installation.

B. Store all roofing materials in a dry place, on pallets or raised platforms, out of direct exposure to the elements until time of application. Store materials at least 4 inches above ground level and covered with "breathable" tarpaulins.

C. Stored in accordance with the instructions of the manufacturer prior to their application or installation. Store roll goods on end on a clean flat surface except store KEE-Stone FB 60 rolls flat on a clean flat surface. No wet or damaged materials will be used in the application.

D. Store at room temperature wherever possible, until immediately prior to installing the roll. During winter, store materials in a heated location with a 50 degree F (10 degree C) minimum temperature, removed only as needed for immediate use. Keep materials away from open flame or welding sparks.

E. Avoid stockpiling of materials on roofs without first obtaining acceptance from the Architect/Engineer.

F. Adhesive storage shall be between the range of above 50 degree F (10 degree C) and below 80 degree F (27 degree C). Area of storage shall be constructed for flammable storage.

1.9 COORDINATION

A. Coordinate Work with installing associated metal flashings as work of this section proceeds.

1.10 PROJECT CONDITIONS

A. Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.11 WARRANTY

A. Upon completion of the work, provide the Manufacturer's written and signed Edge-To-Edge NDL System Warranty, warranting that, if a leak develops in the roof during the term of this warranty, due either to defective material or defective workmanship by the installer, the manufacturer shall provide the Owner, at the Manufacturer's expense, with the labor and material necessary to return the defective area to a watertight condition including Garland Metal Components.
   1. Warranty Period:
      a. 20 years from date of acceptance.

B. Installer is to guarantee all work against defects in materials and workmanship for a period indicated following final acceptance of the Work.
   1. Warranty Period:
      a. 5 years from date of acceptance.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Garland Company, Inc. (The); 3800 E. 91st St., Cleveland, OH 44105. ASD. Toll Free: 800-321-9336. Phone: 850-274-9054. Fax: 216-641-0633. Web Site: www.garlandco.com. Email: dhammond@garlandind.com **OR APPROVED EQUAL**

B. Requests for substitutions will be considered in accordance with provisions of Section 01600.

C. The Products specified are intended and the Standard of Quality for the products required for this project. If other products are proposed the bidder must disclose in the bid the manufacturer and the products that they intend to use on the Project. If no manufacturer and products are listed, the bid

may be accepted only with the use of products specified.

1. Bidder will not be allowed to change materials after the bid opening date.
2. If alternate products are included in the bid, the products must be equal to or exceed the products specified. Supporting technical data shall be submitted to the Architect/ Owner for approval prior to acceptance.
3. In making a request for substitution, the Bidder/Roofing Contractor represents that it has:
   a. Personally investigated the proposed product or method, and determined that it is equal or superior in all respects to that specified.
   b. Will provide the same guarantee for substitution as for the product and method specified.
   c. Will coordinate installation of accepted substitution in work, making such changes as may be required for work to be completed in all respects.
   d. Will waive all claims for additional cost related to substitution, which consequently become apparent.
   e. Cost data is complete and includes all related cost under his/her contract or other contracts, which may be affected by the substitution.
   f. Will reimburse the Owner for all redesign cost by the Architect for accommodation of the substitution.
4. Architect/ Owner reserves the right to be the final authority on the acceptance or rejection of any or all bids, proposed alternate roofing systems or materials that has met ALL specified requirement criteria.
5. Failure to submit substitution package, or any portion thereof requested, will result in immediate disqualification and consideration for that particular contractors request for manufacturer substitution.

2.2 COLD APPLIED 2-PLY SOLVENT FREE ASPHALT ROOFING - STRESSPLY, OPTIMAX, OR VERSIPLY

A. Nailable Base Sheet: One ply fastened to the deck per wind uplift calculations.
   1. VersiPly 40:

B. Polyisocraynate rigid insulation to meet current building code r-value requirements

C. Interply insulation adhesive: Insul-Lock HR applied to layers of polyisocryanate

D. Base (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive:
   1. StressBase 80:

E. Modified Cap (Ply) Sheet: One ply bonded to the prepared substrate with interplay adhesive.
   1. VersiPly Mineral:

F. Interply Adhesive: (Layer 1 and 2)
   1. Green-Lock Membrane Adhesive:

G. Flashing Base Ply: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
   1. StressBase 80:

H. Flashing Cap (Ply) Sheet: One ply bonded to the prepared substrate with Interply Adhesive: except torch sheet.
   1. VersiPly Mineral:

I. Flashing Ply Adhesive:
   1. Green-Lock Flashing Adhesive:

J. Surfacing: Requires 30 days wait before applying.
   1. Surface Coatings

a. Garla-Brite:

2.3 ACCESSORIES:

A. Roof Insulation: In accordance with Section 07220.

B. Roof Coverboard: Provide G-P Gypsum DenDeck Prime

C. Glass Fiber Cant - Glass Cant: Continuous triangular cross Section made of inorganic fibrous glass used as a cant strip as recommended and furnished by the membrane manufacturer.

2.4 EDGE TREATMENT AND ROOF PENETRATION FLASHINGS

A. Manufactured Flashing Ply: R-MER Ply galvalume steel and modified membrane roof termination/flashing system comprised of a flexible, tie-in membrane, factory-bonded within a watertight, mechanical seal to a galvalume steel vertical flashing or fascia reveal profile. Siliconized modified polyester, epoxy primer baked both sides. Modified membrane is a 180 mil, Styrene-Butadiene-Styrene SBS (Styrene-Butadiene-Styrene) rubber modified membrane reinforced with a dual fiberglass scrim.
1. Tensile Strength, ASTM D 5, 147
   a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 210 lbf/in CMD 210 lbf/in
   b. 50 mm/min. @ 23 +/- 3 deg. C MD 36.75 kN/m CMD 36.75 kN/m
2. Tear Strength, ASTM D 5147
   a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 250 lbf CMD 250 lbf
   b. 50 mm/min. @ 23 +/- 3 deg. C MD 1112 N CMD 1112 N
3. Elongation at Maximum Tensile, ASTM D5147
   a. 2 in/min. @ 73.4 +/- 3.6 deg. F MD 6.0% CMD 6.0%
   b. 50 mm/min. @ 23 +/- 3 deg. C MD 6.0% CMD 6.0%
4. Low Temperature Flexibility, ASTM D5147: Passes -30 deg. F (-34 deg. C)
5. Coating Properties:
   a. PencilHardness, NCCA II-2 - ASTM D3363, F-H
   b. Bend, NCCA II-19, ASTM D 4145, 2-T
   c. Adhesion / Cross-Hatch, ASTM D3359, no loss of adhesion
   d. Gloss (60 deg. angle), ASTM D 523, 90 +/- 5%
   e. Reverse Impact, ASTM D 2794no cracking or loss of adhesion
   f. Nominal Thickness, ASTM D 1005, primer and topcoat 1.0 mils.

B. Flashing Boot - Rubbertite Flashing Boot: Neoprene pipe boot for sealing single or multiple pipe penetrations adhered in approved adhesives as recommended and furnished by the membrane manufacturer.

C. Vents and Breathers: Heavy gauge aluminum and fully insulated vent that allows moisture and air to escape but not enter the roof system as recommended and furnished by the membrane manufacturer.

D. Pitch pans, Rain Collar 24 gauge stainless or 20oz (567gram) copper. All joints should be welded/soldered watertight. See details for design.

E. Drain Flashings should be 4lb (1.8kg) sheet lead formed and rolled.

F. Plumbing stacks should be 4lb (1.8kg) sheet lead formed and rolled.

G. Liquid Flashing - Tuff-Flash: An asphaltic-polyurethane, low odor, liquid flashing material designed for specialized details unable to be waterproofed with typical modified membrane flashings.
1. Tensile Strength, ASTM D 412: 400 psi
2. Elongation, ASTM D 412: 300%
3. Density @77 deg. F 8.5 lb/gal typical

H. Fabricated Flashings: Fabricated flashings and trim are specified in Section 07620.

1. Fabricated flashings and trim shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the CDA Copper Development Association "Copper in Architecture - Handbook" as applicable.

I. Manufactured Roof Specialties: Shop fabricated copings, fascia, gravel stops, control joints, expansion joints, joint covers and related flashings and trim are specified in Section 07710.
1. Manufactured roof specialties shall conform to the detail requirements of SMACNA "Architectural Sheet Metal Manual" and/or the NRCA "Roofing and Waterproofing Manual" as applicable.

PART 3 EXECUTION

3.1 EXAMINATION

A. Do not begin installation until substrates have been properly prepared.

B. Inspect and approve the deck condition, slopes and fastener backing if applicable, parapet walls, expansion joints, roof drains, stack vents, vent outlets, nailers and surfaces and elements.

C. Verify that work penetrating the roof deck, or which may otherwise affect the roofing, has been properly completed.

D. If substrate preparation and other conditions are the responsibility of another installer, notify Architect of unsatisfactory preparation before proceeding.

3.2 PREPARATION

A. General: Clean surfaces thoroughly prior to installation.
1. Prepare surfaces using the methods recommended by the manufacturer for achieving the best result for the substrate under the project conditions.
2. Fill substrate surface voids that are greater than 1/4 inch wide with an acceptable fill material.
3. Roof surface to receive roofing system shall be smooth, clean, free from loose gravel, dirt and debris, dry and structurally sound.
4. Wherever necessary, all surfaces to receive roofing materials shall be power broom and vacuumed to remove debris and loose matter prior to starting work.
5. Do not apply roofing during inclement weather. Do not apply roofing membrane to damp, frozen, dirty, or dusty surfaces.
6. Fasteners and plates for fastening components mechanically to the substrate shall provide a minimum pull-out capacity of 300 lbs. (136 k) per fastener. Base or ply sheets attached with cap nails require a minimum pullout capacity of 40 lb. per nail.
7. Prime decks where required, in accordance with requirements and recommendations of the primer and deck manufacturer.

B. Wood Deck:
1. Dimensional wood deck shall be minimum 1 inch (25 mm) thick, knotholes and cracks larger than 1/4 inch shall be covered with sheet metal. All boards shall be appropriately nailed and have adequate end bearing to the centers of beams/rafters. Lumber shall be kiln dried.
2. Plywood shall be a minimum 15/32 inch (11.9 mm) thick and conform to the standards and installation requirements of the American Plywood Association (APA).
3. If no roof insulation is specified, provide a suitable dry sheathing paper, followed by an approved base sheet nailed appropriately for the specified roof system, with 1 inch (25 mm) diameter caps and annular nails unless otherwise required by the applicable Code or Approval agency.
4. Insulation is to be mechanically attached in accordance with the insulation manufacturer's recommendations unless otherwise required by the applicable Code.
5. In all retrofit roof applications, it is required that deck be inspected for defects. Any defects are to be corrected per the deck manufacturer's recommendations and standards of the

APA/Engineered Wood Association prior to new roof application.

6. Light metal wall ties or other structural metal exposed on top of the wood deck shall be covered with one ply of a heavy roofing sheet, such as HPR Glasbase Base Sheet, extending 2 inches to 6 inches (51 mm to 152 mm) beyond the metal in all directions. Nail in place before applying the base ply.

3.3 INSTALLATION - GENERAL

A. Install modified bitumen membranes and flashings in accordance with manufacturer's instructions and with the recommendations provided by the National Roofing Contractors Association's Roofing & Waterproofing Manual, the Asphalt Roofing Manufacturers Association, and applicable codes.

B. General: Avoid installation of modified bitumen membranes at temperatures lower than 40-45 degrees F. When work at such temperatures unavoidable use the following precautions:
   1. Take extra care during cold weather installation and when ambient temperatures are affected by wind or humidity, to ensure adequate bonding is achieved between the surfaces to be joined. Use extra care at material seam welds and where adhesion of the applied product to the appropriately prepared substrate as the substrate can be affected by such temperature constraints as well.
   2. Unrolling of cold materials, under low ambient conditions must be avoided to prevent the likelihood of unnecessary stress cracking. Rolls must be at least 40 degrees F at the time of application. If the membrane roll becomes stiff or difficult to install, it must be replaced with roll from a heated storage area.

C. Commence installation of the roofing system at the lowest point of the roof (or roof area), working up the slope toward the highest point. Lap sheets shingle fashion so as to constantly shed water

D. All slopes greater than 2:12 require back-nailing to prevent slippage of the ply sheets. Use ring or spiral-shank 1 inch cap nails, or screws and plates at a rate of 1 fastener per ply (including the membrane) at each insulation stop. Place insulation stops at 16 ft o.c. for slopes less than 3:12 and 4 feet o.c. for slopes greater than 3:12. On non-insulated systems, nail each ply directly into the deck at the rate specified above. When slope exceeds 2:12, install all plies parallel to the slope (strapping) to facilitate backnailing. Install 4 additional fasteners at the upper edge of the membrane when strapping the plies.

3.4 INSTALLATION COLD APPLIED ROOF SYSTEM

A. Base Ply: Cut base ply sheets into 18 foot lengths and allow plies to relax before installing. Install base sheet in Interply Adhesive: applied at the rate required by the manufacturer. Shingle base sheets uniformly to achieve one ply throughout over the prepared substrate. Shingle in proper direction to shed water on each large area of roofing.
   1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
   2. Solidly bond to the substrate and adjacent ply with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
   3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Use care to eliminate air entrapment under the membrane.
   4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
   5. Extend plies 2 inches beyond top edges of cants at wall and projection bases.
   6. Install base flashing ply to all perimeter and projection details.
   7. Allow the one ply of base sheet to cure at least 30 minutes before installing the modified membrane. However, the modified membrane must be installed the same day as the base plies.

B. Modified Cap Ply(s): Cut cap ply sheets into 18 foot lengths and allow plies to relax before installing. Install in interplay adhesive applied at the rate required by the manufacturer. Shingle sheets uniformly over the prepared substrate to achieve the number of plys specified. Shingle in proper direction to

shed water on each large area of roofing.

1. Lap ply sheet ends 8 inches. Stagger end laps 12 inches minimum.
2. Solidly bond to the base layers with specified cold adhesive at the rate of 2 to 2-1/2 gallons per 100 square feet.
3. Roll must push a puddle of adhesive in front of it with adhesive slightly visible at all side laps. Care should be taken to eliminate air entrapment under the membrane.
4. Install subsequent rolls of modified across the roof as above with a minimum of 4 inch side laps and 8 inch staggered end laps. Lay modified membrane in the same direction as the underlayers but the laps shall not coincide with the laps of the base layers.
5. Allow cold adhesive to set for 5 to 10 minutes before installing the top layer of modified membrane.
6. Extend membrane 2 inches beyond top edge of all cants in full moppings of the cold adhesive as shown on the Drawings.

C. Fibrous Cant Strips: Provide non-combustible perlite or glass fiber cant strips at all wall/curb detail treatments where angle changes are greater than 45 degrees. Cant may be set in approved cold adhesives, hot asphalt or mechanically attached with approved plates and fasteners.

D. Wood Blocking, Nailers and Cant Strips: Provide wood blocking, nailers and cant strips as specified in Section 06114.

1. Provide nailers at all roof perimeters and penetrations for fastening membrane flashings and sheet metal components.
2. Wood nailers should match the height of any insulation, providing a smooth and even transition between flashing and insulation areas.
3. Nailer lengths should be spaced with a minimum 1/8 inch gap for expansion and contraction between each length or change of direction.
4. Nailers and flashings should be fastened in accordance with Factory Mutual "Loss Prevention Data Sheet 1- 49, Perimeter Flashing" and be designed to be capable of resisting a minimum force of 200 lbs/lineal foot in any direction.

E. Metal Work: Provide metal flashings, counter flashings, parapet coping caps and thru-wall flashings as specified in Section 07620 or Section 07710. Install in accordance with the SMACNA "Architectural Sheet Metal Manual" or the NRCA Roofing Waterproofing manual.

F. Termination Bar: Provide a metal termination bar or approved top edge securement at the terminus of all flashing sheets at walls and curbs. Fasten the bar a minimum of 8 inches (203 mm) o/c to achieve constant compression. Provide suitable, sealant at the top edge if required.

G. Flashing Base Ply: Install flashing sheets by the same application method used for the base ply.

1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Solidly adhere the entire flashing ply to the substrate. Secure the tops of all flashings that are not run up and over curb through termination bar fastened at 6 inches (152 mm) O.C. and sealed at top.
5. Seal all vertical laps of flashing ply with a three-course application of trowel-grade mastic and fiberglass mesh.
6. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
7. Coordinate roof accessories, miscellaneous sheet metal accessory items, including piping vents and other devices with the roofing system work.

8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

H. Flashing Cap Ply:
1. Seal curb, wall and parapet flashings with an application of mastic and mesh on a daily basis. Do not permit conditions to exist that will allow moisture to enter behind, around or under the roof or flashing membrane.
2. Prepare all walls, penetrations, expansion joints and where shown on the Drawings to be flashed with required primer at the rate of 100 square feet per gallon. Allow primer to dry tack free.
3. Adhere to the underlying base flashing ply with specified flashing ply adhesive unless otherwise specified. Nail off at a minimum of 8 inches (203 mm) o.c. from the finished roof at all vertical surfaces.
4. Coordinate counter flashing, cap flashings, expansion joints and similar work with modified bitumen roofing work as specified.
5. Coordinate roof accessories, miscellaneous sheet metal accessory items with the roofing system work.
6. All stripping shall be installed prior to flashing cap sheet installation.
7. Heat and scrape granules when welding or adhering at cut areas and seams to granular surfaces at all flashings.
8. Secure the top edge of the flashing sheet using a termination bar only when the wall surface above is waterproofed, or nailed 4 inches on center and covered with an acceptable counter flashing.

I. Surface Coatings: Apply roof coatings in strict conformance with the manufacturer's recommended procedures.

J. Roof Walkways: Provide walkways in areas indicated on the Drawings.

3.5 INSTALLATION EDGE TREATMENT AND ROOF PENETRATION FLASHING

A. Metal Edge:
1. Inspect the nailers to assure proper attachment and configuration.
2. Run one ply over the edge. Assure coverage of all wood nailers. Fasten plies with ring shank nails at 8 inches (203 mm) o.c.
3. Install continuous cleat and fasten at 6 inches (152 mm) o.c.
4. Install new metal edge hooked to continuous cleat and set in bed of roof cement. Fasten flange to wood nailers every 3 inches (76 mm) o.c. staggered.
5. Prime metal edge at a rate of 100 square feet per gallon and allow to dry. Do not prime for Green-Lock System lightly sand metal to improve bond.
6. Strip in flange with base flashing ply covering entire flange in bitumen with 6 inches (152 mm) on to the field of roof. Assure ply laps do not coincide with metal laps.
7. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Seal outside edge with rubberized cement.

B. Scupper Through Wall:
1. Inspect the nailer to assure proper attachment and configuration.
2. Run one ply over nailer, into scupper hole and up flashing as in typical wall flashing detail. Assure coverage of all wood nailers.
3. Install a scupper box in a 1/4 inch (6 mm) bed of mastic. Assure all box seams are soldered and have a minimum 4 inch (101 mm) flange. Make sure all corners are closed and soldered. Prime scupper at a rate of 100 square feet per gallon and allow to dry.
4. Fasten flange of scupper box every 3 inches (76 mm) o.c. staggered.
5. Strip in flange of scupper box with base flashing ply covering entire area with 6 inch (152 mm) overlap on to the field of the roof and wall flashing.
6. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches

(228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all seams.

C. Coping Cap:
1. Minimum flashing height is 8 inches (203 mm) above finished roof height. Maximum flashing height is 24 inches (609 mm). Prime vertical wall at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Attach tapered board to top of wall.
4. Install base flashing ply covering entire wall and wrapped over top of wall and down face with 6 inches (152 mm) on to field of roof and set in cold asphalt. Nail membrane at 8 inches (203 mm) o.c.
5. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Apply a three-course application of mastic and mesh at all seams and allow to cure and aluminize.
6. Install continuous cleat and fasten at 6 inches (152 mm) o.c. to outside wall.
7. Install new metal coping cap hooked to continuous cleat.
8. Fasten inside cap 24 inches (609 mm) o.c. with approved fasteners and neoprene washers through slotted holes, which allow for expansion and contraction.

D. Skylight With Protection Screen:
1. Minimum curb height is 8 inches (203 mm) above finished roof height. Prime vertical at a rate of 100 square feet per gallon and allow to dry.
2. Set cant in bitumen. Run all field plies over cant a minimum of 2 inches (50 mm).
3. Install base flashing ply covering curb set in bitumen with 6 inches (152 mm) on to field of the roof.
4. Install a second ply of modified flashing ply in bitumen over the base flashing ply, 9 inches (228 mm) on to the field of the roof. Attach top of membrane to top of wood nailer and apply a three-course application of mastic and mesh. Allow to cure and aluminize.
5. Install pre-manufactured lens and fasten flashing sides at 8 inches (203 mm) o.c. with fasteners and neoprene washers.
6. Install OSHA compliant, compression mounted skylight protection screen per membranes manufacturer's written instructions.

E. Roof Drain:
1. Plug drain to prevent debris from entering plumbing.
2. Taper insulation to drain minimum of 24 inches (609 mm) from center of drain.
3. Run roof system plies over drain. Cut out plies inside drain bowl.
4. Set lead/copper flashing (30 inch square minimum) in 1/4 inch bed of mastic. Run lead/copper into drain a minimum of 2 inches (50 mm). Prime lead/copper at a rate of 100 square feet per gallon and allow to dry.
5. Install base flashing ply (40 inch square minimum) in bitumen.
6. Install modified membrane (48 inch square minimum) in bitumen.
7. Install clamping ring and assure that all plies are under the clamping ring.
8. Remove drain plug and install strainer.

F. Plumbing Stack:
1. Minimum stack height is 12 inches (609 mm).
2. Run roof system over the entire surface of the roof. Seal the base of the stack with elastomeric sealant.
3. Prime flange of new sleeve. Install properly sized sleeves set in 1/4 inch (6 mm) bed of roof cement.
4. Install base flashing ply in bitumen.
5. Install membrane in bitumen.
6. Caulk the intersection of the membrane with elastomeric sealant.
7. Turn sleeve a minimum of 1 inch (25 mm) down inside of stack.

G. Liquid Flashing:
1. Mask target area on roof membrane with tape.
2. Clean all non-porous areas with isopropyl alcohol.
3. Apply 32 wet mil base coat of liquid flashing over masked area.
4. Embed polyester reinforcement fabric into the base coat of the liquid flashing.
5. Apply 48-64 wet mil top coat of the liquid flashing material over the fabric extending 2 inches (51 mm) past the scrim in all directions.
6. Apply minerals immediately or allow the liquid flashing material to cure 15-30 days and then install reflective coating.

3.6 CLEANING

A. Clean-up and remove daily from the site all wrappings, empty containers, paper, loose particles and other debris resulting from these operations.

B. Remove asphalt markings from finished surfaces.

C. Repair or replace defaced or disfigured finishes caused by Work of this section.

3.7 PROTECTION

A. Provide traffic ways, erect barriers, fences, guards, rails, enclosures, chutes and the like to protect personnel, roofs and structures, vehicles and utilities.

B. Protect exposed surfaces of finished walls with tarps to prevent damage.

C. Plywood for traffic ways required for material movement over existing roofs shall be not less than 5/8 inch (16 mm) thick.

D. In addition to the plywood listed above, an underlayment of minimum 1/2 inch (13 mm) recover board is required on new roofing.

E. Special permission shall be obtained from the Manufacturer before any traffic shall be permitted over new roofing.

3.8 FIELD QUALITY CONTROL

A. Inspection: Provide manufacturer's field observations at start-up and at intervals of approximately 30 percent, 60 percent and 90 percent completion. Provide a final inspection upon completion of the Work.
1. Warranty shall be issued upon manufacturer's acceptance of the installation.
2. Field observations shall be performed by a Sales Representative employed full-time by the manufacturer and whose primary job description is to assist, inspect and approve membrane installations for the manufacturer.
3. Provide observation reports from the Sales Representative indicating procedures followed, weather conditions and any discrepancies found during inspection.
4. Provide a final report from the Sales Representative, certifying that the roofing system has been satisfactorily installed according to the project specifications, approved details and good general roofing practice.

3.9 SCHEDULES

A. Base (Ply) Sheet:
1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
a. Tensile Strength, ASTM D 5147
1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
2) 50mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m

b. Tear Strength, ASTM D 5147
   1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
   2) 50mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
c. Elongation at Maximum Tensile, ASTM D 5147
   1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
   2) 50mm/min@ -17.78 +/- 2 deg. C MD 4 % XD 4 %
d. Low Temperature Flexibility, ASTM D 5147, Passes -40 deg. F (-40 deg. C)

B. Thermoplastic/Modified Cap (Ply) Sheet:
1. VersiPly Mineral: 145 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane with dual fiberglass reinforced scrim. ASTM D6163, Type III Grade S
   a. Tensile Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 220 lbf/in XD 220 lbf/in
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 38.5 kN/m XD 38.5 kN/m
   b. Tear Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N
   c. Elongation at Maximum Tensile, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. FMD 4.5% XD 4.5%
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 4.5% XD 4.5%
   d. Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)

C. Interply Adhesive:
1. Green-Lock Membrane Adhesive: Cold applied solvent free membrane adhesive: zero V.O.C. compliant performance requirements:
   a. Non-Volatile Content ASTM D 4586 100%
   b. Density ASTM D 1475 11.4 lbs./gal. (1.36 g/m3)
   c. Viscosity Brookfield 20,000-50,000 cPs.
   d. Flash Point ASTM D 93 400 deg. F min. (232 deg. C)
   e. Slope: up to 3:12

D. Flashing Base Ply:
1. StressBase 80: 80 mil SBS (Styrene-Butadiene-Styrene) rubber modified roofing base sheet reinforced with a fiberglass scrim, performance requirements according to ASTM D 5147.
   a. Tensile Strength, ASTM D 5147
      1) 2 in/min. @ 0 +/- 3.6 deg. F MD 100 lbf/in XD 100 lbf/in
      2) 50 mm/min. @ -17.78 +/- 2 deg. C MD 17.5 kN/m XD 17.5 kN/m
   b. Tear Strength, ASTM D 5147
      1) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 110 lbf XD 100 lbf
      2) 50 mm/min. @ 23 +/- 2 deg. C MD 489 N XD 444 N
   c. Elongation at Maximum Tensile, ASTM D 5147
      1) 2 in/min. @ 0 +/- 3.6 deg. F MD 4 % XD 4 %
      2) 50 mm/min. @ -17.78 +/- 2 deg. C MD 4 % XD 4 %
   d. Low Temperature Flexibility, ASTM D 5147
      1) Passes -40 deg. F (-40 deg. C)

E. Flashing Ply Adhesive:
1. Green-Lock Flashing Adhesive: Cold applied solvent free flashing adhesive: zero V.O.C.
   a. Non-Volatile Content ASTM D 4586 100%
   b. Density ASTM D 1475 11.8 lbs./gal. (1.17 g/m3)
   c. Viscosity Brookfield 400,000 cPs.
   d. Flash Point ASTM D 93 400 deg. F min. (232 deg. C)

F. Insulation Adhesive:
1. Insul-Lock HR: Zero VOC low rise insulation foam adhesive
   a. Tensile: 250 psi (ASTM D 412)

b. Density (ASTM D 1875) 8.5 lbs/gal
c. Peel Strength (ASTM D 903) 17 lb/in
d. Flexibility (ASTM D 816) Pass @ -70 degrees F

G. Surfacing:
1. Flashing Cap (Ply) Sheet:
a. VersiPly Mineral: 145 mil SBS (Styrene-Butadiene-Styrene) mineral surfaced, rubber modified roofing membrane with dual fiberglass reinforced scrim. ASTM D6163, Type III Grade S
1) Tensile Strength, ASTM D 5147
a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 220 lbf/in XD 220 lbf/in
b) 50 mm/min. @ 23 +/- 2 deg. C MD 38.5 kN/m XD 38.5 kN/m
2) Tear Strength, ASTM D 5147
a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 300 lbf XD 300 lbf
b) 50 mm/min. @ 23 +/- 2 deg. C MD 1335 N XD 1335 N
3) Elongation at Maximum Tensile, ASTM D 5147
a) 2 in/min. @ 73.4 +/- 3.6 deg. F MD 4.5% XD 4.5%
b) 50 mm/min. @ 23 +/- 2 deg. C MD 4.5% XD 4.5%
4) Low Temperature Flexibility, ASTM D 5147, Passes -30 deg. F (-34 deg. C)
2. Surface Coatings:
a. Surfacing:
1) Garla-Brite: ASTM D 2824 aluminum coating non-fibered aluminum roof coating non-fibered aluminum roof coating having the following characteristics:
a) Flash Point 103 deg. F (39 deg. C) min.
b) Weight/Gallon 7.9 lbs./gal. (1.0 g/cm3)

END OF SECTION

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SECTION 076200 - FLASHING & SHEET METAL

PART 1 - GENERAL:

Conform to profiles and sizes shown on drawings, and comply with "Architectural Sheet Metal Manual" by SMACNA, for each general category of work required.

Metal flashing and counter flashing.
Downspouts and Gutters.

Guarantee: Five-year maintenance guarantee stating that all work in this section not guaranteed under the roof warranty, will remain watertight for a period of 5-years from the date of project acceptance, co-signed by the General Contractor.

PART 2 - PRODUCTS:

Gutters and Downspouts: Provide 0.040 continuous pre-finished aluminum gutters and downspouts with baked enamel finish. Color shall be selected by Architect. Contractor to provide typical ADS downspout adapters and ADS piping as requited to connect with existing system.

Solder: For use with steel or copper, provide 50-50 tin/lead solder (ASTM B 32), with rosin flux.

Fasteners: Same metal as flashing/sheet metal or other non-corrosive metal as recommended by sheet manufacturer. Match finish of exposed heads with material being fastened.

Bituminous Coating: SSPC-Paint 12, solvent-type bituminous mastic, nominally free of sulfur, compounded for 15-mil dry film thickness per coat.

Elastomeric Sealant: Generic type recommended by manufacturer of metal and fabricator of components being sealed and complying with requirements for joint sealants as specified in Section 07900 - Joint Sealers.

Epoxy Seam Sealer: 2-part noncorrosive metal seam cementing compound, recommended by metal manufacturer for exterior/interior nonmoving joints including riveted joints.

Reglets: Metal or plastic units of type and profile indicated, compatible with flashing indicated, noncorrosive.

Metal Accessories: Provide sheet metal clips, straps, anchoring devices, and similar accessory units as required for installation of work, matching or compatible with material being installed, noncorrosive, size and gage required for performance.

Mill Finish Aluminum: ASTM B 209, 3003-H14, with a minimum thickness of 0.040 inch, unless otherwise indicated.

Fabricated Units

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

Provide for thermal expansion of running sheet metal work by overlaps of expansion joints in fabricated work. Where required for water-tight construction, provide hooked flanges filled with polyisobutylene mastic for 1-inch embedment of flanges. Space joints at intervals of not more than 50 feet for steel, 24 feet for copper or stainless steel, or 30 feet for zinc alloy or aluminum. Conceal expansion provisions where possible.

PART 3 - EXECUTION:

Metal Protection: Where dissimilar metals will contact each other or corrosive substrates, protect against galvanic action by painting contact surfaces with bituminous coating or by other permanent separation as recommended by fabricator or manufacturers of dissimilar metals.

A. Coat side of uncoated aluminum and stainless-steel sheet metal flashing and trim with bituminous coating where flashing and trim will contact wood, ferrous metal, or cementitious construction.

B. Underlayment: Where installing metal flashing directly on cementitious or wood substrates, install a course of felt underlayment and cover with a slip sheet or install a course of polyethylene underlayment.

C. Bed flanges in thick coat of asphalt roofing cement where required for waterproof performance.

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

Seal moving joints in metal work with elastomeric joint sealants, complying with requirements specified in Division 7 Section "Joint Sealants."

Clean metal surfaces of soldering flux and other substances which could cause corrosion.

Nail flanges of expansion joint units to substrates at spacing of 6 inches o.c.

Composition Stripping: Cover flanges (edges) of work set on bituminous substrate with 2 courses of glass fiber fabric (ASTM D-1668) set in and covered with asphaltic roofing cement.

Performance: Water-tight and weatherproof performance of flashing and sheet metal work is required.

END OF SECTION 076200

SECTION 079200 - JOINT SEALERS

PART 1 - GENERAL

1.01 PRECONSTRUCTION FIELD TESTS: Prior to installation of joint sealers, field-test their adhesion to joint substrates per field adhesion test in AAMA Aluminum Curtain Wall Series No. 13.

1.02 SUBMITTALS: Submit product data, samples of each type and color of joint sealer required and certified test reports for joint sealers evidencing compliance with requirements.

1.03 COMPATIBILITY: Provide joint sealers, joint fillers and other related materials that are compatible with one another and with joint substrates under service and application conditions, as demonstrated by testing and field experience.

1.04 COLORS: Provide color of exposed joint sealers to match color of adjacent surface.

PART 2 - PRODUCTS

2.01 ELASTOMERIC SEALANT STANDARD: Provide manufacturer's standard chemically curing, elastomeric sealant of base polymer indicated, complying with ASTM C 920 requirements.

A. One-Part Nonacid-Curing Silicone Sealant: Type S, Grade NS, Class 25, Uses NT, M, G, A, and O. Additional capability, when tested per ASTM C 719, to withstand 35 percent movement in both extension and compression for a total of 70 percent movement as measured at time of application and still comply with other requirements of ASTM C 920.

B. One-Part Nonsag Urethane Sealant for Use NT: Type S; Grade NS; Class 25; and Uses NT, M, A, and O.

2.02 ACRYLIC SEALANT: Manufacturer's standard one-part nonsag, solvent-release-curing, acrylic terpolymer sealant complying with ASTM C 920 for Type S; Grade NS; Uses NT, M, G, A and O; except for selected test properties which are revised as follows:

Heat-aged hardness: 40-50
Weight loss: 15 percent
Max. cyclic movement capability: plus or minus 7.5 percent

2.03 SILICONE-EMULSION SEALANT: Manufacturer's standard one part, nonsag, mildew-resistant, paintable, silicone-emulsion sealant complying with ASTM C 834.

2.04 ACOUSTICAL SEALANT FOR CONCEALED JOINTS: Manufacturer's standard, nondrying, nonhardening, nonskinning, nonstaining, gunnable, synthetic rubber sealant recommended for sealing interior concealed joints to reduce transmission of airborne sound.

2.05 FIRESTOP CAULKING AND PUTTY: Provide Firestop Putty or Adhesive Firestop Caulking/Sealant for fire sealing rated partitions at penetrations, junctions with roofing panels, and intersections at dissimilar materials. Firestop putty shall be Nelson FSP Firestop Putty as manufactured by Hevi-Duty/Nelson, OR Approved Equal. Adhesive Firestop caulking/sealant shall be Nelson CLK Adhesive Firestop Sealant as manufactured by Hevi-Duty/Nelson, OR Approved Equal. Materials furnished for firestopping shall comply with ASTM E-84 and ASTM E-814. Comply with manufacturer's instructions for installation and suitability for application.

A. Rated Partitions: Fire caulk shall be tooled at floor and ceiling/roof connections at all rated partitions.

B. Penetrations: All penetrations at rated partitions shall be tooled fire caulk.

2.06 FOAMED-IN-PLACE FIRE-STOPPING SEALANT: Two-part, foamed-in-place, silicone sealant for use as part of a through-penetration fire-stop system for filling openings around cables, conduit, pipes and similar penetrations through walls and floors, with fire-resistance rating indicated, per ASTM E 814; listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

2.07 ONE-PART FIRE-STOPPING SEALANT: One part elastomeric sealant formulated for use as part of a through-penetration fire-stop system for sealing openings around cables, conduit, pipes and similar penetrations through walls and floors, listed by UL or other testing and inspecting agency acceptable to authorities having jurisdiction.

2.08 SEALANT BACKINGS, GENERAL: Nonstaining; compatible with joint substrates, sealants, primers and other joint fillers; approved for applications indicated by sealant manufacturer based on field experience and laboratory testing.

A. Elastomeric Tubing Joint-Fillers: Neoprene, butyl, EPDM, or silicone tubing complying with ASTM D 1056, nonabsorbent to water and gas, capable of remaining resilient at temperatures down to -26 deg F (-15 deg C). Provide products with low compression set and of size and shape to provide a secondary seal, to control sealant depth and otherwise contribute to optimum sealant performance.

B. Bond-Breaker Tape: Polyethylene tape or other plastic tape as recommended by sealant manufacturer for preventing bond between sealant and joint filler or other materials at back of joint.

2.09 PRIMER: As recommended by joint sealer manufacturer where required for adhesion of sealant to joint substrates indicated.

2.10 ACCESSORY MATERIALS FOR FIRE-STOPPING SEALANTS: Forming, joint-fillers, packing and other accessory materials as required for installation of fire-stopping sealants.

PART 3 - EXECUTION

3.01 GENERAL: Comply with joint sealer manufacturers' instructions applicable to products and applications indicated.

3.02 INSTALLATION:

A. Elastomeric Sealant Installation Std: Comply with ASTM C 962.

B. Latex Sealant Installation Standard: Comply with ASTM C 790.

C. Acoustical Sealant Application Standard: Comply with ASTM C 919 for use of joint sealants in acoustical applications.

D. Installation of Fire-Stopping Sealant: Install sealant, including forming, packing and other accessory materials to fill openings around mechanical and electrical services penetrating floors and walls to provide fire-stops with fire resistance ratings indicated.

END OF SECTION 079200

SECTION 08 88 53 – SECURITY GLAZING

PART ONE – GENERAL

1.01 DESCRIPTION

A. Work Included: Provide all SECURITY GLAZING complete in place, where shown on the drawings, as specified here in and as needed for a complete and proper installation, including but not necessarily limited to:
   1. Exterior Glazing.
   2. Interior Glazing.
   3. Doors.
   4. Side Lights.
   5. Security speaker port device.

B. Related Work specified elsewhere:
   1. Metal Doors and Frames — Section 08 11 13
   2. Security Doors and Frames — Section 08 34 63

C. Related Documents:
   Drawings and general provisions of Contract, including General, Supplementary and Special Conditions and Division One Sections of these Specifications, apply to this Section.

1.02 QUALTIY ASSURANCE

A. General:
   Comply with the latest edition, or code referenced editions, of the standards and references listed herein.

B. Manufacturer's Qualifications:
   Manufacturers, not prior approved, shall provide evidence of five years of satisfactory experience in the manufacture of the type of Safety Glazing specified herein.

C. Testing:
   All Specified products to be installed in the Work shall be tested by a Laboratory conforming to the requirements of ASTM E 699.

D. Standards and References:
   1. Glass Association of North America (GANA) Glazing Manual.
   2. CSPC 16 CFR Part 1201 Safety Standard for Architectural Glazing.
   3. ANSI Z 97.1 - American National Standard for Glazing Materials Used in Buildings – Safety Performance Specifications and Methods of Test.
   4. ASTM C 1036 Specification for Flat Glass.
   5. ASTM C 1172 Standard Specifications for Laminated Architectural Flat Glass.
   6. ASTM C 1349 Standard Specification for Architectural Flat Glass.
   7. ASTM D 256 - Standard Test Method for Determining the Pendulum Impact Resistance of Notched Specimens of Plastics.
   8. ASTM D 638 - Standard Test Method for Tensile Properties of Plastics.
   9. ASTM D 790 - Standard Test Methods for Flexural Properties of Unreinforced and Reinforced Plastics and Electrical Insulating Materials.
   10. ASTM D 792 - Standard Test Methods for Density and Specific Gravity (Relative Density) of Plastics by Displacement.
   11. ASTM D 1044 Test Method for Resistance of Transparent Plastics to Surface Abrasion.
   12. ASTM D 1929 - Standard Test Method for Ignition Properties of Plastics.
   13. ASTM D 2843 - Standard Test Method for Density of Smoke from the Burning or Decomposition of Plastics.
   14. ASTM E 84 - Standard test method for surface burning characteristics of building materials.
   15. ASTM E 699 Standard Practice for Evaluation of Agencies Involved in Testing, Quality Assurance, and Evaluating of Building Components
   16. ASTM F 1233 - Standard Test Method for Security Glazing Materials and Systems.
   17. ASTM F 1592 Standard Test Method for Detention Hollow Metal Vision Systems.
   18. ASTM F 1915 - Standard Test Method for Glazing for Detention Facilities.
   19. UL 752 – Ballistic Standards.

1.03 SUBMITTALS

A. General:

All requests for substitutions for the materials specified in this Specification shall be submitted to the Architect for review 30 days prior to bid.

B. Product Data: Submit:
   1. Manufacturer's data sheets on each product to be used, including but not limited to:
      a. Physical properties including data on material:
      b. weight,
      c. windload capacity,
      d. light transmission,
      e. shading coefficient,
      f. thermal expansion,
      g. self-ignition temperature,
      h. smoke developed index and
      i. construction combustibility class.
      j. surface abrasion
      k. blast resistance
   2. Preparation instructions and recommendations.
   3. Storage and handling requirements and recommendations.
   4. Installation methods and glazing procedures, including edge engagement guidelines.
   5. Letters of compatibility for each caulk, setting block, tape or other glazing materials to be used in the Work.
   6. Other documentation necessary to demonstrate compliance with this Specification.

B Verification Samples:
Submit two (2) samples for each finish product specified, minimum size 12 x 12 inches square, of each type of security glazing to be installed in the Work.

C. Warranty:
Submit a signed copy of the manufacturer's warranty, and warranties as described below, for each security glazing product to be installed in the Work.

D. Shop Drawings:
Submit shop drawings of all proposed Security Glazing showing details of caulking, setting blocks, and tapes,

1.04 DELIVERY, STORAGE, AND HANDLING

A. Deliver polycarbonate sheets on enclosed pallets.
B. Store products in manufacturer's unopened packaging until ready for installation.
C. Store in dry, well-ventilated and covered areas at temperatures below 80 degrees F.
D. Handle polycarbonate sheets carefully to prevent damage; do not drop, slide, or drag.

1.05 PROJECT CONDITIONS

Maintain environmental conditions (temperature, humidity, and ventilation) within limits recommended by manufacturer for optimum results. Do not install products under environmental conditions outside manufacturer's absolute limits.

1.06 WARRANTY

A. General:
Provide manufacturer's written warranty covering breakage, abrasion resistance, coating failure, loss of light transmission, and yellowing.

B. Warranty:
   1. Laminated Glass and Glass Clad Polycarbonate:
      Written Warranty from the manufacturer of the installed product, agreeing to provide replacement material, FOB point of manufacture, freight prepaid and allowed, in the event of product failure or defect, for a period of five (5) years from date of substantial completion. Defect is and shall be defined as delamination, yellowing or hazing.
   2. Laminated Polycarbonate:
      Written Warranty from the manufacturer of the installed product, agreeing to provide replacement material, FOB point of manufacture, freight prepaid and allowed, in the event of product failure or defect, for a period of seven (7) years from date of substantial completion. Defect is and shall be defined as delamination, yellowing or hazing.

PART TWO – PRODUCTS

2.01 MANUFACTURERS

A. General:
Unless otherwise specified, provide materials of this Section from the manufacturer's listed below or if not listed materials which meet the requirements of this section.

B. Substitutions:
1. Products of other manufacturer's may be acceptable.
2. To obtain approval of other manufacturer's products the request must be submitted to the Architect 30 days prior to the time and date set for the bid.
3. Requests for substitutions shall include any and all product data necessary to demonstrate the product's conformance with these specifications.
4. If the request is approved, the manufacturer's name and product will be added to the approved manufacturers by addendum.
5. Products of manufacturers who have not been approved will not be acceptable and if found on the jobsite, they shall be removed and replaced by approved products at no additional cost to the Owner.

C. Acceptable Manufacturers:
1. Global Security Glazing
616 Selfield Road
Selma, Al 36703-8702
Tel: (800) 633-2513
Fax: (334) 875-2704
2. Sheffield Plastics Inc. (Bayer Material Science LLC)
119 Salisbury Road
Sheffield, MA 01257
Tel: (800) 628-5084
Fax: (413) 229-8717

D. Other Manufacturers:
1. Products of other manufacturers may be acceptable when approved by the Architect.
2. Requests for approval of products of other manufacturers must be submitted to the Architect along with all information and data needed by the Architect to substantiate that the product conforms to the requirements specified herein.
3. The request and supporting data must reach the Architect no later than 30 days prior to the date and time set for the Bid opening.
4. If the request is approved an addendum shall be issued adding the name of the manufacturer as an acceptable manufacturer.

2.02 SECURITY GLAZING MATERIALS

A. General:
All plastic materials proposed to be installed in the Work shall comply with the requirements of the Florida Building Code and ANSI Z 97.1 and with the minimum properties as follows:
1. Specific gravity: 1.2, per ASTM D 792.
2. Tensile strength, yield: 9,000 psi, per ASTM D 638.
3. Tensile strength, ultimate: 9,500 psi, per ASTM D 638.
4. Tensile modulus: 340,000 psi, per ASTM D 638.
5. Flexural strength at 5 percent strain: 13,500 psi, per ASTM D 790.
6. Flexural modulus: 345,000 psi, per ASTM D 790.
7. Izod impact strength (0.125 inch notched): 12-16 ft lb/in/in of notch, per ASTM D 256.
8. Self ignition temperature: 1040 degrees F, per ASTM D 1929.
9. Flash ignition temperature: 800 degrees F, per ASTM D 1929.
10. Smoke-Developed Index: Not Greater Than 450 per ASTM E 84.
11. Construction Combustibility Class: CC-1 minimum.

B. Polycarbonate:
1. Laminated or monolithic shall be extruded, UV stabilized, but when laminated uses various layers of urethane resins.
2. Polycarbonate laminates shall have a flexural strength not less than 13,500 psi, ASTM D 790, 180 degrees F continuous service temperature.

C. Glass Clad Polycarbonate:
1. Shall be laminated glass-polycarbonate construction using urethane inter layers.
2. Product proposed to be installed in the Work must be manufactured to ASTM C 1349.

3. All bullet resistant glass clad polycarbonate are to be "no spall" as defined by UL 752 test procedure.

D. Security Glazing Types (GLASS-CLAD-POLYCARBONATE):
   1. SG-GCP-4 (10 Minute Forced Entry):
      a. 7/16" nominal thickness, glass-clad-polycarbonate, clear, UL 752, Level 3.
      b. Combination of heat or chemically strengthened glass outboard lite laminated to a polycarbonate core.

E. Security Glazing Types (POLYCARBONATE):
   1. SG-PC-4 (10 Minute Forced Entry):
      a. 1/2" nominal thickness, monolithic mar resistant polycarbonate, clear, ASTM F 1915, Grade 4, 10 minute forced entry rated.
      b. *Globe Security Glazing;* Lexgard MR-10 (AR-2), ASTM F1233 Class II /ASTM 1915 Grade 4, HP White Level I - TP-0500.02.

F. Security Speaker Port Device:
   1. 6" diameter cast stainless steel. UL Level 3 bullet resistant.
   2. Model ISP-100 "Speaker Port" as manufactured by Norix Group, Inc., West Chicago, Illinois or approved equal.

2.03 SECURITY GLAZING SEALANTS

A. Comply with recommendations of the security glazing manufacturer for each type of security glazing material regarding, installation, Storage, shelf-life, tooling, and finish.

B. Use only those products previously tested and approved for use with the specified security glazing materials. It shall be the Responsibility of the glazing installer to coordinate such approval to the Architect through submittals for silicones, setting blocks, glazing tape, and edge blocks.

C. Provide sealants of a color as indicated by the architect.

D. Materials:
   1. Silicone sealants shall be:
      a. single component elastomeric silicone
      b. complies with FSTT-S-001543, Class A, nonsag, ASTM C-920 Type S, Grade NS class 25. Use G for high modulus silicone. Dow Corning 795 or GE Silpruf SC2000 as determined acceptable by the Architect.
      c. Color: black or as identified on the drawings.
   2. Glazing tapes shall be 1/8" x ½" preformed butyl tape, 100% solids, Tremco 440 or approved equal. Shimmed or unshimmed as needed.
   3. Blocking shall be EPDM, Neoprene, silicone or thermoset rubber as tested to be compatible with the specified security glazing product.
   4. Setting blocks are to be 80-90 shore A durometer, ¼" thick.
   5. Edge blocks are to be 70-80 shore A durometer, 1/8" thick.
   6. Primers, cleaners, sealers shall be supplied per the manufacturers recommendations for compatibility as required.

2.04 OTHER PRODUCTS OR MATERIALS

All other materials or products not specifically described but required for a complete and proper installation of the work of this Section, shall be as selected by the Contractor subject to the approval of the ARCHITECT.

PART THREE - EXECUTION

3.01 EXAMINATION

A. Inspect pallets upon delivery for evidence of damage.

B. Inspect and verify that frame openings are correct size and conform to recommendations of the plastic glazing sheet manufacturer.

C. Do not proceed with installation until unsatisfactory non-conforming conditions have been corrected.

3.02 PREPARATION

A. Prior to installation, the glazier shall inspect all frames for compliance with specifications, including:
   1. Size;
   2. Squareness;

3. Edge;
4. Clearance;
5. Weep holes;
6. Weld splatter; and any other conditions detrimental to the installer's successful completion of the install.
7. Any unsatisfactory non-conforming conditions shall be brought to the attention of the Architect and the Contractor immediately.
8. All such conditions shall be corrected prior to commencement of installation.
9. Clean frame contact surfaces with compatible solvent and wipe dry.
10. Do not allow solvent to pool in glazing channels.

B. Confirm sizes of all glass; the use of field measurements for ordering glass shall be at the discretion of the installer.
C. Cut in speak through holes and add speaker devices as shown on the plans.
D. Immediately prior to installation, expose glazing edges of plastic sheet by peeling back factory-applied protective masking to a dimension sufficient for edge engagement.

3.03 INSTALLATION

A. Comply with the written recommendations of the manufacturer as approved by the Architect.
B. Install security glazing as late as possible in the construction of the facility.
C. All polycarbonate glazing shall have its masking removed only for approximately 1-2" from the edge so as to allow installation.
D. All polycarbonate glazing exposed to direct sunlight shall have it's masking entirely removed, recovered with plastic poly/duct tape to the frames. Failure to remove polycarbonate masking when in direct sunlight may cause staining or "shadows" later.
E. Silicone cap beads shall be required on all exterior glazing tape and all lites (either interior or exterior) in direct contact with inmates.
F. Proper coordination of cleaning the security glazing shall be the sole responsibility of the Contractor. It is highly recommended that a meeting of related trades; installer, glazing manufacturer, painter, GC be conducted to assure glazing is not damaged by subsequent trades.

3.04 PROTECTION

A. Use all means necessary to protect the materials of this Section before, during, and after installation and to protect the work and materials of all other trades.
B. In the event of damage, immediately make all repairs and replacements necessary to the approval of the Architect and at no additional cost to the Owner.
C. Affix polyethylene film or other covering approved by plastic glazing sheet manufacturer to framing members, as required to protect plastic glazing from other construction operations.

END OF SECTION

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SECTION 092900 - GYPSUM DRYWALL

PART 1 - GENERAL

1.01 Fire-Resistance Ratings: Provide gypsum drywall construction fire-resistance ratings indicated, conforming to assemblies tested per ASTM E 119 by inspecting and testing organization acceptable to authorities having jurisdiction.

A. **All fire and/or smoke barriers or walls shall be effectively and permanently identified with stenciling above any decorative ceiling and/or in concealed space with letters a minimum of two (2) inches high on a contrasting background spaced a maximum of twelve (12) feet on center with a minimum of one per wall or barrier. The hourly fire rating shall be included on all rated barriers or walls. Wording shall be as follows: "(__) Hour Fire and Smoke Barrier-Protect All Openings."**

B. **Storage rooms which are sprinkled shall have permanently stenciled, eighteen (18) inches below sprinkler heads, a designation line (red) with the following wording: "NO STORAGE ABOVE LINE." Requirements for stenciling shall be as noted above.**

C. See UL cut sheets at end of this section.

1.02 SUBMITTALS

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

PART 2 – PRODUCTS

2.01 Manufacturers: Subject to compliance with requirements, provide gypsum board and related products by one of the following:

Georgia-Pacific Corp.
Gold Bond Building Products Div.
National Gypsum Co.
United States Gypsum Co.

2.02 Steel Framing Components for Suspended Ceilings: As follows, sized per ASTM C 754, unless otherwise indicated:

A. Wire for Hangers and Ties: ASTM A 641, soft, Class 1 zinc coating.

B. Grid Suspension System: ASTM C 645, manufacturer's standard grid suspension system composed of main beams and cross furring members which interlock to form a modular supporting network.

2.03 Steel Framing for Walls and Partitions

2.04 Gypsum Board: Provide gypsum board of types indicated in maximum lengths available to minimize end joints:

A. Exposed Gypsum Board: ASTM C 36, 5/8" thickness, Type 'X'. For fire-rated-assemblies refer to Drawings for UL Design Numbers.

B. Moisture & Mold Resistant Gypsum Board: ASTM C 1396, 5/8" thickness, regular type except where Type X Fire-resistant type is indicated or required to meet UL assembly types. Edges shall be tapered. Provide Sheetrock brand Mold Tough Firecode Gypsum Panels by USG OR approved equal. **Note: All wet areas to receive Moisture & Mold Resistant Gypsum Board. Wet areas include walls and ceilings where gypsum board is specified. Areas include, but are not necessarily limited to, bathrooms, gang toilets, showers, janitor closets, kitchens and laundry areas.**

C. Mineral Board: Provide 1/2" gypsum sheathing board core in accordance with ASTM C 1177 with glass mats both sides and long edges. Application requires a No.15, nonperforated, asphalt saturated felt complying with ASTM D 226, Type 1or equal. Provide Dens-Glass Gold by Georgia-Pacific Corp. OR approved equal.

2.05 Trim Accessories: ASTM C 840; manufacturer's standard trim accessories, including cornerbead and edge trim of beaded type with face flanges for concealment in joint compound.

2.06 Gypsum Board Joint Treatment Materials: ASTM C 475 and ASTM C 840, and as follows:

A. Joint Tape: Paper reinforcing tape, unless open-weave glass fiber tape is recommended by gypsum board manufacturer.

B. Setting-Type Joint Compound: Factory-prepackaged, job-mixed chemical-hardening powder products formulated for uses indicated.

C. Drying-Type Joint Compounds: Factory-prepackaged -premixed vinyl-based products. Taping compound formulated for embedding tape and first coat over fasteners and flanges of corner beads and edge trim. Topping compound formulated for fill (2nd) and finish (3rd) coats.

2.07 Miscellaneous Materials: As recommended by gypsum board manufacturer:

A. Gypsum Board Screws: ASTM C 1002.

B. Concealed Acoustical Sealant: Comply with requirements specified in Division-7 Section "Joint Sealers."

PART 3 - EXECUTION:

3.01 Install steel framing to comply with ASTM C 754 and ASTM C 840.

A. Do not bridge building expansion joints with support systems, frame both sides of joints with furring and other supports as indicated.

B. Secure hangers to structural support by connecting directly to structure where possible, otherwise connect to inserts, clips other anchorage devices or fasteners as indicated.

C. Install direct-hung grid suspension system, including perimeter wall track or angle, with members spaced and installed to comply with mfr's instructions.

D. Install steel studs with bottom and top runner tracks anchored to substrates. Isolate system from building structure to prevent transfer of loading and deflections into metal support system, both vertically and horizontally.

E. Install supplementary framing, runners, furring, blocking, steel plate, and bracing at openings and terminations in gypsum drywall and where required for support of other work which cannot be adequately supported on gypsum board alone.

3.02 Install and finish gypsum board to comply with ASTM C 840 and as follows:

A. Isolate drywall construction from abutting structural and masonry work; provide edge trim and acoustical sealant as recommended by manufacturer.

B. Screw gypsum board to metal supports.

C. Do not bridge building expansion joints. Leave space of the width indicated between boards, and trim both edges for installation of sealant or gasket.

3.03 Install water-resistant backing board where indicated to receive thin-set tile.

3.04 DRYWALL FINISHING:

A. General: Treat gypsum board joints, interior angles, edge trim, control joints, penetrations, fastener heads, surface defects, and elsewhere as required to prepare gypsum board surfaces for

decoration. Promptly remove residual joint compound from adjacent surfaces.

B. Prefill open joints and damaged surface areas.

C. Apply joint tape over gypsum board joints, except for trim products specifically indicated as not intended to receive tape.

D. Gypsum Board Finish Levels: Finish panels to levels indicated below and according to ASTM C840:

1. Level 4:
   a. All Joints and interior angles shall have tape embedded in joint compound and two separate coats of joint compound applied over all flat joints and one separate coat of joint compound applied over interior angles. Fastener heads and accessories shall be covered with three separate coats of joint compound. All joint compound shall be smooth and free of tool marks and ridges. Note: It is recommended that the prepared surface be coated with a drywall primer prior to the application of final finishes. (See Section 099000 – Painting.)

3.05 Install compound in 3 coats (plus prefill of cracks where recommended by manufacturer); sand between coats and after last coat.

A. Embedding and First Coat: Ready-mix drying type all-purpose of taping compound.

B. Fill (Second) Coat: Ready-mix drying type all-purpose or topping compound.

C. Finish (Third) Coat: Ready-mix drying-type all-purpose or topping compound.

END OF SECTION 092900

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SECTION 095100 - ACOUSTICAL CEILINGS

PART 1 - GENERAL

1.01 Acoustical Panel and Tile Standard: FS SS-S-118.

1.02 Acoustical Suspension System Standards: ASTM C 635 for materials, ASTM C 636 for installation.

1.03 Surface Burning Characteristics: 25 or less for flame spread, 50 or less for smoke developed, per ASTM E 84.

1.04 Submittals: Submit product data for each type of acoustical ceiling tile along with 6" square samples of each type of acoustical tile.

1.05 Coordination: Review Finish Plan on drawings and Mechanical and Electrical Drawings for layout and pattern of acoustical units, location of recessed light fixtures, ceiling diffusers and grilles, details of ceiling penetrations, details of fire rated acoustical treatment, access doors and necessary connections to work of other trades.

Provide coordination drawings for reflected ceiling plans drawn accurately to scale and coordinating penetrations and ceiling-mounted items. Show the following:

1. Ceiling suspension members.
2. Methods of attaching hangers to building structure.
3. Size and location of initial access modules.
4. Ceiling-mounted items including light fixtures; air outlets and inlets; speakers; sprinkler heads; and column penetrations and other junctures with adjoining construction.

1.06 Installer Qualifications: Engage an experienced Installer who has successfully completed acoustical ceilings similar in material, design and extent to that indicated for Project.

1.07 Preinstallation Conference: Conduct a preinstallation conference at the Project site to coordinate work from all trades.

1.08 Delivery, Storage and Handling: Deliver acoustical ceiling units to project site in original, unopened packages and store them in a fully enclosed space where they will be protected against damage from moisture, direct sunlight, surface contamination and other causes. Before installing acoustical ceiling units, permit them to reach room temperature and a stabilized moisture content.

1.09 Deliver extra materials to Owner. Furnish extra materials of each size and type matching products installed and equaling 2.0% of acoustical units and exposed suspension members installed. Package materials in protective covering and identify with appropriate labels.

1.10 Warranty: Provide acoustical panels and grid from the same manufacturer with a thirty year warranty from the date of substantial completion.

PART 2 - PRODUCTS:

2.01 **Approved Manufacturers:**
Armstrong Commercial Ceilings
USG Commercial Ceilings

A. **ACT-1**–Match Existing Ceiling Tiles

2.02 Dimensional Stability: Suspension systems shall meet or exceed the requirements of ASTM C635 for dimensional tolerances, coatings and finishes, and load carrying capabilities.

2.02 Humidity control: Ceilings shall have a 30-year system warranty against system sagging and warping when installed according to manufacturer's recommendations. Ceilings shall have and anti-microbial warranty against fungi, mold, mildew, bacteria, yeast or algae.

2.04 Suspension Systems:

A. Non-Fire-Resistance-Rated Exposed Double Web Steel Direct-Hung Suspension System with 15/16" Wide Exposed Faces: Roll-formed from prefinished cold-rolled steel sheet, with hanger wire, attachment devices and edge moldings and trim; intermediate-duty system structural classification; white painted finish. Note: All cold-rolled steel sheets shall be hot dipped galvanized (G-30).

Armstrong – 15/16" Prelude XL.

(Manufacturer's Ceiling Tile shall be installed with Manufacturer's Suspension System in order to keep the 30 year system warranty. No alternate manufacturers warranties will be accepted).

PART 3 - EXECUTION

3.01 Project Conditions: Do not install interior acoustical ceilings until space is enclosed and weatherproof, wet work in space is completed and nominally dry, work above ceilings is complete, and ambient conditions of temperature and humidity will be continuously maintained at values near those indicated for final occupancy.

3.02 Layout: Balance ceiling borders on opposite sides, using more-than-half-width acoustical units.

3.03 Tolerance: 1/8" in 12'-0" level tolerance.

3.04 Suspension System: Secure to building structure, with hangers spaced 4'-0" along supported members.

3.05 Edge Moldings: Secure to substrate with screw anchors spaced 16" o.c. Miter corner joints. Cope exposed edges of intersecting exposed suspension members to produce flush intersections.

3.06 Damaged ceiling panels: Prior to Substantial Completion, remove and replace skinned, damaged or dirty ceiling panels with new material.

3.07 Cleaning: Clean exposed surfaces of acoustical ceilings, including trim, edge moldings and suspension members. Comply with manufacturer's instructions for cleaning and touch-up of minor finish damage. Remove and replace work that cannot be successfully cleaned and repaired to permanently eliminate evidence of damage.

END OF SECTION 095100

SECTION 096500 - RESILIENT TILE

PART 1 – GENERAL

1.01 RELATED DOCUMENTS:

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

1.02 SUMMARY:

A. Section Includes:
   1. Resilient floor tile.
   2. Vinyl Wood floor planks

1.03 SUBMITTALS:

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

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

C. Qualification Data: For qualified Installer.

D. Maintenance Data: For each type of floor tile to include in maintenance manuals.

1.04 QUALITY ASSURANCE

A. Qualifications: A qualified installer who employs workers for this Project who are competent in techniques required by manufacturer for floor tile installation indicated.
   1. Engage an installer who employs workers for this Project who are trained for installation techniques required.

B. Fire-Test-Response Characteristics: As determined by testing identical products according to ASTM E 648 or NFPA 253 by a qualified testing agency.
   1. Critical Radiant Flux Classification: Class I, not less than 0.45 W/sq. cm.

1.05 DELIVERY, STORAGE, AND HANDLING

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

1.06 PROJECT CONDITIONS

A. Maintain ambient temperatures within range recommended by manufacturer, but not less than 68 deg F (20 deg C) or more than 72 deg F (22.2 deg C), in spaces to receive floor tile during the following time periods:
   1. 48 hours before installation.
   2. During installation.
   3. 48 hours after installation.

B. Until Substantial Completion, maintain ambient temperatures within range recommended by manufacturer, but not less than 60 deg F (15.6 deg C or more than 80 deg F (26.7 deg C).

C. Close spaces to traffic during floor tile installation.

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

E. Install floor tile after other finishing operations, including painting, have been completed.

1.08 EXTRA MATERIALS

A. Furnish extra materials that match products installed and that are packaged with protective covering for storage and identified with labels describing contents.
1. Floor Tile: Furnish 1 box for every 50 boxes or fraction thereof, of each type, color, and pattern of floor tile installed.

PART 2 - PRODUCTS

2.01 VINYL WOOD FLOORING - VWF

A. Mfr: Centiva OR approved equal
Series: Event
Contact: Ed Zanders with Tandus flooring (904) 535-6791.

B. Tile Standard: ASTM F 1700.
1. Class: Class III, printed film vinyl tile.
2. Type: Type B, embossed surface.

C. Nominal Thickness: overall - 0.120 inch (3.0 mm); wear layer - 30 mil

D. Test Performance:
ASTM E648: Critical Radiant Flux - Class 1, CRF > 0.45
ASTM E662: Smoke Density - > 450, Good
ASTM F925: Chemical Resistance - Excellent
ASTM C1028: Slip resistance - Very good
ASTM D2047: Passes
ADA Compliant: FTC slip resistant classified product

E. Size: 6" x 36"

F. Seaming Method: Standard

G. Edges: Square

H. Surface Texture: Rustic, RU

I. Color: See color legend in drawings.

J. Warranty: 20 year commercial

2.03 INSTALLATION MATERIALS

A. Trowelable Leveling and Patching Compounds: Latex-modified, portland cement based formulation provided or approved by manufacturer for applications indicated.
   1. Basis-of-Design Product: Subject to compliance with requirements, provide Centiva; 6000 for 6 lbs. of mver. Provide mr 12 adhesive if mver is between 6 lbs and 12 lbs.

PART 3 - EXECUTION

3.01 EXAMINATION

A. Examine substrates, with Installer present, for compliance with requirements for maximum moisture content and other conditions affecting performance of the Work.

B. Verify that finishes of substrates comply with tolerances and other requirements specified in other Sections and that substrates are free of cracks, ridges, depressions, scale, and foreign deposits that might interfere with adhesion of floor tile.

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

3.02 PREPARATION

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

B. Concrete Substrates: Prepare according to ASTM F 710.
   1. Verify that substrates are dry and free of curing compounds, sealers, and hardeners.

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

   3. Alkalinity and Adhesion Testing: Perform tests recommended by manufacturer. Proceed with installation only after substrates pass testing.

   4. Moisture Testing: Perform tests recommended by manufacturer and as follows. Proceed with installation only after substrates pass testing. Testing shall be done by an independent third party.
      a. Perform anhydrous calcium chloride test, ASTM F 1869. Proceed with installation only after substrates have maximum moisture-vapor-emission rate of 5 lb of water/1000 sq. ft. (2.27 kg of water/92.9 sq. m) in 24 hours.

      b. Perform relative humidity test using in situ probes, ASTM F 2170. Proceed with installation only after substrates have a maximum 75% relative humidity level measurement.

      c. Both tests shall be done. Results shall be documented and retained. A copy shall be submitted to the Architect, Contractor and Flooring Subcontractor within 72 hours.

C. Fill cracks, holes, and depressions in substrates with trowelable leveling and patching compound and remove bumps and ridges to produce a uniform and smooth substrate.

D. Do not install floor tiles until they are same temperature as space where they are to be installed.
   1. Move resilient products and installation materials into spaces where they will be installed at least 48 hours in advance of installation.
   2.

E. Sweep and vacuum clean substrates to be covered by resilient products immediately before installation.

3.03 FLOOR TILE INSTALLATION

A. Comply with manufacturer's written instructions for installing floor tile.

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

C. Match floor tiles for color and pattern by selecting tiles from cartons in the same sequence as manufactured and packaged, if so numbered. Discard broken, cracked, chipped, or deformed tiles.
1. Lay tiles carefully, noting directional arrows on the back of tiles when present.

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

E. Extend floor tiles into toe spaces, door reveals, closets, and similar openings. Extend floor tiles to center of door openings.

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

G. Install floor tiles on covers for telephone and electrical ducts, building expansion-joint covers, and similar items in finished floor areas. Maintain overall continuity of color and pattern between pieces of tile installed on covers and adjoining tiles. Tightly adhere tile edges to substrates that abut covers and to cover perimeters.

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

3.04 CLEANING AND PROTECTION

A. Comply with manufacturer's written instructions for cleaning and protection of floor tile.

B. Perform the following operations immediately after completing floor tile installation:
1. Remove adhesive and other blemishes from exposed surfaces.
2. Sweep and vacuum surfaces thoroughly.
3. Damp-mop surfaces to remove marks and soil.

C. Protect floor tile products from mars, marks, indentations, and other damage from construction operations and placement of equipment and fixtures during remainder of construction period.

D. Remove soil, visible adhesive, and surface blemishes from floor tile surfaces .
1. Not less than 48 hours after installation, clean floor with a neutral liquid cleaner, as recommended by the flooring and cleaner manufacturers.

END OF SECTION 096500

SECTION 099100 – PAINTING

PART 1 - GENERAL

1.01 RELATED DOCUMENTS

A. Drawings and Division 1 Specification Sections, apply to this section.

1.02 DESCRIPTION OF WORK

A. Painting and finishing of interior and exterior items and surfaces, unless otherwise indicated.

B. Includes field painting of bare and covered pipes and ducts (including color coding), and hangers, exposed steel and iron work, and primed metal surfaces of equipment installed under mechanical and electrical work.

C. Paint exposed surfaces, except as otherwise indicated, whether or not colors are designated. If not designated, colors will be selected by Architect from designer colors available for the coatings required.

D. See Section 099600 for textured coatings to be utilized on the exterior of the building.

1.03 WORK NOT INCLUDED: Unless otherwise indicated, shop priming of ferrous metal items and fabricated components are included under their respective trades. Pre-finished items, are not included.

A. Unless otherwise indicated, painting not required on surfaces of concealed areas except for piping, equipment and other such items within concealed spaces. Finished metals such as anodized aluminum, stainless steel, bronze, and similar metals will not be painted. Do not paint any moving parts of operating units, or over any equipment identification, performance rating, name or nomenclature plates or code-required labels.

1.04 RELATED SECTIONS

A. Section 042000 - CMU

B. Section 081113 - Steel Doors and Frames

C. Section 092900 - Gypsum Drywall

1.05 FLAME SPREAD RATING

A. Class A (0-25) over non-combustible surfaces.

1.06 SUBMITTALS: In addition to manufacturer's data, application instructions, and label analysis for each coating material, submit samples for Architect's review of color and texture only. Resubmit samples if requested until required sheen, color and texture is achieved.

A. On 8" x 8" hardboard, provide samples of each color and material, with texture to simulate finish conditions.

B. On actual wall surfaces and other building components, duplicate painted finishes of acceptable samples, as directed by Architect. Final acceptance of paint color and texture shall be from wall sample.

1.07 PROJECT CONDITIONS

A. Do not apply paint in rain, fog or mist or when relative humidity exceeds 85%. Do not apply paint to damp or wet surfaces or before the building is weathered in.

1.08 EXTRA MATERIALS

A. Furnish extra paint materials from the same production run as the materials applied. Package with protective covering for storage and identify with labels describing contents. Deliver extra materials to Owner. Furnish Owner with 1 gal. of each material and color applied.

PART 2 - PRODUCTS

2.01 MANUFACTURERS

A. Provide specified paint by Sherwin-Williams Company OR approved equal by one of the following paint manufacturers:

1. Pittsburgh Paints.
2. Porter Paints.
3. ICI Paint Stores.
4. Benjamin Moore.
5. Color Wheel.

2.02 PAINT MATERIALS – GENERAL

A. Material Compatibility: Provide block fillers, primers, and finish-coat materials that are compatible with one another and with the substrates recommended by manufacturer.

B. Material Quality: Provide manufacturer's best-quality paint material of the various coating types specified that are factory formulated and recommended by manufacturer for application indicated. Paint-material containers not displaying manufacturer's product identification will not be acceptable.

2.03 PAINT SCHEDULE

A. **Exterior Surfaces: **Final Color to be Selected by Owner****

1. **Ferrous Metal (Exterior) (Shop Primed Metal):**
   - 1st Coat: S-W PRO Industrial Acrylic Semi-Gloss Coating, B66-650 Series
   - 2nd Coat: S-W PRO Industrial Acrylic Semi-Gloss Coating, B66-650 Series
   - (2.5-4 mils dry per coat; VOC 0 g/L)

2. **Concrete Masonry Units (EP-Epoxy Paint):**
   - 1st Coat : S-W Loxon Block Surfacer, A24W200
   - (50-100 sq ft/gal; VOC 81 g/L, 0.68 lb/gal)
   - 2nd Coat: S-W ProIndustrial Pre-Catalyzed Waterbased Epoxy, K46
   - 3rd Coat: S-W ProIndustrial Pre-Catalyzed Waterbased Epoxy, K46
   - (4.0 mils wet, 1.5 mils dry per coat; VOC 155 g/L, 1.29 lb/gal)

B. **Interior Surfaces: **Final Color to be Selected by Owner****

1. **Concrete Masonry Units (EP-Epoxy Paint):**
   - 1st Coat : S-W Loxon Block Surfacer, A24W200
   - (50-100 sq ft/gal; VOC 81 g/L, 0.68 lb/gal)
   - 2nd Coat: S-W ProIndustrial Pre-Catalyzed Waterbased Epoxy, K46
   - 3rd Coat: S-W ProIndustrial Pre-Catalyzed Waterbased Epoxy, K46
   - (4.0 mils wet, 1.5 mils dry per coat; VOC 155 g/L, 1.29 lb/gal)

2. **Concrete Floor (SC-Sealed Concrete):**
   - Properly prepare concrete surface for stain/sealer.
   - See manufacturer's surface preparation guidelines
   - 1st Coat: S-W H&C Concrete Stain, Solid Color, Water Based
   - 2nd Coat: S-W H&C Concrete Stain, Solid Color, Water Based
   - (100-150 sq/ft per gallon)

3. **Ferrous Metal (Interior):**
   - Primer: S-W Pro-Cryl Universal Primer, B66-310 Series
   - (5.0-10.0 mils wet, 2.0-4.0 mils dry; VOC <100 g/L, <0.93 lb/gal)
   - 1st Coat: S-W PRO Industrial Acrylic Semi-Gloss Coating, B66-650 Series

2nd Coat: S-W PRO Industrial Acrylic Semi-Gloss Coating, B66-650 Series (2.5-4 mils dry per coat; VOC 0 g/L)

PART 3 - EXECUTION

3.01 EXAMINATION:

A. Examine substrates, areas, and conditions, with Applicator present, for compliance with requirements for paint application.

1. Proceed with paint application only after unsatisfactory conditions have been corrected and surfaces receiving paint are thoroughly dry.
2. Start of painting will be construed as Applicator's acceptance of surfaces and conditions within a particular area.
3. Notify Architect about anticipated problems when using the materials specified over substrates primed by others.

3.02 PREPARATION

A. Remove hardware and accessories, machined surfaces, plates, lighting fixtures and similar items in place and not to be finish-painted or provide surface-applied protection. Reinstall removed items and remove protective coverings at completion of work.

B. Surface Preparation: Clean and prepare surfaces to be painted according to manufacturer=s written instructions for each particular substrate condition and as specified.

1. Cementitious Surfaces: Prepare concrete, concrete masonry, cement plaster and surfaces to be painted. Remove efflorescence, chalk, dust, dirt, grease, oils, and release agents. Roughen as required to remove glaze. If hardeners or sealers have been used to improve curing, use mechanical methods of surface preparation. Determine alkalinity and moisture content of surfaces to be painted. Do not paint surfaces where moisture content exceeds that permitted in manufacturer's printed directions.
2. Wood: Clean surfaces of dirt, oil, or other foreign substances with scrapers, mineral spirits, and sandpaper, as required. Sand surfaces exposed to view smooth, and dust off.
   a. Scrape and clean small, dry, seasoned knots, and apply a thin coat of white shellac or other recommended knot sealer before applying primer. After primer, fill holes and imperfections in finish surfaces with putty or plastic wood filler. Sand
   b. Prime, stain, or seal wood to be painted immediately upon delivery. Prime edges, ends, faces, undersides, and backsides of wood, including cabinets, counters, cases, and paneling.
   c. Seal tops, bottoms, and cut-outs of unprimed wood doors with a heavy coat of varnish or sealer immediately upon delivery.

C. Ferrous Metals: Clean non-galvanized ferrous metal surfaces that have not been shop-coated; remove oil, grease, dirt, loose mill scale and other foreign substances. Use solvent or mechanical cleaning methods that comply with recommendations of the Steel Structures Painting Council. Touch-up shop-applied prime coats that have been damaged, and bare areas. Wire-brush, clean with solvents and touch-up with the same primer as the shop coat.

D. Galvanized Surfaces: Clean galvanized surfaces with non-petroleum based solvents so that surface is free of oil and surface contaminants. Remove pretreatment from galvanized sheet metal fabricated from coil stock, by mechanical methods.

E. Material Preparation: Mix and prepare paint materials according to Manufacturer's written instructions.

3.03 APPLICATION:

A. Apply painting and finishing materials in accordance with manufacturer's directions. Use applicators, and techniques best suited for materials and surfaces to which applied.

B. Apply additional coats when undercoats, stains or other conditions show through final paint coat, until paint film is of uniform finish, color and appearance.

C. Paint surfaces behind movable equipment and furniture same as similar exposed surfaces. Paint surfaces behind permanently fixed equipment or furniture with prime coat only before equipment is installed.

D. Paint interior surfaces of ducts, where visible through registers or grilles, flat, non-specular black.

E. Paint back sides of access panels, and removable or hinged covers to match exposed surfaces.

F. Sand lightly between exceeding enamel or varnish coats.

G. Omit first coat (primer) on metal surfaces which have been shop-primed and touch-up painted, unless otherwise specified.

H. Apply prime coat to material which is required to be painted or finished, and which has not been prime coated by others.

I. Apply each material at not less than manufacturer's recommended spreading rate, to provide a total dry film to thickness of not less than 4.0 mils for entire coating system of prime and finish coats for 3-coat work.

J. Minimum Coating Thickness: Apply paint materials no thinner than manufacturer=s recommended spreading rate to achieve dry film thickness indicated. Provide total dry film thickness of the entire system as recommended by manufacturer.

3.05 PROTECTION:

A. Protect work of other trades. Correct any painting related damages by cleaning, repairing or replacing, and refinishing, as directed by Architect.

3.06 COORDINATION:

A. Provide finish coats which are compatible with prime paints used. Provide barrier coats over incompatible primers where required. Notify Architect in writing of anticipated problems using specified coatings with substrates primed by others.

3.07 COMPLETED WORK

A. Match approved samples for color, texture and coverage. Remove, refinish or repaint work not in compliance with specified requirements.

END OF SECTION 099100

SECTION 102641 – BULLET RESISTANT WALL PANELS

PART 1 – GENERAL

1.1 SUMMARY

A. Section includes bullet resistant fiberglass panels.

1.2 REFERENCES

A. American Society for Testing and Materials:
   1. ASTM E119-98 Standard Test for One-Hour Fire-Rating of Building Construction and Materials
   2. ASTM F1233-98 Standard Test Method for Forced Entry Testing of Materials/Assemblies, Class IV
B. International Organization for Standardization:
   1. ISO 9001:2008 Quality Management System
C. National Institute of Justice Ballistic Standards:
   1. NIJ Standard 0108.01 – Type III-A
D. Small Business Administration:
   1. SBA Small Business Size Standard
E. Underwriters Laboratories:
   1. UL 752 Specifications and Ammunition, 11th Edition, Standard for Bullet Resisting Equipment published September 9, 2005, revised December 21, 2006, Level 3
F. The United States Department of State:
   1. The International Traffic in Arms Regulations (ITAR)

1.3 SUBMITTALS

A. Submittals for Review: Submit for approval prior to fabrication.
   1. Product Data: Include specifications, brochures, and samples.
   2. Recommendations for installation of Bullet Resistant Fiberglass Panels available in print document and video link.
B. Certificates: Submit printed data to indicate compliance with following requirements.
   1. **UL LISTING Verification** and **UL752 Current Test Results** as provided by Underwriters Laboratories.
   2. ASTM E119-98 One-Hour Fire Rating of Building Construction and Materials.
   3. ASTM F1233-98 Standard Test Method for Forced Entry Testing of Materials/Assemblies.
   4. Manufacturer's third party certificate of registration with ISO 9001:2008.
   5. Manufacturer's U.S. Dept. of State ITAR Statement of Registration.
   6. Manufacturer's SBA Profile verifying small business status by the SBA.

1.4 DELIVERY, HANDLING, AND STORAGE

A. Deliver materials to project with manufacturer's **UL LISTED Labels** intact and legible.
B. Handle material with care to prevent damage. Store materials inside under cover, stack flat and off the floor.

1.5 WARRANTY

A. Warrant all materials and workmanship against defects for a period of ten (10) years from the date of Substantial Completion.

PART 2 – PRODUCTS

2.1 MANUFACTURER

A. Design Basis: Contract Documents are based on ArmorCore by **Waco Composites**, (Waco, TX 76710, phone: 254-752-3622, toll free: 866-688-3088, email: sales@armorcore.com, web: www.armorcore.com)

2.2 PERFORMANCE CRITERIA

A. Bullet Resistant Fiberglass Panels shall be "non ricochet type" to permit the encapture and retention of an attacking projectile lessening the potential of a random injury or lateral penetration.
B. Panel Rating: UL752 Level 3.
C. Bullet resistance of joints: equal to that of the panel.

2.3 MATERIALS

A. Panels fabricated of multiple layers of woven roving ballistic grade fiberglass cloth impregnated with a thermoset polyester resin and compressed into flat rigid sheets.
B. Thickness: 7/16" nominal thickness
C. Nominal Weight: 4.8 lbs. per sq. ft.
D. Available Panel Sizes: 4' x 8'or as needed. Provide custom sizes as required for continuity and to minimize joints.
E. Panels manufactured in the United States of America with raw materials sourced from the U.S.A. for quality assurance purposes and to comply with any applicable "Buy American" provisions.

PART 3 - EXECUTION

3.1 EXAMINATION

A. Prior to starting installation, verify work of related trades required in contract documents and architectural drawings is complete to the point where work of this Section may properly commence.

3.2 JOINTS

A. Reinforce joints with a back-up layer of bullet resistive material. Minimum width of reinforcing layer at joint shall be 4-inches, centered on panel joints.

3.3 APPLICATION

A. Install armor in accordance with manufacturer's recommendations and as required by contract documents.
B. Secure armor panels using screws, bolts, or an industrial adhesive.
   1. Method of application shall install panels minimizing vulnerabilities by fitting tightly to adjacent surfaces including concrete floor slab, concrete roof slab, bullet resistive door frames, bullet resistive window frames, and the like.

END OF SECTION 102641