for type indicated as follows:

1. Type II: 1.35 pcf minimum density, R-value of 4.55 and 4.17 at 40 degrees F and 75 degrees F (4.4 degrees C and 23.9 degrees C), respectively.

PART 3 - EXECUTION

3.01 INSULATION

A. General: Install EPS board insulation in single or multiple layers to achieve required R-value, extending EPS insulation over entire roof deck surface to be installed, cutting and fitting around projections and obstructions. Form cant strips, crickets, and tapered areas for positive drainage of roofing system.

B. Insulation Board Joints: Stagger EPS board insulation joints in one direction for each course. For multiple layers, stagger joints in both directions between courses with no gaps to form a complete thermal envelope.

C. Exposure: Do not install more EPS insulation in a day than can be covered with roofing membrane before end of work day or before start of weather conditions which can damage EPS insulation.

D. Adhered Single-Ply Membrane Re-Roof: Install EPS board insulation over roof deck fully adhered and mechanically secured to deck substrate.

E. Install boards with FM 60 fasteners at a rate of 1 fastener per 2 sq. ft. Provide fastener in each corner typical.

* * * * *

SECTION 07270 – FIRESTOPPING

PART 1 – GENERAL

1.01 SUMMARY

A. Work Included: General Contractor shall be responsible for the firestopping installation and the work of this section shall include, but is not necessarily limited to the following:

1. Any and all penetrations (including by other trades) through fire resistance rated construction; including both empty openings and openings containing cables, pipes, ducts, conduits, and other penetrating items.

2. Penetrations through smoke barriers and construction enclosing compartmentalized areas involving both empty openings and openings containing penetrating items.

3. Sealant joints in fire resistance rated construction at intersection of dissimilar materials including at wall and deck locations, etc.

4. Furnishing of dams, clips and closures for support and containment of fire safing materials and installation of dames, clips and closures where possible to install after completion of floors, walls or other construction.

B. Related Sections:

1. Section 03300 – Cast – In – Place Concrete

2. Section 04200 – Unit Masonry

3. Section 07210 – Building Insulation

4. Section 07250 – Fireproofing

5. Section 07900 – Joint Sealers

6. Section 09255 – Gypsum Board Assemblies

7. Division 15 and 16 – Mechanical and Electrical

1.02 QUALITY ASSURANCE

A. Qualifications: The work of this section shall be performed by a qualified and experienced installer, acceptable to the Architect. The term “installer” as used herein, shall mean a firm of established reputation; which has been trained by the

Manufacturer in the proper installation of fire safing materials and which is regularly engaged in, and maintains a regular force of workmen skilled in the installation of fire safing materials of the type specified.

B. Installer's Qualifications: Before proceeding with the work, submit three (3) copies of a list of several comparable projects of similar work that the installer has completed within the past five (5) years, giving the job locations, names of the owners, their telephone numbers and the date on which the work on each project was started and completed.

1.03 REFERENCES

A. Codes and Regulations: Fire safing work shall conform to the New York State Fire Prevention and Building Code and all applicable regulations of governmental authorities having jurisdiction, including safety, health and anti-pollution regulations.

1.04 SUBMITTALS

A. Product Data: Submit product data consisting of Manufacturer's latest published catalog information or technical description and installation instructions; obtain approval before materials are fabricated or delivered to the site.

B. Test Reports: Submit three (3) certified copies of test reports, by an independent testing laboratory, approved by the Architect, indicating that the fire safing materials are in conformance with the requirements specified herein.

C. Coordinating Work: Coordinate construction of openings and penetrating items to ensure that designated through penetration fire stop systems are installed per specified requirements.

D. The School District may employ and pay a qualified inspection agency to check installed firestopping systems for compliance with requirements.

1.05 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original tightly sealed containers or unopened packages, with legible mixing and application instructions.

B. Store materials out of weather in original containers as recommended by manufacturer.

PART 2 – PRODUCTS

2.01 FIRESTOPPING, GENERAL

A. Compatibility: Provide firestopping composed of components that are compatible with each other, the substrates forming openings, and the items, if any, penetrating the firestopping under conditions of service and application, as demonstrated by firestopping manufacturer based on testing and field experience.

B. Accessories: Provide components for each firestopping system that are needed to install fill materials and to comply with "System Performance Requirements" article in Part 1. Use only components specified by the firestopping manufacturer and approved by the qualified testing and inspecting agency for the designated fire resistance rated systems. Accessories include but are not limited to the following items:

1. Permanent forming/damming/backing materials including the following:

   a. Semirefractory fiber (mineral wool) insulation.

   b. Sealants used in combination with other forming/damming materials to prevent leakage of fill materials in liquid state.

   c. Fire rated form board.

   d. Joint fillers for joint sealants.

2. Temporary forming materials.

3. Substrate primers.

4. Collars.

5. Steel sleeves.

6. Safing Clips.

7. Metal support plates.

C. Applications: Provide firestopping systems composed of materials specified in this Section that comply with system performance and other requirements.

2.02 FILL MATERIALS FOR THROUGH-PENETRATION FIRESTOP SYSTEMS

A. Mineral Wool: Loose or formed mineral wood rated non-combustible when tested according to ASTM 136, free of asbestos and glass fiber, and suitable for stuffing to an in place density of 6 to 12 psf.

B. Endothemic, Latex Compound Sealant: Single component, endothermic, latex formulation.

C. Intumescent, Latex Sealant: Single component, intumescent, latex formulation.

D. Intumescent Putty: Nonhardening, dielectric, water resistant putty containing no solvents inorganic fibers, or silicone compounds.

E. Intumescent Wrap Strips: Single component, elastomeric sheet with aluminum foil on one side.

F. Job Mixed Vinyl Compound: Prepackaged vinyl based powder product for mixing with water at project site to produce a paintable compound, passing ASTM E 136, with flame spread and smoke developed ratings of zero per ASTM E 84.

G. Mortar: Prepackaged dry mix composed of a blend of inorganic binders, fillers, and lightweight aggregate formulated for mixing with water at project site to form a nonshrinking, homogenous mortar.

H. Pillow/Bags: Re-usable, heat expanding pillows/bags composed of glass fiber cloth cases filled with a combination of mineral fiber, water insoluble expansion agents and fire retardant additives.

I. Silicone Sealant: Moisture curing, single component, silicone based, neutral curing elastomeric sealant of grade indicated below:

1. Grade: Pourable (self leveling) formulation for openings in floors and other horizontal surfaces and nonsag formulation for openings in vertical and other surfaces requiring a non-slumping/gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.

2. Grade for Horizontal Surfaces: Pourable (self leveling) grade for openings in floors and other horizontal surfaces.

3. Grade for Vertical Surfaces: Nonsag grade for openings in vertical and other surfaces.

J. Solvent Release Curing Intumescent Sealant: Solvent release curing, single component, synthetic polymer based sealant of grade indicated below:

1. Grade: Pourable (self leveling) formulation for openings in floors and other horizontal surfaces and nonsag formulation for openings in vertical and other surfaces requiring a non-slumping/gunnable sealant, unless indicated firestop system limits use to nonsag grade for both opening conditions.

K. Available Products: Subject to compliance with requirements, products that may be incorporated in the work include, but are not limited to the following:

1. Endothermic, Latex Sealant:
   Fyre-Shield, Tremco Inc.

2. Endothermic, Latex Compounds:
   Flame-Safe FS500/600 Series, International Protective Coatings Corp.
   Flame-Safe FS900/FST900 Series, International Protective Coatings Corp.

3. Intumescent Latex Sealant:
   Metacaulk 950, The RectorSeal Corporation
   Fire Barrier CP 25WB Caulk, 3M Fire Protection Products.

4. Intumescent Putty:
   Series SSP, STI Spec Seal FireStop Products
   Flame-Safe FSP1000 Putty, International Protective Coatings Corp.
   Fire Barrier Moldable Putty, 3M Fire Protection Products.

5. Intumescent Wrap Strips:
   Series SSP, STI Spec Seal FireStop Products
   Dow Corning Fire Stop Intumescent Wrap Strip 2002, Dow Corning Corp.
   Fire Barrier FS-195 Wrap/Strip, 3M Fire Protection Products

6. Job Mixed Vinyl Compound:
   USG Firecode Compound, United States Gypsum Co.

7. Mortar:
   SpecSeal Mortar, STI Spec Seal FireStop Products
   Novasit K-10 Firestop Mortar, Bio Fireshield, Inc.
   KBS-Mortar Seal, International Protective Coatings Corp.

8. Pillow/Bags:
   Firestop Pillows, Bio Fireshield, Inc.
   SpecSeal Pillows, STI Spec Seal FireStop Products

9. Silicone Foams:
   Pensil 200 Foam, STI Spec Seal FireStop Products

Dow Corning Fire Stop Foam 2001, Dow Corning Corp.

10. Silicone Sealants:
    Dow Corning Firestop Sealant 2000, Dow Corning Corp.
    Pensil 300, STI Spec Seal FireStop Products
    CS240 Firestop Sealant, Hilti Construction Chemicals, Inc.
    Metacaulk 880, The RectorSeal Corporation

11. Solvent Release Curing Intumescent Sealants:
    Biostop 500 Intumescent Firestop Caulk, bio Fireshield, Inc.
    Fire Barrier CP 25N/S Caulk, 3M Fire Protection Products
    Fire Barrier CP25S/L Caulk, 3M Fire Protection Products

12. Mineral Fiber Fire Safing:
    Therma Fiber Safing Insulation by USG Interiors Inc.
    Fire Master Bulk, 3M
    Fire Protection Products

2.03 MIXING

A. For those products requiring mixing prior to application, comply with firestopping manufacturer's directions for accurate proportioning of materials, water (if required), type of mixing equipment, selection of mixer speeds, mixing containers, mixing time, and other procedures needed to produce firestopping products of uniform quality with optimum performance characteristics for application indicated.

PART 3 – EXECUTION

3.01 EXAMINATION

A. Examine substrates and conditions, with installer present, for compliance with requirements for opening configurations, penetrating items, substrates, and other conditions affecting performance of firestopping. Do not proceed with installation until unsatisfactory conditions have been corrected.

3.02 PREPARATION

A. Surface Cleaning: Clean out openings and joints immediately prior to installing firestopping to comply with recommendations of firestopping manufacturer and the following requirements:

    1. Remove all foreign materials from surfaces of opening and joint substrates and from penetrating items that could interfere with adhesion of firestopping.

2. Clean opening and joint substrates and penetrating items to produce clean, sound surfaces capable of developing optimum bond with firestopping. Remove loose particles remaining from cleaning operation.

3. Remove laitance and form release agents from concrete.

B. Priming: Prime substrates where recommended by firestopping manufacturer using that manufacturer's recommended products and methods. Confine primers to areas of bond; do not allow spillage and migration onto exposed surfaces.

C. Masking Tape: Use masking tape to prevent firestopping from contacting adjoining surfaces that will remain exposed upon completion of Work and that would otherwise be permanently stained or damaged by such contact or by cleaning methods used to remove smears from firestopping materials. Remove tape as soon as it is possible to do so without disturbing firestopping's seal with substrates.

3.03 INSTALLING THROUGH-PENETRATION FIRESTOPS

A. General: Comply with the "System Performance Requirements" article in Part 1 and the through-penetration firestop manufacturer's installation instructions and drawings pertaining to products and applications indicated.

B. Install forming/damming materials and other accessories of types required to support fill materials during their application and in the position needed to produce the cross-sectional shapes and depths required to achieve fire ratings of designated through-penetration firestop systems. After installing fill materials, remove combustible forming materials and other accessories not indicated as permanent components of firestop systems.

C. Install fill materials for through-penetration firestop systems by proven techniques to produce the following results:

1. Completely fill voids and cavities formed by openings, forming materials, accessories, and penetrating items.

2. Apply materials so they contact and adhere to substrates formed by openings and penetrating items.

3. For fill materials that will remain exposed after completing Work, finish to produce smooth, uniform surfaces that are flush with adjoining finishes.

4. Provide 20 gage minimum metal plates where required for fire safing support to comply with fire rating.

5. For mineral safing insulation, apply in continuous length using manufacturer's standard safing clips compress insulation until stable without movement.

3.04 INSTALLING FIRE-RESISTIVE JOINT SEALANTS

A. General: Comply with "System Performance Requirements" article in Part 1, with ASTM C 1193, and with the sealant manufacturer's installation instructions and drawings pertaining to products and applications indicated.

B. Install joint fillers to provide support of sealants during application and at position required to produce the cross-sectional shapes and depth of installed sealants relative to joint widths that allow optimum sealant movement capability and develop fire-resistance rating required.

C. Install sealants by proven techniques that result in sealants directly contacting and fully wetting joint substrates, completely filling recesses provided for each joint configuration, and providing uniform, cross-sectional shapes and depths relative to joint width that optimum sealant movement's capability. Install sealants at the same time joint fillers are installed.

D. Tool nonsag sealants immediately after sealant application and prior to the time skinning or curing begin. Form smooth, uniform beads of configuration indicated or required to produce fire-resistance rating, as well as to eliminate air pockets, and to ensure contact and adhesion of sealants with sides of joint. Remove excess sealant from surfaces adjacent to joint. Do not use tooling agents that discolor sealants or adjacent surfaces or are not approved by sealant manufacturer.

3.05 FIELD QUALITY CONTROL

A. Inspecting agency employed and paid by Government will examine completed firestopping to determine, in general, if it is being installed in compliance with requirements.

B. Inspecting agency will report observations promptly and in writing to Contractor and Architect.

C. Do not proceed to enclose firestopping with other construction until reports of examinations are issued.

D. Where deficiencies are found, repair or replace firestopping so that is complies with requirements.

3.06 CLEANING

A. Clean off excess fill materials and sealants adjacent to openings and joints as work progresses by methods and with cleaning materials approved by manufacturers of firestopping products and of products in which opening and joints occur.

B. Protect firestopping during and after curing period from contact with contaminating substances or from damage resulting from construction operations or other causes so that they are without deterioration or damage at time Substantial Completion. If, despite such protection, damage or deterioration occurs, cut out and remove damaged or deteriorated firestopping immediately and install new materials to produce firestopping complying with specified requirements.

SECTION 07300 - ROOF SHINGLES

07300.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements" which form a part hereof whether attached hereto or not.

7300.200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all roof shingles and grade ice and water shield underlayment and related work, complete, in strict accordance with the Contract Drawings and as herein specified, or reasonably implied. Roof shingles to be “Hatteras” style by GAF, color selected by Owner. Provide stop flashings and related flashings at any and all junctions with dissimilar materials and surfaces.

07300.0300 SHOP DRAWINGS

1. Submit product literature for approval of the following items herein specified in accordance with the requirements of the Supplementary General Conditions.

07300.0400 SAMPLES

1. Submit for approval in accordance with the requirements of the Supplementary General Conditions, samples of all materials herein specified as requested by the Architect and as follows:

    a. Insulations

07300.0500 GUARANTEE

1. The Contractor shall and hereby does guarantee all workmanship and materials entering into this Section of the specifications to be free of all leaks and other defects for a period of five years. Should any defects in the work develop within the five year period, the Contractor shall and hereby does agree to repair such defective work and to make all repairs to work of others damaged in correcting the defective work, and further, he agrees to and shall repair or replace work of others damaged by leaks in his defective work without additional cost to the Owner. All repairs shall be made within five (5) days after notice to the Contractor. Such guarantee shall be made in writing to the Owner and transmitted to the Architect.

2. Submit manufacturer’s 40 year warranty including 5 year sure start protection.

07300.0600 MATERIALS

1. General: Materials shall be delivered in unbroken containers, stored and handled so as to prevent inclusion of foreign substances and damage by water or breakage. All manufactured materials shall bear the manufacturer's labels. All materials shall be the product of one manufacturer.

2. Roof shingles shall be Certainteed Hatteras with integral ridge and hip vents (shingle vent II) by Air Vent Inc.

07300.0700 PRELIMINARY INSPECTION

1. Before starting work, carefully examine surfaces on which work of this Section is dependent. Check and verify lines, elevations, contours, and general condition of preliminary work. Any defects in surfaces to which materials of this Section are to be applied must first be corrected. Report any unsatisfactory conditions to the Architect before starting work, and do not commence work until so directed by the Architect. Start of installation will be considered acceptance of preceding work and acceptance of responsibility for correcting defects.

07300.0800 COOPERATION

1. Coordinate work of this section with work of contiguous trades under this and other Contracts. Flashings built into masonry shall be formed in advance so as not to delay work.

SECTION 07550
MODIFIED BITUMINOUS MEMBRANE ROOFING

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Cold Applied 2-Ply Asphalt Roofing (StressPly)

1.2 RELATED SECTIONS

A. Section 06114 - Wood Blocking and Curbing: Wood nailers and cant strips.

B. Section 07220 - Insulation Board: Insulation and fastening.

C. Section 07620 - Sheet Metal Flashing and Trim: Weather protection for base flashings.

D. Section 15120 - Piping Specialties: Roof Drains, Sumps.

1.3 REFERENCES

A. ASTM D 41 - Standard Specification for Asphalt Primer Used in Roofing, Dampproofing, and Waterproofing.

B. ASTM D 312 - Standard Specification for Asphalt used in Roofing.

C. ASTM D 451 - Standard Test Method for Sieve Analysis of Granular Mineral Surfacing for Asphalt Roofing Products.

D. ASTM D 1970 - Specification for Sheet Materials, Self-Adhering Polymer Modified Bituminous, Used as Steep Roofing Underlayment for Ice Dam Protection.

E. ASTM D 1079 Standard Terminology Relating to Roofing, Waterproofing and Bituminous Materials.

F. ASTM D 1863 Standard Specification for Mineral Aggregate Used as a Protective Coating for Roofing.

G. ASTM D 4586 Standard Specification for Asphalt Roof Cement, Asbestos-Free.

H. ASTM D 5147 Standard Test Method for Sampling and Testing Modified Bituminous Sheet Materials.

I. ASTM D 6162 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using a Combination of Polyester and Glass Fiber Reinforcements.

J. ASTM D 6163 Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Glass Fiber Reinforcements.

K. ASTM D 6164 - Standard Specification for Styrene Butadiene Styrene (SBS) Modified Bituminous Sheet Materials Using Polyester Reinforcements.

L. ASTM E 108 - Standard Test Methods for Fire Test of Roof Coverings

M. National Roofing Contractors Association (NRCA): Roofing and Waterproofing Manual.

N. Sheet Metal and Air Conditioning Contractors National Association, Inc. (SMACNA) - Architectural Sheet Metal Manual.

O. ANSI-SPRI ES-1 Wind Design Standard for Edge Systems used with Low Slope Roofing Systems.

P. ASCE 7, Minimum Design Loads for Buildings and Other Structures

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Perform work in accordance with all federal, state and local codes.

B. Exterior Fire Test Exposure: Roof system shall achieve a UL, FM or WH Class rating for roof slopes indicated on the Drawings

C. Design Requirements:
1. Uniform Wind Uplift Load Capacity - Wind Uplift Calculation to be provided

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

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 instructions.

C. Shop Drawings: Submit shop drawings including installation details of roofing, flashing, fastening, insulation and vapor barrier, including notation of roof slopes and fastening patterns of insulation and base modified bitumen membrane, prior to job start.

D. Design Pressure Calculations: Submit design pressure calculations for the roof area in accordance with ASCE 7 and local Building Code requirements. Include a roof system attachment analysis report, certifying the system's compliance with applicable wind load requirements before Work begins.

E. Verification Samples: For each modified bituminous membrane ply product specified, two samples, minimum size 6 inches (150 mm) square, representing actual product, color, and patterns.

F. Manufacturer's Certificates: Provide to certify products meet or exceed specified requirements.

G. Test Reports: Submit test reports, prepared by an independent testing agency, for all modified bituminous sheet roofing, indicating compliance with ASTM D5147. Testing must be performed at 77 deg. F. Tests at 0 deg. F will not be considered.

H. Closeout Submittals: Provide manufacturer's maintenance instructions that include recommendations for periodic inspection and maintenance of all completed roofing work. Provide product warranty executed by the manufacturer. Assist Owner in preparation and submittal of roof installation acceptance certification as may be necessary in connection with fire and extended coverage insurance on roofing and associated work.

1.6 QUALITY ASSURANCE

A. Perform Work in accordance with NRCA Roofing and Waterproofing Manual.

B. Manufacturer Qualifications: Company specializing in manufacturing products specified with

documented ISO 9001 certification and minimum of twelve years of documented experience and must not have been in Chapter 11 bankruptcy during the last five years.

C. Installer Qualifications: Company specializing in performing Work of this section with minimum five years documented experience and a certified Pre-Approved Garland Contractor.

D. Installer's Field Supervision: Maintain a full-time Supervisor/Foreman on job site during all phases of roofing work while roofing work is in progress.

E. Product Certification: Provide manufacturer's certification that materials are manufactured in the United States and conform to requirements specified herein, are chemically and physically compatible with each other, and are suitable for inclusion within the total roof system specified herein.

F. Source Limitations: Obtain all components of roof system from a single manufacturer. Secondary products that are required shall be recommended and approved in writing by the roofing system Manufacturer. Upon request of the Architect or Owner, submit Manufacturer's written approval of secondary components in list form, signed by an authorized agent of the Manufacturer.

1.7 PRE-INSTALLATION MEETINGS

A. Convene minimum two weeks prior to commencing Work of this section.

B. Review installation procedures and coordination required with related Work.

C. Inspect and make notes of job conditions prior to installation:
1. Record minutes of the conference and provide copies to all parties present.
2. Identify all outstanding issues in writing designating the responsible party for follow-up action and the timetable for completion.
3. Installation of roofing system shall not begin until all outstanding issues are resolved to the satisfaction of the Architect.

1.8 DELIVERY, STORAGE, AND HANDLING

A. Deliver and store products in manufacturer's unopened packaging with labels intact until ready for installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 216-641-7500. Fax: 216-641-0633. Web Site: www.garlandco.com.

2.2 COLD APPLIED 2-PLY ROOF SYSTEM - STRESSPLY, OPTIMAX, OR VERSIPLY

A. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
1. FlexBase 80:

B. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
1. StressPly Plus FR Mineral:

C. Interply Adhesive: (1 and 2)
1. Weatherking :

D. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive:
1. FlexBase 80:

E. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
1. StressPly Plus FR Mineral:

F. Flashing Ply Adhesive:
1. Weatherking Flashing Adhesive:

2.3 ACCESSORIES:

A. Roof Insulation: In accordance with Section 07220.

B. Roof Insulation: Provide G-P Gypsum DenDeck Prime.

C. Walkway Pads - Commercial Innovations Walkway Pads: As recommended and furnished by the membrane manufacturer set in approved adhesive to control foot traffic on roof top surface and provide a durable system compliant non-slip walkway.

D. Pitch Pocket Sealer - Seal-Tite: Two part, 100% solids, self-leveling, polyurethane sealant for filling pitch pans as recommended and furnished by the membrane manufacturer.
1. Durometer, ASTM D 2240: 40-50 Shore
2. Elongation, ASTM D 412: 250%
3. Tensile Strength, ASTM D 412: 200 @ 100 mil

E. Glass Fiber Cant - Glass Cant: Continuous triangular cross Section made of inorganic fibrous glass used as a cant strip as recommended and furnished by the membrane manufacturer.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Pre-Manufactured Coping Cap: R-Mer Edge Coping Cap Cover and Splice Plate.
   1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 24 gauge, 22 gauge or 20 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.
   2. Aluminum, ASTM B209, alloy 3105-H14, in thickness of .040" nom. or .050" nom. or .063" nom

B. Pre-Manufactured Coping Cap: R-Mer Edge Coping Chairs
   1. Zinc-coated steel, ASTM A653, coating designation G-90, in thickness of 0.0635 nom./ 16 gauge, 36" to 48" by coil length, chemically treated, commercial or lock-forming quality.

C. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.

D. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.

E. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

F. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.

G. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

H. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
   1. Tensile Strength, ASTM D 412: 400 psi
   2. Elongation, ASTM D 412: 300%
   3. Density @77 deg. F 8.5 lb/gal typical

I. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.
   1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

J. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
   1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
   1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
   2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
   3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
   4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
   5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
   6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
   7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Metal Deck: Metal deck shall be installed as specified in Section
   1. Fastening of the deck should comply with the anticipated live and dead loads pertaining to the building as well as applicable Code.
   2. Steel decks shall be minimum 22-gauge factory galvanized or zinc alloy coated for protection against corrosion.
   3. Suitable insulation shall be mechanically attached as recommended by the insulation manufacturer.
   4. Decks shall comply with the gauge and span requirements in the current Factory Mutual FM Approval Guide and be installed in accordance with Loss Prevention Data Sheet 1-28 or specific FM approval.
   5. When re-roofing over steel decks, surface corrosion shall be removed, and repairs to severely corroded areas made. Loose or inadequately secured decking shall be fastened, and irreparable or otherwise defective decking shall be replaced.

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
   1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
   2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

3.4 INSTALLATION COLD APPLIED ROOF SYSTEM

A. Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
   1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
   2. Solidly bond to the substrate and adjacent ply with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
   3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.
   4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
   5. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
   6. Install base flashing ply to all perimeter and projection details.
   7. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plys specified. Shingle in proper direction to shed water on each large area of roofing.
   1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
   2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
   3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
   4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
   5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
   6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.
   1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
   2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
   3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
   4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss

Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.
   1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
   2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
   3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
   4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.
   5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
   6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
   7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.
   8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Flashing Cap Ply:
   1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
   2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
   3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
   4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
   5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
   6. All stripping shall be installed prior to flashing cap sheet installation.
   7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
   8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Pre-manufactured Snap-On Coping Cap:
   1. Install miters first.
   2. Position base flashing of the Built-Up and/or Modified Roofing membrane over the wall edge covering nailers completely, fastening 8 inches on center. Install membrane and cap sheet with proper material and procedure according to manufacturer's recommendations.
   3. Install minimum 16 gauge, 16 inch long by specified width anchor chair at [Contact Garland Representative] feet on center.
   4. Install 6 inch wide splice plate by centering over 16 inch long by specified width anchor chair. Apply two beads of sealant to either side of the splice plate's center. Approximately 2 inches from the coping cap joint. Install Coping Cap by hooking outside hem of coping on outside face of anchor chair. Press downward on inside edge of coping until "snap" occurs and hem is engaged on the entire chair.

B. Liquid Flashing:
   1. Mask target area on roof membrane with tape.
   2. Clean all non-porous areas with isopropyl alcohol.
   3. Apply 32 wet mil base coat of liquid flashing over masked area.
   4. Embed polyester reinforcement fabric into the base coat of the liquid flashing.
   5. Apply 48-64 wet mil top coat of the liquid flashing material over the fabric extending 2 inches (51 mm) past the scrim in all directions.
   6. Apply minerals immediately or allow the liquid flashing material to cure 15-30 days and then install reflective coating.

C. Roof Drain:
   1. Plug drain to prevent debris from entering plumbing.
   2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
   3. Run roof system plies over drain. Cut out plies inside drain bowl.
   4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
   5. Install base flashing ply (40 inch square minimum) in bitumen.
   6. Install modified membrane (48 inch square minimum) in bitumen.
   7. Install clamping ring and assure that all plies are under the clamping ring.
   8. Remove drain plug and install strainer.

D. Pitch Pocket:
   1. Run all plies up to the penetration.
   2. Place the pitch pocket over the penetration and prime all flanges.
   3. Strip in flange of pitch pocket with one ply of base flashing ply. Extend 6 inches (152 mm) onto field of roof.
   4. Install second layer of modified membrane extending 9 inches (228 mm) onto field of the roof.
   5. Fill pitch pocket half full with non-shrink grout. Let this cure and top off with pourable sealant.
   6. Caulk joint between roof system and pitch pocket with roof cement.

3.6 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.7 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent and 90 percent completion. Provide a final inspection upon completion of the Work.
   1. Warranty shall be issued upon manufacturer's acceptance of the installation.
   2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
   3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
   4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
   1. FlexBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.
      a. Tensile Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39 kN/m
      b. Tear Strength, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N
      c. Elongation at Maximum Tensile, ASTM D 5147
         1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 7%
         2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 7%
      d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34.4 deg. C)

B. Modified Cap (Ply) Sheet:
   1. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G
      a. Tensile Strength, ASTM D 5147

1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
2) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m

b. Tear Strength, ASTM D 5147
1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
2) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N

c. Elongation at Maximum Tensile, ASTM D 5147
1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
2) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%

d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

C. Interply Adhesive:
1. Weatherking: Rubberized, polymer modified cold process asphalt roofing bitumen V.O.C. compliant ASTM D 3019. Performance Requirements:
a. Non-Volatile Content ASTM D 4479 70%
b. Density ASTM D1475 8.9 lbs./gal.
c. Viscosity Stormer ASTM D562 400-500 grams
d. Flash Point ASTM D 93 100 deg. F min. (37 deg. C)
e. Slope: up to 3:12

D. Flashing Base Ply:
1. FlexBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a dual fiberglass reinforced scrim, performance requirements according to ASTM D 5147.
a. Tensile Strength, ASTM D 5147
1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 225 lbf/in XD 225 lbf/in
2) 50 mm/min. @ 23 +/- 2 deg. C MD 39.0 kN/m XD 39 kN/m

b. Tear Strength, ASTM D 5147
1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N

c. Elongation at Maximum Tensile, ASTM D 5147
1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 7% XD 7%
2) 50 mm/min. @ 23 +/- 2 deg. C MD 7% XD 7%

d. Low Temperature Flexibility, ASTM D 5147:
1) Passes -30 deg. F (-34.4 deg. C)

E. Flashing Ply Adhesive:
1. Weatherking Flashing Adhesive: Brush grade flashing adhesive.
a. Non-Volatile Content ASTM D 4479 70 min.
b. Density ASTM D 1475 8.6 lbs./gal. (1kg/l)
c. Flash Point ASTM D 93 100 deg. F (37 deg. C)

F. Surfacing:
1. Flashing Cap (Ply) Sheet:
a. StressPly Plus FR Mineral: 155 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane reinforced with a fiberglass and polyester composite scrim. ASTM D 6162, Type III Grade G
1) Tensile Strength, ASTM D 5147
a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 310 lbf/in XD 310 lbf/in
b) 50 mm/min. @ 23 +/- 2 deg. C MD 54.25 kN/m XD 54.25 kN/m
2) Tear Strength, ASTM D 5147
a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 500 lbf XD 500 lbf
b) 50 mm/min. @ 23 +/- 2 deg. C MD 2224 N XD 2224 N
3) Elongation at Maximum Tensile, ASTM D 5147
a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 8% XD 8%
b) 50 mm/min. @ 23 +/- 2 deg. C MD 8% XD 8%
4) Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg.

C)

END OF SECTION

SECTION 07620 - SHEET METAL FLASHING AND TRIM

PART 1 GENERAL

1.01 WORK INCLUDED

A. Paratet flashings.

B. Scuppers.

C. Roof and sill flashings.

D. Counterflashings over roofing.

E. Counterflashings at roof mounted mechanical equipment and vent stacks.

F. Counterflashings for roof hatches and skylights.

1.02 RELATED WORK

A. Section 07530 Roofing.

B. Section 07724 - Roof Hatches.

C. Section 07900 - Joint Sealers.

1.03 REFERENCES

A. ASTM B370 - Copper Sheet and Strip for Building Construction.

B. ASTM D226 - Asphalt-Saturated Organic Felt Used in Roofing and Waterproofing.

C. CDA (Copper Development Association) - Contemporary Copper, A Handbook of Sheet Copper Fundamentals, Design, Details and Specifications.

D. CDA - Copper Roofing - A Practical Handbook.

E. FS O-F-506 - Flux, Soldering, Paste and Liquid.

F. FS QQ-S-571 - Solder, Tin Alloy.

G. NRCA (National Roofing Contractors Association) - Roofing Manual.

H. SMACNA - Architectural Sheet Metal Manual.

1.04 SYSTEM DESCRIPTION

A. Work of this Section is to physically protect membrane roofing and cavity walls, heads and sills, etc. from damage that would permit water leakage to building interior.

1.05 QUALITY ASSURANCE

A. Applicator: Company specializing in sheet metal flashing work with 5 years minimum experience.

1.06 SUBMITTALS

A. Submit product data under provisions of Section 01300.

B. Describe material profile, jointing pattern, jointing details, fastening methods, and installation details.

C. Submit manufacturer's installation instructions under provisions of Section 01300.

D. Submit samples under provisions of Section 01300.

1.07 STORAGE AND HANDLING

A. Store products under provisions of Section 01600.

B. Stack preformed and prefinished material to prevent twisting, bending, or abrasion, and to provide ventilation.

C. Prevent contact with materials during storage which may cause discoloration, staining, or damage.

PART 2 PRODUCTS

2.01 SHEET MATERIALS

A. Copper: ASTM B370, cold rolled; 20 oz/sq ft, thick; natural finish.

2.02 ACCESSORIES

A. Fastener: Copper

B. Underlayment: ASTM D266; No. 15 asphalt saturated roofing felt. 6 mil (0.15 mm) polyethylene.

C. Slip Sheet: Rosin sized building paper.

D. Bedding Compound: Rubber-asphalt type.

E. Solder: FS QQ-S-571.

F. Flux: FS O-F-506.

2.03 FABRICATION

A. Form sections true to shape, accurate in size, square, and free from distortion or defects.

B. Fabricate cleats and starter strips of same material as sheet, interlockable with sheet.

C. Form pieces in longest practical lengths.

D. Hem exposed edges on underside 1/2 inch (13 mm); miter and seam corners.

E. Form material with flat lock seam.

F. Pretin edges of copper sheet.

G. Solder and seal metal joints. After soldering, remove flux. Wipe and wash solder joints clean.

H. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.

I. Fabricate vertical faces with bottom edge formed outward 1/4 inch (6 mm) and hemmed to form drip.

J. Fabricate flashings to allow toe to extend 6 inches over roofing. Return and brake edges.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, cant strips and reglets in place, and nailing strips located.

B. Verify membrane termination and base flashings are in place, sealed, and secure.

C. Beginning of installation means acceptance of existing conditions.

3.02 PREPARATION

A. Field measure site conditions prior to fabricating work.

B. Install starter and edge strips, and cleats before starting installation.

C. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

D. Insert flashings into reglets to form tight fit. Secure in place with lead wedges at maximum 24 inches on center. Seal flashings into reglets with sealant.

E. Secure flashings in place using concealed fasteners.

F. Lap and seal all joints.

G. Apply plastic cement compound between metal flashings and felt flashings.

H. Fit flashings tight in place. Make corners square, surfaces true and straight in planes, and lines accurate to profiles.

I. Seal metal joints watertight.

3.03 INSTALLATION

A. Conform to drawing details and "Copper and Common Sense" handbook and NRCA manual.

* * * * *

SECTION 07715 - ALUMINUM GUTTERS & LEADERS

PART 1 GENERAL

1.01 DESCRIPTION

A. GUTTERS

1. Furnish and install Industrial Gutter System at upper roof and at garage alternate with accessories as manufactured by Perimeter Systems, Division of Southern Aluminum Finishing Company (SAF), or equal. Provide Profile No. G4-(R) manufactured of Aluminum .063" thickness 14 gauge, White Kynar 500 finish.

2. Gutters shall be manufactured in 10'-0" lengths, tapered and notched to provide a 1" telescoping lap joint. Gutters shall be pre-punched at 12" O.C. to provide for thermal movement after installation.

3. Provide manufacturer's standard support brackets and interior straps for installation at 30" O.C. Bracketry shall be of a compatible material to gutter, with matching finish and color.

B. DOWNSPOUTS

1. Furnish and install manufacturer's standard downspout Profile No. DS manufactured of Aluminum, 050" thickness 16 gauge, White Kynar 500 finish.

2. Downspout shall be manufactured in 10'-0" lengths, factory offset on one end to provide for a ¾" telescope joint. Downspout shall contain a factory mounted back, which is non-sealed to allow seepage of water in overflow conditions.

3. Elbows for downspouts shall be of welded construction, with matching finish applied after welding. Such finish shall be of quality equal to finish for non-welded parts. Grinding and spray painting of parts to match will not be permitted. Elbows will be provided with a factory offset on its lower end to allow a ¾" telescope joint.

4. Provide manufacturer's standard wall brackets of compatible material to downspout with matching finish and color.

1.02 QUALITY ASSURANCE

A. Installing contractor shall be responsible for installing gutter system in accordance with manufacturer's printed instructions. Follow primary roofing

material manufacturer's printed instructions for installation of joining eave trims.

1.03 SUBMITTALS

A. Prior to start of installation, the installing contractor shall furnish details or catalog cuts indicating products to be used conform to these specifications.

1.04 DELIVERY & PRECAUTIONS

A. All products delivered shall be stored in a clean, dry location prior to installation.

B. Products furnished with strippable protective plastic film should have film removed prior to installation. Such film coated products shall not be exposed to sunlight for more than 30 minutes without removing film.

C. Workmen shall use diligent care to avoid care to avoid damage, scars, and abrasions to product when handling. Moreover, contractor shall wear protective gloves and clothing to avoid bodily injury when handling products.

PART 2 INSTALLATION

2.01 SUBSTRATE PREPARATION

A. All horizontal blocking to receive gutters shall be installed true and straight and free of splinters, knots, or other irregularities. Follow local building codes or Factory Mutual Loss Prevention Data 1-49 (whichever is greater) for proper attachment of plates.

B. Fascia boards shall be installed in a vertical fashion, true and straight and free of knots, splinters, or other irregularities. Soffits, extenders, or cladding to be applied to fascias shall be installed prior to gutter installation.

C. Wall Conditions: Wall surfaces, which shall be subject to water runoff from gutters, shall be protected when project conditions do not allow immediate installation.

2.02 INSTALLATION PROCEDURES

A. Review carefully and follow primary roof materials manufacturer's general recommendations as to installing waterproof membranes to this gutter system.

B. Support Bracket Installation: Locate low and high points of gutter installation and chalk a guide line to allow a maximum ¼"/40' slope. Install support brackets at 30" on center aligned with the chalk or other type of guideline. Take

care to avoid locating bracket directly over downspout outlet locations. Attach brackets with 2" x #10 wood screw.

C. Gutter Installation: Install gutter sections from left to right (roof side) into support brackets. Insert each telescoping section into previous section for a distance of 1" seal and rivet at 2" O.C. Provide sealants and fasteners as provided by manufacturer. Nail rear upper portion of gutter with 2" self-drilling screws through pre-punched elongated holes at 12" O.C.

D. Inside Strap Installation: Install straps at 30" O.C. alternating with support brackets. Strap shall be hooked into leading edge (bead) of gutter and riveted at its rear side. In no case shall strap be nailed, screwed, or otherwise fastened which would restrain thermal movement of product.

E. Expansion Joints: At 40'-0" intervals, or as shown on plans, install manufacturer's standard elastomeric expansion joint assembly.

1. Provide manufacturer's standard elastomeric expansion joint assembly. Install in strict accordance with printed instructions taking diligent care to allow:

    a. Proper spacing between gutter sections.
    b. Ample curing time for primers and adhesives prior to application of membrane.
    c. Smooth, wrinkle free application of membrane.

2. Follow plans and details for proper location of expansion joints.

F. Miter Corners: Install manufacturer's welded miter units at locations shown on plans. Corners shall have 30" legs, pre-punched, notched, and telescoping to match gutter. All units shall be finished after fabrication, grinding and touch-up painting will not be allowed.

G. End Caps/Terminations: Install manufacturer's end caps at all end terminations. End caps shall be riveted at 2" O.C. and sealed.

H. Outlets: Locate all outlet locations and field cut hole in a neat workmanlike manner. Hole shall be located a distance of 1" from backside of gutter. Insert manufacturer's stainless steel outlet, fasten in place with 4 rivets (one being located on each flange), and seal.

SECTION 07900 - CAULKING AND SEALANTS

07900.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

07900.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of caulking and all related work, complete, in strict accordance with the Contract Drawings and as specified herein or reasonably implied.

    a. Complete caulking between structure and frames of all windows, doors, louvers and any and all other items in exterior walls, between concrete, door saddles and other joints and/or openings without exception as required for tightness.

    b. Caulking around all interior frames.

    c. Caulking of control and/or expansion joints.

    d. Other caulking as shown on the drawings, and not specified under other sections of the specifications.

    e. Caulk junctions between all dissimilar finish installations including at J bead installations installed where gyp board wall meet other walls, frames, stair stringers, etc.

07900.0300 RELATED WORK SPECIFIED ELSEWHERE

1. Doors and Windows - Division 8.

07900.0400 DELIVERY AND STORAGE

1. Deliver, store and handle materials in a manner to prevent the inclusion of foreign materials and damage. Deliver and store packaged materials in original sealed containers until ready for use. Delivery materials in ample time to facilitate inspection and test.

2. Package materials showing evidence of damage will be rejected.

07900.0500 SAMPLES

1. Submit the following samples of material for approval, in accordance with the

requirements of the Supplementary General Conditions:

a. Caulking compound: 1/2 pint containers of each in original manufacturer's containers with labels intact and seals unbroken.

b. Primer: Pint containers.

c. Oakum: 1 pound.

d. Joint Packing: 10'-0" strip.

e. Install sample caulked joint of each type, at the site and obtain approval of same before proceeding with the work.

07900.0600 MATERIALS

1. Caulking and Sealing Compound (Exterior): Construction joints around door frames and window enframements, under sills and door saddles and where shown on the drawings; shall be Tremco Manufacturing Company's "Dymetric" plus or equal. Colors as selected by the Architect.

2. Caulking Compound (Interior): For around windows and interior door frames, for door saddles and where shown on the drawings; shall be "Tremco Manufacturing Company's "Spectrem" or other approved equal. Colors as selected by the Architect.

3. Primers: Apply as required to the surfaces to be caulked; shall be as made by the manufacturer of the caulking and sealing compounds as approved by the Architect; of composition which will not stain or discolor the materials with which it comes in contact; and applied in accordance with the manufacturer's instructions.

4. Oakum: Hand picked dry spun oakum. Use for interior work only.

5. Joint Packing: Approved closed cell type as made by Everlastic or equal non-absorbing and non-staining.

07900.0700 APPLICATION

1. General: Apply in accordance with the manufacturer's instructions as approved by the Architect and as herein specified.

2. Preparatory work:

a. Joints and spaces to be caulked shall be cleaned thoroughly of mortar and other foreign and deleterious materials before caulking.

b. Joints and spaces shall be not less than 1/4" wide and 1/2" deep.

c. Joints and spaces shall be thoroughly dry before installing caulking compound.

3. Priming: Immediately prior to caulking, prime sides of joints as required with specified primer.

4. Caulking shall not be applied at a temperature of below 40 degrees F.

5. Caulking:

a. Unless otherwise indicated and specified herein, caulking joints and spaces which are open to depth greater than 3/4" shall be solidly filled with picked oakum or joint packing to within 3/4" of surface before caulking. Pack tightly and make continuous throughout length of joints.

b. In joints less than 1/4" wide, omit packing and completely fill with caulking compound. Solidly, fill open depth of joints with caulking compound. (For joints other than masonry).

c. If maximum depth of joint is less than 3/4", due to design, then fill completely with caulking compound.

6. Method of Application: Apply caulking compound by approved type of caulking gun in accordance with the manufacturer's instructions, and as herein specified. Where use of gun is not practicable, use suitable hand caulking tools. Avoid applying compound to surfaces outside caulking joints.

a. Frames: Caulk joints at perimeter of outside face of all exterior doors, window enframements, louver and other frames and penetrations. Perimeter includes sills, heads, jambs, also mullions where detail requires caulking.

b. Jambs and Mullions: Caulk joints at bottom of jambs and mullions at exterior openings.

c. Door Saddles: Spread bed of caulking compound over entire seat of exterior metal door saddles and sills. Thickness of compound shall be sufficient to form solid bed. Remove excess compound after setting and neatly point joints between sills or saddles and sub-sills. Caulk joints between sills, saddles and frames at jambs and mullions.

d. Caulk around items passing through walls, at outside faces.

e. Caulking Generally: Caulk joints where indicated, specified or required for tightness.

f. Pointing: Neatly point caulking and finish to match adjacent mortar joints, unless otherwise required. Point exterior joints window, door and other frames to make a slightly concave joint, the edges flush with the surfaces of the frames. Caulked joints on the interior side of the frames shall be neatly pointed flush with adjoining work.

7. Cleaning: Immediately clean thoroughly adjacent materials which have been soiled. Leave work in neat and clean condition as approved.

07900.0800 DEFECTIVE WORK

1. Work under this Section shall be watertight. Repair defects in work due to faults in materials, method and workmanship. Do all work necessary to make work watertight. Correct other defects. Make good any work damaged by such defects or by renewal of caulking.

07900.0900 GUARANTEE

1. Guarantee in accordance with the Supplementary General Conditions that the caulked joints will be thoroughly watertight for a period of two years after completion and acceptance, as evidenced by date of final payment.

* * * * *

DIVISION 8 - DOORS AND WINDOWS

SECTION 08100 - METAL DOORS AND FRAMES

08100.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

08100.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all related work, complete, in strict accordance with the contract drawings, and as specified herein or reasonably implied.

2. Provide and install all hollow metal doors and steel door frames, as manufactured by Curries or equal as noted on schedule.

3. All material, labor and equipment necessary to furnish and deliver to the job site material as specified in this section.

08100.0300 RELATED WORK SPECIFIED ELSEWHERE

1. Metal doors and frames; wood doors and frames; structural steel frames; finish hardware; automatic door closers; glass and glazing; caulking and weatherstripping; field painting.

08100.0400 QUALIFICATIONS

1. Hollow metal doors and steel door frames, including appropriate anchorage, shall be fabricated from prime materials in accordance with manufacturer's normal standards and accepted industry practice. Assembly and installation, including field modifications and custom fabrication, shall be done by a hollow metal contractor.

08100.0500 SHOP DRAWINGS

1. All doors, frames and hollow metal work shall be fabricated as shown on the shop drawings, submitted to and approved by the architect before fabrication.

08100.0600 DELIVERY AND STORAGE OF MATERIALS

1. Doors and frames shall be delivered to the contractor at the job site. They shall be handled so as to avoid damage and stored upright in a protected area on wood skids, covered with tarpaulins or plastic, vented to avoid condensation and entrapped moisture, until ready for installation. Damaged or deteriorated materials shall be removed from the premises.

08100.0700 PRODUCTS

1. Materials

   a. Doors - Hollow metal, full flush seamless Type D steel construction, Series 400 and UL400, 1-3/4" thick, completely filled with small cell phenolic resin-impregnated kraft honeycomb core bonded to 16 ga. skin sheets with heat and pressure-activated adhesive, 14 ga. channel perimeter reinforcement spot-welded to skin sheets top and bottom, skin sheets continuous lock-seamed along vertical edges. Top of exterior swing-out doors filled flush with additional channel to prevent moisture accumulation. Lock edge bevel 1/8" to 2". Provide R-7 polystyrene for all exterior doors as noted on our schedule.

   b. Hinge and lock reinforcements integral with vertical perimeter channel, additional reinforcing box for lock specified, internal reinforcing for overhead-surface mounted closers, and for surface-mounted hardware as required, for field drilling and tapping by contractor. Hinge mortise drilled and tapped, 3 full threads minimum, for standard weight 4 1/2" x 4 1/2" hinges.

   c. Doors to be cleaned, phosphatized and primed with oven-baked enamel of neutral color, ready for finish painting (by GC), and shipped in individual cartons. Cartons to be protected from moisture during shipping and handling.

   d. Door Accessories:

      Kick plates – Plate size to equal door size less 2” x 12” high. Finish shall match door hardware and to be installed on both sides of door.

      Glazing beads - 18 ga. steel, profile with max. 1/16" projection from door face, neatly coped and mitered at corners, (exterior sided nonremovable, interior side screw-attached) provided with all glassed styles.

   e. F-Line Frames - Prime, cold-rolled steel, assembled, arc-welded, ground and finished smooth, mortised, reinforced, drilled and tapped for standard weight, full mortise template hinges and template strike, mortar guards at all hardware preparations. Provide 1 welded-in floor anchor and 3 lock-in anchors each jamb for field insertion, 24" o.c. max., and furnish with rubber mutes, 3 for single

doors, 2 for pairs.

Frames to be cleaned, phosphatized and primed with oven-baked enamel or neutral color, ready for finish painting.

Series F416 frames, 16 ga., for 1 3/4" doors, hinge reinforcements 7 ga., strike reinforcement 14 ga. prepared for 1 1/2 pr. 4 1/2" x 4 1/2" hinges and ANSI 115.1 4 7/8" strike and UL-F416 labeled frames as required on above schedules.

Prepare frame for silencers, provide three (3) single rubber silencers for single doors on strike side, and two (2) single silencers on frame head at double doors without mullions.

f. Labels - Nonremovable labels, of the hourly rating shown on door schedule, shall be permanently affixed to fire-rated doors and frames showing compliance with Underwriters Laboratories requirement (B-Label tyical unless otherwise noted).

g. Provide all door frames with special cut at latch for electrical devices. (verify make & model prior to order). All door frames that do not receive an electric strike at the time of project completion shall receive a fire rated finish cover plate at frame latch.

08100.0800 EXECUTION

1. Doors - Hang doors level and plumb, shimming as necessary at hardware mortises to provide proper clearances and smooth operation with no binding.

2. F-Line Frames - Set plumb and square, securely anchor to floor construction and brace for erection of surrounding walls. Apply 1 coat of bituminous paint to frame surfaces that will be concealed in masonry walls.

3. Labeled Frames - Install labeled frames in accordance with NFPA Publications No. 80 and No. 101, and all applicable codes.

* * * * *

SECTION 08200 - FLUSH WOOD DOORS

08200.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

08200.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all related work, complete, in strict accordance with the contract drawings, and as specified herein or reasonably implied.

2. Except where noted on schedule otherwise, all new doors are to be white oak 1-3/4" solid core flush wood doors, or B label - 60 minute flush white oak wood doors.

08200.0300 QUALITY ASSURANCE

1. Doors shall meet or exceed NWMA Industry Standard IS-76.

08200.0400 SUBMITTALS

1. Submit manufacturer's certification that the doors meet requirements of specified standard.
2. Submit manufacturer’s standard finish stains/varnish to be selected by owner.

08200.0500 PRODUCTS

1. Basic Materials

    a. Cores shall be either: Particle Board designed for doors meeting or exceeding CS 236-66; or Glued-up cores of random short lengths of kiln dried softwood.

    b. Faces rotary cut "good grade" three ply white oak 1/8" thick each side.

    c. Rails top and bottom 2-7/8" wide softwood.

    d. Styles, one piece 1-3/4" wide softwood.

    e. All wood doors shall be as manufactured by Graham Manufacturing Co., 1920 E. 25th St., Marshfield, WI 54449 and shall conform to manufacturer's specifications which will be considered part of this specification. Provide lites, hinges, etc., as noted on the schedule.

    f. Frames shall be 16 ga. stl as previously specified. See Section 08100.

2. Machine doors for butts, locks, etc., in accordance with approved templates. Pre-machined or field work will be accepted.

3. Doors noted to receive vision panels/lites shall get fire rated glass typical.

4. All wood doors shall be factory finished and sealed on all six (6) sides with stain/varnish selected by owner with manufacturer's color selection.

* * * * *

SECTION 08305 - ACCESS DOORS

1.01 GENERAL DESCRIPTION

A. Bidding requirements, conditions of the contract and pertinent portions of sections in Division 1 of these specifications, apply to the section as fully as though repeated herein.

B. Work under this section includes furnishing and installing access panels. Minimum of six (6) to be field verified for locations, 24”x24” minimum size unless otherwise noted.

C. Related work:

1. Section 09250, opening in partitions.
2. Section 09900, painting; field paint finish.

1.02 SUBMITTALS

A. Submit product data under provisions of Section 01300.

B. Include sizes, types, finishes, scheduled locations, and details of adjoining work.

C. Submit manufacturer’s installation instructions under provisions of Section 01300.

1.03 DELIVERY

A. Package, handle, deliver and store access panels at the project site in a manner that will avoid damage.

1.04 QUALITY ASSURANCE

A. Manufacture’s Fire Rated Access Doors and frames to conform to UL Requirements.

PART 2 - PRODUCTS

2.01 MANUFACTURER

A. Access Panels listed as follows as provided by:

Larsen’s Manufacturing Company
7421 Commerce Lane N.E.
Minneapolis, MN 55432
(612) 571-1181

2.02 MATERIAL

A. L-DWB: To be installed in sheetrock or drywall after the board is up.

B. Latch to be knurled knob with interior release lever.

C. Size as noted on drawings.

2.03 FABRICATION

A. Furnish as necessary each access panel assembly manufactured complete with all parts ready for installation.

PART 3 - EXECUTION

3.01 INSPECTION

A. Verify that wall and ceiling openings are correctly dimensioned to receive walls.

3.02 INSTALLATION

A. Install according to manufacturers instructions.

3.03 ADJUST AND CLEAN

A. Adjust latch and lock mechanism to operate.

SECTION 08360 UPWARD ACTING SECTIONAL DOORS

WORK INCLUDED

A. Provide & install overhead doors where indicated on the drawings to include all materials, labor, installations, components, hangers, blocking, supports, motors, switches, etc. for complete installation of doors. All connections, supports, etc. shall be provided and installed by the door installer. Door installer to verify minimum headroom clearance.

SECTIONAL GLASS & ALUMINUM OVERHEAD DOORS
ArmRLite: CUSTOM CI™ MODEL

PART 1 GENERAL

1.1 SECTION INCLUDES

A. Glazed Aluminum Sectional Overhead Doors.

B. Electric Operators and Controls.

C. Operating Hardware, tracks, and support.

1.2 RELATED SECTIONS

A. Section 04810 - Unit Masonry Assemblies: Prepared opening in masonry. Execution requirements for placement of anchors in masonry wall construction.

B. Section 05500 - Metal Fabrications: Steel frame and supports.

C. Section 06114 - Wood Blocking and Curbing: Rough wood framing and blocking for door opening.

D. Section 07900 - Joint Sealers: Perimeter sealant and backup materials.

E. Section 09900 - Paints and Coatings: Field painting.

F. Section 11150 – Parking Control Equipment: Remote door control.

G. Section 16130 - Raceway and Boxes: Empty conduit from control station to door operator.

H. Section 16150 - Wiring Connections: Electrical service to door operator.

1.3 REFERENCES

A. ANSI/DASMA 102 - American National Standard Specifications for Sectional Overhead Type Doors.

1.4 DESIGN / PERFORMANCE REQUIREMENTS

A. Wind Loads: Design and size components to withstand loads caused by pressure and suction of wind acting normal to plane of wall as calculated in accordance with applicable code.
   1. Design pressure of 20 lb/sq ft

B. Wiring Connections: Requirements for electrical characteristics.
   1. 115 volts, single phase, 60 Hz

1.5 SUBMITTALS

A. Submit under provisions of Section 01300.

B. Shop Drawings: Indicate plans and elevations including opening dimensions and required tolerances, connection details, anchorage spacing, hardware locations, and installation details.

C. Manufacturer's Certificates: Certify products meet or exceed specified requirements.

D. Operation and Maintenance Data.

1.6 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum (20) years documented experience.

B. Installer Qualifications: Authorized representative of the manufacturer with minimum (10) years approved by manufacturer.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Store products in manufacturer's unopened labeled packaging until ready for installation.

B. Protect materials from exposure to moisture until ready for installation.

C. Store materials in a dry, ventilated weathertight location.

1.8 WARRANTY

A. 20-year welded aluminum frame warranty. (Except on top sections when trolley operated.) Standard one year warranty applies to the rest of the door (track, spring, hardware.)
B. Finish Warranty:
   1. 20-year warranty finish for clear anodized, dark bronze anodized, or black anodized finish, except on installations within 1 mile of salt water

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: For purposes of designating type and quality of work under this Section, Drawings and Specifications are based on products manufactured or Furnished by ARMRLITE DOOR MANUFACTURING CO. Toll Free: 800-554-5816 P:908-754-2600 ext 4016 Shannon McGrady F: 908-754-6522 email: smcgrady@armrlite.com W: www.armrlite.com.
B. Installing Dealer: Advanced Door Sales, 973-579-0043. Robert Marsh robmarsh@advanceddoor.com

C. Substitutions: Not permitted.

2.2 GLAZED ALUMINUM SECTIONAL OVERHEAD DOORS

A. Glazed Sectional Overhead Doors: Custom CI™ MODEL by ArmRLite Door Manufacturing Co., Inc. Units shall have the following characteristics:
   1. Door Assembly: Stile and rail assembly secured with concealed heli-arch welds. Through rods, bolts, and self-tapping screw construction methods will not be accepted
      a. Panel Thickness: 1-3/4 inches
      b. Center Stile Width: 3-3/8 inches
      c. End Stile Width:
         1) 7-1/2 inches
      d. Meeting Rail Pair Width: 3-7/8 inches wide per pair
      e. Top Rail Width:
         1) 4-1/2 inches
      f. Bottom Rail Width:
         1) 7-1/2 inches
      g. Aluminum Panels:
         1) .050 inch, non-insulated aluminum panels
      h. Stiles and Rails to be constructed of 4-sided .075 - .085 extruded 6063 - T6 aluminum alloy.
         1) Energy Efficiency Package: Polyurethane expanding foam filled insulated rails and stiles with water resistant feature. Polystyrene insulation will not be accepted.
      i. Springs:

1) 100,000 cycles

j. Glazing:

1) 1/8 inch non-insulated glass units

2. Finish and Color:
   a. Anodized Finish: clear anodized
3. Windload Design: Provide to meet the Design/Performance requirements specified.
4. Hardware: All hinges and fixtures made of 14 gauge galvanized steel. Full floating, ball bearing rollers to have hardened steel races and roller sizes to be adequate for design requirements and limitations. Heavy-duty, fully adjustable roller brackets are attached to each end cap to provide an easy adjustment of the door to the job for proper seal. All hardware is heavy-duty and rust resistant with galvanized fasteners.
5. Lock: Interior galvanized single unit.
6. Weatherstripping:
   a. Flexible bulb-type strip at bottom section.
   b. Flexible Jamb seals.
   c. Flexible Header seal.
7. Track: Provide track as recommended by manufacturer to suit loading required and clearances available.
   a. Standard Lift Track
8. Electric Motor Operation: provide jackshaft electric operator, size and type as recommended by manufacturer.
   a. Entrapment Protection: Required for momentary contact, includes radio control operation.
   b. Operator Controls:
      1) Push-button operated control stations with open, close, and stop buttons.

PART 3 EXECUTION

3.1 EXAMINATION

A. Verify that all openings are ready to receive work and opening dimensions and tolerances are within specified limits.

B. Beginning of installation means acceptance of existing surfaces.

3.2 PREPARATION

A. Prepare opening to permit correct installation of door unit.

3.3 INSTALLATION

A. Install overhead doors and track in accordance with approved shop drawings and the manufacturer’s printed instructions. Framing and opening

preparation per submitted shops is the responsibility of the general contractor and not the sectional door installer.

B. Coordinate installation with adjacent work to ensure proper clearances and allow for maintenance.

C. Anchor assembly to wall construction and building framing without distortion or stress.

D. Secure tracks to structural members only.

E. Fit and align door assembly including hardware, level and plumb, to provide smooth operation.

F. Install perimeter trim and closures

3.4 TOLERANCES

A. Maintain dimensional tolerances and alignment with adjacent work

B. Maximum variation from plumb: 1/8 inch

C. Maximum variation from level: 1/8 inch

D. Longitudinal or diagonal warp: plus or minus 1/8 inch from 10 ft. straight edge

3.5 CLEANING AND ADJUSTING

A. Clean doors, frames and glass.

3.6 PROTECTION

A. Do not permit construction traffic through overhead door openings after adjustment and cleaning.

B. Protect installed products until completion of project.

C. Touch-up, damaged coatings and finishes and repair minor damage before Substantial Completion.

SECTION 08700 - FINISHING HARDWARE

08100.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms", whether attached hereto or not.

08700.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operation in connection with the installation of finishing hardware, complete, in strict accordance with the Contract Drawings, the Door Schedule and as herein specified or reasonably implied.

2. Provide all butts, locks, rosettes, estucheons, pulls, push plates, door closers, flush bolts, door stops, anti-panic bolts, kickplates, required panic hardware devices and all other items not specifically mentioned, but necessary and required to make a complete item of work in every respect.

3. All finishing hardware shall be received, stored and distributed and the responsibility for its safety assumed by the Contractor. The protection wrapped around pieces of hardware as it is installed and properly maintained until the final completion of the building.

4. Do not install finishing hardware in the building until all work has been fully completed and dry.

5. Hardware shall be accurately fitted and secured in place, adjusted to operate perfectly and free from scratches and/or other defacements.

6. The Contractor shall be responsible for the condition and operation of all finished hardware until the issuance of the Certificate of Final Acceptance or until the building is occupied, whichever event is sooner.

7. Face hardware shall, after being fitted, be removed before finish or painting is applied and neatly replaced after the finishing or painting is fully completed.

8. Provide and install all electric door strikes in door frames. Coordinate wiring with the electrician.

9. Immediately prior to completion of all work, go over the entire building with the Architect and see that each piece of hardware is undamaged, in perfect working order.

10. Coordinate keying schedule with Owner and provide/install full primary & secondary master keying for all installed lockset hardware.

08700.0300 QUALITY ASSURANCE

1. Manufacturer as quality standard for lock sets and latch sets: Schlage.

2. Standards for latch sets: Schlage.

3. Manufacturer as quality standard for hinges: Stanley Hardware.

4. All other requirements as noted on the drawings.

5. Provide lock sets on all exterior doors and doors called to be locked as called for in the door schedule. Panic bar all exterior doors.

6. Provide passage latch on all other doors not called for on the drawings and specifications.

08700.0400 SUBMITTALS

1. Manufacturer's literature.

08700.0500 PRODUCTS

1. Latch Sets

   A. All new lock and latch sets to be Schlagelock, "D" Series. (Verify with Owner)

      1. Function:

         a. Passage Latch - D105 Rhodes 625

         b. Key Lock - D53PD, D405, D80PD, L9462, D12D Rhodes 626

      2. Finish: Satin Chromium 626

      3. Style: Rhodes

   B. Approved substitutions shall be listed BHMA performance standards.

   C. Install electric strikes provided by Owner in door frames to be coordinated with Electrician.

2. Door Stops (All Doors)

   A. Floor type as FB13/FB14R by Glynn Johnson Corp.

B. Wall type as 50C by Glynn Johnson Corp.

3. Hinges

A. All doors to have 1 1/2" pair, 4 1/2" standard weight, full mortise hinges.

4. Templates

A. Provide templates for installation.

5. Door Closers

A. Norton - Series 1600 or equal. Provide integral closer at storefront type entry and exit doors to be supplied by door manufacturer.

08700.0600 FINISHES

1. All finishes to match that specified for lock and latch sets above. (Verify with Owner)

08700.0700 CUTTING, FITTING AND PATCHING

1. Do all cutting and fitting of woodwork necessary to accommodate the work of other trades, patch and make good and work cut or damaged from any cause.

08700.0710 ACCESS SYSTEM STRIKE INSTALLATIONS

1. All frames shall be pre-cut for HES strike installations.
2. Coordinate installation schedule with electrician as required for electrician to have laborer on site to wire strikes during installation.

08700.0800 KEYING

1. All locksets shall be keyed in compliance with key schedule to be provided by the Owner.

* * * * *

08730 WEATHERSTRIPPING AND THRESHOLDS

08730.0100 GENERAL

1. The work under this Section is subject to all applicable provisions of the "Bidding Requirements", the "General Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

08730.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with the installation of all related work, complete, in strict accordance with the contract drawings, and as specified herein or reasonably implied.

2. Provide and install thresholds and weatherstripping on all exterior doors, including those which must comply with ADA requirements for handicap access.

3. Provide thresholds on interior doors at all locations of adjoining (non-continuous) floor types. Threshold material to be aluminum, or as specifically noted on the drawings.

4. Provide carpet thresholds 404 Series at all carpet locations. (See schedule for all types and locations)

08730.0300 MATERIALS

1. Provide thresholds and weatherstripping shall be aluminum alloy extrusions of 6063 hardness T-5 with mill finish complete with all fasteners as required for installation, as manufactured by National Guard Products, Inc. (See schedule for all types and locations)

08730.0400 SUBMITTALS

1. Submit manufacturer's literature.

* * * * *

DIVISION 9 - FINISHES

SECTION 09260 - GYPSUM BOARD SYSTEMS

PART 1 GENERAL

1.01 WORK INCLUDED

A. Metal stud wall framing.

B. Metal channel ceiling framing.

C. Acoustic insulation.

D. Gypsum board.

E. Taped and sanded joint treatment.

1.02 RELATED WORK

1.03 Section 05400 - Cold Formed Metal Framing.

A. Section 07213: Thermal insulation.

C. Section 08111 - Standard Steel Doors and Frames.

D. Section 08305 - Access Doors: Metal access panels.

E. Section 09111 - Metal Stud Framing System.

F. Section 09900 - Painting.

1.05 REFERENCES

A. ANSI/ASTM C36 - Gypsum Wallboard.

B. ANSI/ASTM C79 - Gypsum Sheathing Board.

C. ANSI/ASTM C442 - Gypsum Backing Board.

D. ANSI/ASTM C475 - Joint Treatment Materials for Gypsum Wallboard Construction.

E. ANSI/ASTM C557 - Adhesive for Fastening Gypsum Wallboard.

F. ANSI/ASTM C630 - Water Resistant Gypsum Backing Board.

G. ANSI/ASTM C645 - Non-Load (Axial) Bearing Steel Studs, Runners (Track), and Rigid Furring Channels for Screw Application of Gypsum Board.

H. ANSI/ASTM C646 - Steel Drill Screws for the Application of Gypsum Sheet Material to Light Gage Steel Studs.

I. ANSI/ASTM C754 - Installation of Framing Members to Receive Screw Attached Gypsum Wallboard, Backing Board, or Water Resistant Backing Board.

J. ANSI/ASTM E90 - Method for Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions.

K. ANSI/ASTM E119 - Fire Tests of Building Construction and Materials.

L. FS HH-I-521 - Insulation Blankets, Thermal (Mineral Fiber, for Ambient Temperatures).

M. GA-201 - Gypsum Board for Walls and Ceilings.

N. GA-216 - Recommended Specifications for the Application and Finishing of Gypsum Board.

1.06 SYSTEM DESCRIPTION

A. Acoustic Attenuation for Interior Partitions in accordance with ANSI/ASTM E90.

1.07 QUALITY ASSURANCE

A. Applicator: Company specializing in gypsum board systems work with 5 years documented experience approved by manufacturer.

1.08 SUBMITTALS

A. Submit product data under provisions of Section 01300.

B. Provide product data on metal framing, gypsum board, joint tape.

C. Submit samples under provisions of Section 01300.

D. Submit manufacturer's installation instructions under provisions of Section 01300.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - GYPSUM BOARD SYSTEM

A. Gold Bond or equal.

2.02 FRAMING MATERIALS

A. Studs and Tracks: ANSI/ASTM C645; GA 201 and GA 216; galvanized sheet steel.

B. Furring, Framing and Accessories: ANSI/ASTM C645.

C. Fasteners: ANSI/ASTM C514.

D. Adhesive: ANSI/ASTM C557.

2.03 GYPSUM BOARD MATERIALS

A. Standard Gypsum Board: ANSI/ASTM C36; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.

B. Fire Rated Gypsum Board: ANSI/ASTM C36; fire resistive type, UL rated; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.

C. Moisture Resistant Gypsum Board: ANSI/ASTM C630; 5/8 inch thick, maximum permissible length; ends square cut, tapered edges.

2.04 ACCESSORIES

A. Acoustical Insulation: FS-HH-I-521; preformed mineral wool, friction fit type without integral vapor barrier membrane.

B. Acoustical Sealant: Non-hardening, non-skinning, for use in conjunction with gypsum board.

C. Corner Beads: Metal.

D. Edge Trim: GA 201 and GA 216; Type U exposed reveal bead.

E. Joint Materials: ANSI/ASTM C475; reinforcing tape, joint compound, adhesive, water, and fasteners.

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that site conditions are ready to receive work.

B. Beginning of installation means acceptance of existing surfaces and substrate.

3.02 METAL STUD INSTALLATION

A. Install studding in accordance with ANSI/ASTM C754.

B. Metal Stud Spacing: 16 inches on center.

C. Partition Heights: Full height to floor or roof construction above. Install additional bracing for partitions extending above ceiling.

D. Door Opening Framing: Install double studs at door frame jambs. Install stud tracks on each side of opening, at frame head height, and between studs and adjacent studs.

E. Blocking: Bolt or screw steel channels to studs. Install blocking for support of plumbing fixtures, toilet partitions, wall cabinets, toilet accessories, etc.

F. Coordinate installation of bucks, anchors, blocking, electrical and mechanical work placed in or behind partition framing.

3.03 WALL FURRING INSTALLATION

A. Erect wall furring for direct attachment to concrete block and concrete walls.

B. Erect Z furring channels vertically. Secure in place on alternate channel flanges at maximum 24 inches on center.

C. Space furring channels maximum 24 inches on center, not more than 4 inches from abutting walls.

D. Install thermal insulation vertically and hold in place with Z-furring channels spaced maximum 24 inches on center, not more than 3 inches at external corners and 12 inches at internal corners.

E. Erect free-standing metal stud framing tight to concrete masonry walls, attached by adjustable furring brackets in accordance with manufacturer's instructions.

3.04 CEILING FRAMING INSTALLATION

A. Install in accordance with ANSI/ASTM C754 manufacturer's instructions.

B. Coordinate location of hangers with other work.

C. Install ceiling framing independent of walls, columns, and above-ceiling work.

3.05 GYPSUM BOARD INSTALLATION

A. Install gypsum board in accordance with GA 201 and GA 216 manufacturer's instructions.

B. Erect single layer standard gypsum board in most economical direction, with ends and edges occurring over firm bearing.

C. Erect single layer fire rated gypsum board vertically, with edges and ends occurring over firm bearing.

E. Use screws when fastening gypsum board to metal furring or framing.

F. Treat cut edges and holes in moisture resistant gypsum board with sealant.

G. Place control joints consistent with lines of building spaces as directed.

H. Place corner beads at external corners as indicated. Use longest practical length.

I. Place J bead edge trim where gypsum board abuts dissimilar materials including at masonry walls, door frames, window frames, etc. except for area that will be covered by trim.

J. Upon completion of all trades work, field review and correct/repair any and all overcuts that will not be covered by wall plates, escutcheons, trim, etc. throughout typical.

3.06 JOINT TREATMENT

A. Tape, fill, and sand exposed joints, edges, and corners to produce smooth surface ready to receive finishes.

B. Feather coats onto adjoining surfaces so that camber is maximum 1/32 inch.

C. Taping, filling, and sanding is not required at surfaces behind adhesive applied ceramic tile.

D. Erect in accordance with manufacturer's instructions.

3.10 TOLERANCES

A. Maximum Variation from True Flatness: 1/8 inch in 10 feet in any direction.

END OF SECTION

SECTION 09311 - CERAMIC TILE FLOOR FINISH

PART 1 GENERAL

1.01 WORK INCLUDED

A. Cleavage membrane and Portland cement mortar bed.

B. Ceramic tile floor and base, installed using the thinset method, with cementitious grouted joints.

C. Marble thresholds in wall openings.

1.02 RELATED WORK

A. Section 03346 - Concrete Floor Finishing: Trowelling of floor slab for tile adhesive.

B. Section 09312 - Ceramic Wall Tile Finish.

C. Section 09330 - Quarry Tile.

1.03 REFERENCES

A. ANSI A108.1 - Ceramic Tile Installed with Portland Cement Mortar.

B. ANSI A108.4 - Ceramic Tile Installed with Water-Resistant Organic Adhesives.

C. ANSI A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar.

D. ANSI A108.6 - Ceramic Tile Installed with Chemical Resistant, Water Cleanable Tile-Setting Epoxy.

E. ANSI A118.1 - Dry-Set Portland Cement Mortar.

F. ANSI-A118.3 - Chemical Resistant, Water Cleanable Tile- Setting Epoxy.

G. ANSI A118.4 - Latex-Portland Cement Mortar.

H. ANSI A136.1 - Organic Adhesives for Installation of Ceramic Tile.

I. TCA 137.1 - Recommended Standard Specifications for Ceramic Tile.

1.04 QUALITY ASSURANCE

A. Conform to ANSI - American National Standard Specifications for the Installation of Ceramic Tile.

B. Conform to ANSI - Recommended Standard Specifications for Ceramic Tile - TCA 137.1.

1.05 SUBMITTALS

A. Submit product data under provisions of Section 01300.

B. Indicate patterns, color arrangement, perimeter conditions, junctions with dissimilar materials, thresholds setting details.

C. Submit product data, specifications, and instruction for using adhesives and grouts.

D. Submit samples under provisions of Section 01300.

E. Mount tile, adhesive, and grout on 16 X 16 inch plywood panel, representative of pattern, color variations, and grout joint size variations.

F. Submit manufacturer's certification that tile materials supplied conform to TCA 137.1.

1.06 MAINTENANCE DATA

A. Submit maintenance data.

B. Include cleaning methods, cleaning solutions recommended, stain removal methods, and polishes and waxes recommended.

1.07 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 TILE MATERIALS

A. Ceramic Floor Tile: Refer to finish schedule & notes.

B. Thresholds: Marble type at all floor tile locations, color selected by architect, factory finish, 4 x 3/4 inch size by full width of wall or frame opening, beveled both sides, radiused edges from bevel to vertical face.

2.02 MORTAR MATERIALS

A. Mortar Materials: ANSI Ceramic Tile Standard A-2.

2.03 ADHESIVE MATERIALS

A. Organic Adhesive: ANSI A136.1, thinset bond type.

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

2.04 MORTAR BED

A. Mortar Bed: ANSI A118.1, thinset bond coat, dry-set cementitious mortar.

2.05 GROUT TYPE

A. Grout: Cementitious type; color to be selected; resistant to shrinking.

2.06 ACCESSORIES

A. Cleavage Membrane: 4 mil (0.1 mm) thick polyethylene film.

2.07 MORTAR MIX AND GROUT

A. Mix and proportion pre-mix setting bed and grout materials in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install cleavage membrane

B. Install ceramic tile floor, thresholds, and base in accordance with ANSI A108.1.

C. Lay tile to pattern indicated. Verify pattern is uninterrupted through openings.

D. Provide thresholds at wall or frame openings to other building areas not receiving ceramic tile floor finish.

E. Cut and fit tile tight to protrusions and vertical interruptions. Form corners [and bases] neatly.

F. Work tile joints uniform in width, subject to variance in tolerance allowed in tile size. Joints: Watertight, without voids, cracks, excess mortar, or grout.

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

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

3.02 PROTECTION

A. Prohibit traffic from floor finish for 48 hours after installation.

END OF SECTION

SECTION 09312 - CERAMIC TILE WALL FINISH

PART 1 GENERAL

1.01 WORK INCLUDED

A. Ceramic tile walls and base, installed using thinset method, with cementitious grouted joints.

B. Ceramic washroom accessories.

1.02 RELATED WORK

A. Section 09210 - Gypsum Plaster.

B. Section 09220 - Portland Cement Plaster: Base coat for ceramic tile finish.

C. Section 09311 - Ceramic Tile Floor Finish.

1.03 REFERENCES

A. ANSI A108.1 - Ceramic Tile Installed with Portland Cement Mortar.

B. ANSI A108.4 - Ceramic Tile Installed with Water-Resistant Organic Adhesives.

C. ANSI A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar.

D. ANSI A108.6 - Ceramic Tile Installed with Chemical Resistant, Water Cleanable Tile-Setting Epoxy.

E. ANSI A118.1 - Dry-Set Portland Cement Mortar.

F. ANSI-A118.3 - Chemical Resistant, Water Cleanable Tile- Setting Epoxy.

G. ANSI A118.4 - Latex-Portland Cement Mortar.

H. ANSI A136.1 - Organic Adhesives for Installation of Ceramic Tile.

I. TCA 137.1 - Recommended Standard Specifications for Ceramic Tile.

1.04 QUALITY ASSURANCE

A. Conform to ANSI - American National Standard Specifications for the Installation of Ceramic Tile.

B. Conform to ANSI - Recommended Standard Specifications for Ceramic Tile - TCA 137.1.

1.05 SUBMITTALS

A. Submit product data under provisions of Section 01300.

B. Submit product data specifications and instructions for using adhesives and grouts.

C. Submit samples under provisions of Section 01300 for color selection.

D. Mount tile, adhesive, and grout on 16 x 16 inch plywood panel, representative of pattern, color variations, and grout joint size variations.

E. Submit manufacturer's certification that tile materials supplied conform to TCA 137.1.

1.06 MAINTENANCE DATA

A. Submit maintenance data.

B. Include cleaning methods, cleaning solutions recommended, stain removal methods, and polishes and waxes recommended.

1.07 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 TILE MATERIALS

A. Refer to finish schedule & notes.

2.02 MORTAR MATERIALS

A. Mortar Materials: ANSI Ceramic Tile Standard A-2.

2.03 ADHESIVE MATERIALS

A. Organic Adhesive: ANSI A136.1, thinset bond type.

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

2.04 MORTAR BED

A. Mortar Bed: ANSI A118.1, thinset bond coat, dry-set cementitious mortar.

2.05 GROUT TYPE

A. Grout: Cementitious type; color to be selected; resistant to shrinking.

2.06 MORTAR MIX AND GROUT

A. Mix and proportion pre-mix [setting bed and] grout materials in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install ceramic wall tile, in accordance with ANSI A108.1.

B. Cut and fit tile tight to protrusions and perpendicular interruptions. Form corners and bases neatly.

C. Form internal angles square and external angles bullnosed.

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

E. Allow tile to set for minimum 48 hours prior to grouting.

3.02 PROTECTION

A. Prohibit activities near wall finish for 48 hours after installation.

END OF SECTION

SECTION 09330 - QUARRY TILE

PART 1 GENERAL

1.01 WORK INCLUDED

A. Cleavage membrane and Portland cement mortar bed.

B. Quarry tile flooring and base installed using thinset with cementitious grouted joints.

1.02 RELATED WORK

A. Section 03346 - Concrete Floor Finishing. Trowelling of floor slab for tile adhesive.

B. Section 09311 - Ceramic Tile Floor Finish.

1.03 REFERENCES

A. ANSI A108.3 - Quarry Tile and Paver Tile Installed with Portland Cement Mortar.

B. ANSI A108.4 - Ceramic Tile Installed with Water-Resistant Organic Adhesives.

C. ANSI A108.5 - Ceramic Tile Installed with Dry-Set Portland Cement Mortar.

D. ANSI A108.6 - Ceramic Tile Installed with Chemical Resistant, Water Cleanable Tile-Setting Epoxy.

E. ANSI A118.1 - Dry-Set Portland Cement Mortar.

F. ANSI A118.3 - Chemical Resistant, Water Cleanable Tile- Setting Epoxy.

G. ANSI A118.4 - Latex-Portland Cement Mortar.

H. ANSI A136.1 - Organic Adhesives for Installation of Ceramic Tile.

I. TCA 137.1 - Recommended Standard Specifications for Ceramic Tile.

1.04 QUALITY ASSURANCE

A. Conform to ANSI - American National Standard Specifications for the Installation of Ceramic Tile.

B. Conform to ANSI - Recommended Standard Specifications for Ceramic Tile- TCA 137.1.

1.05 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01300.

B. Indicate tile layout, patterns, color arrangement, perimeter materials, and thresholds setting details.

C. Submit product data, specifications, and instructions for using adhesives and grouts.

D. Submit samples under provisions of Section 01300.

E. Mount tile, adhesive, and grout on 24 x 24 inch plywood panel, representative of pattern, color variations, and grout joint size variations.

F. Submit manufacturer's certification that tile materials supplied conform to TCA 137.1.

1.06 MAINTENANCE DATA

A. Submit maintenance data.

B. Include cleaning methods, cleaning solutions recommended, stain removal methods, and polishes and waxes recommended.

1.07 DELIVERY, STORAGE, AND HANDLING

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

PART 2 PRODUCTS

2.01 TILE MATERIALS

A. Quarry Floor Tile: TCA 137.1; 0 to 5.0 percent water absorption; 6 x 6 inch size; square cushioned edge, non-slip surface; unglazed finish, color to be selected. Up to three (3) colors may be used at all locations with decorative pattern to be provided by Architect.

2.02 MORTAR MATERIALS

A. Mortar Materials: ANSI Ceramic Tile Standard A-2.

2.03 ADHESIVE MATERIALS

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

2.04 MORTAR BED

A. Mortar Bed: ANSI A118.1, thinset bond coat, dry-set cementitious mortar.

2.05 GROUT TYPE

A. Grout: Chemical resistant type, consisting of epoxy resin and hardener; color to be selected.

2.06 ACCESSORIES

A. Cleavage Membrane: No. 15 (6.8 kg) asphalt saturated felt. 4 mil (0.1 mm) thick polyethylene film. Reinforced asphalt paper, duplex type.

2.07 MORTAR MIX AND GROUT

A. Mix and proportion pre-mix setting bed and grout materials in accordance with manufacturer's instructions.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install cleavage membrane.

B. Install ceramic tile floor, thresholds, and base in accordance with ANSI A108.3.

C. Lay tile to pattern indicated. Verify pattern is uninterrupted through openings.

D. Cut and fit tile tight to protrusions and vertical interruptions. Form corners and bases neatly.

E. Work tile joint uniform in width, subject to variance in tolerance allowed in tile size. Joints: Watertight, without voids, cracks, excess mortar, or grout.

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

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

3.02 PROTECTION

A. Prohibit traffic from floor finish for 48 hours after installation.

END OF SECTION

Division 0900-4000
Floor Resurfacing 4000

Flooring Specification

SECTION 1 – GENERAL

1.1 SUBMITTALS

A. Product Data: Submit manufacturer's technical data, installation instructions and general recommendation for each resinous flooring material required. Include certification indicating compliance of materials with requirements.

B. Samples: Submit, for verification purposes, 4-inch square samples of each type of resinous flooring required, applied to a rigid backing, in color and finish indicated.

1.2 QUALITY ASSURANCE

A. Single Source Responsibility: Obtain primary resinous flooring materials including primers, resins, hardening agents, finish or sealing coats from a single manufacturer/installer (no subcontractors) with not less than twenty years of successful experience in manufacturing and installing principal materials described in this section. Manufacturer and installer must furnish certified documentation regarding the successful completion of at least 15 projects of similar size and complexity.

B. Pre-Installation Conference
   1. General contractor shall arrange a meeting not less than thirty days prior to starting work.
   2. Attendance
      a. General Contractor
      b. Architect/Owner's Representative
      c. Manufacturer/Installer

1.3 MATERIAL DELIVERY, STORAGE AND HANDLING

A. Material shall be delivered to job site and be checked by flooring installer for completeness and shipping damage prior to job start.

B. Material shall be stored in a dry enclosed area, protected from exposure to moisture. Temperature of storage area shall be maintained between 60 and 85°F (16 and 30° C).

1.4 PROJECT CONDITIONS

A. Concrete substrate shall be properly cured for a minimum of 30 days. A vapor barrier should be present for concrete subfloors on or below grade. Otherwise, contact the Engine Bay Floors Technical Department prior to the installation of the resinous flooring.

B. Utilities, including electric, water , heat (air temperature between 60 and 85°F (16 and 30° C) and finished lighting to be supplied by the owner.

C. Job area to be free of other trades during, and for a period of 24 hours, after floor installation.

D. Protection of finished floor from damage by subsequent trades shall be the responsibility of the General Contractor.

SECTION 2 – PRODUCTS

2.1 MANUFACTURERS

A. The products of Engine Bay Floors (800-573-9198) are identified below as the basis of design, or equal.

2.2 RESINOUS FLOORING SYSTEM

Floor Resurfacing 4000 Primer - a two component, greater than 95% solids, lower than 50 g/l VOC, epoxy primer cured with modified cycloaliphatic amine hardener with additive offering enhanced adhesion to concrete substrates.

Floor Resurfacing 4000 Mortar - a three component (epoxy resin, modified cycloaliphatic amine, silica sand mortar) with greater than 95% solids, lower than 50 g/l VOC, cementitious modified silica aggregate offering enhanced coefficient of thermal expansion resulting in better adhesion to concrete.

Floor Resurfacing 4000 Grout Coat - a three component (epoxy resin, modified cycloaliphatic amine, colorant) with greater than 95% solids, lower than 50 g/l VOC. The coating should be fast curing to minimize outgassing typically less than 6-7 hours and modified with adhesion promoters.

Floor Resurfacing 4000 Topcoat - a dimer aliphatic isocyanate urethane coating with UV blockers with greater than 92% solids, lower than 100 g/l VOC. Urethane cannot contain any extenders or diluents that are not reactive or do not come out of the film.

2.3 SYSTEM CHARACTERISTICS

A. Color and Pattern: As selected by engineer/architect/owners agent from manufacturer's standard colors. A minimum of three colors will be used.

B. Wearing Surface: Textured for slip resistance per engineer/architect/owner's agent from manufacturer's full range.

C. Integral Cove Base: 6 inches high with 1-1/2 inch radius.

D. Striping: Striping guide lines must be included. Striping shall be four inches in width. Color selected for these guide lines shall be one of three to be used. Exact location shall be confirmed by the engineer architect or owner.

E. Physical Strength Qualification: Flooring system must be durable enough to resist the constant loads of heavy engines and apparatus. The floor must be capable of dissipating high temperatures from hot tires and guaranteed to stay bonded and resistant to delamination. The contractor, in conjunction with the manufacturer, is responsible for gathering the data in regards to engine weights, load points, and temperature exposure required to guarantee this qualification.

2.3 SYSTEM COMPONENTS

A. Primer: Type recommended by manufacturer for substrate and body coat(s) indicated.

B. Body Coat(s):
1. Resin: Epoxy
2. Application method: troweled

C. Pigmented Grout Coating
1. Resin: Epoxy
2. Application method: squeegee/back roll

D. Pigmented Top Coating
1. Resin: Epoxy aliphatic polyester polyurethane
2. Application method: squeegee/back roll

2.5 ACCESSORY MATERIALS

A. Patching and Fill Material: Resinous product of resinous flooring manufacturer.

B. Joint Sealant: Type produced by manufacturer or resinous flooring system for type of service and joint condition indicated.

SECTION 3 – EXECUTION

3.1 INSPECTION

A. Ensure area is clean and dry with adequate heat, light and ventilation. The surface must be clean and dry, physically sound, and free of contamination. Surfaces must be free of holes, voids or defects. Cracks and abrupt changes in the surface profile must be corrected. Area shall be free of other trades to allow smooth flow of installation process to ensure optimum installation.

3.2 SURFACE PREPARATION

A. Prepare surface utilizing mechanical means where possible (i.e. self-contained Blastrac, scarifiers, scabblers, etc.)

B. Saw cut and chase perimeter edges to provide a "key-in" of material.

C. Ensure all static (non-moving) cracks are filled as recommended by manufacturer/installer.

D. Identify and mark all active (moving) joints.

E. Enlarged cracks and spalled areas shall be filled and leveled with an epoxy fill material before coatings are applied (Engine Bay Floor's fine crack fill).

F. Pre-fill all divots/holes in the concrete surface that are larger than 2" with Engine Bay Floor's epoxy patching compound.

G. Existing coatings greater than 4 mils must be removed by the PrepMaster diamond grinding process. No other method of removal will be accepted.

3.3 INSTALLATION

A. General: Apply components of flooring system according to manufacturer's written instructions to produce a uniform monolithic wearing surface of thickness indicated.
   1. Coordinate application of components to provide optimum adhesion of resinous flooring system to substrate and optimum intercoat adhesion.
   2. Cure resinous flooring components according to manufacturer's written instructions. Prevent contamination during application and curing process.

3. At substrate expansion and isolation joints, provide joint in flooring to comply with flooring manufacturer's written recommendations.

B. Installation
1. Saw cut and chase perimeter edges to provide a "key-in" of material.
2. Prepare surface utilizing mechanical means where possible (i.e. self-contained Blastrac, scarifers, scabblers, etc.).
3. Notched rake apply hybrid epoxy mortar overlayment at ¼" minimum thickness.
4. Grind based after initial cure to ensure smooth appearance.
5. Apply pigmented 100% solids epoxy grout coat.
6. Broadcast for texture, (if desired).
7. Apply pigmented aliphatic polyester polyurethane topcoat.

C. Application

System Installation – Epoxy mortar system to be installed at a minimum total thickness of 250 mils. Finish coat to achieve even color consistency and non-slip texture as specified by owner.

3.4 FIELD QUALITY CONTROL

A. The right is reserved to invoke the following material testing procedure at any time, and any number of times during period of floor application.

B. If test results show material being used do not comply with specific requirements, Contractor may be directed by Owner to stop work; remove non-complying materials; pay for testing; reapply flooring materials to properly prepared surfaces which had previously been coated with unacceptable materials.

3.5 CURING, PROTECTION AND CLEANING

A. Cure resinous flooring materials in compliance with manufacturer's directions, taking care to prevent contamination during stages of application and prior to completion of curing process. Close area of application for a minimum of 24 hours.

B. Protect resinous flooring materials from damage and wear during construction operation. Where temporary covering is required for this purpose, comply with manufacturer's recommendations for protective materials and method of application. General Contractor is responsible for protection and cleaning of surfaces after final coats.

C. Cleaning: Remove temporary covering and clean resinous flooring just prior to final inspection. Use cleaning materials and procedures recommended by resinous flooring manufacturer.

SECTION 4 – WARRANTY

4.0 WARRANTY

A. Guarantee and Warranty: Warranty shall be from a single source manufacturer/polymer systems applicator. The polymer system shall be warranted against defects in materials and workmanship for a period of ten years. Repair or replace any or all portions of the work that fail under normal conditions or use during the warranty period, promptly and at no cost to the customer and by using methods and materials specified for the initial construction.

SECTION 09500 - SUSPENDED ACOUSTICAL CEILINGS

PART 1 GENERAL

1.01 WORK INCLUDED

Provide and install:

A. Suspended metal grid ceiling system.

B. Acoustical tile.

C. Fire rated assembly with gypsum board boxes over light fixtures.

D. Hold down clips and access clips.

E. Perimeter trim.

1.02 REFERENCES

A. ASTM C635 - Metal Suspension Systems for Acoustical Tile and Lay-in Panel Ceilings

B. ASTM C636 - Installation of Metal Ceiling Suspension Systems for Acoustical Tile and Lay-in Panels.

C. Armstrong Specification an Installation Guidelines.

D. UL - Underwriter's Laboratories System Ratings.

1.03 SYSTEM DESCRIPTION

A. Installed System: Conform to UL Assembly rating noted on plans.

1.04 QUALITY ASSURANCE

A. Manufacturer: Company specializing in manufacture of ceiling suspension system and ceiling tile 10 years minimum experience.

B. Installer: Company with 5 years minimum experience.

1.05 SUBMITTALS

A. Submit product data.

B. Provide product data on metal grid system components, acoustic units, and related accessories.

C. Submit samples of ceiling tile and grid components.

1.06 ENVIRONMENTAL REQUIREMENTS

A. Maintain uniform temperature of minimum 60 degrees F (16 degrees C) and humidity of 20 to 40 percent prior to, during, and after installation.

1.07 SEQUENCING/SCHEDULING

A. Do not install acoustical ceilings until building is enclosed, sufficient heat is provided, dust generating activities have terminated, and overhead work is completed, tested, and approved.

B. Schedule installation of acoustic units after interior wet work is dry.

C. Install all cut tiles (perimeters, etc.) in all areas. Do not install final tile until coordinated with other trades.

D. Install tiles in all locations required for other trades to cut and install their work including fire sprinklers, smoke detectors, etc. Coordinate installation with other trades.

E. Upon installation of work and written verification of other trades, complete installation of ceiling tiles (white out). Upon completion liability for tile replacement and or repair shall not be the liability of the general contractor unless the damage is the result of the general contractors subsequent work or installations.

1.08 EXTRA STOCK

A. Provide one extra quantity of each type of acoustic units to Owner.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS - SUSPENSION SYSTEM

A. Armstrong 15/16" prelude fire guard heavy duty system with hold down clips at all locations, or equal. Refer to schedule for variations in grid types.

B.

2.02 SUSPENSION SYSTEM MATERIALS

B. Grid: ASTM C635, heavy duty, fire rated to 2 hour assembly, exposed T; components die cut and interlocking.

C. Accessories: Stabilizer bars clips splices edge moldings and hold down clips required for suspended grid system.

D. Grid Materials: Commercial quality cold rolled steel with galvanized coating.

E. Grid Finish: White.

2.03 ACCEPTABLE MANUFACTURERS - ACOUSTIC UNITS

A. Armstrong and Celotex tile as indicated on plans/finish schedule notes or equal.

2.04 ACOUSTIC UNIT MATERIALS

A. Acoustic Panels shall conform to the Armstrong Physical Data (Refer to Finish Schedule for designations).

PART 3 EXECUTION

3.01 INSPECTION

A. Verify that existing conditions are ready to receive work.

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

C. Beginning of installation means acceptance of existing conditions.

3.02 INSTALLATION

A. Install system in accordance with ASTM C636 and manufacturer's instructions and as supplemented in this Section.

B. Install fire rated system in accordance with UL Design No. G250.

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

D. Supply hangers with instructions for their correct placement. If metal deck is not supplied with hanger tabs, coordinate the installation of hanger

clips during steel deck erection. Provide additional hangers and inserts as required.

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

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

G. Locate system on room axis according to reflected plan.

H. Do not support components on main runners or cross runners if weight causes total dead load to exceed deflection capability. Support fixture loads by supplementary hangers located within 6 inches of each corner; or support components independently.

I. Do not eccentrically load system, or produce rotation of runners.

J. Install edge molding at intersection of ceiling and vertical surfaces, using longest practical lengths. Miter corners. Provide edge moldings at junctions with other interruptions. Field rabbet panel edge. Where bullnose concrete block corners or round obstructions occur, provide preformed closers to match edge molding.

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

L. Lay directional patterned units one way with pattern parallel to shortest room axis. Fit border neatly against abutting surfaces.

M. Install acoustic units level, in uniform plane, and free from twist, warp and dents.

N. Install hold-down clips to retain panels tight to grid system.

O. Install light fixture boxes constructed of gypsum board above light fixtures in accordance with UL assembly requirements.

3.03 TOLERANCES

A. Variation from Flat and Level Surface: 1/8 inch in 10 ft.

B. Variation from Plumb of Grid Members Caused by Eccentric Loads: Two degrees maximum.

SECTION 09650 - RESILIENT FLOORING

PART 1 GENERAL

1.01 WORK INCLUDED

Provide, prep and installation of the following:

A. Preparation of substrate surfaces.

B. Rubber bases at all areas.

C. Application of Acrylx Gencore laminate flooring with pattern and colors as provided by Architect.

D. Application of rubber stair treads at all stairs except lobby.

E. Cleaning of all surfaces and areas of work.

1.02 RELATED WORK

A. Section 03346 - Concrete Floor Finishing: Finish trowelling of floor slab.

1.03 REFERENCES

A. FS SS-T-312 - Tile, Floor: Asphalt, Rubber, Vinyl, Vinyl- Asbestos.

B. FS L-F-450 - Flooring, Vinyl Plastic.

C. FS SS-W-40 - Wall Base: Rubber and Vinyl Plastic.

1.04 SUBMITTALS

A. Submit shop drawings and product data under provisions of Section 01300.

B. Describe floor pattern, scaled design, color of various materials, and location of floor accessories.

C. Submit samples under provisions of Section 01300.]

D. Include duplicate 12 x 12 inch sized samples of each flooring material, color, and pattern selected.

E. Include duplicate 12 x 12 inch long samples of base and stair tread selected.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Maintain minimum 70 degrees F (21 degrees C) air temperature at flooring installation area for three days prior to, during, and for 24 hours after installation.

B. Store flooring materials in area of application. Allow three days for material to reach equal temperature as area.

1.06 EXTRA STOCK

A. Deliver 25 sq ft of each color and pattern of floor tile material required for project, for maintenance use.

B. Clearly identify each box or roll.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Gencor or equal.

2.02 FLOOR COVERING MATERIALS

A. Vinyl Tile: 12 x 12 inch size x 1/8 inch thick, marbleized pattern; color; to match existing.
B. Laminate strip tile Acrylx Gencore.

2.03 BASE MATERIALS

A. Base: Conforming to FS SS-W-40, Type I rubber; top set coved, 4 inch high, 1/8 inch thick including premolded end stops and external corners, color as selected.

2.04 ACCESSORIES/ADHESIVES/SEALERS

A. Edge Strips: rubber type; factory finish; color selected by Architect/Engineer.

B. Sub-Floor Filler: White premix latex, mix with water to produce cementitious paste.

C. Primers and Adhesives: Waterproof; of types recommended by resilient flooring manufacturer for specific material.

D. Sealer and Wax: Type recommended by resilient flooring material manufacturer for material type and location.

PART 3 EXECUTION

3.01 INSPECTION

A. Ensure floor surfaces are smooth and flat with maximum variation of 1/8 inch in 10 feet (1 1/960).

B. Ensure concrete floors are dry (maximum 7 percent moisture content) and exhibit negative alkalinity, carbonization, or dusting.

3.02 PREPARATION

A. Remove sub-floor ridges and bumps. Fill low spots, cracks, joints, holes and other defects with sub-floor filler.

B. Clean floor and apply, trowel and float filler to leave smooth, flat hard surface. Prohibit traffic until filler is cured.

3.03 INSTALLATION - FLOORING

A. Open floor tile cartons, enough to cover each area, and mix tile to ensure shade variations do not occur within any one area.

B. Clean substrate. Spread cement evenly in quantity recommended by manufacturer to ensure adhesion over entire area of installation. Spread only enough adhesive to permit installation of flooring before initial set.

C. Set flooring in place; press with heavy roller to ensure full adhesion.

D. Lay flooring with joints and seams parallel to building lines to produce symmetrical tile pattern.

E. Install with minimum tile width 1/2 full size at room or area perimeter, to square grid pattern with all joints aligned with pattern grain parallel for all units and parallel to width of room.

F. Terminate resilient flooring at centerline of door openings where adjacent floor finish is dissimilar.

G. Install edge strips at unprotected or exposed edges where flooring terminates.

H. Scribe flooring to walls, columns, cabinets, floor outlets and other appurtenances to produce tight joints.

I. Install flooring in pan type floor access covers. Maintain floor pattern.

J. Continue flooring through areas to receive moveable type partitions without interrupting floor pattern.

K. Install feature strips and floor markings where indicated. Fit joints tightly.

3.04 INSTALLATION - BASE

A. Fit joints tight and vertical. Maintain minimum measurement of 18 inches (457 mm) between joints.

B. Miter internal corners. Use premolded sections for external corners and exposed ends.

C. Install base on solid backing. Adhere tightly to wall and floor surfaces.

D. Scribe and fit to door frames and other obstructions.

E. Install straight and level to variation of plus or minus 1/8 inch over 10 feet (1/960).

3.06 PROTECTION

A. Prohibit traffic from floor finish for 48 hours after installation.

3.07 CLEANING

A. Remove excess adhesive from floor, base, and wall surfaces without damage.

B. Clean, seal, and wax floor and base surfaces in accordance with manufacturer's instructions.

END OF SECTION

SECTION 09688 - CARPETING GLUE DOWN

PART 1 GENERAL

1.01 WORK INCLUDED

A. Prepare surfaces to receive carpeting.

B. Apply glue down carpeting on floor surfaces where indicated, complete with required accessories.

C. Install edge strips where carpeting terminates at other floor finishes.

1.04 SUBMITTALS

A. Clearly indicate the location of all seams, method of joining seams, direction of carpet, type of adhesive to be used, method of integrating edge strips with carpet, and installation procedures.

B. Submit samples under provisions of Section 01300.

1.05 ENVIRONMENTAL REQUIREMENTS

A. Do not commence with carpet installation until painting and finishing work is complete and ceilings and overhead work, tested, approved, and completed.

B. Maintain room temperature at minimum 60 degrees F (15 degrees C) for at least 24 hours prior to installation, and relative humidity at approximately that at which the area is to be maintained.

C. Provide sufficient lighting.

PART 2 PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Mohawk.

2.02 MATERIALS

A. Carpet: Commercial Manu broadloom textured patterned cut & loop.

B. Adhesive: Type recommended by carpet manufacturer to suit application and expected service.

C. Edge Strips: Rubber type; factory finish; color selected by Architect.

PART 3 EXECUTION

3.01 PREPARATION

A. Clean floors of dust, dirt, solvents, oil, grease, paint, plaster, and other substances detrimental to proper performance of adhesive and carpet. Allow floors to thoroughly dry.

B. Ensure floors are level, with maximum surface variation of 1/4 inch in 10 feet, noncumulative.

C. Ensure floors are free from scaling and irregularities and exhibit neutrality relative to acidity and alkalinity.

D. Use an approved cementitious filler to patch cracks, small holes, and for levelling.

3.02 INSTALLATION

A. Lay out pattern of carpet for Architect/Engineer approval.

B. Check matching of carpet before cutting and ensure there is no visible variation between dye lots.

C. Cut carpet, where required, in manner to allow proper seam and pattern match. Ensure cuts are straight and true and un-frayed.

E. Join seams in recommended manner so as not to detract from the appearance of the carpet installation and decrease its life expectancy. Ensure seams are straight, not overlapped or peaked and free of gaps.

F. Vacuum clean substrate. Spread adhesive in quantity recommended by manufacturer after primer application to ensure proper adhesion over full

area of installation. Apply only enough adhesive to permit proper adhesion of carpet before initial set.

I. Cut and fit carpet neatly around projections through floor and to walls and other vertical surfaces.

J. Fit carpet snugly to walls or other vertical surfaces where no base is scheduled, leaving no gaps.

K. Do not place heavy objects such as furniture on carpeted surfaces for minimum of 24 hours or until adhesive is set.

L. Entire carpet installation is to be laid tight and flat to subfloor, well fastened at edges, and present a uniform pleasing appearance. Ensure monolithic color, pattern, and texture match within any one area.

M. Install edging strips where carpet terminates at other floor coverings. Use full length pieces only. Butt tight to vertical surfaces. Where splicing cannot be avoided, butt ends tight and flush.

END OF SECTION

SECTION 09900 PAINTING

09900.0100 GENERAL

1. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 - "General Requirements", which form a part hereof whether attached hereto or not.

09900.0200 WORK INCLUDED

1. Include all labor, materials and appliances and perform all operations in connection with painting and finishing and all related work, complete, in strict accordance with the Contract Drawings, the Schedule of Finishes and as specified herein.

2. Examine the Specifications and Drawings for the various other trades. Let it be understood that all surfaces normally requiring painting or colored finish that are left unfinished by the requirements of other Specifications shall be painted or finished as part of this Section.

3. All exposed surfaces, interior and exterior, of every description except glass and not designated in the contract drawings to be finished with a special coating as specified herein or to be factory finished or pre-finished, shall be finished as part of the work of this Section, all as required for a complete job or as specified herein including, but not limited to the following:

    a. Painting of all exterior metal work excepting aluminum, copper and other non-ferrous metals unless otherwise noted on the drawings.

    b. Painting of all interior metal work, trims, hollow metal work not factory finished as part of this contract and all exposed miscellaneous metal, etc., excepting non-ferrous metals.

    c. Interior painting and/or finishing of all gypsum board, doors, miscellaneous trim, door frames, moulding, concrete block walls, etc.

    d. Exterior wood trim, fascias, soffits, wood siding, doors, etc., to be finished as hereinafter specified and as noted on drawings.

    e. Painting of all ferrous metal access panels, ducts, registers and grilles and convector enclosures, piping, conduit and component parts, etc., not factory finished. The inside of all ducts at register and grille openings shall be painted black.

    f. Paint colors, textures, finishes, etc., shall be as selected by the Architect.

09900.0300 MATERIALS

1. Painting and finishing products for use in work shall be standard best or top brands produced for each particular kind of material required, as manufactured by Pittsburgh Plate Glass Co., Pratt and Lambert, Benjamin Moore & Co. or Sherwin Williams. All materials shall bear original manufacturer's identifying label on each container.

    a. Each kind of coating for the several types of paint finish shall be factory mixed to match samples and colors and consistencies for immediate application to the surface involved.

2. Materials for succeeding coats on any one surface shall be products of same manufacturer furnishing first or primer-sealer coat for that particular surface, except where red lead paint or other metal primer is used. Compatibility with finish coats must be verified before application of finish.

3. Raw linseed oil: ASTM D-234

4. Boiled linseed oil: ASTM D-260

5. Turpentine: ASTM D-13

6. Shellac: Pure, white or orange gum, cut in pure denatured alcohol, using 5 pounds of gum to gallon. Orange shellac shall be used for painting over knots, sap and resinous woods.

7. Spackling Compound: Finely ground, grit-free; when dry shall set easily and take any finish.

8. Putty: ASTM D-219, Class "B", white lead whiting putty.

9. Patching Plaster: White, non-shrinking, containing no lime; uniform in set and quality.

10. Tinting colors: Where required for oil paint shall be ground in pure linseed oil. Colors shall be non-fading and shall be as recommended by manufacturer of tinting coating.

11. Required Samples and Colors:

    a. Colors: As selected by the Architect. Obtain approval before starting work. Color shall include up to three (3) colors per area to allow for accent walls & soffits, etc.

    b. Following approval of manufacturers, submit samples of materials described

herein in one pint containers. Approval of samples will be based upon information from paint manufacturers certifying that products proposed for use are standard, best or top brands produced by then for purpose intended and are readily obtainable as such in "over the counter" sales to consumer market. Do not proceed with work until samples are approved.

c. Before placing orders for materials, submit name or names of paint manufacturers and brands for approval. Such submission to be made within 30 days after approval.

d. Do not construe approval of advanced samples as total guarantee of acceptance of materials as they will be subjected to field inspection, from time to time, as work progresses.

e. Where directed, prepare a Schedule of Colors as selected by the Architect. Prepare sample panels in accordance with the Schedule of Colors to be approved before work proceeds. panels will be considered standard for workmanship throughout.

12. Other materials as hereinafter specified:

a. All materials used shall be in compliance with current Federal Regulations concerning use of lead in paint.

b. All paints, stains and coatings applied shall be in conformance with current Federal and/or local regulations regarding hydrocarbon emissions. (air pollution, etc.)

09900.0400 RELATED WORK SPECIFIED ELSEWHERE

1. Priming, backpainting, factory finishing, painting of concealed work as described under various Divisions of the Contract.

2. Finishes - Division 9.

09900.0500 GENERAL REQUIREMENTS

1. Order materials in advance, in large enough quantities. Deliver in unopened containers in ample time to facilitate work.

2. Store materials on premises where directed. Keep storage space clean and accessible. Remove oil, paint soaked rags, waste, overall and the like at close of each day's work. Take every precaution to avoid damage by fire.

3. Provide suitable coverings, clean drop cloths and the like to protect work of this

Section, adjacent surfaces, equipment, objects such as adjacent woodwork, glass and metal work and the like.

4. Upon completion of work, remove from premises surplus materials, protective coverings, empty containers, rags, dirt, other debris resulting from work of this Section. Retouch finished work where ever necessary, as directed. Remove daubs, paint spatters and the like from walls, floors, glass, metal and other surfaces.

5. The Contractor shall take every precaution he deems necessary to prevent damage by fire. In addition, keep two (2) fire extinguishers, 5 pounds, CO2 or dry chemical type, Underwriters' approved, in paint storage room at all times, prominently located one near entrance to room, another near windows. Keep not less than three (3) buckets of sand near materials at all times. Buckets shall have round bottoms, shall be prominently located and painted bright red and shall have the word "FIRE" stencilled thereon in large, white letters. All other precautions and requirements as required by the institution and other authorities having jurisdiction shall be adhered to.

6. Rooms or spaces assigned for the storage and mixing of paint shall be kept locked. At least one key of each room or space shall be deposited with the Owner's field representative or custodial service so as to provide access thereto during non-working hours.

09900.0600 PREPARATION OF SURFACES

1. General: Properly prepare surfaces required to receive paint and other finishes. Broom clean rooms and spaces before painting is started. Surfaces to be painted shall be perfectly dry.

2. Sandpaper woodwork required to be painted or finished. Remove roughness; brush and remove dust. Wash off grease, dirt with approved cleaner. Give knots and sappy streaks, two thin coats of orange shellac. Cracks, nail holes and surface defects shall be filled with putty after priming coat, filler or shellac has been applied. Putty shall be brought up flush with surface.

3. Plaster Surfaces: Clean thoroughly of grit, grease, dirt, loose material, etc. Cut off, fill with patching plaster of affected surfaces. Give patched portions coat of primer-sealer in addition to other specified coats.

    a. The priming coat on plaster shall be tinted to the approximate shade of the final coat. All suction sports or "hot spots" in plaster or cement after the application of the first coat, shall be touched up before applying the second coat, to product an even result in the finished coat. Obtain color schedules for rooms before priming walls.

4. Thoroughly clean bare metal surfaces required to be painted of foreign matter such as

grease, rust, scale and dirt, before applying priming coat. Where solder flux has been used, clean with benzine before applying paint. Clean shop coated metal surfaces of foreign materials; touch up spots where marred. Remove rough surfaces by sandpapering.

5. Galvanized metal surfaces scheduled to be painted shall be thoroughly cleaned with solvent until they are completely free from dirt, oil and grease. Thoroughly treat the cleaned surface with phosphoric acid etch. Remove all excess etching solution and allow to dry completely before application of paint.

6. Dents, cracks and the like, hollow places, open joints and other irregularities in metal work to be painted shall be filled with approved metal filler suitable for purpose. After setting, sand to smooth hard finish.

09900.0700 MIXING

1. Mix materials thoroughly. Strain if necessary before using. Addition of thinners, such as linseed oil or turpentine shall be added to ready mixed materials only in accordance with paint manufacturers' printed instructions. If no printed instructions appears on containers, obtain this information in writing from paint manufacturer.

09900.0800 WORKMANSHIP

1. General

   Use only qualified painters for the mixing and application of paint on exposed surfaces. In the acceptance or rejection of installed painting, no allowance will be made for lack of skill on the part of painters. All paint shall be applied in accordance with the materials manufacturer's instructions.

2. Environment

   a. Do no painting or finishing when air is dust laden nor where weather or temperature conditions are suitable. Temperature within building shall be maintained at a minimum of 60 degrees F. during painting and drying period.

   b. Plaster, mortar, brick, concrete or any masonry related surfaces shall not be painted if its moisture content exceeds 12% -- an alkali resistant primer is to be used in place of scheduled primer if moisture content is between 8% and 12%.

   c. Exterior wood shall not be painted if moisture content exceeds 15%.

   d. When necessary, an approved moisture meter will be used to determine moisture conditions.

3. Operating Units

   When painting operating units, do not apply paint to sliding contact surfaces, where bare metal is necessary for proper operation.

4. Undercoats shall approximate shade of finish coat.

5. Exposed Duct Covering: Painted top, bottom, sides and ends, except where these surfaces are inaccessible.

6. Number of Coats: Except as otherwise specified under paragraph SCHEDULE, paint coats described herein are in addition to prime coats applied under this and other Sections: unless otherwise specified.

7. Mechanics: All work shall be executed by skilled mechanics in conformance with the requirements of the specifications.

8. Conditions for Painting: Surfaces shall be clean, dry and free from frost. Atmosphere must be free from dust and dirt, preventing the lodgement of foreign material on fresh paint. Floors must be broom swept clean before painting is started.

9. Sanding: Except for final coat, each coat on metal shall be thoroughly and uniformly sanded with No. 00 sandpaper, or other equal abrasive, removing all surface defects and providing a smooth, even surface for subsequent coats.

10. Puttying: Putty-stop nail holes, imperfections and defacements after priming coat of paint, filler or shellac has been applied. Putty stopping shall be brought flush with finished surface in a neat and workmanlike manner. Defacement about interior metal work shall be corrected. Open joints, broken surfaces by unused holes, screws; bolts and the like shall be closed and smoothed, producing a finished piece of work.

11. Fixture Removals: Hardware, lighting fixtures, switch and receptacle plates, etc., shall be removed wherever practicable before painting and replaced after completion of painting, or these items which are in place shall be adequately protected during painting operations.

    Plumbing or heating equipment adjacent to surfaces which are to be painted shall be disconnected and removed if necessary to complete all of painting required by these Specifications and shall be replaced upon completion of painting, the removal and replacement of fixtures and equipment shall be done by the trades responsible for the installation thereof.

12. All work where a coat of material has been applied must be inspected and approved by the Architect before the application of the succeeding specified coat, otherwise no

credit for the coat applied will be given and the Contractor automatically assumes the responsibility to recoat the work in question. The Contractor shall furnish the Architect a report of the particular coat applied when completed for inspection and approval to comply with the above.

13. If this Contractor finds problems arising in connection with the successful application of the paint, stain or coating to a surface so as to prevent a good, workmanlike job, work on that area should be stopped at once. The Architect, paint supplier to be contacted directly to see what must be done to rectify the condition.

    Failure to do so by the subcontractor shall be construed as acceptance of the surface and conditions with the full responsibility thereof to produce a satisfactory job.

14. Protection: Provide, install and maintain over entire period of painting work all drop cloths, barricades and other forms of protection as may be necessary to safeguard and keep clean such adjoining work of others as will not be painted and as required to preserve painted work free from damages of every nature. Freshly painted surfaces shall be legibly posted as such immediately following their completion.

09900.0900 COATS AND COLORS

1. The number of coats herein specified are the minimum to be applied over exposed surfaces or shop coats as designated. Each coat shall be of proper ground color for each succeeding coat and shall appreciably differ in tint. Colors shall be as selected by the Architect.

2. Unless otherwise specified, paint designation refers to the "Pittsburgh Paints". Products of equal quality as manufactured by other manufacturers may be used, as approved by the Architect.

3. Color in general will be limited to:

    a. There shall be up to two (2) deep tone accent colosr used in each space.

    b. Colors in general will be soft pastel colors.

09900.1000 SCHEDULE

All references to products of PPG Industries (Pittsburgh Paints)

1. Exterior Ferrous Metal:

    1 Coat PPG Speedhide Inhibitive Primer, 7-858; 2 coats PPG Speedhide

Exterior/Interior Alkyd Enamel, 7-814 series.

2. Exterior Galvanized Metal:

   1 coat PPG Speedhide Galvanized Steel Primer, 9-712; 2 coats PPG Speedhide Exterior/Interior or Alkyd enamel, 7-814 series.

3. Wood (not specified or noted elsewhere):

   1 coat PPG Speedhide 6-855 Enamel Primer
   2 coats PPG 7-814 Series Alkyd Gloss Enamel

4. Interior Ferrous Metal

   a. Prime with PPG Speedhide Interior Primer, 7-858 (red) or 6-208 (red) or 6-212 (white).

   b. Finish coat: 1 coat PPG Speedhide Alkyd enamel, semi-gloss 7-814 series or gloss, 6-250 series. (As designated by Architect).

5. Interior Galvanized Steel

   Same as ferrous metal except that primer shall be PPG Speedhide Galvanized Steel Primer, 90-712.

6. Interior Dry Wall

   a. Ceilings: 1 coat PPG Speedhide Latex Sealer/Primer, 6-2; 2 coat PPG Speedhide Alkyd flat, 6-51 series.

   b. Walls: 1 coat PPG Speedhide Latex Sealer/Primer, 6-2; 2 coat PPG Speedhide Alkyd flat, 6-70 series.

7. Interior Conc. Block Walls

   a. 1 coat PPG Maestro-prime quick drying primer & Sealer 6-12 3.6 mils per coat.

   b. 2 coats PPG fast dry Alkyd Industrial Gloss Enamel 7-814 lines series. MWF 3.6 mils per coat. Color as selected by Architect.

8. Insulated Pipes, Conduits, Etc.

   1 Coat PPG Speedhide Latex Sealer, 6-2

   2 Coats to match adjacent wall/ceiling finish.

9. Uncovered Piping (Ducts)

   PPG Speedhide Inhibitive Metal Primer (white) 6-70.

   PPG Speedhide LoSheen Alkyd Enamel, 6-70 series.

10. Other items (requiring finishing as shown by the drawings, details or finish schedule).

09900.1100 CLEANING

1. When so directed by the Architect, the Contractor shall go over all of the building where he has worked, retouch where necessary, restore where damaged or defaced and clean off all paint spots from floors, walls, finish hardware, glass and other unpainted surfaces and shall leave all painted surfaces clean and in a satisfactory condition.

2. At the end of each working day and upon completion of all work, all surplus materials, empty packages and/or containers and all debris shall be removed from the site.

09900.1200 GUARANTEE

1. All work under this Section of the Specifications shall be guaranteed against checking, cracking, peeling, chalking, discoloration or other defects due to improper materials or workmanship, due to improper preparation of the surface, or due to the painting, varnishing, etc. of surfaces which were not in proper condition to receive, paint, varnish or other painters' materials and such unsatisfactory work shall be refinished at no additional cost to the Owner.

09900.1300 PAINT MANUFACTURER'S REPRESENTATIVE

1. Notify and permit representatives of paint manufacturers, whose materials are used, access to the premises for the purpose of inspecting materials and proper use thereof.

* * * * *

SECTION 10200 - LOUVERS & VENTS

PART 1 GENERAL

1.01 SUMMARY

A. Section Includes: Provide & install metal wall louvers and screens exposed to view in finish work, including:
1. Exterior metal louvers.
2. Louvers at locations where HVAC ductwork terminates at exterior walls.
3. Other exposed exterior and interior louvers indicated on Drawings.

B. Extent: Extent of exterior louvers is shown on architectural drawings. Coordinate requirements, quantities and sizes with mechanical drawings. Louvers not shown on architectural drawing, but indicated on mechanical drawings shall be provided & installed as part of work of this section.

C. Related Sections: Section(s) related to this section include:
1. Sealant and Caulking: Division 7 Joint Treatment Section.
2. Dampers and Ductwork: Division 15 Dampers and Ductwork Sections.
3. Grilles and Registers: Division 15 Grilles and Registers Sections.

1.02 REFERENCES

A. General: Standards listed by reference, including revisions by issuing authority, form a part of this specification section to extent indicated. Standards listed are identified buy issuing authority, authority abbreviation, designation number, title, or other designation established by issuing authority. Standards subsequently referenced herein are referred to by issuing authority abbreviation and standard designation.

B. American Society for Testing and Materials (ASTM):
1. ASTM B209 - Specification for Aluminum and Aluminum-Alloy Sheet and Plate.
2. ASTM B221 - Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Shapes, and Tubes.

C. Air Movement and Control Association (AMCA):
1. AMCA Standard 500 - Test Method for Louvers, Dampers, and Shutters.
2. AMCA Publication 261 - Directory of Licenses Products, current edition.

D. Sheet Metal and Air Condition Contractors National Association (SMACNA)
1. SMACNA - Architectural Sheet Metal Manual, current edition

E. American Architectural Manufacturer's Association (AAMA):
1. AAMA Standard 605 - Voluntary Specification for High Performance Organic Coating on Architectural Extrusions and Panels.

1.03 SYSTEM DESCRIPTION

A. Performance Requirements: Provide louvers, which have been manufactured, fabricated and installed to maintain performance criteria stated by manufacturer without defects, damage, or failure.

B. Louver Performance: where louvers are indicated to comply with specific performance requirements, provide units whose performance ratings have been determined in compliance with Air Movement and Control Association (AMCA) Standard 500.

1.04 SUBMITTALS

A. General: Submit listed submittals in accordance with Conditions of the Contract and Division 1 Submittal Procedures section.

B. Product Data: Submit product data sheet for specified products.
   1.Performance Certificates: Submit performance certification, if not included in product data

C. Shop Drawings: Submit shop drawings showing layout, profiles and product components, including anchorage, accessories, finish colors, patterns and textures.
   1. Include information necessary for fabrication and installation of louvers. Indicate materials, sizes, thickness, fastenings and profiles.

D. Quality Assurance Submittals: Submit the following:
   1. Test Reports: Certified test reports showing compliance with specified performance characteristics and physical properties.
      a. Submit certified test results from an approved testing laboratory showing that the louvers proposed meet the criteria specified herein.
   2. Certificates: Product certificates signed by manufacturer certifying materials comply with specified performance characteristics and criteria, and physical requirements.

1.05 DELIVERY, STORAGE & HANDLING

A. General: Comply with Division 1 Product Requirements Sections.

B. Ordering: Comply with manufacturer's ordering instructions and lead-time requirements to avoid construction delays.

C. Delivery: Deliver materials in manufacturer's original, unopened, undamaged containers with identification labels intact.
   1. Deliver, store and handle products to avoid any distortion or damage due to moisture, physical abuse or other cause Louvers shall be free from nicks, scratches and blemishes. Replace defective or damaged materials with new.

1.06 PROJECT CONDITIONS

A. Field Measurements: Verify actual measurements/openings by field measurements before fabrication; show recorded measurements on shop drawings. Coordinate field measurements and fabrication schedule with construction progress to avoid construction delays.

1.07 WARRANTY

A. Project warranty refers to Conditions of the Contract for project warranty provisions. Manufacturer's Warranty: Submit, for Owner's acceptance, manufacturer's standard warranty document executed by authorized company official. Manufacturer's warranty is in addition to, and not a limitation of, other rights owner may have under Contract Documents.

PART II PRODUCTS

2.01 WALL LOUVERS

A. Manufacturer: Industrial Louvers Inc. (ILI).
   1. Contact: 511 South 7th Street, Delano, MN 55328; Telephone: (763) 972-2981; Fax: (763) 972-2911.

B. Other Available Manufacturers – subject to compliance with requirements stated within.

2.02 DRAINABLE BLADE LOUVERS

A. ILI Model 458XP:
   1. Extruded aluminum frame and blades shall be designed to collect and drain water to exterior at sill by means of gutters in front edges of blades and of channels in jambs. Frames and blade thickness to be .081" (2.06 mm) extruded aluminum 6063 alloy. Sill and jamb frames shall be continuously welded and caulked to prevent water penetration to interior wall construction. Blades are attached by means of all-welded construction.

   2. Louvers shall bear the AMCA Certified Ratings Seal for both air performance and water penetration. Louvers shall have a minimum of 8.91 sq., ft. (0829 m2) (56 %) free area on 48" x48" (1219 x 1219) louver. Rating shall show a maximum water penetration of .01 oz. at an air flow rate of 1046 FPM. Static Pressure Loss shall be not more than 15 inch of water gauge at an air flow of 914 FPM free area velocity.

2.03 LOUVER ACCESSORIES

A. Exterior Aluminum Sill: Provide sill flashing of same material and finish as louvers where indicated on the drawings.
B. Louver Screens: Provide framed removable screens for exterior louvers.

1. Screens shall be ½" (12.7 mm) mesh .063 (1.6 mm) flattened expanded aluminum mounted in extruded aluminum rewireable frames.
2. Locate screens on inside face of louvers.
1. Screen frames shall have welded corners and be secured to the louver frame with machine screws, at each corner and at 12" (304.8 mm) c.o. between.

2.04 MATERIALS

A. Aluminum Sheet: ASTM B209 Alloy 3003 or 5005 with temper as required for forming or as otherwise recommended by metal producer to provide required finish.
B. Aluminum Extrusions: ASTM B221, Alloy 6063.
C. Fastenings: Provide stainless steel screws and fasteners for aluminum louvers and zinc-coated or stainless steel screws and fasteners for steel louvers. Provide other accessories as required for complete and proper installation.

2.05 FABRICATION

A. Fabrication Requirements:
   1. Performance: Fabricate as required for optimum performance with respect to water penetration, strength, durability and uniform appearance.
   2. Size:
      a. Fabricate louvers in masonry walls to outside dimensions indicated, with allowance of ¼" (6.4 mm) on each side for sealant joints.
      b. Verify sizes with final HVAC shop drawings, including detail dimensions of ductwork, dampers or other fittings abutting louvers.
   3. Field Measurements: Verify size, location and placement of louver units prior to fabrication.
   4. Shop Assembly:
      a. Fabricate to minimize field adjustments, splicing, mechanical joints and field assembly of units.
      b. Preassemble units in shop to greatest extent possible and disassemble as necessary for shipping and handling.
      c. Clearly mark units for reassemble and coordinated installation.
   5. Accessories: Include supports, anchorages and accessories required for complete assembly.
   6. Vertical Mullions: Provide vertical mullions of type and spacing indicated but not further apart than recommended by the manufacturer.
   7. Horizontal Mullions: Provide horizontal mullions at horizontal joints between louver units except where continuous vertical assemblies are indicated.
   8. Connections: Join frame and blade members to one another by welding, except where field bolted connections between frame members are made necessary by size of louvers.
   9. Spacing: Maintain equal blade spacing to produce uniform appearance.

1.06 FINISHES (FACTORY)

A. Shop Finishing: Factory finish louvers and accessories with an organic coating.

1. Organic Coating: Clean and prime exposed aluminum surfaces and apply a Kynar 500/Hylar 5000 2-coat finish conforming to AAMA 605 in a standard color. Minimum dry film thickness shall be 1.2 mil.

B. Finish Protection: Provide finish protection as recommended by louver manufacturer.

PART 3 EXECUTION

3.01 MANUFACTURER'S INSTRUCTIONS

A. Compliance: Comply with manufacturer's product data, including product technical bulletins, product catalog installation instructions, and product carton instructions for installation.

3.02 EXAMINATION

A. Site Verification of Conditions: Verify substrate conditions, which have been previously installed under other sections, are acceptable for product installation in accordance with manufacturer's instructions.

3.03 INSTALLATION Louver Installation:

1. Louvers shall be installed in accordance with manufacturers approved shop drawings and as shown. Provide all necessary fastenings and anchors required to a complete installation. Units to be installed plumb, level and in proper alignment with adjacent work.
2. Form tight joints within work of this Section. Fit exposed connections accurately.
3. Louvers shall be protected from damage from subsequent building operations.
4. Protect metal surfaces from corrosion or galvanic action by application of a heavy coating of bituminous paint on surfaces, which shall be in contact with concrete, masonry or dissimilar metals.

SECTION 10155

PLASTIC TOILET COMPARTMENTS

10 2116-05 Solid Plastic Toilet Compartments (Eclipse - floor mounted, overhead braced)

PART 1 GENERAL

1.1 SUMMARY

A. Section Includes:
1. Plastic toilet compartments and urinal screens.

B. Related Sections:
1. Division 01: Administrative, procedural, and temporary work requirements.

1.2 REFERENCES

A. ASTM International (ASTM):
1. A167 - Standard Specification for Stainless and Heat-Resisting Chromium-Nickel Steel Plate, Sheet, and Strip.
2. B221 - Standard Specification for Aluminum and Aluminum-Alloy Extruded Bars, Rods, Wire, Profiles, and Tubes.

1.3 SYSTEM DESCRIPTION

A. Compartment Configurations:
1. Toilet partitions: Floor mounted, overhead braced.
2. Urinal screens: Wall mounted.

1.4 SUBMITTALS

A. Submittals for Review:
1. Shop Drawings: Include dimensioned layout, elevations, trim, closures, and accessories.
Product Data: Manufacturer's descriptive data for panels, hardware, and accessories.
Samples: [2 x 3] inch samples showing available colors.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Minimum [5] years experience in manufacture of plastic toilet compartments with products in satisfactory use under similar service conditions.

B. Installer Qualifications: Minimum [5] years experience in work of this Section.

1.6 WARRANTIES

A. Provide manufacturer’s 5 year warranty against breakage, corrosion, and delamination under normal conditions.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Contract Documents are based on Resistal products by Scranton Products. (www.scrantonproducts.com)

B. Substitutions; Under provisions of Division 01.

2.2 MATERIALS

A. Doors, Panels and Pilasters:
   1. Constructed of two sheets of 1/8 inch thick high density polyethylene (HDPE), thermoformed with touch points into single engineered panel, with structural inserts on top ad middle rails.
   2. Waterproof and nonabsorbent, with self-lubricating surface, resistant to marks by pens, pencils, markers, and other writing instruments.
   3. 1 inch thick with thermoformed edges.
   4. Color: To be selected from manufacturer's full color range.

B. Aluminum Extrusions: ASTM B221, 6463-T5 alloy and temper.

C. Stainless Steel: ASTM A167, Type 304.

2.3 HARDWARE

A. Hinges:
   1. 8 inches long, fabricated from heavy-duty extruded aluminum with bright dip anodized finish, wrap-around flanges, through bolted to doors and pilasters with stainless steel, Torx head sex bolts.
   2. Hinges operate on field-adjustable nylon cams, field adjustable in 30 degree increments.

B. Door Strike and Keeper:
   1. 6 inches long, fabricate from heavy-duty extruded aluminum with bright dip anodized finish, secured to pilasters with stainless steel tamper resistant Torx head sex bolts.
   2. Bumper: Extruded black vinyl.

C. Latch and Housing:
   1. Heavy-duty extruded aluminum.
   2. Latch housing: Bright dip anodized finish.
   3. Slide bolt and button: Black anodized finish.

D. Coat Hook/Bumper:
   1. Combination type, chrome plated Zamak.
   2. Equip outswing handicapped doors with second door pull and door stop.

E. Door Pulls: Chrome plated Zamak.

2.4 COMPONENTS

A. Doors and Dividing Panels: 55 inches high, mounted 14 inches above finished floor.

B. Pilasters: 82 inches high, fastened to 3 inch high pilaster sleeves with stainless steel tamper resistant Torx head sex bolt.

C. Pilaster Sleeves: 3 inches high, [one-piece molded HDPE,] [20 gage stainless steel,] secured to pilaster with stainless steel tamper resistant Torx head sex bolt.

D. Wall Brackets: 54 inches long, [Extruded PVC,] [heavy-duty aluminum, 1-1/2 inch stirrup type, bright dip anodized finish,] fastened to pilasters and panels with stainless steel tamper resistant Torx head sex bolts.

E. Headrail: Heavy-duty extruded aluminum, anti-grip design, integrated curtain track, clear anodized finish, fastened to headrail bracket with stainless steel tamper resistant Torx head sex bolt and at top of pilaster with stainless steel tamper resistant Torx head screws.

F. Headrail Brackets: 20 gage stainless steel, satin finish, secured to wall with stainless steel tamper

resistant Torx head screws.

PART 3 EXECUTION

3.1 INSTALLATION

A. Install compartments in accordance with manufacturer’s instructions and approved Shop Drawings.

B. Install rigid, straight, plumb, and level.

C. Locate bottom edge of doors and panels 14 inches above finished floor.

D. Provide uniform, maximum 3/8 inch vertical clearance at doors.

E. Not Acceptable: Evidence of cutting, drilling, or patching.

3.2 ADJUSTING

A. Adjust doors and latches to operate correctly.

END OF SECTION

SECTION 10520 – FIRE EXTINGUISHER CABINETS

1. Scope:

    a. Provide & install eight (8) fully recessed fire extinguisher cabinets, to be installed where directed by Architect.

2. Quality Assurance:

    a. Materials will be Larsen or equal.

3. Submittals:

    a. Manufacturers catalog cuts for specified items.

4. Products:

    a. Larsen Cosmopolitan 1035 V10 Recessed Stainless Cabinet with Flat Trim Series 1835.

    b. Provide double strength glass contemporary V profile.

    c. Finish to be Brushed Stainless Steel.

5. Installation:

    a. Mount to solid blocking as per manufacturers specifications. Trim vinyl wall cover to rough opening prior to installation.

    b. Review & adjust wall thickness at all install locations to allow for fully recessed cabinet.

DIVISION 10 SPECIALTIES

SECTION 10550 MAILBOXES

1. Scope

   Provide and install thru wall mail box from Corridor to Chiefs Office, or where as indicated on the drawings. Mailbox shall include but is not necessarily limited to the following:

   a. Thirty two (32) 5 ¼" x 13" doors
   b. Rear loading type units.
   c. Five (5) Pin cylinder lock with two (2) keys.
   d. Box of ten (10) key blanks.
   e. Finish to be brushed stainless steel.

2. Quality Assurance

   a. System shall be Salsbury Industries Model 3610

3. Submittals

   a. Manufacturer's product literature.

4. Installation

   a. All materials, systems components, etc. shall be installed in strict compliance with the manufacturers printed product system specifications and installation instructions. Provide blockings, etc. as required to receive system installation.

SECTION 10800 - TOILET ACCESSORIES

1. Scope:
   a. Provide accessories at all restroom locations, and where as indicated on drawings.

2. Quality Assurance:
   a. Materials will be American Specialties, Inc. or equal.

3. Submittals:
   a. Manufacturers catalog cuts for specified items.

4. Products:

   AC-1 Surface mounted dual roll toilet paper dispenser Model 0030 (provide at compartments without framed walls).
   AC-2 Recessed dual roll toilet paper dispenser Model 0031 (provide at all compartments with framed walls).
   AC-4 Lavatory surface mounted soap dispenser Model 0362.
   AC-5 Surface mounted baby changing table Model 9012 (provide one at each second floor restroom)
   AC-6 Surface mount shower dispenser Model 9343. (provide one at all shower stalls)
   AC-7 Recessed heavy duty soap dish Model 0398 – D. (provide one at all shower stalls)
   AC-8 Towel Pin Model 7301. (provide one per shower stall)
   AC-9 Extra heavy duty shower curtain rod Model 1204. (provide one at all shower stalls)
   AC-10 Grab Bars:

      (1) 42" 3100 Series 1-1/4” dia. with concealed mounting, Stainless Steel.
      (2) 36" 3100 Series 1-1/4" dia. with concealed mounting, Stainless Steel.
      (3) 12” 3100 Series 1-1/4” dia. vertical with concealed mounting, Stainless Steel.

5. All finishes shall be #4 satin stainless steel.

6. Installation:

   a. Mount handrails to solid blocking as per manufacturers specifications.

DIVISION 11 – EQUIPMENT

SECTION 11132 – PROJECTION SCREENS

1. GENERAL

    a. The work under this section is subject to all applicable provisions of the "Bidding Requirements", the "Conditions of the Contract", "Contract Forms" and Division 1 – "General Requirements", which form a part hereof whether attached hereto or not.

2. WORK INCLUDED

    a. Include all labor, materials, and appliances and perform all operations in connection with providing and installing required projection screens.

3. MATERIALS

    a. Examine the Specifications and Drawings for the various other trades. Let it be understood that all surfaces normally requiring painting or colored finish that are left unfinished by the requirements of other Specifications shall be painted or finished as part of this Section

    b. DA-LITE or equal projection screens, 6 ft. (H) x 8 ft. (W), electrically operated 115 volt (60 Hz), 1.3 amps. Shall have specially designed motor mounted inside the roller with a patented noise silencer to be three wire quick reversal type, oiled for life, with automatic thermal overload cutout, integral gears, capacitor and an electric brake to prevent coasting. To have preset but adjustable limit switches to automatically stop picture surface in the "up" and "down" positions. The roller to be of rigid metal, 3" in diameter, mounted on two vibration and noise absorbing supports. Screen fabric to be flame retardant and mildew resistant fiberglass with glass beaded, matte white or spectra picture surface with black masking borders standard. Bottom of fabric shall be formed into a pocket holding a 3/8" metal rod. The ends of the rod shall be protected by heavy duty plastic caps. Case to be of wood with metal-lined wiring compartment. A section of the bottom of the case shall be an aluminum door equipped with hinges so that it opens and closes automatically with the lowering and raising of the picture surface. When the picture surface is being lowered, the door shall drop open by gravity. When the picture surface is being raised, the two ends of the slat in the bottom pocket of the screen fabric shall engage two hooks on the door to lift it to the closed position where a limit switch shall cut off the electrical current to the screen. The balance of the bottom of the case shall be a second hinged aluminum

door with manual openings to provide access. Hinges shall be mounted to allow matching of the doors to the ceiling. Case to be finished with a primer coat, ready to accept final finish by others. To be complete with the three position control switch in box with cover plate. Screen to be listed by Underwriter's Laboratories and CSA.

END OF SECTION

SECTION 14 24 00
HYDRAULIC PASSENGER ELEVATORS
HARRISON FIRE DISTRICT

PART 1 GENERAL

1.01 SUMMARY

A. Section includes: Hydraulic passenger elevators as shown and specified. Elevator work includes:
   1. Standard pre-engineered hydraulic passenger elevators.
   2. Elevator car enclosures, hoistway entrances and signal equipment.
   3. Operation and control systems.
   4. Jack(s).
   5. Accessibility provisions for physically disabled persons.
   6. Equipment, machines, controls, systems and devices as required for safely operating the specified elevators at their rated speed and capacity.
   7. Materials and accessories as required to complete the elevator installation.

B. Related Sections:
   1. Division 1 General Requirements: Meet or exceed all referenced sustainability requirements.
   2. Division 3 Concrete: Installing inserts, sleeves and anchors in concrete.
   3. Division 4 Masonry: Installing inserts, sleeves and anchors in masonry.
   4. Division 5 Metals:
      a. Providing hoist beams, pit ladders, steel framing, auxiliary support steel and divider beams for supporting guide-rail brackets.
      b. Providing steel angle sill supports and grouting hoistway entrance sills and frames.
   5. Division 9 Finishes: Providing elevator car finish flooring and field painting unfinished and shop primed ferrous materials.
   6. Division 16 Sections:
      a. Providing electrical service to elevators, including fused disconnect switches.
      b. Emergency power supply, transfer switch and auxiliary contacts.
      c. Heat and smoke sensing devices.
      d. Convenience outlets and illumination in control room, hoistway and pit.
   7. Division 22 Plumbing
      a. Sump pit and oil interceptor.
   8. Division 23 Heating, Ventilation and Air Conditioning
      a. Heating and ventilating hoistways and/or control room.

C. Work Not Included: General contractor shall provide the following in accordance with the requirements of the Model Building Code and ANSI A17.1 Code. For specific rules, refer to ANSI A17.1, Part 3 for hydraulic elevators. State or local requirements must be used if more stringent. The cost of this work is not included in the thyssenkrupp Elevator's proposal, since it is a part of the building construction.
   1. Elevator hoist beam to be provided at top of elevator shaft. Beam must be able to accommodate proper loads and clearances for elevator installation and operation.
   2. Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports and bracing including all setting templates and diagrams for placement.

3. Hatch walls require a minimum two hours of fire rating. Hoistway should be clear and plumb with variations not to exceed 1/2" at any point.
4. Elevator hoistways shall have barricades, as required.
5. Install bevel guards at 75° on all recesses, projections or setbacks over 2" (4" for A17.1 2000 areas) except for loading or unloading.
6. Provide rail bracket supports at pit, each floor and roof. For guide rail bracket supports, provide divider beams between hoistway at each floor and roof.
7. Pit floor shall be level and free of debris. Reinforce dry pit to sustain normal vertical forces from rails and buffers.
8. Where pit access is by means of the lowest hoistway entrance, a vertical ladder of non-combustible material extending 42" minimum, (48" minimum for A17.1-2000 areas) shall be provided at the same height, above sill of access door or handgrips.
9. Machine room to be enclosed and protected.
10. Machine Room temperature must be maintained between 55º and 90º F.
11. If machine room is remote from the elevator hoistway, clear access must be available above the ceiling or metal/concrete raceways in floor for oil line and wiring duct from machine room.
12. Access to the machinery space and machine room must be in accordance with the governing authority or code.
13. Provide an 8” x 16” cutout through machine room wall, for oil line and wiring duct, coordinated with elevator contractor at the building site.
14. All wire and conduit should run remote from the hoistways.
15. When heat, smoke or combustion sensing devices are required, connect to elevator control cabinet terminals. Contacts on the sensors should be sided for 12 volt D.C.
16. Install and furnish finished flooring in elevator cab.
17. Finished floors and entrance walls are not to be constructed until after sills and door frames are in place. Consult elevator contractor for rough opening size. The general contractor shall supply the drywall framing so that the wall fire resistance rating is maintained, when drywall construction is used.
18. Where sheet rock or drywall construction is used for front walls, it shall be of sufficient strength to maintain the doors in true lateral alignment. Drywall contractor to coordinate with elevator contractor.
19. Before erection of rough walls and doors; erect hoistway sills, headers, and frames. After rough walls are finished; erect fascias and toe guards. Set sill level and slightly above finished floor at landings.
20. To maintain legal fire rating (masonry construction), door frames are to be anchored to walls and properly grouted in place.
21. The elevator wall shall interface with the hoistway entrance assembly and be in strict compliance with the elevator contractor's requirements.
22. General Contractor shall fill and grout around entrances, as required.
23. Elevator sill supports shall be provided at each opening.
24. All walls and sill supports must be plumb where openings occur.
25. For applications with jack hole, free and clear access to the elevator pit area for the jack hole-drilling rig is required.
26. Where jack hole is required, remove all spoils from jack hole drilling.
27. When not provided by Elevator Contractor, jack hole shall accommodate the jack unit. If required the jack hole is to be provided in strict accordance with the elevator contractor's shop drawings.

28. Locate a light fixture (200 lx / 19 fc) and convenience outlet in pit with switch located adjacent to the access door.
29. A light switch and fused disconnect switch for each elevator should be located inside the machine room adjacent to the door, where practical, per the National Electrical Code (NFPA No. 70).
30. For signal systems and power operated door: provide ground and branch wiring circuits, including main line switch.
31. For car light and fan: provide a feeder and branch wiring circuits, including main line switch.
32. Wall thickness may increase when fixtures are mounted in drywall. These requirements must be coordinated between the general contractor and the elevator contractor.
33. Provide supports, patching and recesses to accommodate hall button boxes, signal fixtures, etc..
34. Locate telephone and convenience outlet on control panel.

1.02 SUBMITTALS

A. Product data: When requested, the elevator contractor shall provide standard cab, entrance and signal fixture data to describe product for approval.

B. Shop drawings:
   1. Show equipment arrangement in the corridor, pit, and hoistway and/or optional control room. Provide plans, elevations, sections and details of assembly, erection, anchorage, and equipment location.
   2. Indicate elevator system capacities, sizes, performances, safety features, finishes and other pertinent information.
   3. Show floors served, travel distances, maximum loads imposed on the building structure at points of support and all similar considerations of the elevator work.
   4. Indicate electrical power requirements and branch circuit protection device recommendations.

C. Powder Coat paint selection: Submit manufacturer’s standard selection charts for exposed finishes and materials.

D. Plastic laminate selection: Submit manufacturer’s standard selection charts for exposed finishes and materials.

E. Metal Finishes: Upon request, standard metal samples provided.

F. Operation and maintenance data. Include the following:
   1. Owner’s manuals and wiring diagrams.
   2. Parts list, with recommended parts inventory.

1.03 QUALITY ASSURANCE

A. Manufacturer Qualifications: An approved manufacturer with minimum 15 years of experience in manufacturing, installing, and servicing elevators of the type required for the project.
   1. The manufacturer of machines, controllers, signal fixtures, door operators cabs, entrances, and all other major parts of elevator operating equipment.

a. The major parts of the elevator equipment shall be manufactured by the installing company, and not be an assembled system.
2. The manufacturer shall have a documented, on-going quality assurance program.
3. ISO-9001:2000 Manufacturer Certified
4. ISO-14001:2004 Environmental Management System Certified
5. LEED Gold certified elevator manufacturing facility.

B. Installer Qualifications: The manufacturer or an authorized agent of the manufacturer with not less than 15 years of satisfactory experience installing elevators equal in character and performance to the project elevators.

C. Regulatory Requirements:
1. ASME A17.1 Safety Code for Elevators and Escalators, latest edition or as required by the local building code.
2. Building Code: National.
3. NFPA 70 National Electrical Code.
4. NFPA 80 Fire Doors and Windows.
5. Americans with Disabilities Act - Accessibility Guidelines (ADAAG)
6. Section 407 in ICC A117.1, when required by local authorities
7. CAN/CSA C22.1 Canadian Electrical Code
8. CAN/CSA B44 Safety Code for Elevators and Escalators.
9. California Department of Public Health Standard Method V1.1–2010, CA Section 01350

D. Fire-rated entrance assemblies: Opening protective assemblies including frames, hardware, and operation shall comply with ASTM E2074, CAN4-S104 (ULC-S104), UL10(b), and NFPA Standard 80. Provide entrance assembly units bearing Class B or 1 1/2 hour label by a Nationally Recognized Testing Laboratory (2 hour label in Canada).

E. Inspection and testing:
1. Elevator Installer shall obtain and pay for all required inspections, tests, permits and fees for elevator installation.
2. Arrange for inspections and make required tests.
3. Deliver to the Owner upon completion and acceptance of elevator work.

F. Sustainable Product Qualifications:
1. Environmental Product Declaration:
a. GOOD: If Product Category Rules (PCR) are not available, produce a publicly available, critically reviewed life-cycle assessment conforming to ISO 14044 that has at least a cradle to gate scope.
b. BEST: If Product Category Rules (PCR) are available, produce and publish an Environmental Product Declaration (EPD) based on a critically reviewed life-cycle assessment conforming to ISO 14044, with external verification recognized by the EPD program operator.
2. Material Transparency:
a. GOOD: Provide Health Product Declaration at any level
b. BETTER: Provide Health Product Declaration (HPD v2 or later). Complete, published declaration with full disclosure of known hazards, prepared using the Health Product Declaration Collaborative's "HPD builder" on-line tool.

c. BEST: Cradle to Cradle Material Health Certificate v3, Bronze level or higher.

3. LEED v4 – Provide documentation for all Building Product Disclosure AND Optimization credits in LEED v4 for product specified.
4. Living Building Challenge Projects: Provide Declare label for products specified.

1.04 DELIVERY, STORAGE AND HANDLING

A. Manufacturing shall deliver elevator materials, components and equipment and the contractor is responsible to provide secure and safe storage on job site.

1.05 PROJECT CONDITIONS

A. Temporary Use: Elevators shall not be used for temporary service or for any other purpose during the construction period before Substantial Completion and acceptance by the purchaser unless agreed upon by Elevator Contractor and General Contractor with signed temporary agreement.

B. Provide the hole for the jack unit (if required by the type of jack provided), based on excavation through normal soil or clay which can be removed by manual digging or by standard truck-mounted regular drilling unit. Provide a casing if required to retain the walls of the hole. General contractor shall remove excavation spoils deposited in the elevator pit.
   1. If a physical obstruction or hindrance is encountered below the ground surface, including boulders, rock, gravel, wood, metal, pilings, sand, water, quick sand, caves, public utilities or any other foreign material, obtain written authorization to proceed with excavating using special excavation equipment.
   2. Maintain a daily log of time and material costs involved.
   3. Elevator contractor will be compensated on a time and material basis for additional costs incurred after encountering the physical obstruction or hindrance, including the cost of the special excavation equipment.

1.06 WARRANTY

A. Warranty: Submit elevator manufacturer's standard written warranty agreeing to repair, restore or replace defects in elevator work materials and workmanship not due to ordinary wear and tear or improper use or care for 12 months after final acceptance.

1.07 MAINTENANCE

A. Furnish maintenance and call back service for a period of 12 months for each elevator after completion of installation or acceptance thereof by beneficial use, whichever is earlier, during normal working hours excluding callbacks.
   1. Service shall consist of periodic examination of the equipment, adjustment, lubrication, cleaning, supplies and parts to keep the elevators in proper operation. Maintenance work, including emergency call back repair service, shall be performed by trained employees of the elevator contractor during regular working hours.
   2. Submit parts catalog and show evidence of local parts inventory with complete list of recommended spare parts. Parts shall be produced by manufacturer of original equipment.
   3. Manufacturer shall have a service office and full time service personnel within a 100 mile radius of the project site.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Manufacturer: Design based around thyssenkrupp Elevator's endura hydraulic elevator.

2.02 MATERIALS, GENERAL

A. All Elevator Cab materials including frame, buttons, lighting, wall and ceiling assembly, laminates and carpet shall have an EPD and an HPD, and shall meet the California Department of Public Health Standard Method V1.1–2010, CA Section 01350 as mentioned in 1.03.9 of this specification.

B. Colors, patterns, and finishes: As selected by the Architect from manufacturer's full range of standard colors, patterns, and finishes.

C. Steel:
   1. Shapes and bars: Carbon.
   2. Sheet: Cold-rolled steel sheet, commercial quality, Class 1, matte finish.
   3. Finish: Factory-applied baked enamel for structural parts, powder coat for architectural parts. Color selection must be based on elevator manufacture's standard selections.

D. Plastic laminate: Decorative high-pressure type, complying with NEMA LD3, Type GP-50 General Purpose Grade, nominal 0.050" thickness. Laminate selection must be based on elevator manufacture's standard selections.

E. Flooring by others.

2.03 HOISTWAY EQUIPMENT

A. Platform: Fabricated frame of formed or structural steel shapes, gusseted and rigidly welded with a wood sub-floor. Underside of the platform shall be fireproofed. The car platform shall be designed and fabricated to support one-piece loads weighing up to 25% of the rated capacity.

B. Sling: Steel stiles bolted or welded to a steel crosshead and bolstered with bracing members to remove strain from the car enclosure.

C. Guide Rails: Steel, omega shaped, fastened to the building structure with steel brackets.

D. Guides: Slide guides shall be mounted on top and bottom of the car.

E. Buffers: Provide substantial buffers in the elevator pit. Mount buffers on continuous channels fastened to the elevator guide rail or securely anchored to the pit floor. Provide extensions if required by project conditions.

F. Jack: A jack unit shall be of sufficient size to lift the gross load the height specified. Factory test jack to ensure adequate strength and freedom from leakage. Brittle material, such as gray cast iron, is prohibited in the jack construction. Provide the following jack type: Twin post holeless telescopic 3-stage. Two jacks piped together, mounted one on each side of the car with each

having three telescopic sections designed to extend in a synchronized manner when oil is pumped into the assembly. Each jack section will be guided from within the casing or the plunger assembly used to house the section. Each plunger shall have a high pressure sealing system which will not allow for seal movement or displacement during the course of operation. A follower guide shall be furnished for the top of the lower two plungers and be guided by rollers running inside a steel guide channel which is firmly attached to the guide rail system. This plunger guide system shall maintain a stabilized support for the plunger sections. Each jack assembly shall have check valves built into the assembly to allow for automatically re-syncing the three plunger sections by moving the jack to its fully contracted position..

G. Automatic Self-Leveling: Provide each elevator car with a self-leveling feature to automatically bring the car to the floor landings and correct for over travel or under travel. Self-leveling shall, within its zone, be automatic and independent of the operating device. The car shall be maintained approximately level with the landing irrespective of its load.

H. Wiring, Piping, and Oil: Provide all necessary hoistway wiring in accordance with the National Electrical Code. All necessary code compliant pipe and fittings shall be provided to connect the power unit to the jack unit. theoiltype

2.04 POWER UNIT

A. Power Unit (Oil Pumping and Control Mechanism): A self-contained unit consisting of the following items:
   1. An oil reservoir with tank cover.
   2. An oil hydraulic pump.
   3. An electric motor.
   4. An oil control valve with the following components built into single housing; high pressure relief valve, check valve, automatic unloading up start valve, lowering and leveling valve, and electro-magnetic controlling solenoids.

B. Pump: Positive displacement type pump specifically manufactured for oil-hydraulic elevator service. Pump shall be designed for steady discharge with minimum pulsation to give smooth and quiet operation. Output of pump shall not vary more than 10 percent between no load and full load on the elevator car.

C. Motor: Standard manufacture motor specifically designed for oil-hydraulic elevator service. Duty rating shall be selected for specified speed and load.

D. Oil Control Unit: The following components shall be built into a single housing. Welded manifolds with separate valves to accomplish each function are not acceptable. Adjustments shall be accessible and be made without removing the assembly from the oil line.
   1. Relief valve shall be adjustable and be capable of bypassing the total oil flow without increasing back pressure more than 10 percent above that required to barely open the valve.
   2. Up start and stop valve shall be adjustable and designed to bypass oil flow during start and stop of motor pump assembly. Valve shall close slowly, gradually diverting oil to or from the jack unit, ensuring smooth up starts and up stops.

3. Check valve shall be designed to close quietly without permitting any perceptible reverse flow.
4. Lowering valve and leveling valve shall be adjustable for down start speed, lowering speed, leveling speed and stopping speed to ensure smooth "down" starts and stops. The leveling valve shall be designed to level the car to the floor in the direction the car is traveling after slowdown is initiated.
5. Provided with constant speed regulation in both up and down direction. Feature to compensate for load changes, oil temperature, and viscosity changes.
6. Solid State Starting: Provide an electronic starter featuring adjustable starting currents.
7. Oil Type: Provide a zinc free, inherently biodegradable lubricant formulated with premium base stocks to provide outstanding protection for demanding hydraulic systems, especially those operating in environmentally sensitive areas.

2.05 HOISTWAY ENTRANCES

A. Doors and Frames: Provide complete hollow metal type hoistway entrances at each hoistway opening bolted\knock down construction.
   1. Manufacturer's standard entrance design consisting of hangers, doors, hanger supports, hanger covers, fascia plates (where required), sight guards, and necessary hardware.
   2. Main landing door & frame finish: Stainless steel panels, no. 4 brushed finish.
   3. Typical door & frame finish: Stainless steel panels, No. 4 brushed finish.

B. Interlocks: Equip each hoistway entrance with an approved type interlock tested as required by code. Provide door restriction devices as required by code.

C. Door Hanger and Tracks: Provide sheave type two point suspension hangers and tracks for each hoistway horizontal sliding door.
   1. Sheaves: Polyurethane tires with ball bearings properly sealed to retain grease.
   2. Hangers: Provide an adjustable device beneath the track to limit the up-thrust of the doors during operation.
   3. Tracks: Drawn steel shapes, smooth surface and shaped to conform to the hanger sheaves.

D. Hoistway Sills: Extruded metal, with groove(s) in top surface. Provide mill finish on aluminum.

2.06 PASSENGER ELEVATOR CAR ENCLOSURE

A. Car Enclosure:
   1. Walls: Cab type a steel shell design, reinforced cold-rolled steel with an applied panel design. The applied panels design, shall be arranged vertically on wood core panels covered on both sides with high pressure plastic laminate.
   2. Reveals and frieze: Factory applied powder coat
   3. Canopy: Cold-rolled steel with hinged exit.
   4. Ceiling: Suspended type, LED lighting with translucent diffuser mounted in a metal frame. Framework shall be finished with a factory applied powder coat finish.
   5. Cab Fronts, Return, Transom, Soffit and Strike: Provide panels faced with No. 4 brushed stainless steel

6. Doors: Horizontal sliding car doors reinforced with steel for panel rigidity. Hang doors on sheave type hangers with polyurethane tires that roll on a polished steel track and are guided at the bottom by non-metallic sliding guides.
    a. Door Finish: Stainless steel panels: No. 4 brushed finish.
    b. Cab Sills: Extruded aluminum, mill finish.
7. Handrail: Provide 1.5" diameter cylindrical metal on side and rear walls on front opening cars and side walls only on front and rear opening cars. Handrails shall have a stainless steel, No. 4 brushed finish.
8. Ventilation: Manufacturer's standard exhaust fan, mounted on the car top.
9. Protection pads and buttons: Not required

B. Car Top Inspection: Provide a car top inspection station with an "Auto-Inspection" switch, an "emergency stop" switch, and constant pressure "up and down" direction and safety buttons to make the normal operating devices inoperative. The station shall give the inspector complete control of the elevator. The car top inspection station shall be mounted in the door operator assembly.

2.07 DOOR OPERATION

A. Door Operation: Provide a direct or alternating current motor driven heavy duty operator designed to operate the car and hoistway doors simultaneously. The door control system shall be digital closed loop and the closed loop circuit shall give constant feedback on the position and velocity of the elevator door. The motor torque shall be constantly adjusted to maintain the correct door speed based on its position and load. All adjustments and setup shall be through the computer based service tool. Door movements shall follow a field programmable speed pattern with smooth acceleration and deceleration at the ends of travel. The mechanical door operating mechanism shall be arranged for manual operation in event of power failure. Doors shall automatically open when the car arrives at the landing and automatically close after an adjustable time interval or when the car is dispatched to another landing. AC controlled units with oil checks, or other deviations are not acceptable.
    1. No Un-Necessary Door Operation: The car door shall open only if the car is stopping for a car or hall call, answering a car or hall call at the present position or selected as a dispatch car.
    2. Door Open Time Saver: If a car is stopping in response to a car call assignment only (no coincident hall call), the current door hold open time is changed to a shorter field programmable time when the electronic door protection device is activated.
    3. Double Door Operation: When a car stops at a landing with concurrent up and down hall calls, no car calls, and no other hall call assignments, the car door opens to answer the hall call in the direction of the car's current travel. If an onward car call is not registered before the door closes to within 6 inches of fully closed, the travel shall reverse and the door shall reopen to answer the other call.
    4. Nudging Operation: The doors shall remain open as long as the electronic detector senses the presence of a passenger or object in the door opening. If door closing is prevented for a field programmable time, a buzzer shall sound. When the obstruction is removed, the door shall begin to close at reduced speed. If the infra-red door protection system detects a person or object while closing on nudging, the doors shall stop and resume closing only after the obstruction has been removed.

5. Door Reversal: If the doors are closing and the infra-red beam(s) is interrupted, the doors shall reverse and reopen. After the obstruction is cleared, the doors shall begin to close.
6. Door Open Watchdog: If the doors are opening, but do not fully open after a field adjustable time, the doors shall recycle closed then attempt to open six times to try and correct the fault.
7. Door Close Watchdog: If the doors are closing, but do not fully close after a field adjustable time, the doors shall recycle open then attempt to close six times to try and correct the fault.
8. Door Close Assist: When the doors have failed to fully close and are in the recycle mode, the door drive motor shall have increased torque applied to possibly overcome mechanical resistance or differential air pressure and allow the door to close.

B. Door Protection Device: Provide a door protection system using microprocessor controlled infra-red light beams. The beams shall project across the car opening detecting the presence of a passenger or object. If door movement is obstructed, the doors shall immediately reopen.

2.08 CAR OPERATING STATION

A. Car Operating Station, General: The main car control in each car shall contain the devices required for specific operation mounted in an integral swing return panel requiring no applied faceplate. Wrap return shall have a No. 4 brushed stainless steel finish. The main car operating panel shall be mounted in the return and comply with handicap requirements. Pushbuttons that illuminate using long lasting LED’s shall be included for each floor served, and emergency buttons and switches shall be provided per code. Switches for car light and accessories shall be provided.

B. Emergency Communications System: Integral phone system provided.

C. Auxiliary Operating Panel: Not Required

D. Column Mounted Car Riding Lantern: A car riding lantern shall be installed in the elevator cab and located in the entrance. The lantern, when illuminated, will indicate the intended direction of travel. The lantern will illuminate and a signal will sound when the car arrives at a floor where it will stop. The lantern shall remain illuminated until the door(s) begin to close.

E. Special Equipment: Not Applicable

2.09 CONTROL SYSTEMS

A. Controller: The elevator control system shall be microprocessor based and software oriented. Control of the elevator shall be automatic in operation by means of push buttons in the car numbered to correspond to floors served, for registering car stops, and by "up-down" push buttons at each intermediate landing and "call" push buttons at terminal landings.

B. Automatic Light and Fan shut down: The control system shall evaluate the system activity and automatically turn off the cab lighting and ventilation fan during periods of inactivity. The settings shall be field programmable.

C. Emergency Power Operation: (10-DOA) Upon loss of the normal power supply, building-supplied standby power is available on the same wires as the normal power supply. Once the loss of normal power is detected and standby power is available, the elevator is lowered to a pre-designated landing and the doors are opened. After passengers have exited the elevator, the doors are closed and the car is shut down. When normal power is restored, the elevator automatically resumes operation.

D. Special Operation: Not Applicable

2.10 HALL STATIONS

A. Hall Stations, General: Buttons shall illuminate to indicate call has been registered at that floor for the indicated direction.
   1. Provide one pushbutton riser with faceplates having a No. 4 brushed stainless steel finish.
      a. Phase 1 firefighter's service key switch, with instructions, shall be incorporated into the hall station at the designated level.

B. Floor Identification Pads: Provide door jamb pads at each floor. Jamb pads shall comply with Americans with Disabilities Act (ADA) requirements.

C. Hall Position Indicator: Not Applicable

D. Hall lanterns: Not Applicable

E. Special Equipment: Not Applicable

2.11 MISCELLANEOUS ELEVATOR COMPONENTS

A. Oil Hydraulic Silencer: Install multiple oil hydraulic silencers (muffler device) at the power unit location. The silencers shall contain pulsation absorbing material inserted in a blowout proof housing.

PART 3 EXECUTION

3.01 EXAMINATION

A. Before starting elevator installation, inspect hoistway, hoistway openings, pits and/or control room, as constructed, verify all critical dimensions, and examine supporting structures and all other conditions under which elevator work is to be installed. Do not proceed with elevator installation until unsatisfactory conditions have been corrected in a manner acceptable to the installer.

B. Installation constitutes acceptance of existing conditions and responsibility for satisfactory performance.

3.02 INSTALLATION

A. Install elevator systems components and coordinate installation of hoistway wall construction.
   1. Work shall be performed by competent elevator installation personnel in accordance with ASME A17.1, manufacturer's installation instructions and approved shop drawings.
   2. Comply with the National Electrical Code for electrical work required during installation.

B. Jack unit excavation (if required by the type of jack provided): Drill or otherwise excavate below elevator pit construction as required to install the jack unit.
   1. Install casing for jack unit.
   2. Provide HDPE jack protection system for all in ground jacks.
   3. Set casing for jack unit assembly plumb, and partially fill with water set¬tled sand, eliminating voids. Back fill depth shall be sufficient to hold the bottom of the jack in place over time.

C. Perform work with competent, skilled workmen under the direct control and supervision of the elevator manufacturer's experienced foreman.

D. Supply in ample time for installation by other trades, inserts, anchors, bearing plates, brackets, supports, and bracing including all setting templates and diagrams for placement.

E. Welded construction: Provide welded connections for installation of elevator work where bolted connections are not required for subsequent removal or for normal operation, adjustment, inspection, maintenance, and replacement of worn parts. Comply with AWS standards for workmanship and for qualification of welding operators.

F. Coordination: Coordinate elevator work with the work of other trades, for proper time and sequence to avoid construction delays. Use benchmarks, lines, and levels designated by the Contractor, to ensure dimensional coordination of the work.

G. Install machinery, guides, controls, car and all equipment and accessories to provide a quiet, smoothly operating installation, free from side sway, oscillation or vibration.

H. Alignment: Coordinate installation of hoistway 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 dimensions at each landing.

I. Erect hoistway sills, headers, and frames before erection of rough walls and doors; erect fascia and toe guards after rough walls finished. Set sill units accurately aligned and slightly above finish floor at landings.

J. Lubricate operating parts of system, where recommended by manufacturer.

3.03 FIELD QUALITY CONTROL

A. Acceptance testing: Upon completion of the elevator installation and before permitting use of elevator, perform acceptance tests as required and recommended by Code and governing regulations or agencies. Perform other tests, if any, as required by governing regulations or agencies.

B. Advise Owner, Contractor, Architect, and governing authorities in advance of dates and times tests are to be performed on the elevator.

3.04 ADJUSTING

A. Make necessary adjustments of operating devices and equipment to ensure elevator operates smoothly and accurately.

3.05 CLEANING

A. Before final acceptance, remove protection from finished surfaces and clean and polish surfaces in accordance with manufacturer's recommendations for type of material and finish provided. Stainless steel shall be cleaned with soap and water and dried with a non-abrasive surface; it shall not be cleaned with bleach-based cleansers.

B. At completion of elevator work, remove tools, equipment, and surplus materials from site. Clean equipment rooms and hoistway. Remove trash and debris.
    1. Use environmentally preferable and low VOC emitting cleaners for each application type. Cleaners that contain solvents, pine and/or citrus oils are not permitted.

3.06 PROTECTION

A. At time of Substantial Completion of elevator work, or portion thereof, provide suitable protective coverings, barriers, devices, signs, or other such methods or procedures to protect elevator work from damage or deterioration. Maintain protective measures throughout remainder of construction period.

3.07 DEMONSTRATION

A. Instruct Owner's personnel in proper use, operations, and daily maintenance of elevators. Review emergency provisions, including emergency access and procedures 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.

B. Make a final check of each elevator operation, with Owner's personnel present, immediately before date of substantial completion. Determine that control systems and operating devices are functioning properly.

3.08 ELEVATOR SCHEDULE

A. Elevator Qty. 1
    1. Elevator Model: endura Above-Ground (3-Stage)
    2. Elevator Type: Hydraulic Passenger
    3. Rated Capacity: 3500 lbs.
    4. Rated Speed: 80 ft./min.
    5. Operation System: TAC32H
    6. Travel: 26'-8"
    7. Landings: 5 total
    8. Openings:
        a. Front: 3
        b. Rear: 2
    9. Clear Car Inside: 6' - 8" wide x 5' - 5 1/2" deep
    10. Cab Height: 8'-0" standard
    11. Hoistway Entrance Size: 3' - 6" wide x 7'-0" high
    12. Door Type: Single Speed
    13. Power Characteristics: 208 volts, 3 Phase, 60 Hz.
    14. Seismic Requirements: Zone 1
    15. Hoistway Dimensions: 8' - 8" wide x 7' - 10 3/4" deep
    16. Pit Depth: 4' - 0"
    17. Button & Fixture Style: Traditional Signal Fixtures
    18. Special Operations: None

3.09 SPECIAL CONDITIONS (Note: Add Special Conditions as Needed)

END OF SECTION