

SECTION 6
BUILDING AND BUILDING SERVICE EQUIPMENT

- 6.01 General Requirements: The Contractor shall furnish under this section all labor, material, tools and equipment for, and erect all building structures complete as herein specified and as shown on the Drawings.
- 6.02 Materials and Workmanship:
- A. All materials furnished and used under this Section shall be specified, or if not particularly designated, shall be of the best of their respective kinds.
 - B. Workmanship shall be first class in all respects. Neat and workmanlike appearances in the finished work will be required.
 - C. All work shall be done in accordance with all pertinent codes, laws and regulations. Where gauges are shown, these shall be U.S. Standard for all metals except aluminum which shall be "B and S".
 - D. Where Contractor's or manufacturer's detail drawings are called for herein, these shall be from measurement of structures as built and to which the several materials may apply.
- 6.03 Color Requirement: Within 14 days of the "Notice to Proceed", the Contractor shall submit a complete set of color samples for each product in these Specifications requiring color selection to the Engineer for selection.
- 6.04 Concrete Work and Steel Reinforcement:
- A. All concrete work and steel reinforcement required as part of the work to be performed under this item shall be in accordance with the applicable provisions of "Concrete" and "Reinforcing Steel, Structure Steel, and Miscellaneous Metal" Sections of these Specifications. The Contractor shall grout all column bases, beams, and other structural members, to their correct elevation.
 - B. Sleeves for all waste and water lines and all other plumbing and pipe lines, all electrical lines, floor drains, etc., passing through concrete floors and roofs shall be provided and set in accordance with applicable items specified elsewhere in these Specifications.
 - C. All metal wheel guards, angle guards, etc. which are anchored or embedded in concrete shall be installed properly before the concrete is poured.
- 6.05 Miscellaneous Metals: Furnish all bolts, nuts, anchor bolts, plates, anchors, ties, clamps, hangers, nails, spikes, screws, straps, toggle and expansion bolts and other items of rough hardware of sufficient size and number to tie together the various parts of the building and secure all of its parts in place. Such miscellaneous items shall be of same material as metals they contact.
- A. Materials:

1. Bronze and Aluminum: All bronze and aluminum shall be close-grained, tough metal, with planes, angles and corners true and out of wind. The work shall be free of blowholes, flaws and other defects.
2. Cast Iron: All castings shall be tough gray iron, of uniform thickness and free from blowholes and other defects, cast true to pattern and finished in a workmanlike manner.
3. Steel: All structural shapes and plates shall conform to Standard Specifications for Structural Steel for Buildings as adopted by the American Society for Testing Materials,
4. Wrought Iron: Wrought iron shall be tough, fibrous and of uniform quality.

B. Fabrication:

1. All work shall be laid out, cut and assembled by mechanics skilled in the fabrication of the different metals required so that the work will present a neat, satisfactory appearance in the building. Measurements shall be accurate, cutting true in line, joints tight and secure, all in accordance with the best practice in modern fabricating shops.
2. When the cutting torch is used, the burned edges of the metal shall be milled to dimension. All exposed edges of metal shall be milled smooth and straight.
3. All required holes shall be drilled or punched, not cut with the torch. Punching or drilling shall be accurately done and any holes not matching shall be reamed and not drifted.
4. Welding shall be done with electric arc equipment and executed in accordance with the "Code for Fusion Welding in Building Construction" of the American Welding Society. The welding electrode shall conform to American Welding Society Specifications Class E-40. Welding joints in metal cut with torch shall have the scale and burned metal ground or stripped back to bright metal before welding. All welded joints that will be exposed to view shall have the welds formed so the joint can be and shall be ground smooth. Unless otherwise specifically noted for items specified hereinafter, exposed welds shall be ground smooth so that connected surfaces are true to place, of same texture and generally imperceptible.
5. Should it be necessary to use cutting torch or welding arc on the inside of the building, the Contractor shall provide adequate fire extinguishers and other protective devices at the location of the work before any cutting or welding is started.

C. Joints in Metal Work: All jointing of metal members shall be designed to develop the full strength of the members at the connection. Where members are bolted together, not less than two bolts are to be used for each connection, unless otherwise noted.

D. Galvanizing: Any items specified under this section to be hot-dip galvanized shall conform to the following:

1. Rolled, pressed, or forged steel shapes, or steel plates, bars, or strips, 1/8" thick and heavier shall meet the requirements of ASTM Designation A 123-59.
2. Bolts and other fasteners shall meet the requirements of ASTM Designation A 153.
3. Iron or steel sheets lighter than 1/8" thickness shall meet the requirements of ASTM Designation A 93- 59T.
4. If the Engineer requires verification of weight of coating on any item delivered to the job site, he shall select sample and the Contractor shall effect test by the stripping method in accordance with ASTM Designation A 90. If the tested item conforms to coating requirements, the Owner will pay cost of test.
5. If the items fail to meet coating requirements, the Contractor shall pay cost of test. In event of failure, at the Contractor's option and expense, second and third specimens may be similarly selected and tested. Failure of tested item or items to meet coating requirements shall cause the entire lot to be rejected. All rejected items shall be replaced with items meeting the requirements at no additional cost to the Owner.

6.06 Metal Building: Furnish and erect at location shown, an expansion to a prefabricated steel building so designed and constructed to be weathertight, easily erected, and capable of being dismantled and re-erected. The building shall be self-supported and seamlessly connected to existing building to prevent leaks. The building shall be the project of a manufacturer regularly engaged in the fabrication of pre-engineered rigid frame type produced by Adel Steel, Inc., American Building Company, Butler Manufacturing Company, Ceco Building Systems, Inland Southern Corporation, Kirby Building Systems, Nucor Building Systems, OSTRO Steel Structures, Star Building System, Steel Building Solutions, Inc., Varco-Pruden Buildings or equal. The color will be selected by the Owner from manufacturer's standard color charts. The materials furnished by the manufacturer shall include the wind bracing, roofing, siding, anchor bolts, hardware, fasteners, caulk, ridge vent, gutters and downspouts, including the erection of same. All materials shall be manufacturer's standard, new, unused, free from defects and imperfections, and fabricated in workmanlike manner.

- A. Description: The building shall match the dimensions of the masonry structure shown on the Drawings. The building shall have a gable roof with a slope of 1" rise for each 12" of horizontal run. The building shall have vertical side and end walls as shown on the Drawings. Interior frames shall be clear span rigid frame. End wall columns and girts shall be the same depth. Building shall be equipped with gutters and downspouts.

Interior roof and wall bays shall be supported by a clear span, modular type frame. The building dimensions shall be as shown on the Drawings.

End roof and wall bays shall be supported by a load bearing column and beam end frame.

- B. Design: Frames shall consist of plates welded to form either constant depth or tapered sections. Outside flanges of frame columns shall be placed a nominal ¼" from side wall panel. All other interior frame columns shall be placed a nominal 8-1/8" from side wall panels. Top flange of all frames shall be a nominal 8-1/4" from roof panels. Interior columns for modular frames shall be either welded plate "H" sections or structural pipe.

Load bearing column and beam end frames shall consist of cold formed channel or welded plate sections as required.

Frames and other welded members shall be designed in accordance with the MBMA Low Rise Building Systems Manual requirements for items not covered by the American Institute of Steel Construction "Specifications for the Design, Fabrication, and Erection of Structural Steel for Buildings" latest edition shall apply.

All welding shall conform to the requirements of the American Welding Society. All welders shall be qualified for the type of weld performed.

Light gauge cold-formed members shall be designed in accordance with the requirements of American Iron and Steel Institute "Specifications for the Design of Light Gauge Cold-formed Steel Structural Members" latest Edition.

Air changing equipment shall provide a minimum of 12 air changes per hour.

- C. Design Loads: The building shall be designed for wind load as per ASCE 7 (latest edition) and 20-psf roof live load. Complete structural design analysis shall be submitted by the metal building manufacturer through the Contractor, to the Engineer.

- D. Material: Flange material for build-up sections shall be fabricated from material having a minimum yield stress of 50,000-psi.

Web material for build-up sections shall be fabricated from material having a minimum yield stress of 36,000-psi.

All light gauge cold-formed structural members shall be fabricated from steel having a minimum yield stress 50,000-psi.

High tensile bolts shall conform to the requirements of the American Society for Testing and Material Specifications A-325-71a. Bolts shall be electro-galvanize plated followed by supplementary di-chromate treatment applied by the dip process.

Machine bolts shall conform to the requirements of the American Society for Testing and Material Specification A-307-68. Bolts shall be electro-galvanize plated followed by a supplementary gold di-chromate treatment applied by the dip process.

Galvanized steel shall conform to the requirement of the American Society for Testing and Materials Specification A-525-71. The class of zinc coating shall be 1.25-ounce per square foot.

Diagonal brace rods shall be fabricated from steel conforming to the requirements of the American Society for Testing and Materials Specification (ASTM) A36-70a. All diagonal cable shall be fabricated from galvanized wire strand extra high strength grade with a minimum guaranteed proof load.

- E. Wall and Roof Covering: The configuration of the architecturally designed panel shall consist of 3 standard ribs and 1 lap rib. Ribs shall be spaced 1' on center. Net coverage of the panel shall be 3'. Each rib shall be a nominal 1¼" high. Standard material thickness shall be 26-gauge

The roof lap rib shall have a ¾" crown with a 1/8" × 3/32" deep groove to provide a receptacle for the mastic.

Wall panels shall have a minimum end lap of 4". Roof panels shall have a minimum end lap of 6". End laps shall occur only over a purlin or girt.

Panel substrate shall be Galvalume AZ50 coating in accordance with ASTM A792. Wall panels shall be coated with a fluoropolymer top coat containing not less than 70% polyvinylidene fluoride over primer with total DFT of 0.8-1.0-mil. The reverse side shall be coated with pigmented polymer. Exterior color to be selected by the Owner from the manufacturer's standard color chart.

- F. Trim: The ridge of the building shall be made weather-tight by the use of die-formed ridge panels. The ridge panels shall have the same standard rib configuration as the roof panel. Auxiliary ribs may be added in the center of the ridge panel to aid in the forming process.

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Gable ends of the building shall be made weathertight by use of a rake trim conforming in cross section to that shown on the plans. The trim shall provide an architecturally pleasing appearance and shall be pre-painted. At the eave, the rake trim shall be closed at the end with a plastic closure conforming in cross section and color to the rake trim.

The corner trim shall be a 90° formed trim to match color of end wall panels.

- G. Mastic: Standard mastic shall be preformed bead type meeting or exceeding Military Specification Mil-C-18969, Type 2, Grade B.

At roof side laps a permanently, pliable, 3/16" bead of mastic shall be placed in the mastic groove of the under lapping rib in a bed of constant cross section to ensure continuous contact of the mastic with the upper and lower panels.

At roof end laps 2 beads, 3/16" permanently, pliable mastic shall be applied 1" of center.

- H. Base Angle: Roof fasteners shall be a No. 14 by ¾" self-tapping bolt. The No. 14 fastener shall be zinc plated to a minimum thickness of 0.0010", with a clear chromatic dip post treatment. Washers shall be 5/8" O.D. plated steel with elastomer

sealer. Fastener shall have a type "AB" point, $\frac{3}{8}$ " hexagonal head, and shall be manufactured from materials meeting AISI No. C-1018. Fasteners shall be installed in the flat of the panel at a spacing of 1' on center except at end laps and terminal ends where the spacing shall be a nominal 6" on center.

Roof side lap fasteners shall be a No. 14 by $\frac{5}{8}$ " self-tapping bolt. The No. 10 shall be zinc-plated to a minimum thickness of 0.0010" with a clear chromatic dip post treatment. Washer shall be $\frac{1}{2}$ " O.D. plated steel with elastomer sealer. Fastener shall have a type "A" point, $\frac{5}{16}$ " hexagonal head and shall be manufactured from material meeting AISI No. C-1018. Fasteners shall be installed at $\frac{1}{3}$ point between purlins.

Standard fasteners for colored walls shall be a No. 14 by $\frac{3}{4}$ " self-tapping bolt, with heads and washers colored to match wall color. The No. 14 fastener shall be zinc plated to a minimum thickness of 0.0010" with a clear chromatic dip post treatment. Washers shall be $\frac{5}{8}$ " O.D. plated steel with elastomer sealer. Fastener shall have a type "AB" material meeting AISI No. C-1018. The fastener shall be installed in the flat of the panel at a spacing of 1' on center.

Wall panel side lap fasteners shall be blind rivets, colored to match panel color. Fasteners shall be spaced at $\frac{1}{3}$ points between girts.

- I. Paint: All steel surfaces of the structural framework shall be cleaned conforming to the requirements of Steel Structures Painting Council Specification SSPC-SP-2-63 and one shop coat of rust inhibiting Golden Tan chromate primer shall be applied. The paint shall be comparable to the performance requirements of the federal Specification TT-T-636D, and Mil-P-8585A. The primer coat thickness shall be one mil average. Wall and roof covering and trim color samples shall be submitted to the Engineer for Owner approval.
- J. Shop Drawings: Shall be submitted in accordance with the General Requirements section of these Specifications and shall show plan, sections, elevations, materials of construction, locations of anchor bolts, and erection information.
- K. Bonds: Building manufacturer shall furnish a 15 year bond for the walls and a 20 year bond for the roof.
- L. Insulation: Wall and roof insulation shall be 0.66-pound density fiberglass blanket with a minimum thickness of 3" with a 0.004 vinyl facing, U.L. rated, and have a minimum "U" value of 0.10.
- M. Erection: Building shall be erected where shown, and in accord with the building manufacturer's printed instructions.
- N. Steel Framing: The intent of this Specification is to establish general guidelines for the design, fabrication and erection of the light gauge cold-formed structural steel system.
Specific criteria and certain restrictions are also included herein. System shall conform to Specification for the Design of Cold-Formed Steel Structural Members, American Iron and Steel Institute.

1. Materials: Design, analysis and computation of Section properties shall be in conformance with the Specification for the Design of Cold-Formed Steel Structural Members of the American Iron and Steel Institute and comply with loading requirement of International Building Code 2006. Shop drawings shall show calculations and be sealed by a Professional Engineer licensed in Georgia.
 - a. Design, analysis and computation of Section properties shall be in conformance with the Specification for the Design of Cold-Formed Steel Structural Members of the American Iron and Steel Institute.
 - b. Technical tabulations of Section properties and load capacities shall indicate dimensions, steel characteristics and allowable stresses upon which computations are based.
 - c. Composite design systems shall incorporate a cementitious membrane facing attached to the studs through a series of shear connectors. Composite design shall not increase allowable axial loads or allowable bending strength. Composite design shall improve deflection characteristics only.
 - d. Metal lath for cementitious membrane facings shall be of the type and weight for the spacing of supports in accordance with the Specifications for Metal Lathing and Furring.
 - e. All steel members shall be galvanized or primed with rust inhibiting paint.
 - f. All 16 gauge and heavier painted structural members shall be formed from steel that corresponds to the requirements of ASTM A-570 with a minimum yield of 50 ksi.
 - g. All 16 gauge and heavier galvanized structural members shall be formed from steel that corresponds to the requirements of ASTM A-446, Grade D (minimum yield of 50 ksi).
 - h. All 18 gauge and lighter painted structural members shall be formed from steel that corresponds to the requirements of ASTM A-611, Grade C (minimum yield of 33 ksi).
 - i. All 18 gauge and lighter galvanized structural members shall be formed from steel that corresponds to the requirements of ASTM A-436, Grade A (minimum yield of 33 ksi).
2. Fabrication and Erection: Prior to the commencement of fabrication of framing, Contractor shall submit fabrication and erection drawings to Engineer for review.
 - a. Provide stud walls at locations indicated on plans as “shear walls” for frame stability and lateral load resistance. Such stud walls shall be braced as indicated on Drawings and Specifications. Additional studs shall be positioned to resist the vertical components as indicated on plans and specifications.

- b. At corners of stud walls provide 3 studs minimum located to provide surfaces for attachment of all interior and exterior facings.
- c. Provide web stiffeners at reaction points where indicated by Drawings and Specifications.
- d. All framing components shall be cut squarely or at an angle to fit squarely against abutting members. Members shall be held firmly in position until properly fastened.
- e. Pre-fabricated panels shall be square. Wire tying of framing components in structural applications is not permitted.
- f. Members comprising trusses shall be joined by welding.
- g. Joists shall be sized and spaced as shown on Drawings. Provide additional joists or "blocking" adjacent to exterior and interior walls, openings and elsewhere as necessary to provide support for ceiling construction as indicated by plans and specifications.
- h. Provide an additional joist under parallel partitions when the partition length exceeds $\frac{1}{2}$ the joist span and around all floor and roof openings which interrupt one or more spanning members, unless otherwise noted.
- i. Provide lateral bracing and bridging in wall, floor and roof systems to manufacturer's specifications or recommendations.
- j. Track shall be securely anchored to floor and overhead structure as indicated by Drawings and these Specifications. Axially loaded studs shall be seated squarely in the track with the stud web and flange abutting the track web, and all studs shall be plumbed and aligned and securely attached to the flanges or webs of both upper and lower tracks.
- k. Splices in axially loaded studs shall not be permitted.
- l. Vertical SLD connectors shall be used where required.

O. Sealants and Caulking:

- 1. Sealants: Sealant for exterior work shall be a 1 part silicone rubber meeting the requirements of Federal Specification TTS-001543 without primer. Prior to use of this material, the Contractor shall submit 2 copies of tests made by recognized testing laboratory certifying that sealants meet this Specification. Color shall match color of adjacent material.
- 2. Primer: Primers shall be furnished by the sealant manufacturer.
- 3. Caulking: Caulking for interior work shall be gun consistency. Compound shall be a non-staining gray. Caulking shall be "Tremco Caulking and Pointing Compound" by Tremco Manufacturing Company, "Architectural Grade" by P.R.C., "Architectural Grade" by Pecora, or equal.

4. Joint Back-up Strips: Strips shall be closed cell structure extruded rod by Tremco Manufacturing Company, P.R.C., or equal. Width of material shall be 1-½ times the width of joint. Depth of rod shall be same as width of joint, but in no case less than ¼".

P. Flashing and Sheet Metal:

1. Materials: Contractor shall furnish sheet metal items in 8' to 10' length. Single pieces less than 8' long may be used to connect to factory-fabricated inside and outside corners and at ends of runs. Factory fabricate corner pieces with minimum 36" legs. Provide accessories and other items essential to complete the sheet metal installation. These accessories shall be made of the same materials as the items to which they are applied. Fabricate sheet metal items of the materials specified below and to the gauge, thickness or weight shown in Table One at the end of this Section.
2. Finish: Exposed exterior aluminum sheet metal items shall have a baked-on, factory-applied color coating of polyvinylidene fluoride (PVF2) or other equivalent fluorocarbon coating applied after metal substrates have been cleaned and pretreated. Finish coating dry-film thickness shall be 0.8 to 1.3 mils, and color shall match adjacent materials.
3. Installation:
 - a. Requirements: Surfaces receiving sheet metal shall be plumb and true, clean, even, smooth, dry and free of defects and projections which might affect the application. Installation of items not shown in detail or not covered by Specifications shall conform to the applicable requirements of SMACNA ASMM, Architectural Sheet Metal Manual. Provide sheet metal flashing in the angles formed where roof decks abut walls, curbs, ventilators, pipes or other vertical surfaces and wherever indicated and necessary to make the work watertight. Join sheet metal items together as shown in Table Two at the end of this chapter.
 - b. Nailing: Contractor shall confine nailing of sheet metal generally to sheet metal having a maximum width of 18". Confine nailing of flashing to one edge only. Space nails evenly approximately ½" from edge and no more than 3" on centers, unless otherwise specified or indicated. Face nailing will not be permitted.
 - c. Flat Lock Seams: The finish shall not be less than ¾" wide.
 - d. Lap Seams: The overlap seams shall not be less than 3".
 - e. Loose Lock Expansion Seams: Seams shall not be less than 3" wide and shall provide a minimum 1" movement within the joint. Contractor shall completely fill the joints with the manufacturer specified sealant applied at not less than ⅛" thick bed.
 - f. Mechanical Fastening of Aluminum: Contractor shall use No. 12 aluminum alloy, sheet metal screws or other suitable aluminum

alloy or stainless steel fasteners. Drive fasteners in holes made with a No. 26 drill in securing side laps, end laps and flashings. Space fasteners 12" maximum on centers. Where end lap fasteners are required to improve closure, locate the end lap fasteners not more than 2" from the end of the overlapping sheet.

- a. Metal Surfaces: Contractor shall paint surfaces in contact with mortar, concrete or other masonry materials with alkali-resistant coatings such as heavy-bodied bituminous paint.
- b. Wood or Other Absorptive Materials: Surfaces that may become repeatedly wet and in contact with metal shall be painted with 2 coats of aluminum paint or a coat of heavy-bodied bituminous paint.
- c. Aluminum: Aluminum surfaces shall not directly contact other metals, stainless steel, zinc or zinc coating. Where aluminum contacts another metal, paint the dissimilar metal with a primer followed by 2 coats of aluminum paint. Where drainage from a dissimilar metal passes over aluminum, paint the dissimilar metal with a non-lead pigmented paint.
- d. Expansion and Contraction: Contractor shall provide expansion and contraction joints at not more than 32' intervals for aluminum and at not more than 40' intervals for other metals. Where the distance between the last expansion joint and the end of the continuous run is more than half the required interval, an additional joint shall be provided. Space joints evenly. Join extruded aluminum flashing stops and fascias by expansion and contraction joints evenly. Join extruded aluminum flashing stops and fascias by expansion and contraction joints spaced not more than 12' apart.
- e. Counterflashing: Except where indicated or specified otherwise, insert counterflashing in reglets located from 9" to 10" above roof decks, extend down vertical surfaces over upturned vertical leg of base flashings not less than 3". Fold the exposed edges of counterflashings $\frac{1}{2}$ ". Stepped counterflashings, if applicable, may be installed in short lengths or may be the preformed, 1-piece type. Provide end laps in counterflashings not less than 3" and make it weathertight with plastic cement. Lengths of metal counterflashings shall not exceed 10'. Form the flashings to the required shapes before installation. Factory-form the corners not less than 12" from the angle. Secure the flashings in the reglets with lead wedges, and space not more than 18" apart. On short runs, place wedges closer together. Fill calked-type reglets or raked joints which receive counterflashing with calking compound. Turn up the concealed edge of counterflashings built into masonry or concrete walls not less than $\frac{1}{4}$ " and extend not less than 2" into the walls. Install counterflashing to provide a spring action against base flashing.

- f. Fascias: Contractor shall prefabricate fascias in the shapes and sizes indicated in the Drawings and in lengths not less than 8'. Extend flange at least 4" onto roofing. Provide prefabricated, mitered corners for internal and external corners.
- g. Edge Strip: Contractor shall hook the lower edge of fascias at least 3/4" over a continuous strip of the same material bent outward at an angle not more than 45° to form a drip. Nail hook strip to a wood nailer at 6" maximum on centers. Where fastening is made to concrete or masonry, use screws spaced 12" on centers driven in expansion shields set in concrete or masonry. Where necessary, install strips over 1/16" thick compatible spacer or washers.
- h. Joints: Contractor shall leave open the section ends of flashing stops and fascias 1/4" and backed with a formed flashing plate, mechanically fastened in place, and lapping each section end a minimum of 4" set laps in plastic cement. Face nailing will not be permitted. Install prefabricated aluminum fascias in accordance with the manufacturer's printed instructions and details.
- i. Metal Drip Edge: Contractor shall provide a metal drip, designed to allow run-off to drip free of underlying construction at overhangs. Extend back from the edge not more than 3" and secure with compatible fasteners spaced not more than 10" on center along upper edge.

TABLE 6.06 P- 1: SHEET METAL WEIGHTS, THICKNESSES AND GAUGES

<i>Sheet Metal Items</i>	<i>Aluminum Inch</i>
Covering on minor flat, pitched or curved surfaces	.40
Scupper lining	.32
Strainers, wire diameter or gauge	.144
Flashings:	
▪ Cap (Counterflashing)	.32
▪ Overhang	--
▪ Valley	.32
Fascia:	
▪ Extrusions	.075
▪ Sheets, corrugated	.032
▪ Sheets, smooth	.050
▪ Edge strip	.050
Joint cover plates (See Table Two)	.032

<i>TABLE 6.06 - P-2: SHEET METAL JOINTS TYPE OF JOINT</i>		
<i>Item Designation</i>	<i>Steel, Zinc-Coated</i>	<i>Aluminum</i>
Overhang flashing	1" flat	1" flat
	Locked, cleated	Locked, cleated
	1" loose locked, expansion joint cleated	1" loose locked, sealed expansion joints, cleated
Edge strip	Butt	Butt
Sheet, smooth	Butt with ¼" space	Butt with ¼" space

Q. Metal Door Frames:

1. Shop Drawings: Submit shop drawings for work fabricated under this Section in accordance with the General Requirements section of these Specifications. Drawings shall show elevations, gauges of materials, and sections through frames indicating adjacent materials and anchorage.
2. Products: Unit type full welded door frames shall be fabricated to details and profiles shown of cold rolled buck steel.
 - a. Manufacturer: Hollow metal door frames shall be as manufactured by Amweld Metal Door and Frame Company, Habersham Metal Products Company, or equal.
 - b. Gauges: Frames shall be 16 USS gauge.
 - c. Sizes: Frame sizes shall be as shown on the Drawings.
 - d. Construction:
 - i. Head and jamb intersections including angles, molds, returns and miters, shall be continuously welded and ground off smooth and flush.
 - ii. Steel reinforcements, minimum 1/8" x 1 1/2" x 9", shall be provided for hardware cutouts to ensure rigid construction, and shall be spot welded to the inside surface of the jambs over which weld 26 gauge galvanized plaster guards.
 - iii. Removable steel angle spreaders shall be welded to the bottom to ensure parallel alignment.
 - iv. Provide minimum of three, 16 gauge x 2" x 10" adjustable corrugated steel anchors per jamb except as required for labeled frames. Jambs at columns shall be provided for transoms at a maximum spacing of 24" O.C.
 - v. Removable stops of 14-gauge steel shall be provided where indicated on Drawings for securing glass and grilles. Stops

shall be secured to frames with countersunk oval head Phillip's head sheet metal screws at 9" O.C.

- vi. Each jamb shall be provided with sill clips welded to the frame and punched with two $\frac{3}{8}$ " holes for anchoring. Unless specifically indicated otherwise on the Drawings, frames shall extend down to structural slabs.
 - vii. Holes shall be drilled and tapped from template to receive butts, closers, and lock strikes. Templates for this purpose shall be furnished to the frame manufacturer by the hardware manufacturer.
 - viii. Painting: Frames shall be thoroughly cleaned of oil, grease, dirt, and filled to ensure a smooth finish, and shall be given factory baked-on prime coat of rust inhibitive paint.
3. Execution: Doorframes shall be stored on jobsite in an upright position, under cover, on wooden sills to protect frames from rust, stain, and damage prior to installation. Attach sill clips on frames to concrete slabs with 5/16" expansion bolts operating in expansion shields. Secure jambs to steel studs. Where frames are installed in masonry walls, the space between masonry and frame shall be filled with mortar. Erect frames plumb and in perfect alignment.

R. Metal Doors:

- 1. Shop Drawings: Submit shop drawings for work fabricated under this Section in accordance with the General Requirements section of these Specifications. Drawings shall show elevations, gauges of materials, and sections.
- 2. Products: Hollow metal doors shall be as manufactured by Amweld Metal Door and Frame Company, Habersham Metal Products Co., or equal.
 - a. Flush type doors shall be Amweld Metal Door and Frame Company, Habersham Metal Products Company, or equal seamless door with face sheets of No. 16 U.S. gauge cold rolled, leveled sheet metal. Doors shall be covered by a 10 year performance warranty.
 - b. Doors shall be mortised reinforced for hardware and shall be drilled and tapped at the factory from templates to receive items of mortised hardware. Templates shall be provided by hardware manufacturer. Surface applied items shall be reinforced, but drilling and tapping shall be done in the field.
 - c. Tops and bottoms of doors shall be closed with not less than 18 gauge channels. Tops of doors shall be completely closed.
 - d. Doors shall be given one factory baked-on prime coat of rust inhibitive paint. Prior to painting, all materials shall be thoroughly cleaned of oil, grease, dirt, and filled to assure a smooth finish.

3. Door Hardware: Contractor shall furnish and deliver to the jobsite all items of finish hardware not specified in other Sections. Hardware shall be a perfect fit, uniform in color, free from imperfections affecting serviceability or marring appearance. Locks shall be keyed to Owner's master. Hardware shall be equal in quality, design and function to the hardware listed below. Hardware manufacturers' names are given as a standard only and equal hardware will be acceptable from Corbin, Sargent, Von Duprin, or equal. Hardware finish shall be US32D Standard.

a. Door A:

	<i>Item</i>	<i>Quantity</i>	<i>Manufacturer Item No.</i>
a.	1½ pr butts	3	Hager BB 1199, Stanley FBB199, or equal, 4 ½ x 4 ½, US 32D
b.	Silencers	3	Hager 307D, Ives SR64, or equal
c.	Closer	1	Dorma 8618, Hager 5100, or equal
d.	Threshold	1	Hager 431S, Reese S245, or equal aluminum with insert
e.	Weatherstripping	3	Hager 891SS, Reese 825, or equal
f.	Exit Device	1	Sargent 8700, Corbin Russwin ED5000, or equal
g.	Lockset	1	Sargent 8200 mortise, 626 CPC trim, Corbin Russwin ML2000 mortise, 626C trim, or equal with lever trim, doors marked with asterisk (*) to have keypad door locks
h.	Kickplate	1	ASSA Abloy K1050, Ives 8400 or equal

b. Doors B and C:

	<i>Item</i>	<i>Quantity</i>	<i>Manufacturer Item No.</i>
a.	1½ pr butts	3	Hager BB 1199, Stanley FBB199, or equal, 4 ½ x 4 ½, US 32D
b.	Silencers	3	Hager 307D, Ives SR64, or equal
c.	Closer	1	Dorma 8618, Hager 5100, or equal
d.	Lockset*	1	Sargent 8200 mortise, 626 CPC trim, Corbin Russwin ML2000 mortise, 626C trim, or equal with lever trim
e.	Kickplate	1	ASSA Abloy K1050, Ives 8400 or equal

**Maintenance area and blower building interior doors to have passage locksets.*

4. Execution: Doors shall be stored indoors, in a horizontal position, on wooden sills and covered to protect from damage prior to installation. Installation shall be plumb and true and doors shall be adjusted to operate free and easily. Locks shall be keyed to City master. Provide wall stops for all doors opening to a wall, Hager 255W, Ives WS11X, or equal.
- S. Overhead Doors: Contractor shall furnish and install the overhead doors as shown and specified. Doors shall be Overhead Door Co. model 625, Wayne Dalton model 800C, or equal. Doors shall be fabricated for installation as shown on the Drawings. Submit shop drawings for work fabricated under this Section in accordance with the General Requirements section of these Specifications before fabrication. Doors shall be furnished complete with hardware and accessories.
1. Performance Requirements:
 - a. Wind Loads: Design door assembly to withstand wind/suction load of 20 psf (958 Pa) without damage to door or assembly components in conformance with ASTM E 330.
 - b. Operation: Design door assembly, including operator, to operate for not less than 20,000 cycles.
 - c. Through Curtain Sound Rating:
 - i. Sound Rating: STC-28 (STC-30+ with HZ noise generator) as per ASTM E 90
 - ii. Installed System Sound Rating: STC-21 as per ASTM E 90
 - d. Air Infiltration: Meets ASHRAE 90.1 and IECC 2012/2015 C402.4.3 Air leakage <1.00 cfm/ft².
 2. Construction:
 - a. Curtain: Interlocking roll-formed slats as specified:
 - i. Endlocks shall be attached to each end of alternate slats to prevent lateral movement.
 - ii. Shall be flat profile type F-265i for doors up to 40' wide
 - iii. Shall be front slat fabricated of 24 gauge galvanized steel and back slat fabricated of 24 gauge galvanized steel
 - iv. Slat cavity shall be filled with CFC-free foamed-in-place, polyurethane insulation with:
 - o R-Value: 7.7
 - o U-Value: 0.13
 - o Sound Rating: STC-21
 - b. Finish:
 - i. Slats and hood shall be galvanized in accordance with ASTM A 653 and receive rust-inhibitive, roll coating

process, including 0.2 mils thick baked-on prime paint and 0.6 mils thick baked-on polyester top coat. Contractor shall submit color samples to Engineer for Owner's selection.

- ii. Non-galvanized exposed ferrous surfaces shall receive one coat of rust-inhibitive primer.
 - a. Weatherseals: Vinyl bottom seal and internal hood seals, interior and exterior EPDM triple-seal finned guide, lintel weatherseal shall be provided.
 - b. Bottom Bar: Two galvanized steel angles minimum thickness 1/8" bolted back to back to reinforce curtain in the guides shall be provided.
 - c. Guides: Three structural steel angles with finish with iron/black powder
 - d. Brackets: Galvanized steel to support counterbalance, curtain and hood
 - e. Counterbalance: Helical torsion spring type housed in a steel tube or pipe barrel, supporting the curtain with deflection limited to 0.03" per foot of span shall be provided. Counterbalance is adjustable by means of an adjusting tension wheel.
 - f. Hood: Provide with internal hood baffle weatherseal and 24 gauge galvanized steel with intermediate supports as required
 - g. Electric Motor Operation: Provide UL listed electric operator, size as recommended by manufacturer to move door in either direction at not less than 2/3' nor more than 1' per second with the following:
 - i. Electric sensing edge protection
 - ii. Push-button operated control stations with open, close and stop buttons and surface mounted controls for interior location
 - iii. Motor voltage shall be 115/230 single phase, 60 Hz.
 - iv. Operator shall be Overhead Door model RHX, Genie GCL-GH, or equal heavy duty commercial operator or equal.
 - v. Provide electric motor operators for existing overhead doors in sludge dewatering building.
 - h. Locking: Chain keeper locks for chain hoist operation
 - i. Wall Mounting Condition: Face-of-wall mounting
3. Heavy Duty Sectional Door Operator: Operator shall be Model RHX True Gear Head, Genie GCL-GH or equal, type door operator and meet the following conditions:

- a. Electric Motor: Motor shall be UL listed and washdown rated – NEMA 4 / NEMA 4X construction. The operator shall be NEMA ICS 6 Type 4X water tight dust tight environment with corrosion resistance.
 - i. Reduction: Primary reduction is worm gear in oil bath. Secondary reduction is by chain and sprocket on trolley model only.
 - ii. Duty Cycle: Motor shall accommodate heavy usage, up to 60 cycles per hour under a large constant load.
 - o Brake: DC disc type with selectable progressive braking for smooth stopping
 - o Clutch: Adjustable torque-limiter type
 - o Limit System: LimitLock limit system, magnetic type providing absolute positioning with push to set and remote setting capabilities. Limit system shall remain synchronized with the door during manual operation and supply power interruptions.
- b. Control System: Microprocessor based with relay motor controls on a single board. System incorporates a 16 character Liquid Crystal Display (LCD) to display the system status and shall include the following:
 - iii. Capable of monitoring and reporting on a variety of operating conditions, including: current operating status, current command status, motor movement status, current error status (if applicable), hoist interlock status (if applicable), external interlock status, and 24VDC status;
 - iv. A delay-on-reverse operating protocol;
 - v. Maximum run timers in both directions of travel that limit motor run time in the event a clutch-slips or some other problem occurs;
 - vi. Provisions for the connection of a 2-wire monitored photo-eye or a 2-wire monitored edge sensor, as well as non-monitored 2-wire sensing edges, photo-eyes or other entrapment protection devices;
 - vii. Control action will be constant contact close until a monitored entrapment device is installed, allowing for selection of momentary contact.
 - viii. Provisions for connection of single and/or 3-button control stations;
 - ix. Provisions for connection of an external 3-wire radio controls and related control devices;

- x. On board open, close and stop control keys for local operation;
 - xi. CodeDodger radio receiver that is dual frequency cycling at 315 Mhz and 390 Mhz capable of storing 250 single button and/or 250 Open-Close-Stop transmitters with the ability to add and/or delete transmitters individually, identify and store activating transmitter IDs.
 - o Mounting as required
 - o Release: Release shall be a pull and hold type mechanism with single cable operation and an integrated interlock switch on hoist units. Release shall consist of a manual disconnect door arm on trolley units.
 - o Hoist: Chain hoist consists of chain pocket wheel, chain guard and smooth hand chain on hoist units.
 - o Entrapment Protection: Control system shall have provisions to connect monitored entrapment protection devices such as monitored electric sensing edge, or monitored photo-eye and to provide constant contact close control operation in lieu of such devices.
- b. Execution:
- xii. Doors shall be stored indoors, in a horizontal position, on wooden sills and covered to protect from damage prior to installation.
 - xiii. Install in accordance with manufacturer's instructions
 - xiv. Installation shall be plumb and true and doors shall be adjusted to operate free and easily.
 - xv. Contractor shall install perimeter trim and closures.
 - xvi. Contractor shall instruct Owner's personnel in proper operating procedures and maintenance schedule.
 - xvii. Contractor shall test for proper operation and adjust as necessary to provide proper operation without binding or distortion.
 - xviii. Contractor shall adjust hardware and operating assemblies for smooth and noiseless operation.
4. Warranty: Manufacturer's door and operator system warranty for 3 years or 20,000 cycles, whichever occurs first, for all parts and components shall be provided.

6.07 Galvanized Steel Carport (Alt-1):

Furnish and erect at location shown, an expansion to a prefabricated galvanized steel carport so designed and constructed to be easily erected, and capable of being dismantled and re-erected. The building shall be self-supported. The building shall be the project of a manufacturer regularly engaged in the fabrication of pre-engineered carports such as American Steel Structures, or equal. The color will be selected by the Owner from manufacturer's standard color charts. The materials furnished by the manufacturer shall include the wind bracing, roofing, siding, base clips, anchor bolts, hardware and fasteners. All materials shall be manufacturer's standard, new, unused, free from defects and imperfections, and fabricated in workmanlike manner. Details for each site are shown in table 6.08 below.

TABLE 6.07-1: GALVANIZED STEEL CARPORT				
Well:	Well 1 - Forsyth	Well 2 - Homer	Well 3 - Industrial	Well 4 - Hammock
Style:	RV Carport			
Nominal Dimensions:	26'x35'	26'x35'	26'x35'	28'x40'
Colors:	As chosen by City during Shop Drawing Phase			
Roof Style:	Vertical Style			
Roof Pitch:	3 / 12			
Roof Overhang:	6"			
Eave Support:	Truss			
Leg Style:	Double Legs			
Framing Gauge:	12-Gauge			
Brace:	2'			
Wind Warranty:	140MPH / 35PSF based on 3 second gust			
Side Height:	16'			
Side Panels Height:	6'			
Side Panel Orientation:	Vertical			
Front and Back End Panel Height:	6' Gable			
Front and Back End Siding Orientation:	Vertical			
Approximate Peak Height:	19'2"			
Warranty:	10 Year			

6.08 Galvanized Steel Garage (Alt-2):

Furnish and erect at location shown, an expansion to a prefabricated galvanized steel garage so designed and constructed to be easily erected, and capable of being dismantled and re-erected. The building shall be self-supported. The building shall be the project of a manufacturer regularly engaged in the fabrication of pre-engineered garages such as American Steel Structures, or equal. The color will be selected by the Owner from manufacturer's standard color charts. The materials furnished by the manufacturer shall include the wind bracing, roofing, siding, base clips, anchor bolts, hardware and fasteners. All materials shall be manufacturer's standard, new, unused, free from defects and imperfections, and fabricated in workmanlike manner. Details for each site are shown in table 6.09 below.

TABLE 6.08-1: GALVANIZED STEEL GARAGE				
Well:	Well 1 - Forsyth	Well 2 - Homer	Well 3 - Industrial	Well 4 - Hammock
Style:	Garage			
Nominal Dimensions:	26'x35'	26'x35'	26'x35'	28'x40'
Colors:	As chosen by City during Shop Drawing Phase			
Roof Style:	Vertical Style			
Roof Pitch:	3 / 12			
Roof Overhang:	6"			
Eave Support:	Truss			
Leg Style:	Double Legs			
Framing Gauge:	12-Gauge			
Brace:	2'			
Wind Warranty:	140MPH / 35PSF based on 3 second gust			
Side Height:	14'			
Side Panels Height:	Fully Enclosed			
Side Panel Orientation:	Vertical			
Front and Back End Panel Height:	Fully Enclosed			
Front and Back End Siding Orientation:	Vertical			
Approximate Peak Height:	17'2"			
Warranty:	10 Year			
Roll-up Doors	3 - 12'x12'			

Walk-In Doors	1 – 36”x 80” Steel with Window, Exit Bar and Kick Plate
Lighting	Per Steel Building in Base Bid
Insulation	2 inch fiberglass along all walls and roof
HVAC	Per Steel Building in Base Bid

6.09 Vapor Barrier: Contractor shall furnish and install 15 mil vapor barrier under slabs where shown on the Drawings. Barrier shall be W.R. Meadows, Inc., Perminator, Insulation Solutions, Inc., Viper Vaporcheck II or equal.

A. Plastic Vapor Retarder: Vapor retarder membrane shall be manufactured from virgin polyolefin resins, and when tested according to all requirements of ASTM E1745, shall meet the following minimum performance requirements:

1. Maximum Water Vapor Permeance (ASTM E154 Sections 7, 8, 11, 12, 13, by ASTM E96, Method B or ASTM F1249)
 - a. As received: 0.0063 perms
 - b. After Wetting and Drying: 0.0052 perms
 - c. Resistance to Plastic Flow and Temperature: 0.0057 perms
 - d. Effect Low Temperature and Flexibility: 0.0052 perms
 - e. Resistance to Deterioration from Organisms and Substances in Contacting Soil: 0.0052 perms
2. Puncture Resistance (ASTM D1709): >3,200 grams
3. Tensile Strength ASTM E154, Section 9: 72 pound force/inch

B. Accessories:

1. Seam Tape: High Density Polyethylene Tape with pressure sensitive adhesive; minimum width 4"
2. Pipe Collars: Construct pipe collars from vapor retarder material and pressure sensitive tape per manufacturer's instructions.

C. Surface Preparation: Prepare surfaces in accordance with manufacturer's instructions. Level, tamp, or roll earth or granular material beneath the slab base.

D. Examination: Examine surfaces to receive membrane. Notify Engineer if surfaces are not acceptable. Do not begin surface preparation or application until unacceptable conditions have been corrected.

E. Application:

1. Install the vapor retarder membrane in accordance with manufacturer's instructions and ASTM E 1643-98.
2. Unroll vapor retarder with the longest dimension parallel with the direction of the pour.
3. Lap vapor retarder over footings and seal to foundation walls.
4. Overlap joints 6" and seal with manufacturer's tape.
5. Seal all penetrations (including pipes) with manufacturer's pipe boot.
6. No penetration of the vapor retarder is allowed except for reinforcing steel and permanent utilities.
7. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6" and taping all 4 sides with tape

6.10 Heating, Ventilation and Air Conditioning:

- A. Scope: Provide a complete, functional heating, ventilation and air conditioning system as shown on the Drawings or specified herein.
- B. Reference to Other Sections: The following work is specified under other Sections, unless otherwise noted on Drawings or specified hereinafter:
 1. Electrical wiring
 2. Painting
- C. Codes and Reference Specifications: Comply with the following publications:
 1. Refrigeration Equipment: ASHRAE "Safety Code for Mechanical Refrigeration" ANSI B9.1
 2. Local heating, ventilation and air conditioning and electrical codes
 3. All electrical equipment field of factory installed shall be UL listed.
- D. Noise: When in operation, system shall be free from objectionable noise and vibration.
- E. Guarantee: Guarantee shall include prompt repair of leaks and refrigerant and oil lost through leaks.
- F. Shop Drawings:
 1. Submit for approval complete performance data and drawings on the following items in accordance with the General Requirements section of these Specifications:
 - a. Electric unit heaters
 - b. Exhaust fans
 - c. Louvers
 2. Information on submittal data pertaining to specific equipment features, performance, arrangement, accessories and space limitations specified or

shown on drawings shall be underlined or encircled. Such information which does not appear on manufacturer's standard literature shall be added in preparing submittal data.

G. Maintenance and Operating Instructions:

1. Submit to the Engineer, maintenance data on all equipment requiring maintenance in accordance with the General Requirements section of these Specifications.
2. Instruct the Owner's representative in operation and maintenance of the system.
3. Start-up and adjustment of heating units shall be done during cold weather, of cooling units during hot weather.

H. Space Conditions:

1. All material shall fit the space available. Verify dimensions and clearances at building before commencing work.
2. Maintain maximum headroom and accessibility to equipment consistent with requirement of the drawings and specifications.
3. Minor deviations from drawings, required by space limitations shall be made at no additional cost, subject to Engineer's approval.

I. Equipment and Materials:

1. Exhaust Fans: Exhaust fans manufactured by Greenheck, Aerovent or equal and shall be rated as shown on the Drawings and as specified.
2. Louvers: Louvers shall be as manufactured by Ruskin, United Enertech or equal, be weatherproof, have automatic inlet and be of the size shown on the Drawings. Free area of the louvers shall be 40% minimum. Louvers shall be provided with insect/bird screens. Finish shall match window frames.
3. Electric Unit Heaters: Suspended type, and wall mount fan-forced electric unit heaters manufactured by Q'Mark, Markel, Chromalox or equal shall be installed as shown on the Drawings, and as specified. Units shall have heating capacity shown on the Drawings. Heaters shall be provided and installed with ceiling/wall mount bracket, wall mounted thermostat and 3-pole disconnect switch.

J. Foundations and Supports: Provide foundations, supports and means of attachment to structure for all equipment furnished under this section unless otherwise noted or specified.

K. Installation and Functions:

1. Manufacturer's Recommendations: Install materials and equipment specified in this section in compliance with current recommendations of the manufacture.

2. Installation Details: Install equipment complete with all components, services and connections for safe operation and compliance with requirements of the drawings and specifications.
3. Starters: Overload elements shall be of the proper size to protect motors in accordance with the N.E.C.
4. Condensate Lines: All interior condensate lines shall be insulated and piped outside of the building. Discharge shall be at least 6" above grade, turned down 90° and be in a conspicuous location.
5. HVAC Schedule: (see Drawings).

6.11 Specialties:

- A. Desk: Provide one double pedestal metal desk, 5'-0" W × 2'-6" D with plastic laminate flakeboard top, lockable center drawer, 3 standard box drawers on the left and box over file drawer on the right. Baked-on enamel finish shall be black with walnut colored laminate top. Desk shall be "Metro Series" by Hon, "Elevation Series" by High Point Furniture Industries, or equal.
- B. Desk Chair: Provide one multi task, swivel desk chairs with fully welded, one-piece frame and base construction, foam back and arm rests, lumbar support and pneumatic height adjustment. Chair color to be navy with black base and frame. Chairs to be Hon HVL601, High Point Furniture Industries 1007, or equal.
- C. File Cabinet: Provide one four drawer, letter size file cabinet with lock and one 4-drawer, legal size cabinet with lock. Cabinets to be full suspension of steel construction and have a baked-on enamel finished in black color. Cabinets to be "210 Series" by Hon, "Elevation Series" by High Point Furniture Industries, or equal.
- D. Guest Arm Chair: Provide 2 sledbase guest chairs. Chair color is navy with black frame. Chairs to be "Sensible Seatins" by Hon, 1004 by High Point Furniture Industries, or equal.
- E. Bookcase: Provide one 48" width × 84" height square edge abrasion resistant thermal fused laminate bookcase. Color is to be walnut. Bookcase to be "Value Series" by Hon, "Elevation Series" by High Point Furniture Industries, or equal.
- F. Fire Extinguishers: Contractor shall provide 5 dry chemical fire extinguishers to be mounted as instructed by the Owner. Dry chemical extinguishers shall be 10% capacity rated for Class A, B, C fires. Shell material shall be enameled steel. Extinguishers shall be wall-mounted in cabinet as shown on the Drawings.
 1. Submittals: Shop drawings showing details of extinguishers shall be submitted to the Engineer in accordance with the General Requirements section of these Specifications.
 2. Execution: Installation shall be in strict accordance with reviewed shop drawings.

- G. Safety Shower: Contractor shall furnish and install where shown on the Drawings self-draining, safety shower with eye wash, Guardian Model G1941, Haws 8300.158, or equal.
 - H. Miscellaneous Furnishings: The Contractor shall supply all office furnishings as specified and as shown on the Drawings.
 - I. Plaque: The Contractor shall furnish and install on the building as directed by the Engineer, one anodized aluminum plaque sized as indicated on the Drawings. The plaque shall be a simple design and shall bear inscriptions in raised letters as shown on the Drawings. The Contractor shall submit detailed full scale drawings to the Engineer showing the inspection as directed and indicating clearly the means for attaching the plaque to the wall. No work shall be done until the detailed drawing and rubbing have been approved by the Owner.
 - J. Water Heater: Contractor shall furnish and install a water heater in the maintenance building where shown on the Drawings meeting the following:
 - 1. Description: 199,000 BTU gas, tankless water heater, continuous, maximum flow up to 10 gpm
 - 2. Model: AO Smith CR-199, Takagi H3H Series, or equal
 - K. Safety Ring Buoy: Contractor shall provide one safety ring buoy per basin for a total of 6 safety ring buoys. The buoy shall be equipped with a 90' highly-visible polypropylene floating rope that functions as a throw line. The buoys shall be manufactured by Stearns, Kemp USA, or equal.
- 6.12 Payment: No separate payment will be made for the work of this Section. The cost of the work, and all costs incidental thereto, shall be included in the price bid for the item to which the work pertains.

