CONSTRUCTION SPECIAL SPECIALIZATION

SECTION 04270_S

GLASS BLOCK

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PART 1 - GENERAL

1.01 DESCRIPTION:

A. Glass block masonry is indicated on the Drawings and includes glass block panel assemblies with end closure.

1.02 QUALITY ASSURANCE:

A. ASTM A123, Spec. for Zinc (Hot Galvanized) Coatings on Products Fabricated from rolled, pressed and forged steel shapes, plates, bars, and strips.

1. ASTM C144, Spec. for aggregate for Masonry

2. ASTM C150, Spec. for Portland Cement ASTM C207, Spec. for Lime

3. ASTM E163, Fire Test of window assemblies (equivalent to UL 9)

4. ASTM C27, Spec. for Mortar for unit masonry

B. Construction Tolerances:

1. Variation from Plumb: For vertical lines and surfaces do not exceed 1/4" in 10'. For external corners, expansion joints, control joints and other conspicuous lines, do not exceed 1/4" in 20'.

2. Variation from Level: For lines of exposed lintels, sills, parapets, horizontal grooves and other conspicuous lines, do not exceed 1/4" in 20'.

C. Mortar Testing Service: Owner will employ a testing laboratory acceptable to

D. Architect to perform material evaluation tests and to design mortar mixes.

E. Materials and installed work may require testing and retesting, as directed by Architect, at any time during progress of work. Allow free access to material stockpiles and facilities. Tests, not specifically indicated to be done at Owner's expense, including retesting of rejected materials and installed work, shall be done at Contractor's expense.

F. Fire Rating: All glass block units, which are to be installed into a corridor wall, must have a minimum 45 minute UL fire rating. NOTE: 12' X 12' size is not fire rated, do not use in Exit corridors.

1.03 SUBMITTALS:

A. Product Data: Submit manufacturer's specifications and other data for each type of masonry unit, accessory, and other manufactured products, including certifications that each type complies with specified requirements.

B. Fire Tests (if required): Submit documents verifying glass block units are classified for a 3/4 hour fire exposure according to ASTM E163 or UL 9. All such glass block unit cartons shall carry UL labels.

C. Submit sample blocks for final selection of color and pattern.

D. Submit shop drawing showing dimensions of joints, spacing of reinforcing and steel supports, details needed for correlation of related work.

E. Laboratory Test Reports: Submit laboratory test reports for mortar materials and mix design test as specified.

F. Field Construction Mock-Ups: Prior to installation of masonry work, erect sample wall panels to represent each type of completed masonry work for qualities of appearance, materials and construction. Size of panels to be minimum 4' x 4', including expansion strips, reinforcing, and anchor strips.

G. Fire Rating: Submit applicable fire rating certification from a recognized testing agency

1.04 JOB CONDITIONS:

A. Protection of Work: During erection, cover top of walls with heavy waterproof sheeting at end of each days' work. Cover partially completed structures when work is not in progress.

1. Extend cover a minimum of 24" down both sides and hold cover securely in place.

2. Protect sills, ledges and projections from droppings of mortar.

3. Where fresh masonry joins masonry that is partially set or totally set, clean the exposed surface of the set masonry to obtain the best possible bond with the new work. Remove all loose unit masonry and mortar. If it is necessary to "stop off" a horizontal run of masonry, this shall be done by racking back one block length in each course. Toothing will not be permitted.

4. Consult other trades and make provisions that will permit the installation of their work in a manner to avoid cutting and patching. Build in work specified under sections, as work progresses. Set steel lintels in beds of mortar. Fill spaces around jambs and heads of metal door bucks and frames, solidly with mortar.

B. Cold Weather Protection:

1. Remove any ice or snow formed on masonry bed by carefully applying heat until top surface is dry to the touch.

2. Remove all masonry determined to be frozen or damaged by freezing conditions.

3. Do not lay masonry when the temperature of the outside air is below 40 degrees F. unless suitable means as approved by the Architect are provided to heat materials, protect work from cold and frost and insure that mortar will harden without freezing. No antifreeze ingredient shall be used in the mortar.

C. Perform the following construction procedures while the work is progressing:

1. When air temperature is from 40 degrees F. to 32 degrees F., heat sand or mixing water to produce mortar temperatures between 40 degrees F. and 120 degrees F.

2. When air temperature is from 32 degrees F. to 25 degrees F., heat sand or water to produce mortar temperature between 40 degrees F. and 120 degrees F.; maintain temperature of mortar on boards above freezing.

3. When air temperature is from 25 degrees F. to 20 degrees F., heat sand and mixing water to produce mortar temperatures between 40 degrees F. and 120 degrees F.; maintain temperature of mortar on boards above freezing; use salamanders or other heat sources on both sides of walls under construction; use wind breaks when wind is in excess of 15 mph.

4. When air temperature is 20 degrees F. and below, heat sand and mixing water to produce mortar temperatures between 40 degrees F. and 120 degrees F.; provide enclosures and auxiliary heat to maintain air temperature above 32 degrees F. do not lay units which have a surface temperature of 20 degrees F. and below.

D. Perform the following protections for completed masonry and masonry not being worked on:

1. When the mean daily air temperature is from 40 degrees F. to 32 degrees F., protect masonry from rain or snow for at least 24 hours by covering with weather-resistive membrane.

2. When mean daily air temperature is from 32 degrees F. to 20 degrees F., completely cover masonry with insulating blankets or similar protection for at least 24 hours.

3. When mean daily temperature is 20 degrees F. and below, maintain masonry temperature above 32 degrees F. for 24 hours using enclosures and supplementary heat, electric heating blankets, infrared lamps, or other acceptable methods.

PART 2 - PRODUCTS

2.01 GLASS UNIT MASONRY GENERAL:

A. Manufacturer: PITTSBURGH CORNING CORPORATION.

B. The drawings and specifications are based on catalog data, specifications and products of the Pittsburgh Corning Corporation and designate the type and quality of work intended under this section.

C. Products of other manufacturers proposed as equivalent quality may be submitted in accordance with Section 01340.

2.02 GLASS BLOCK UNITS:

A. Architect will make selection from one or several (no limit) of the following patterns: TEXTRA, ARGUS, ESSEX AA, DECORA, VUE; regular 3-7/8" thickness; and from one or several (no limit) of the following sizes: 6" x 6", 8" x 8", 12" x 12".

2.03 ACCESSORIES:

A. Panel Reinforcing: Two parallel 9 gage wires either 1-5/8" or 2" on center with electrically welded cross-wires at regular intervals, galvanized after welding.

B. Expansion Strips: Made of fibrous glass or polyethylene foam with a thickness of 3/8".

C. Panel Anchors: 20 gauge perforated steel strips 24" long by 1-3/4" wide, galvanized after perforating.

D. Asphalt Emulsion: A water-based asphalt emulsion, by Karnak Chemical Corp., or equal.

E. Joint filler and sealant materials are specified in Division 7 Sections of these specifications.

F. Metal and/or plastic perimeter channels for linear and curved walls.

G. Clear silicone sealant.

2.04 MORTAR MATERIALS:

A. Type S in accordance with ASTM C270. (For exterior glass block panels, an integral type waterproofer should be added to the mortar mix.)

B. Portland Cement: Type 1 in accordance with ASTM C150.

C. Lime: Type S, in accordance with ASTM C207.

D. Sand: A clean, white quartzite type, essentially free of iron compounds, for thin joints, in accordance with ASTM C144.

E. Integral Type Waterproofer: Stearate type by Sonneborn Building Products, or equal.

2.05 PROPORTIONING AND DESIGN OF MIXES:

A. Prepare design mixes for each type and strength of mortar in accordance with applicable provisions. Use an independent testing facility acceptable to Architect for preparing and reporting proposed mix designs.

B. Submit written reports to Architect of each proposed mix for each class of mortar at least 15 days prior to start of work. Do not begin mortar production until mixes have been reviewed by Architect.

C. Adjustment to mortar mixes: Mix design adjustments may be requested by Contractor when characteristics of materials, job conditions, weather, test results, or other circumstances warrant; at no additional cost to Owner and as accepted by Architect. Laboratory test data for revised mix design and strength results must be submitted to and accepted by Architect before using in work.

2.06 MORTAR MIXES:

A. Do not lower the freezing point of mortar by use of admixtures or antifreeze agents.

Do not use calcium chloride in mortar or grout.

B. Mortar for Unit Masonry: Comply with ASTM C 270, Proportion Specifications, except limit materials to those specified herein, and limit cement/lime ratio (by volume) as follows:

Mortar Mix Type S; 1800 PSI and the following:

Use Type PL mortar proportioned by volume; one part portland cement, 1/4 to 1/2 part lime, and sand equal to 2-1/4 to 3 times the sum of the volume of cement and lime materials, Sonneborn mortar proofing.

2.07 STYLE CAPS (EDGE TRIM):

A. Provide 1/4" thick “STYLE CAP” of same width and length as the glass block unit. Color to be: “Smoke” - 356. (Contact: Masonry and Glass, San Antonio, Texas. Tele: 800-353-2469, Attn: Jim White.

Web site: www.seattleglassblock.com/stylecaps.htm)

PART 3 - EXECUTION

3.01 PREPARATION:

A. Verify that any channels, chases, panel anchors have been provided at head and jambs for the purpose of providing panel support within the opening.

B. Mix all mortar components to a consistency that is drier than mortar for ordinary masonry. Do not use antifreeze compounds or accelerators.

3.02 INSTALLATION:

A. General specifications of the Masonry Institute as to conditions and precautions for laying masonry shall also apply to glass block masonry.

B. Manufacturer's specifications and recommendations shall be followed. Drawings and specifications for this project shall be carefully examined to verify that they comply with manufacturer's recommendations. Particular care shall be exercised to provide for expansion at heads and jambs of glass block panels, and to anchor and reinforce panels as detailed.

C. Cover sill area with a heavy coat of Asphalt Emulsion. Allow emulsion to dry before placing mortar.

D. Adhere Expansion Strips to jambs and head. Make certain expansion strip extends to sill.

E. Set a full mortar bet joint, applied to sill.

F. Set lower course of block. Maintain a uniform joint width of 1/4" plus or minu 1/8". All mortar joints must be full land not furrowed. Steel tools must not be used to tap block into position. Place a rubber crutch tip on end of trowel to tap block into position.

G. Install panel reinforcing at each joint horizontally and vertically. Panel anchors shall be installed on 24" centers at jambs and heads. Run reinforcing continuously from end to end of panels. Lap reinforcing not less than 6" whenever it is necessary to use more than one length. Do not bridge expansion joints with reinforcing. Install reinforcing as follows:

1. Place lower half of mortar in bed joint. Do not furrow.

2. Press panel reinforcing into place.

3. Cover panel reinforcing with upper half of mortar bed and trowel smooth. Do no furrow.

H. Place full mortar bed for joints not requiring panel reinforcing - do not furrow. Maintain uniform joint width.

I. Set succeeding course of block. Space at head of panel must remain free of mortar.

J. Strike joints smooth while mortar is still plastic and before final set. At this time rake out all spaces requiring sealant to a depth equal to the width of the spaces. Remove surplus mortar from faces of glass block and wipe dry. (See Cleaning) Tool joints smooth and concave, before mortar takes final set. Remove wedges from lower courses, if used, and point the voids with mortar.

K. After final mortar set install packing tightly between glass block panel and jambs and head construction. Leave space for sealing.

L. Apply sealant evenly to the full depth of recesses as indicated on the drawings and in accordance with the manufacturer's application manual and instructions.

3.03 CLEANING:

A. Remove surplus mortar from the faces of the glass block at the time joints are struck or tooled. Mortar should be removed while it is still plastic using a clean, wet sponge or an ordinary household scrub brush having stiff bristles.

B. Do not use harsh cleaners, acids, abrasives or alkaline materials while cleaning glass block. Never use steel wool or wire brush to remove mortar from glass block surfaces.

C. Final mortar removal is accomplished with a clean, wet sponge or cloth. Rinse sponge or cloth frequently in the clean water to remove abrasive particles. Allow any remaining film on the block to dry to a powder.

D. After all organic sealants, caulking, etc. have been applied, remove excess caulking materials with commercial solvents such as xylene, toluene, mineral spirits or maptha and follow with normal wash and rinse. Be careful not to damage caulking by overgenerous application of strong solvents. Comply with solvent manufacturer's directions on label for toxicity and flammability warning.

E. Final cleaning of glass block panels is accomplished after they are completely installed. Wait until panels are not exposed to direct sunlight. Start at the top of the panel and wash with generous amounts of clean water. Use a clean, dry, soft cloth to remove all water from the glass block surface. Change cloth frequently to eliminate dried mortar particles or aggregate that could scratch the glass surface.

3.04 FIELD QUALITY CONTROL:

A. Notify testing lab 24 hours prior to any samples or testing to be performed.

B. The General Contractor will cooperate totally with the testing lab and engineer. The General Contractor is warned that no chances will be taken on this project and if any of the tests show marginal performance, that area will be removed and replaced. No

additional funds will be dispersed to the General Contractor and no addition time will be allowed. The findings of the Owner's quality control representative and the following determination of the A/E will be final!

3.05 FIELD QUALITY CONTROL SCHEDULE:

A. Mortar Compressive Strength Tests:

B. ASTM C 270; One set of 3 specimens shall be taken at installation of field constructed mock up and not less than one set per week thereafter unless otherwise directed by the Architect. One specimen tested at 7 days, 2 specimens tested at 28 days.

END OF SECTION