

- A. Perform Work in accordance with ACI 347.
- B. Maintain two copies of each document on site.

1.8 QUALIFICATIONS

- A. Design formwork under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed at the place where the Project is located in the State of Maine.

1.9 REGULATORY REQUIREMENTS

- A. Conform to applicable code for design, fabrication, erection and removal of formwork.

1.10 FIELD SAMPLES

- A. Provide under provisions of Section 01400. Coordinate with requirements stated in Section 03300.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Deliver void forms and installation instructions in manufacturer's packaging.
- C. Store off ground in ventilated and protected manner to prevent deterioration from moisture.

1.12 COORDINATION

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate this Section with other Sections of work which require attachment of components to formwork.
- C. If formwork is placed after reinforcement resulting in insufficient concrete cover over reinforcement, request instructions from Architect/Engineer before proceeding.

2 PART 2 PRODUCTS

2.1 WOOD FORM MATERIALS

- A. Plywood: Douglas Fir species; solid one side, tight face medium density overlaid one side grade; sound undamaged sheets with clean, true edges.
- B. Lumber: Spruce species; No 2 grade; with grade stamp clearly visible.
- A. SIMPLEX.
- B. Substitutions: Under provisions of Section 01600.

2.2 FORMWORK ACCESSORIES

- A. Form Ties: Removable Snap-off type, metal, fixed adjustable length, 10 & 12 inch back break dimension, free of defects that could leave holes larger than one inch in concrete surface.

anchors, and other inserts.

- D. Install accessories in accordance with manufacturer's instructions, straight, level, and plumb. Ensure items are not disturbed during concrete placement.
- E. Provide temporary ports or openings in formwork where required to facilitate cleaning and inspection. Locate openings at bottom of forms to allow flushing water to drain.
- F. Close temporary openings with tight fitting panels, flush with inside face of forms, and neatly fitted so joints will not be apparent in exposed concrete surfaces.

3.6 FORM CLEANING

- A. Clean and remove foreign matter within forms as erection proceeds.
- B. Clean formed cavities of debris prior to placing concrete.
- C. Flush with water or use compressed air to remove remaining foreign matter. Ensure that water and debris drain to exterior through clean-out ports.
- D. During cold weather, remove ice and snow from within forms. Do not use de-icing salts or water to clean out forms, unless formwork and concrete construction proceed within heat enclosure. Use compressed air or other means to remove foreign matter.

3.7 FORMWORK TOLERANCES

- A. Construct formwork to maintain tolerances required by ACI 301.

3.8 FIELD QUALITY CONTROL

- A. Inspect erected formwork, shoring, and bracing to ensure that work is in accordance with formwork design, and that supports, fastenings, wedges, ties, and items are secure.
- B. Do not reuse wood formwork more than two times for concrete surfaces to be exposed to view. Do not patch formwork.

3.9 FORM REMOVAL

- A. Do not remove forms or bracing until concrete has gained sufficient strength to carry its own weight and imposed loads.
- B. Loosen forms carefully. Do not wedge pry bars, hammers, or tools against finish concrete surfaces scheduled for exposure to view.
- C. Store removed forms in manner that surfaces to be in contact with fresh concrete will not be damaged. Discard damaged forms.

END OF SECTION

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate bar sizes, spacings, locations, and quantities of reinforcing steel and wire fabric, bending and cutting schedules, and supporting and spacing devices.
- C. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with ACI 301 ANSI/ASTM A184.
- B. Maintain one copy of each document on site.
- C. Submit certified copies of mill test report of reinforcement materials analysis.

1.6 QUALIFICATIONS

- A. Design reinforcement under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Maine.

1.7 COORDINATION

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate with placement of formwork, formed openings and other Work.

2 PART 2 PRODUCTS

2.1 REINFORCEMENT

- A. Reinforcing Steel: ASTM A615, 60 ksi yield grade; deformed billet steel bars, Class I.
- B. Welded Steel Wire Fabric: ASTM A185 Plain Type; in coiled rolls; plain, Class I.

2.2 ACCESSORY MATERIALS

- A. Tie Wire: Minimum 16 gage annealed type Patented system.
- B. Chairs, Bolsters, Bar Supports, Spacers: Sized and shaped for strength and support of reinforcement during concrete placement conditions including load bearing pad on bottom to prevent vapor barrier puncture.
- C. Special Chairs, Bolsters, Bar Supports, Spacers Adjacent to Weather Exposed Concrete Surfaces: size and shape as required.

2.3 FABRICATION

- A. Fabricate concrete reinforcing in accordance with ACI 318.
- B. Weld reinforcement in accordance with ANSI/AWS D1.4
- C. Locate reinforcing splices not indicated on Drawings, at point of minimum stress. Review location of splices with Architect/Engineer.

SECTION 03300

CAST-IN-PLACE CONCRETE

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cast-in-place concrete floors and foundation walls.
- B. Floors and slabs on grade.
- C. Control, and expansion and contraction joint devices associated with concrete work, including joint sealants.
- D. Equipment pads, light pole base, and thrust blocks.

1.2 RELATED SECTIONS

- A. Section 03100 - Concrete Formwork: Formwork and accessories.
- B. Section 03200 - Concrete Reinforcement.
- C. Section 03346 - Concrete Floor Finishing.
- D. Section 03370 - Concrete Curing.
- E. Section 05800 - Expansion Control.
- F. Section 07900 - Joint Sealers.

1.3 REFERENCES

- A. ACI 301 - Structural Concrete for Buildings.
- B. ACI 302 - Guide for Concrete Floor and Slab Construction.
- C. ACI 304 - Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete.
- D. ACI 305R - Hot Weather Concreting.
- E. ACI 306R - Cold Weather Concreting.
- F. ACI 308 - Standard Practice for Curing Concrete.
- G. ACI 3 Building Code Requirements for Reinforced Concrete.
- H. ANSI/ASTM D1190 - Concrete Joint Sealer, Hot-Poured Elastic Type.
- I. ASTM C33 - Concrete Aggregates.
- J. ASTM C94 - Ready-Mixed Concrete.

- B. Coordinate the placement of joint devices with erection of concrete formwork and placement of form accessories.

2 PART 2 PRODUCTS PRODUCTS

2.1 CONCRETE MATERIALS

- A. Cement: ASTM C150, Type I - Normal Portland type.
- B. Fine and Coarse Aggregates: ASTM C330.
- C. Water: Clean and not detrimental to concrete.
- D. Glass Fiber Reinforcement: ASTM C948.

2.2 ACCESSORIES

- A. Vapor Barrier: 6 mil thick clear polyethylene film, type recommended for below grade application.
- E. Non-Shrink Grout: Premixed compound consisting of non-metallic aggregate, cement, water reducing and plasticizing agents; capable of developing minimum compressive strength of 2,400 in 48 hours and 7,000 psi in 28 days.

2.2 JOINT DEVICES AND FILLER MATERIALS

- A. Joint Filler Type A: ASTM D1751; Asphalt impregnated fiberboard or felt, 1/2 inch thick; tongue and groove profile.
- B. Joint Filler Type B: ASTM D1752; Premolded sponge rubber, fully compressible with recovery rate of minimum 95 percent.

2.5 CONCRETE MIX

- A. Mix concrete in accordance with ACI 304. Deliver concrete in accordance with ASTM C94.
- B. Select aggregate proportions for light weight concrete in accordance with ACI 330.
- C. Provide concrete to the following criteria:
 - 1. Compressive Strength (28 days): 4000 psi for slabs.
 - 2. Compressive Strength (28 days): 3000 psi for footings and frost walls.
 - 3. Slump: 1 to 4 inches at point of placement.
- D. Use air-entraining admixture in concrete that will experience freeze/thaw cycles (i.e. exposed slabs, frost walls, etc) unless otherwise indicated. Add air-entraining admixture at manufacturer's prescribed rate to result in concrete at point of placement having air content within following limits: 4% to 8% for maximum 3/4" aggregate.
- E. Use accelerating admixtures in cold weather only when approved by Architect/Engineer. Use of admixtures will not relax cold weather placement requirements.
- F. Do not use calcium chloride.
- G. Use set retarding admixtures during hot weather only when approved by Architect/Engineer.
- H. Add air entraining agent to normal weight concrete mix for work exposed to exterior.

- N. Maintain records of concrete placement. Record date, location, quantity, air temperature, and test samples taken.
- O. Place concrete continuously between predetermined expansion, control, and construction joints.
- P. Do not interrupt successive placement; do not permit cold joints to occur.
- Q. Saw cut joints within 24 hours after placing. Using 3/16 inch thick blade, cut into 1/4 depth of slab thickness.
- R. Screed floors and slabs on grade level, maintaining surface flatness of maximum 1/8 inch in 10 ft.

3.5 CONCRETE FINISHING

- A. Provide formed concrete surfaces to be left exposed with smooth rubbed sand float finish.
- B. Finish concrete floor surfaces in accordance with ACI 301.
- C. Wood float surfaces which will receive quarry tile with full bed setting system.
- D. Steel trowel surfaces which will receive carpeting, resilient flooring, seamless flooring, thin set quarry tile.
- E. Steel trowel surfaces which are scheduled to be exposed.
- F. In areas with floor drains, maintain floor elevation at walls; pitch surfaces uniformly to drains at 1/8 inch per foot nominal.

3.6 CURING AND PROTECTION

- A. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperatures, and mechanical injury.
- B. Maintain concrete with minimal moisture loss at relatively constant temperature for period necessary for hydration of cement and hardening of concrete.
- C. Cure concrete floor surfaces to requirements of Section 03370.
- D. Spraying: Spray water over floor slab areas and maintain wet for 7 days.

3.7 FIELD QUALITY CONTROL

- A. Field inspection and testing will be performed in accordance with ACI 301 and under provisions of Section 01400.
- B. Provide free access to Work and cooperate with appointed firm.
- C. Submit proposed mix design to inspection and testing firm for review prior to commencement of Work.
- D. Tests of cement and aggregates may be performed to ensure conformance with specified requirements.
- E. Three concrete test cylinders will be taken for every 75 or less cu yds of concrete placed.
- F. One additional test cylinder will be taken during cold weather concreting, cured on job site under same conditions as concrete it represents.

SECTION 03451

ARCHITECTURAL PRECAST CONCRETE

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Architectural precast concrete wall panels.
- B. Supports, anchors, and attachments.
- C. Caulking of intermediate and perimeter joints.
- D. Grouting under panels.

1.2 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Section 05500 - Metal Fabrications: Placement of anchors for embedding and welding to building structural components.

1.3 RELATED SECTIONS

- A. Technical Specifications for foundation pile, concrete deck, and fender system dated December 27, 1999 as prepared by TEC Associates of South Portland, Maine (207) 767-6068
- B. Section 05120 - Structural Steel: Building structural frame.
- C. Technical Specifications for foundation pile, concrete deck, and fender system dated December 27, 1999 as prepared by TEC Associates of South Portland, Maine (207) 767-6068 - Precast Concrete Hollow Core Planks: Building structural floor system.
- D. Section 07900 - Joint Sealers: Caulking of perimeter joints.

1.4 REFERENCES

- A. ANSI/ACI 301 - Specifications for Structural Concrete for Buildings.
- B. ANSI/ACI 318 - Building Code Requirements for Reinforced Concrete.
- C. ANSI/ASTM A36 - Structural Steel.
- D. ANSI/ASTM A185 - Welded Steel Wire Fabric for Concrete Reinforcement.
- E. ANSI/ASTM A307 - Carbon Steel Externally Threaded Standard Fasteners.
- F. ANSI/ASTM A386 - Zinc Coating (Hot-Dip) on Assembled Steel Products.
- G. ANSI/ASTM C143 - Test for Slump of Portland Cement Concrete.
- H. ANSI/ASTM C150 - Portland Cement.

1.9 QUALIFICATIONS

- A. Fabricator: Company specializing in performing the work of this Section with minimum 5 years documented experience.
 - B. Design units under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Maine.
 - C. Welder: Qualified within previous 12 months in accordance with ANSI/AWS D1.1 and ANSI/AWS D1.4.
- 1.10 FIELD SAMPLES
- A. Provide field sample under provisions of Section 01400.
 - B. Fabricate and erect in plant, one 10 foot long by full height panel illustrating shape, lifting device, and attachment points, and finish in accordance with approved sample.
 - C. Accepted sample may not be installed as part of the Work.
- 1.12 MOCKUP
- A. Provide mockup of full size panel under provisions of Section 01400.
 - B. Mockup panel to include caulking and panel joinery detail.
 - C. Locate where directed by architect.
 - D. Mockup may remain as part of the Work.
- 1.13 PRE-INSTALLATION CONFERENCE
- A. Convene two weeks prior to commencing work of this Section, under provisions of Section 01039.
- 1.14 DELIVERY, STORAGE, AND HANDLING
- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
 - B. Handle precast units to position, consistent with their shape and design. Lift and support only from support points.
 - C. Lifting or Handling Equipment: Capable of maintaining units during manufacture, storage, transportation, erection, and in position for fastening.
 - D. Blocking and Lateral Support During Transport and Storage: Clean, non-staining, without causing harm to exposed surfaces. Provide temporary lateral support to prevent bowing and warping.
 - E. Protect units to prevent staining, shipping, or spalling of concrete.
 - F. Mark units with date of production in location not visible to view when in final position in structure.
- 1.15 FIELD MEASUREMENTS
- A. Verify that field measurements are as indicated on shop Drawings.

- B. Maintain plant records and quality control program during production of precast units. Make records available upon request.
- C. Use rigid molds, constructed to maintain precast unit uniform in shape, size and finish.
- D. Maintain consistent quality during manufacture.
- E. Fabricate connecting devices, plates, angles, items fit to steel framing members, inserts, bolts, and accessories. Fabricate to permit initial placement and final attachment.
- F. Embed reinforcing steel, anchors, inserts plates, angles, and other cast-in items as indicated on shop Drawings.
- G. Locate hoisting devices to permit removal after erection.
- H. Cure units to develop concrete quality, and to minimize appearance blemishes such as non-uniformity, staining, or surface cracking.
- I. Minor patching in plant is acceptable, providing structural adequacy and appearance of units is not impaired.

2.7 FINISH - PRECAST UNITS

- A. Finish Type A: Ensure exposed-to-view finish surfaces of precast units are uniform in color and appearance.

2.8 FINISH - SUPPORT DEVICES

- A. Clean surfaces of rust, scale, grease, and foreign matter.
- B. Prime paint in two coats, except surfaces in direct contact with concrete or requiring field welding.

2.9 FABRICATION TOLERANCES

- A. Maximum Out of Square: 1/8 inch in 10 feet, non-cumulative.
- B. Variation From Dimensions Indicated on Shop Drawings: Plus or minus 1/8 inch.
- C. Maximum Misalignment of Anchors, Inserts, Openings: 1/8 inch.
- D. Maximum Bowing of Units: Length of bow/360.
- E. Location of Reglets: 1/4 inch from true position.

2.10 SOURCE QUALITY CONTROL AND TESTS

- A. Provide testing of concrete mix under provisions of Section 01400.
- B. Take concrete test cylinders for every 25 cu yds of concrete placed in accordance with ANSI/ASTM C31.
- C. Take slump tests for every set of test cylinders in accordance with ANSI/ASTM C143
- D. Take one air entrainment test cylinders for each set of exterior concrete test cylinders taken.
- E. Take water absorption test in accordance with PCI MNL-117.

B. Provide non-combustible shields during welding operations.

END OF SECTION

0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52 53 54 55 56 57 58 59 60 61 62 63 64 65 66 67 68 69 70 71 72 73 74 75 76 77 78 79 80 81 82 83 84 85 86 87 88 89 90 91 92 93 94 95 96 97 98 99 100

- E. Submit test reports under provisions of Section 01400.
- F. Submit test reports on mortar indicating conformance to ASTM C270.
- G. Submit manufacturer's certificate under provisions of Section 01400 that products meet or exceed specified requirements.
- H. Submit premix mortar manufacturer's installation instructions under provisions of Section 01340.

1.5 DELIVERY, STORAGE, AND HANDLING

- A. Deliver products to site under provisions of Section 01600.
- B. Store and protect products under provisions of Section 01600.
- C. Maintain packaged materials clean, dry, and protected against dampness, freezing, and foreign matter.

1.6 ENVIRONMENTAL REQUIREMENTS

- A. Maintain materials and surrounding air temperatures to minimum 50 degrees F (10 degrees C) prior to, during, and 48 hours after completion of masonry work.
- B. Cold Weather Requirements: IMIAC - Recommended Practices and Guide Specifications for Cold Weather Masonry Construction.

1.7 MIX TESTS

- A. Test mortar in accordance with Section 01400.
- B. Testing of Mortar Mix: In accordance with ASTM C780.
- C. Test mortar mix for compressive strength, consistency, mortar aggregate ratio, water content, air content, and splitting tensile strength and slump.

2 PART 2 PRODUCTS

2.1 MATERIALS

- A. Portland Cement: ASTM C150, Type I, gray color.
- B. Masonry Cement: ASTM C91, Type M.
- C. Mortar Aggregate: ASTM C144, standard masonry type.
- D. Hydrated Lime: ASTM C207, Type S.
- E. Quicklime: ASTM C5, non-hydraulic type.
- F. Premix Mortar: ASTM C387, using gray cement, Normal strength.
- H. Water: Clean and potable.

SECTION 04300

UNIT MASONRY SYSTEM

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Concrete masonry units.
- B. Reinforcement, anchorage, and accessories.

1.2 PRODUCTS INSTALLED BUT NOT FURNISHED UNDER THIS SECTION

- 2 Section 05210 - Steel Joists: Placement of steel bearing pads for joists.
- A. Section 05500 - Metal Fabrications: Placement of loose steel lintels.
- B. Section 07620 - Flashing and Sheet Metal: Placement of reglets for flashings.
- C. Section 08112 - Standard steel Frames: Placement of window anchors in CMU.

2.1 RELATED SECTIONS

- A. Section 01400 - Quality Control: Testing laboratory services.
- B. Section 07212 - Rigid Insulation: Insulation for cavity spaces.
- C. Section 07216 - Granular Insulation: Loose fill insulation for masonry unit cores.
- D. Section 07900 - Joint Sealers: Rod and sealant at control joints.

2.2 REFERENCES

- A. ANSI/ASTM A82 - Cold-Drawn Steel Wire for Concrete Reinforcement.
- B. ANSI/ASTM C55 - Concrete Building Brick.
- C. ASTM A525 - Steel Sheet, Zinc Coated, (Galvanized) by the Hot-Dip Process.
- D. ASTM A615 - Deformed and Plain Billet Steel Bars for Concrete Reinforcement.
- E. ASTM B370 - Copper Sheet and Strip for Building Construction.
- F. ASTM C90 - Hollow Load Bearing Concrete Masonry Units.
- G. ASTM C129 - Non-Load Bearing Concrete Masonry Units.
- H. ASTM C145 - Solid Load Bearing Concrete Masonry Units.
- I. IMIAC - International Masonry Industry All-Weather Council: Recommended Practices and Guide Specification for Cold

- C. Hollow Non-Load Bearing Block Units: ASTM C129, Type I - Moisture Controlled; normal weight.
- D. Concrete Brick Units: ANSI/ASTM C55, of same Grade, Type, and Weight as block units.
- E. Masonry Units: Nominal modular size of 8 x 8 x 16 inches. Provide special units for 90 degree corners, bond beams, lintels, and bullnosed corners.

3.2 REINFORCEMENT AND ANCHORAGE

- A. Single Wythe Joint Reinforcement: Truss Ladder type; hot dip galvanized after fabrication cold-drawn steel conforming to ANSI/ASTM A82, 3/16 inch side rods with 1/8 inch cross ties.
- B. Reinforcing Steel: ASTM A615, 60 ksi yield grade, deformed billet bars, unprotected finish.
- B. Formed Steel Wire Wall Ties: 3/16 inch thick, with 2" legs; galvanized steel finish.

3.3 FLASHINGS

- A. Copper/Kraft Paper Flashings: 2 oz/sq ft sheet copper bonded to fiber reinforced asphalt treated Kraft paper.

3.4 ACCESSORIES

- A. Joint Filler: Closed cell polyethylene; oversized 50 percent to joint width; self-expanding; 3/4 inch wide by maximum lengths.
- B. Building Paper: #15 asphalt saturated felt.
- C. Weep Holes: Preformed plastic tubes.
- D. Cleaning Solutions: Non-acidic, not harmful to masonry work or adjacent materials.

4 PART 3 EXECUTION

4.1 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Verify items provided by other Sections of work are properly sized and located.
- C. Verify that built-in items are in proper location, and ready for roughing into masonry work.
- D. Beginning of installation means installer accepts existing conditions.

4.2 PREPARATION

- A. Direct and coordinate placement of metal anchors supplied to other Sections.
- B. Provide temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent bracing.

4.3 COURSING

4.7 GROUTED COMPONENTS

- A. Reinforce bond beam with 2, No. 5 bars, placed 1 inch from unit interior.
- B. Lap splices minimum 24 bar diameters.
- C. Support and secure reinforcing bars from displacement. Maintain position within 1/2 inch of dimensioned position.
- D. Place and consolidate grout fill without displacing reinforcing.
- E. At bearing locations, around door and window openings and where bolts, steel angles or plates are attached fill masonry cores full height with grout either side of opening.

4.8 CONTROL AND EXPANSION JOINTS

- A. Do not continue horizontal joint reinforcement through control joints.
- B. Form control joint at 20 feet o.c. max and within 4 ft. of CMU wall corners with a sheet building paper bond breaker, fitted to one side of the hollow contour end of the block unit. Fill the resultant elliptical core with grout fill. Rake joint at exposed unit faces for placement of backer rod and sealant.
- C. Size control joint in accordance with Section 07900 for sealant performance.

4.9 BUILT-IN WORK

- A. As work progresses, build in metal door and window frames anchor bolts, plates and other items furnished by other Sections.
- B. Build in items plumb and level.
- C. Bed anchors of metal door and window frames in adjacent mortar joints. Fill frame voids solid with grout. Fill adjacent masonry cores solid with grout.
- D. Do not build in organic materials subject to deterioration.

4.10 TOLERANCES

- A. Maximum Variation From Unit to Adjacent Unit: 1/32 inch.
- B. Maximum Variation From Plane of Wall: 1/4 inch in 10 feet and 1/2 inch in 20 feet or more.
- C. Maximum Variation From Plumb: 1/4 inch per story non-cumulative; 1/2 inch in two stories or more.
- D. Maximum Variation From Level Coursing: 1/8 inch in 3 feet and 1/4 inch in 10 feet; 1/2 inch in 30 feet.
- E. Maximum Variation of Joint Thickness: 1/8 inch in 3 feet.
- F. Maximum Variation From Cross Sectional Thickness of Walls: 1/8 inch.

4.11 CUTTING AND FITTING

- A. Cut and fit for pipes, conduit and sleeves. Coordinate with other Sections of work to provide correct size, shape, and

SECTION 05120

STRUCTURAL STEEL

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Structural steel framing members, support members, struts, and lintels.
- B. Baseplates and columns.
- C. Grouting under baseplates.
- D. Section 08112 - Standard Steel Frames: Anchors for embedding into masonry.

1.2 RELATED SECTIONS

- A. Section 09900 - Painting: Finish painting.

1.3 REFERENCES

- A. ASTM A36 - Structural Steel.
- B. ASTM A325 - High Strength Bolts for Structural Steel Joints.
- C. ASTM A500 - Cold-Formed Welded and Seamless Carbon Steel Structural Tubing in Round and Shapes.
- D. AWS A2.0 - Standard Welding Symbols.
- E. AWS D1.1 - Structural Welding Code.
- F. AISC - Specification for the Design, Fabrication and Erection of Structural Steel for Buildings.
- G. SSPC - Steel Structures Painting Council.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings:
 - 1. Indicate profiles, sizes, spacing, and locations of structural members, attachments and fasteners.
 - 2. Connections detailed.
 - 3. Loads indicated on drawings.
 - 4. Indicate welded connections with AWS A2.0 welding symbols. Indicate net weld lengths.
- C. Manufacturer's Mill Certificate: Submit under provisions of Section 01400 certifying that products meet or exceed specified requirements.
- D. Welders' Certificates: Submit under provisions of Section 01400 Manufacturer's Certificates, certifying welders employed on the Work, verifying AWS qualifications within the previous 12 months.

- A. Shop prime structural steel members. Do not prime surfaces that will be field welded or will come in contact with concrete.

2.4 SOURCE QUALITY CONTROL AND TESTS

- A. Testing of components will be performed under provisions of Section 01400.

2.5 EXAMINATION

- A. Verify that field conditions are acceptable and are ready to receive work.
- B. Beginning of installation means erector accepts existing conditions.

2.6 ERECTION

- A. Allow 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.
- B. Do not field cut or alter structural members without approval of Architect/Engineer.
- C. After erection, prime welds, abrasions, and surfaces not shop primed, except surfaces to be in contact with concrete.
- D. Grout under baseplates in accordance with Section 04100.

2.7 ERECTION TOLERANCES

- A. Maximum Variation From Plumb: 1/4 inch per story, non-cumulative.
- B. Maximum Offset From True Alignment: 1/4 inch.

2.8 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Section 01400.

END OF SECTION

- L. AWS A2.0 - Standard Welding Symbols.
- M. AWS D1.1 - Structural Welding Code.
- N. SSPC - Steel Structures Painting Council.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate profiles, sizes, connection attachments, reinforcing, anchorage, size and type of fasteners, and accessories. Include erection drawings, elevations, and details where applicable.
- C. Indicate welded connections using standard AWS A2.0 welding symbols. Indicate net weld lengths.

1.6 QUALIFICATIONS

- A. Prepare Shop Drawings under direct supervision of a Professional Structural Engineer experienced in design of this work and licensed in the State of Maine.
- B. Welders' Certificates: Submit under provisions of Section 01300, certifying welders employed on the Work, verifying AWS qualification within the previous 12 months.

1.7 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

2 PART 2 PRODUCTS

2.1 MATERIALS

- A. Steel Sections: ASTM A36.
- B. Steel Tubing: ASTM A500, Grade B.
- C. Plates: ASTM A283.
- D. Pipe: ASTM A53, Grade B Schedule 40.
- E. Fasteners:
- F. Bolts, Nuts, and Washers: ASTM A325N.
- G. Welding Materials: AWS D1.1; type required for materials being welded.
- H. Shop and Touch-Up Primer: SSPC 15, Type 1, red oxide.

2.2 FABRICATION

- A. Fit and shop assemble in largest practical sections, for delivery to site.
- B. Fabricate items with joints tightly fitted and secured.

B. Maximum Offset From True Alignment: 1/4 inch.

3.5 SCHEDULE

- A. The Schedule is a list of principal items only. Refer to Drawing details for items not specifically scheduled.
- B. Structural Steel anchor and connection bolts.
- C. Masonry bond beam anchor bolts.
- D. Masonry elevator shaft inserts for connection of elevator guide rails to elevator shaft to meet elevator manufacturer's installation instructions and the specifications.
- E. Lintels: As detailed; prime paint finish.
- F. Steel Pipe handrails: As detailed, prime paint finish

END OF SECTION

- G. NFPA: National Forest Products Association.
- H. WWPA: Western Wood Products Association.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide technical data on insulated sheathing, wood preservative materials, and application instructions.
- C. Samples of Exposed To View Wood Members: Submit two samples, 3-1/2" x 12" inch in size illustrating wood grain, stain, and finish.
- D. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with the following agencies:
 - 1. Lumber Grading Agency: Certified by ALSC.
 - 2. Plywood Grading Agency: Certified by APA.
- B. In lieu of grade stamping exposed to view lumber and plywood, submit manufacturer's certificate under provisions of Section 01400 that products meet or exceed specified requirements.

2.1 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of Section 01600.
- B. Protect site framed structural site fabricated trusses from warping or other distortion by stacking in vertical position, braced to resist movement.

3 PART 2 PRODUCTS

3.1 LUMBER MATERIALS

- A. Lumber Grading Rules: NFPA; SPIB; WCLIB; WWPA.
- B. Beam Framing: Stress Group C, Eastern Spruce species, No. 1 grade, S4S size classification, 19 percent maximum moisture content.
- C. Joist Framing: Stress Group C, Eastern Spruce species, No. 1 grade, S4S size classification, 19 percent maximum moisture content.
- D. Rafter Framing: Stress Group C, Eastern Spruce species, No. 1 Grade grade, S4S size classification, 19 percent maximum moisture content.
- E. Non-structural Light Framing: Stress Group A, Eastern Spruce species, No. 2 grade, S4S size classification, 19 percent maximum moisture content.
- F. Studding: Stress Group B, Eastern Spruce species, No. 1 grade, S4S size classification, 19 percent maximum moisture content.

4.1 FRAMING

- A. Set structural members level and plumb, in correct position.
- B. Make provisions 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. Place horizontal members flat, crown side up.
- D. Construct load bearing framing members full length without splices.
- E. Double members at openings over 24 inches wide. Space short studs over and under opening to stud spacing.
- F. Construct double joist headers at floor and ceiling openings and under wall stud partitions that are parallel to floor joists. Frame rigidly into joists.
- G. Bridge joists framing in excess of 8 feet span at mid-span. Fit solid blocking at ends of members.
- H. Provide horizontal blocking in all load bearing stud wall over 8'-0".
- I. Place full width continuous sill flashings under framed walls on cementitious foundations. Lap flashing joint 24 inches and seal with compatible sealant.
- J. Place sill gasket directly on sill flashing and cementitious foundation.] Puncture gasket clean and fit tight to protruding foundation anchor bolts.
- K. Coordinate installation of wood decking and prefabricated wood trusses.
- L. Curb roof openings except where prefabricated curbs are provided. Form corners by alternating lapping side members.

4.2 SHEATHING

- A. Secure roof sheathing perpendicular to framing members with ends staggered and sheet ends over firm bearing.
- B. Secure wall sheathing with long dimension parallel to wall studs, with ends over firm bearing and staggered.
- C. Place plywood or structural-use panel sheathing at building corners for a horizontal distance of 144 inches.
- D. Place building paper horizontally over wall sheathing, weather lap edges and ends.
- E. Secure subfloor perpendicular to floor framing with end joints staggered and sheet ends over firm bearing. Attach with subfloor glue and drywall screws.
- F. Install plywood to two span continuous with 48 inches minimum length.
- G. Install flooring underlayment after dust and dirt generating activities have ceased and prior to application of finished flooring. Apply perpendicular to subflooring, stagger joints of underlayment. Secure with drywall screw type fasteners.
- H. Install telephone and electrical panel boards with 5/8 inch plywood sheathing material where required. Over size the panel by 24 inches on all sides.

4.3 TOLERANCES

SECTION 06193

PLATE CONNECTED WOOD TRUSSES

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Shop fabricated wood trusses for roof and floor framing.
- B. Bridging, bracing, and anchorage.
- C. Preservative treatment of wood.

1.2 RELATED SECTIONS

- A. Section 05500 - Metal Fabrications: Setting anchors in concrete and masonry.
- B. Section 06112 - Framing and Sheathing.
- C. Section 06114 - Wood Blocking.
- D. Section 06125 - Wood Decking.
- E. Section 06196 - Plywood Web Joists.

1.3 REFERENCES

- A. ALSC - American Lumber Standards Committee: Softwood Lumber Standards.
- B. AWPA (American Wood Preservers Association) C1 - All Timber Products Preservative Treatment by Pressure Process.
- C. AWPA (American Wood Preservers Association) C20 - Structural Lumber Fire Retardant Treatment by Pressure Process.
- D. NFPA: National Forest Products Association.
- E. SPIB: Southern Pine Inspection Bureau.
- F. TPI (Truss Plate Institute) BWT-76 - Bracing Wood Trusses.
- G. TPI (Truss Plate Institute) HET-80 - Handling and Erecting Wood Trusses.
- H. TPI (Truss Plate Institute) PCT-80 - Metal Plate Connected Parallel Chord Wood Trusses.
- I. TPI (Truss Plate Institute) TPI-85 - Metal Plate Connected Wood Trusses.
- J. TPI (Truss Plate Institute) QST-88 - Metal Plate Connected Wood Trusses.
- K. WWPA: Western Wood Products Association.

- A. Lumber Grading Rules: NFPA.
- B. Wood Members: Single top and bottom chord, Stress Group A, Southern Yellow Pine species, dense select grade, SAS size classification, 19 percent maximum and 7 percent minimum moisture content. Finger scarfing not permitted.
- C. Steel Connectors: ASTM A446 steel, Grade B, hot dip galvanized; die stamped with integral teeth sized per Reg. Engineer and TPI.
- D. Truss Bridging: Type, size and spacing recommended by truss manufacturer.

2.3 ACCESSORIES

- A. Wood Blocking and Support Members, Framing for Openings: softwood lumber, Spruce species, construction grade, 19 percent maximum and 7 percent minimum moisture content.
- B. Fasteners: Electro-galvanized steel, type to suit application.
- C. Bearing Plates: Electro-galvanized.

2.4 FABRICATION

- A. Fabricate trusses to achieve structural requirements specified.
- B. Brace wood trusses in accordance with TPI BWT-76.

2.5 WOOD TREATMENT

- A. Fire retardant: AWPA Treatment C20, Interior Type, chemically treated and pressure impregnated; capable of providing a maximum flame spread/smoke development rating of 25.

3 PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that supports and openings are ready to receive trusses.

3.2 PREPARATION

- A. Coordinate placement of bearing and support items.

3.3 ERECTION

- A. Install trusses in accordance with manufacturer's instructions.
- B. Set members level and plumb, in correct position.
- C. Make provisions for erection loads, and for sufficient temporary bracing to maintain structure plumb, and in true alignment until completion of erection and installation of permanent bracing.
- D. Do not field cut or alter structural members without approval of Architect/Engineer.
- E. Place headers and supports to frame openings required.

SECTION 07160

BITUMINOUS DAMPPROOFING

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Cold applied asphalt bitumen damproofing.

1.2 RELATED SECTIONS

- A. Section 02223 - Backfilling.
- B. Section 07212 - Board Insulation; Perimeter insulation.

1.3 REFERENCES

- A. ASTM D449 - Asphalt Used in Damproofing and Waterproofing.
- B. ASTM D491 - Asphalt Mastic Used in Waterproofing.
- C. NRCA (National Roofing Contractors Association) -Waterproofing Manual.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide properties of bitumen and mastics.
- C. Manufacturer's Installation Instructions: Indicate special procedures and perimeter conditions requiring special attention.

1.5 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Waterproofing Manual.
- B. Maintain one copy of each document on site.

1.6 QUALIFICATIONS

- A. Applicator: Company specializing in performing the work of this section with minimum three years experience.

1.7 ENVIRONMENTAL REQUIREMENTS

- A. Maintain ambient temperatures above 40 degrees F for 24 hours before and during application until membrane has cured.

2 PART 2 PRODUCTS

- A. Substitutions: Under provisions of Section 01600.

2.2 COLD ASPHALTIC MATERIALS

Custom House Wharf - Marine Use Facility

SECTION 07190

VAPOR AND AIR BARRIERS

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Sheet and sealant materials to provide a continuous vapor and air barrier throughout the building envelope and to seal wall vapor and air barrier to floor deck, roof deck, window and door frame openings.
- B. Sheet and tape materials to provide a continuous vapor and air barrier beneath new slabs-on-grade.

1.2 RELATED SECTIONS

- A. Section 07213: Insulation and vapor barrier.
- B. Section 07900 - Joint Sealers: Sealants.

1.3 REFERENCES

- A. ANSI/ASTM D491 - Asphalt Mastic Used on Waterproofing.
- B. Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification.

1.4 PERFORMANCE REQUIREMENTS

- A. Materials of this Section shall provide continuity of building enclosure vapor and air barrier.
 - 1. In conjunction with materials described in Section 07213.
 - 2. To seal gaps between building enclosure components and wall opening frames.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Product Data: Provide data indicating material characteristics, performance criteria and limitations.
- C. Manufacturer's Installation Instructions: Indicate preparation and installation requirements, techniques.

1.6 QUALITY ASSURANCE

- A. Perform Work in accordance with Sealant and Waterproofer's Institute - Sealant and Caulking Guide Specification requirements for materials and installation.
- B. Maintain one copy of document on site.

1.7 QUALIFICATIONS

- A. Applicator: Company specializing in performing the work of this Section with minimum three years documented experience.

3.2 PREPARATION

- A. Remove loose or foreign matter which might impair adhesion.

3.3 INSTALLATION

- A. Install sheet materials in accordance with manufacturer's instructions.
- B. Install Sheet barrier Type 1 under all slabs on grade; wrap up walls and secure with compatible sealants around all edges. Lap seam and seal with reinforced polyethylene tape.
- C. Secure sheet barrier Type 2 to wall vapor and air barrier with tape. Position lap seal over firm bearing and secure with tape. Seal sheet barrier to walls, exterior wall doors & windows, roof drains, slabs-on-grade, floor decks, roof decks and other exterior wall penetrations with sheet barrier-type 3 (Perm-a-barrier® self adhering, self healing tape).
- D. Install sheet barrier Type 3 continuously at window and door frames, at soffits and through irregular floor and roof interstitial spaces to extend and seal sheet barrier - type 2 (polyethylene sheet vapor barriers) to wall-floor decks & wall-roof decks to ensure absolute continuity of wall building vapor barriers.

3.5 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01500.
- B. Do not permit adjacent Work to damage Work of this Section.

END OF SECTION

- A. Batt Insulation: Type I - without membranes and Type II - with non-reflective membrane one side FS HH-I-558 ASTM C665; preformed glass fiber batt or roll; friction fit, conforming to the following:

Thermal Resistance: R of 19

Batt or Roll Size: 16 & 24 wd. by longest practical lengths

Facing: Unfaced and Faced on one side with asphalt treated Kraft paper

- B. Sheet Barrier: Clear polyethylene film for above grade application, 6 mil thick.

- C. Staples: Steel wire; electroplated; type and size to suit application.

- D. Tape: Polyester self-adhering type, 2 inch wide.

- E. Insulation Fasteners: Steel impale spindle and clip on flat metal base, self adhering backing, length to suit insulation thickness, capable of securely and rigidly fastening insulation in place.

- C. Strapping: 1 x 3 Spruce species at 24 inch on center for support of insulation blankets or rolls in trussed ceiling spaces. (see drawings)

3 PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify site conditions under provisions of Section 01039.

- B. Verify that substrate, adjacent materials, and insulation are dry and ready to receive insulation.

3.2 INSTALLATION

- A. Install insulation and vapor barrier in accordance with insulation manufacturer's instructions and Section 07190.

- B. Install in exterior walls, roof, and ceiling spaces without gaps or voids.

- C. Trim insulation neatly to fit spaces.

- D. Fit insulation tight in spaces and tight to exterior side of mechanical and electrical services within the plane of insulation. Leave no gaps or voids.

- E. Install with factory applied membrane facing warm side of building spaces. Lap ends and side flanges of membrane between framing members.

- F. Staple or nail in place at maximum 6 inches oc. Tape in place. Retain unfaced units in place with spindle fasteners at 36 inches oc. Retain ceiling unfaced units in place with 1 x 3 strapping at 24 inch on center on bottom chord of wood floor trusses.

- G. Tape seal butt ends, lapped flanges, and tears or cuts in membrane.

- H. Wood Framing: Place vapor and air barrier on warm side of insulation by stapling 6 inches oc. Lap and seal sheet barrier joints between.

SECTION 07311

ASPHALT SHINGLES

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Granular surfaced asphalt shingle roofing.
- B. Moisture shedding underlayment, eave, valley and ridge protection.
- C. Associated metal flashings.

1.2 RELATED SECTIONS

- A. Section 06112 - Framing and Sheathing; 06125 - Wood Decking; Roof sheathing.
- B. Section 07190 - Vapor and Air Barriers.
- C. Section 07620 - Sheet Metal Flashing and Trim.
- D. Section 07631 - Gutters and Downspouts.

1.3 REFERENCES

- A. ANSI/ASTM D225 - Asphalt Shingles (Organic Felt) Surfaced with Mineral Granules.
- B. ANSI/ASTM D2822 - Asphalt Roof Cement
- C. NRCA - Steep Roofing Manual.
- D. UL 580 - Tests for Wind Uplift Resistance of Roof Assemblies.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate specially configured metal flashings, jointing methods and locations, fastening methods and locations, and installation details.
- C. Product Data: Provide data indicating material characteristics, performance criteria and limitations.
- D. Manufacturer's Installation Instructions: Indicate preparation required and installation procedures.
- E. Manufacturer's Certificate: Certify that products meet or exceed specified requirements.

1.4 QUALITY ASSURANCE

- A. Perform Work in accordance with NRCA Steep Roofing Manual.

- B. Nails: Standard round wire roofing type, hot dipped zinc coated steel; minimum 19/64 inch head diameter and 0.104 inch shank diameter; minimum 7/8 inch long of sufficient length to penetrate through roof sheathing 1/2 inch into wood substrate.

2.6 FLASHING FABRICATION

- A. Form flashings to protect roofing materials from physical damage and shed water at least one inch beyond face of eave trim.

3 PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify existing site conditions under provisions of Section 01039.
- B. Verify that roof penetrations and plumbing stacks are in place and flashed to deck surface.
- C. Verify roof openings are correctly framed prior to installing work of this Section.
- D. Verify deck surfaces are dry, free of ridges, warps, or voids.

3.2 PREPARATION

- A. Fill knot holes and surface cracks with latex filler at areas of bonded eave protection.
- B. Broom clean deck surfaces under eave protection and underlayment.

3.3 INSTALLATION - EAVE ICE DAM PROTECTION

- A. Place eave edge and gable edge metal flashings tight with fascia boards. Weather lap joints 6 inches and seal with plastic cement. Secure flange with nails spaced 12 inches oc.
- B. Apply rubberized asphalt/bituthene sheet eave protection in accordance with manufacturer's instructions and up roof at least 90" on large roof areas and 36" up small roof edges.

3.4 INSTALLATION - PROTECTIVE UNDERLAYMENT

- A. Place one ply of underlayment over area not protected by eave protection, with ends and edges weather lapped minimum 12 inches. Stagger end laps of each consecutive layer. Nail in place.
- B. Install protective underlayment perpendicular to slope of roof and weather lap minimum 4 inches over eave protection.
- C. Weather lap and seal watertight with plastic cement, items projecting through or mounted on roof.

3.5 INSTALLATION - VALLEY PROTECTION

- A. Place one layer rubberized bituthene ice and water shield, minimum 36 inches wide, centered over valleys. Weather lap joints minimum 12 inches. Nail in place minimum 18 inches oc, one inch from edges.

3.6 INSTALLATION - METAL FLASHING

- A. Weather lap joints minimum 6 inches on eaves and seal weather tight with plastic cement.

SECTION 07611

CUSTOM SHEET METAL ROOFING - ALTERNATE 1

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Galvanized steel roofing, associated integral flashings, and underlayment.
- B. Counterflashings.
- C. Snow guards.

1.2 RELATED SECTIONS

- A. Section 06112 - Framing & Sheathing: Roof deck construction with sheathing surface.
- B. Section 06114 - Wood Blocking and Curbing: Wood blocking and battens for metal roofing substrate profiles.
- C. Section 07620 - Sheet Metal Flashing and Trim.
- D. Section 07900 - Joint Sealers.

1.3 REFERENCES

- A. ASTM A653 - Steel Sheet, Zinc-Coated (Galvanized) by the Hot-Dip Process for Roofing and Siding.
- B. NRCA (National Roofing Contractors Association) - Roofing Manual.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Product Data: Provide data on metal types, finishes, characteristics, and profile.
- D. Submit specified trade association installation instructions.
- E. Submit two samples 12 x 12 inch in size illustrating metal roofing mounted on plywood backing illustrating typical standing seam, external corner, internal corner, valley, ridge, junction to vertical dissimilar surface, material, and finish.
- F. Submit two samples 12 x 12 inch in size illustrating metal finish color.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA standard details and requirements.
- B. Maintain one copy of each document on site.

- A. Fasteners: Galvanized steel, with concealed fastener clips.
- B. Underlayment: Full cover sheet barrier of rubberized asphalt bonded to sheet polyethylene, 40 mil total thickness, with strippable treated release paper, "Ice and water shield".

2.4 SHOP FABRICATION

- A. Form sections true to shape, accurate in size, square, and free from distortion or defects.
- B. Fabricate cleats of same material as sheet, minimum 3 inches wide, interlockable with sheet.
- C. Fabricate starter strips of same material as sheet, continuous, interlockable with sheet.
- D. Form pieces in longest possible lengths.
- E. Hem exposed edges on underside 1/2 inch; miter and seam corners.
- F. Form material with standing seams.
- G. Fabricate corners from one piece with minimum 18 inch long legs; seam for rigidity, seal with sealant.
- H. Fabricate vertical faces with bottom edge formed outward 1/4 inch and hemmed to form drip.
- I. Provide and install prefabricated acrylic snow guards.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Inspect roof deck to verify deck is clean and smooth, free of depressions, waves, or projections, properly sloped to valley or eaves.
- B. Verify deck is dry and free of snow or ice. Verify joints in wood deck are solidly supported and fastened.
- C. Verify correct placement of wood nailers.
- D. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets are in place, and nailing strips located.
- E. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.

3.3 INSTALLATION - ICE DAM PROTECTION

- A. Place eave edge and gable edge metal flashings tight with fascia boards. Weather lap joints 4 inches and seal with plastic cement. Secure flange with nails spaced 2 inches oc.
- B. Apply rubberized asphalt/polyethylene sheet eave protection over entire roof surface in accordance with manufacturer's instructions.

3.7 PROTECTION OF FINISHED WORK

- A. Protect finished Work under provisions of Section 01500.
- B. Do not permit traffic over unprotected roof surface.

END OF SECTION

- B. Maintain one copy of document on site.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Store in ventilated areas with constant minimum temperature of 60 degrees F.

1.8 WARRANTY

- A. Provide five year warranty under provisions of Section 01700.
- B. Warranty: Include coverage of finished siding products from degradation of color or deterioration of finish.

2 PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Alcoa Vinyl Siding and Accessories Product Alcoa Liberty Vinyl Siding (Double 5 inch) and accessories.
- B. Substitutions: Under provisions of Section 01600.

2.2 SIDING MATERIALS

- A. Solid vinyl siding and accessories of extruded Poly Vinyl Chloride (PVC) compound as defined in ASTM D3769, Standard Specification for PVC Siding. Provide weep holes in the shadow leg of the bottom panel to allow for the escape of moisture and to allow the stud wall to "breathe". Panels shall include elongated nail slots 1" long to allow for seasonal expansion and contraction of panels. The nail hem and the bottom lock of the panels shall be notched on both ends to provide for the proper overlapping of adjacent panels. Textured vinyl panels shall be uniformly embossed to provide an attractive woodgrain pattern.
- B. Dimensions: Horizontal siding panels shall be double 5 inch, 12 foot length and 10 inch exposure.
- C. Finish: Vinyl Siding shall be produced from PVC compound containing quality pigments to provide color throughout thickness of siding. Panels shall maintain color, texture, and finish to provide for an attractive, uniform, weatherable, non-fading surface.

ACCESSORIES

- A. All accessories including but not limited to outside corners, inside corners, window casing, window strips, window trim, undersill trim and window head flashing shall be produced from the same quality PVC compound as used for the siding.
- B. Nails: Aluminum type; non-staining, of size and strength to securely and rigidly retain the work but to allow for expansion and contraction of panels and accessories per the manufacturers installation instructions.
- C. Building Paper: Spun bonded polyolefin sheeting; water repellent breathing type ASTM D226, 10 thick).
- D. Flashing: 26 gage thick galvanized steel.
- E. Soffit Vents: Continuous vent strips with integral nailing fins and insect screening and white baked enamel finish.

SECTION 07620

SHEET METAL FLASHING AND TRIM

1PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Roof flashings.
- B. Window Sill flashings.

1.2 RELATED SECTIONS

- A. Section 07311 - Asphalt Shingles.
- B. Section 07900 - Joint Sealers.

1.3 REFERENCES

- A. ASTM B209-81: Aluminum and Alloy Sheet and Plate.
- B. NRCA (National Roofing Contractors Association) - Roofing Manual.

1.4 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate material profile, jointing pattern, jointing details, fastening methods, flashings, terminations, and installation details.
- C. Submit two samples 6 x 6 inch in size illustrating metal finish color.

1.5 QUALITY ASSURANCE

- A. Perform work in accordance with NRCA standard details and requirements.
- B. Maintain copies of each document on site.

1.6 QUALIFICATIONS

- A. Fabricator and Installer: Company specializing in sheet metal flashing work with 10 years documented experience.

1.7 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Stack preformed material to prevent twisting, bending, or abrasion, and to provide ventilation. Slope metal sheets to ensure drainage.
- C. Prevent contact with materials which may cause discoloration or staining.

3.1 EXAMINATION

- A. Verify roof openings, curbs, pipes, sleeves, ducts, or vents through roof are solidly set, reglets in place, and nailing strips located.
- B. Verify roofing termination and base flashings are in place, sealed, and secure.

3.2 PREPARATION

- A. Install starter and edge strips, and cleats before starting installation.
- B. Install surface mounted reglets true to lines and levels. Seal top of reglets with sealant.

3.3 INSTALLATION

- A. Conform to drawing details included in the NRCA manual.
- B. Secure flashings in place with preformed cleats.
- C. Apply plastic cement compound between metal flashings and felt flashings.
- D. Fit flashings tight in place. Make corners square, or to follow skewed wall line surfaces.
- E. Overlap flashing and seal each joint watertight with sealant as recommended by roofing manufacturer.

3.4 FIELD QUALITY CONTROL

- A. Field inspection will be performed under provisions of Section 01400.
- B. Inspection will involve surveillance of work during installation to ascertain compliance with specified requirements.

END OF SECTION

- A. Single source responsibility for joint sealer materials: Obtain joint sealer materials from a single manufacturer for each different product required.
- B. Provide joint sealers that have been produced and installed to establish and maintain watertight and airtight continuous seals.

1.8 ENVIRONMENTAL REQUIREMENTS

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

1.9 COORDINATION

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate the work with all sections referencing this section.

1.10 WARRANTY

- A. Provide five year warranty under provisions of Section 01700.
- B. Warranty: Include coverage for installed sealants and accessories which fail to achieve air tight seal or water tight seal, and exhibit loss of adhesion or cohesion, or do not cure.

PART 2 PRODUCTS

2.1 SEALANTS

A. General:

1. Compatibility: provide joint sealers, joint fillers, and other related materials that are compatible with one another and with joint substrates under conditions of service and application, as demonstrated by testing and field experience.
2. Use self-leveling compounds for horizontal joints and non-sag compounds for all other areas except as indicated or specified.
3. Sealant Color:
 - a. Concealed Joints: Use sealant with manufacturer's standard color having best overall performance qualities for indicated application.
 - b. Exposed Joints: Use sealant as selected from manufacturer's standard colors unless special colors are shown or specified.
4. ASTM C920, Classification Method:
 - a. Type S: One-part prepackaged.
 - b. Type M: Multi Part, field mixed.
 - c. Grade P: Horizontal flowing.
 - d. Grade NS: Vertical non-sag.
 - e. Use T: Pedestrian and vehicular traffic.
 - f. Use NT: Non-traffic exposure.

2. Plastic Foam Joint Fillers:

- a. Performed, compressible, resilient, non-waxing non-extruding strips of plastic foam of material indicated and of size, shape, and density to control sealant depth and otherwise contribute to producing optimum sealant performance.
- b. Either flexible, open cell polyurethane foam or non-gassing closed-cell polyethylene foam, unless otherwise indicated, subject to approval of sealant manufacturer.

3. Bond-Breaker Tape:

- a. Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back, third surface, of joint.
- b. Provide self-adhesive tape where applicable.

E. Miscellaneous Material:

- 1. Primer: Provide type recommended by sealant manufacturer where required for adhesion of sealant to joint substrates indicated, as determined from preconstruction joint sealer-substrate and field tests.
- 2. Cleaners for Non-Porous Surfaces: Provide non-staining chemical cleaner of type acceptable to manufacturer of sealant and sealant backing materials which are not harmful to substrates and adjacent non-porous materials.
- 3. Masking tape: Provide non-staining, non-absorbent type compatible with joint sealants and to surfaces adjacent to joints.
- 4. Accessory Materials for Fire-Stopping Sealants: Provide forming, joint fillers, packing, and other accessory materials required for installation of fire-stopping sealants as applicable to installation conditions indicated.

PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify that substrate surfaces and joint openings are ready to receive work.
- B. Verify that joint backing and release tapes are compatible with sealant.

3.2 PREPARATION

- A. Remove loose materials and foreign matter which might impair adhesion of sealant.
- B. Clean and prime joints in accordance with manufacturer's instructions.
- C. Remove all foreign materials from joints substrates which could interfere with adhesion of joint sealer, including dust, paints, oil; grease; waterproofing; water repellants, water, surface dirt; and frost.
- D. Perform preparation in accordance with manufacturer's instructions.
- E. Protect elements surrounding the work of this section from damage, discoloration or disfiguration.
- F. Joint Priming:

3.5 PROTECTION OF FINISHED WORK

- A. Protect finished installation under provisions of Section 01500.
- B. Protect sealants until cured.

END OF SECTION

E. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.5 QUALITY ASSURANCE

- A. Conform to requirements of ANSI/SDI-100 and ANSI A117.1.
- B. Maintain one copy of document on site.

1.6 QUALIFICATIONS

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

1.7 REGULATORY REQUIREMENTS

- A. Fire Rated Door Construction: Conform to ASTM E152; NFPA 252; UL 10B.
- B. Fire Rated Door Construction: Rate of rise of 450 F degrees across door thickness.
- C. Installed Door Assembly: Conform to NFPA 80 for fire rated class as scheduled.

1.8 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect, and handle products to site under provisions of Section 01600.
- B. Accept doors on site in manufacturer's packaging. Inspect for damage.
- C. Break seal on-site to permit ventilation.

1.9 FIELD MEASUREMENTS

- A. Verify that field measurements are as indicated on shop drawings.

1.10 COORDINATION

- A. Coordinate work under provisions of Section 01039.
- B. Coordinate the work with door opening construction, door frame and door hardware installation.

2 PART 2 PRODUCTS

2.1 MANUFACTURERS

- A. Steelcraft Product.
- A. Substitutions: Under provisions of Section 01600.

2.2 DOORS

- A. Interior Doors (Non-rated): SDI-100 Grade I Model 1.
- B. Interior Doors (Fire Rated): SDI-100 Grade II Model 1.

SECTION 08112

STANDARD STEEL FRAMES

1 PART 1 GENERAL

1.1 SECTION INCLUDES

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

1.2 PRODUCTS FURNISHED BUT NOT INSTALLED UNDER THIS SECTION

- A. Section 09111 - Metal Stud Framing System: Placement of anchors into wall construction.

1.3 RELATED SECTIONS

- A. Section 08211 - Wood Doors.
- B. Section 08712 - Door Hardware.
- C. Section 09900 - Painting

1.4 REFERENCES

- A. ADAAG - Americans with Disability Act Accessibility Guidelines: Standards for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
- B. ASTM E152 - Methods of Fire Tests of Door Assemblies.
- C. NFPA 80 - Fire Doors and Windows.
- D. NFPA 252 - Fire Tests for Door Assemblies.
- E. UL 10B - Fire Tests of Door Assemblies.

1.5 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate frame elevations, reinforcement, and finish.
- C. Product Data: Indicate frame configuration, anchor types and spacings, location of cut-outs for hardware, reinforcement.
- D. Samples: Submit one sample of frame, 12 inch long in size illustrating factory finished frame colors and surface texture.
- E. Manufacturer's Installation Instructions: Indicate special installation instructions.
- F. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.6 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years

- D. Reinforce frames wider than 48 inches with roll formed steel channels fitted tightly into frame head, flush with top.
- E. Prepare frame for silencers. Provide three single silencers for single doors on strike side. Provide one silencer on frame head at double doors without mullions.

2.5 FINISH

- A. Steel Sheet Galvanized to ASTM A525 G60.
- B. Primer: Baked Enamel.

3 PART 3 EXECUTION

3.1 EXAMINATION

- A. Verify substrate conditions under provisions of Section 01039.
- B. Verify that opening sizes and tolerances are acceptable.

3.2 INSTALLATION

- A. Install frames in accordance with ANSI/SDI-100 and DHI.
- B. Coordinate with wallboard wall construction for anchor placement.
- C. Coordinate installation of glass and glazing.
- D. Coordinate installation of frames with installation of hardware specified in Section 08710 and doors in Section 08211.
- E. Install roll formed steel reinforcement channels between two abutting frames. Anchor to structure and floor.

3.3 ERECTION TOLERANCES

- A. Maximum Diagonal Distortion: 1/8 inch measured with straight edges, crossed corner to corner.

END OF SECTION

plane of wall as calculated in accordance with BOCA code to a design pressure of 30 lb/sq ft and a suction of 15 lb/sq ft and as measured in accordance with ASTM E330.

- B. Limit member deflection to flexure limit of glass 1/200; with full recovery of glazing materials.
- C. System to accommodate, without damage to components or deterioration of seals, movement between window and perimeter framing, deflection of lintel.
- D. Limit air leakage through assembly to 0.25 cfm/min/sq ft of wall area, measured at a reference differential pressure across assembly of 1.57 psf as measured in accordance with ASTM E283.
- E. Vapor Seal with Interior Atmospheric Pressure of 1 inch sp, 72 degrees F, 40 Percent RH: No failure.
- F. Maintain continuous air and vapor barrier throughout assembly, primarily in line with inside pane of glass and heel bead of glazing compound.
- E. Drain water entering joints, condensation occurring in glazing channel, or migrating moisture occurring within system, to the exterior by a weep drainage network.

1.6 SUBMITTALS

- A. Submit under provisions of Section 01300.
- B. Shop Drawings: Indicate opening dimensions, framed opening tolerances, affected related work; and installation requirements.
- C. Product Data: Provide component dimensions, anchorage and fasteners, glass, internal drainage details and nailing flange detail.
- D. Submit two samples 6 x 6 inches in size illustrating window frame section mullion section screen and frame, pre-finished surfaces, and glazing materials.
- E. Submit two samples of operating hardware.
- F. Manufacturer's Certificate: Certify that Products meet or exceed specified requirements.

1.7 QUALITY ASSURANCE

- A. Perform Work in accordance with ANSINWWDA IS-2.

1.8 QUALIFICATIONS

- A. Manufacturer and Installer: Company specializing in manufacturing residential wood windows with minimum Five years documented experience.

1.9 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this Section, under provisions of Section 01039.

1.10 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.

- E. Stools: 1inch nominal thickness, wood; fit under sash to project 1 inch beyond interior wall face; one piece full width of opening.
- G. Insect Screens: FS RR-W-365, woven aluminum mesh; 14/18 mesh size.
- H. Operable Sash Weather Stripping: Nylon pile; permanently resilient, profiled to effect weather seal.
- I. Fasteners: Galvanized steel.

2.4 GLASS AND GLAZING MATERIALS

- A. Glass and Glazing Materials: As specified in Section 08800 of Types described below:
 - 1. Glass in Exterior Lights: Type 3/4 inch insul; Low E.

2.5 SEALANT MATERIALS

- A. Sealant and Backing Materials: As specified in Section 07900 of Types described below.

2.6 HARDWARE

- A. Double Hung Sash: Metal and nylon spiral friction slide cylinder, each sash, each jamb.
- A. Sash lock: Lever latch device with cam lock.

2.7 FABRICATION

- A. Fabricate framing, mullions and sash members with mortise and tenon joints. Glue and steel pin joints to hairline fit, weather tight.
- B. Scarf and Finger joints not permitted.
- C. Form sills and stools in one piece. Slope sills for wash.
- D. Form glass stops of to match cladding sloped for wash.
- E. Form weather stop flange to perimeter of unit.
- F. Fabricate components with minimum clearances and shim spacing around perimeter of assembly, yet enabling installation and dynamic movement of perimeter seal.
- G. Arrange fasteners to conceal from view.
- H. Permit internal drainage weep holes and channels to migrate moisture to exterior. Provide internal drainage of glazing spaces to exterior through weep holes.
- I. Assemble insect screens of rolled aluminum rectangular sections. Miter and reinforced frame corners. Fit mesh taut in frame into frame and secured. Fit frame with four spring loaded steel pin retainers per screen.
- J. Double weatherstrip operable units.
- K. Shop glaze window units.

3.5 CLEANING

- A. Clean work under provisions of 01700.
- B. Remove protective material from pre-finished surfaces.
- C. Wash down surfaces with a solution of mild detergent in warm water, applied with soft, clean wiping cloths. Take care to remove dirt from corners. Wipe surfaces clean.
- D. Remove excess sealant by moderate use of mineral spirits or other solvent acceptable to sealant manufacturer.

END OF SECTION

F. Manufacturer's Installation Instructions: Indicate special procedures, perimeter conditions requiring special attention, and maintenance recommendations.

1.5 PROJECT RECORD DOCUMENTS

- A. Submit under provisions of Section 01700.
- B. Coordinate Masterkeying requirements with Owner's master keying code system and record actual locations of installed cylinders and their keying code.

1.6 OPERATION AND MAINTENANCE DATA

- A. Submit under provisions of Section 01700.
- B. Maintenance Data: Include data on operating hardware, lubrication requirements, and inspection procedures related to preventative maintenance.

1.7 QUALITY ASSURANCE

- A. Perform work in accordance with the following requirements:
 - 1. ADAAG - Americans with Disability Act Accessibility Guidelines for Making Buildings and Facilities Accessible to and Usable by Physically Handicapped People.
 - 2. NFPA 101.
 - 3. NFPA 80.
 - 4. NFPA 252.

1.8 QUALIFICATIONS

- A. Manufacturer: Company specializing in manufacturing the Products specified in this section with minimum five years documented experience.
- B. Hardware Supplier: Company specializing in supplying commercial door hardware with five years documented experience.

1.9 REGULATORY REQUIREMENTS

- A. Conform to NFPA 101 - Life Safety code for requirements applicable to fire rated doors and frames.

1.10 PRE-INSTALLATION CONFERENCE

- A. Convene one week prior to commencing work of this section, under provisions of Section 01039.

1.11 DELIVERY, STORAGE, AND HANDLING

- A. Deliver, store, protect and handle products to site under provisions of Section 01600.
- B. Package hardware items individually, label and identify each package with door opening code to match hardware schedule.
- C. Deliver keys to the Owner by security shipment direct from hardware supplier.

1.12 COORDINATION