ARCHITECTURAL PRODUCTS + SERVICES

SECTION 04 23 00

GLASS UNIT MASONRY

This section includes editing notes to assist the user in editing the section to suit project requirements. These notes are included as hidden text, and can be revealed or hidden by the following method in Microsoft Word:

Display the FILE tab on the ribbon, click OPTIONS, then DISPLAY. Select or deselect HIDDEN TEXT.

This guide specification section has been prepared by GBA Architectural Products+ Services for use in the preparation of a project specification section covering glass masonry units for exterior or interior use.

The following should be noted in using this specification:

Hypertext links to specific websites are included after manufacturer names and names of organizations whose standards are referenced within the text, to assist in product selection and further research. Hypertext links are contained in parenthesis and shown in blue, e.g.:

(www.astm.org)

Items requiring user input are enclosed within brackets and included as red text, e.g.:

Section [09 00 00] [_____.]

Optional paragraphs are separated by an "OR" statement included as red text, e.g.:

**** OR ****

For assistance on the use of the products in this section, contact GBA Architectural Products + Services by calling 877-280-7700, by email at sales@gbaproducts.com or visit their website at www.gbaproducts.com.

PART 1 GENERAL

1.1 SUMMARY

Edit the following to include only those items specified in this section.

A. Section Includes:
   1. [Hollow] [Solid] glass block units.
   2. Joint reinforcing.
   3. Mortar materials.
   4. Joint sealers.

B. Related Sections:
   1. Section [07 92 00 - Joint Sealers.] [_____-_____.]

1.2 REFERENCES

A. ASTM International (ASTM):
   1. A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement.
   2. A167 - Standard Specification for General Requirements for Flat-Rolled Stainless and Heat-Resisting Steel Plate, Sheet, and Strip.

3. A580 - Standard Specification for Stainless Steel Wire.
4. C144 - Standard Specification for Ferrotungsten.
5. C150 - Standard Specification for Portland Cement.
6. C153 - Specification for Refractories for Moderate Duty Stationary Boiler Service.
7. C207 - Standard Specification for Hydrated Lime for Masonry Purposes.
8. C270 - Standard Specification for Mortar for Unit Masonry.
9. D1187 - Standard Specification for Asphalt-Base Emulsions for Use as Protective Coatings for Metal.
10. D1227 - Standard Specification for Emulsified Asphalt Used as a Protective Coating for Roofing.
11. E2010 - Standard Test Method for Positive Pressure Fire Tests of Window Assemblies.

B. National Fire Protection Association (NFPA) 257 - Standard on Fire Test for Window and Glass Block Assemblies.

C. Underwriters Laboratories (UL) 9 - Standard for Fire Tests of Window Assemblies.

1.3 SUBMITTALS

A. Action Submittals:
1. Product Data:
   a. Manufacturer's data sheets on each product to be used.
   b. Preparation instructions and recommendations.
   c. Storage and handling requirements and recommendations.
   d. Installation methods including written plan for cold and hot weather construction and masonry cleaning procedures.
2. Samples: Submit two full size glass block units of each type, size, pattern and color.

B. Manufacturer's Certificates and Test Reports: Certify products meet or exceed specified requirements. Test reports should be within 12 months of bid date.

1.4 ADMINISTRATIVE REQUIREMENTS

A. Pre-Installation Conference:
1. Convene at Project site [2] [ ] weeks prior to beginning work of this Section.
2. Attendance: [Architect,] [Owner,] [Contractor,] [Construction Manager,] installer, and related trades.
3. Review:
   a. Methods and procedures related to masonry work, including set up and mobilization areas for stored material and work area.
   b. Work of other trades and make provisions to permit installation and avoid cutting and patching.
   c. Requirements of Contract Documents.
   d. Finalize schedule related to masonry and related work and verify availability of materials, installer's personnel, equipment and facilities needed to make progress and avoid delays.
   e. Required inspection, testing, and certification procedures.
   f. Weather conditions and procedures for coping with unfavorable conditions.
4. Tour representative areas to receive masonry, inspect and discuss condition of substrate, penetrations, and other preparatory work.

1.5 QUALITY ASSURANCE

A. Manufacturer Qualifications: Company specializing in manufacturing products specified in this section with minimum [10] [ ] years [documented] experience.

B. Installer Qualifications: Company specializing in performing Work of this section with minimum [5] [ ] years [documented] experience with projects of similar scope and complexity.

C. Source Limitations: Provide each type of masonry unit from a single manufacturing source to ensure uniform texture and color for continuous and visually related items.

D. Mockup:

1. Build panels on firm foundation, in location acceptable to Architect.
2. Construct panels full thickness, installing wall reinforcement, anchors, ties and other required accessories.
3. Provide special features as directed.
4. Show color range and texture of masonry units, bond, mortar joints and workmanship to be expected for Project.
5. Build sample panels for each type of glass block masonry construction.

1.6 DELIVERY, STORAGE, AND HANDLING

A. Deliver masonry units on wood pallets with manufacturer's recommended unit protective covers.

B. Inspect masonry units upon delivery; ensure color match with required materials and accepted samples.

C. Stack masonry units in dry location off ground on pallets or prepared platform. Protect with waterproof coverings arranged to allow air circulation around masonry units.

D. Exercise care in storage and handling of masonry units. Do not build soiled or damaged masonry units into Project.

1.7 SEQUENCING

A. Ensure that locating templates and other information required from others for built-in installation of products of this section are furnished in time to prevent interruption of construction progress.

1.8 PROJECT CONDITIONS

A. Maintain materials and ambient air temperatures to a minimum of 40 degrees F (4.4 degrees C) prior to, during and 48 hours after completion of work.

B. Protect masonry units from moisture prior to construction.

C. Cover top of wall until openings are protected by final construction.

PART 2 PRODUCTS

2.1 MANUFACTURERS

A. Acceptable Manufacturer: Seves Glass Block Inc., 10576 Broadview Rd.; Broadview Heights, OH 44147, 877-738-3711.
1. Distributed by: GBA Architectural Products+ Services, 1213 Medina Rd, Medina, OH 44256. 877-280-7700, sales@gbaproducts.com.

B. Substitutions: [Not permitted.] [Refer to Division 01.]

2.2 PERFORMANCE REQUIREMENTS

A. Structural Performance: Glass-block system and building attachments:
1. Loads: As indicated on Drawings.
2. Wind load: [ ] PSF uniform pressure acting inward or outward.
3. Floor live load: [__] PSF.
4. Roof live load: [__] PSF.

B. Fire Rated Glass Block Systems:
1. Assemblies listed by testing and inspecting agencies acceptable to authorities having jurisdiction.
2. Test at positive pressure per UL 9 or NFPA 257.

2.3 DESIGN REQUIREMENTS

Structural members around glass block panels: Limit deflection to L/600.

Provide vertical expansion joints where straight walls and curved walls with radius larger than 24 inches (610 mm) intersect and at reversals of curved walls.

Expansion material at jambs may be omitted for panels with areas of 25 sq ft (2.323 sq m) or less. Expansion joint at head must be maintained.

All steel on the outside, within the wall system and adjacent to wall on inside, should have a coating of hot dipped zinc or be stainless steel to minimize rust staining.

Limitation of Panel Sizes:

Exterior wall panels using Standard Series, 3 7/8 inch (100 mm) thick block exposed to 20 lbs per sq ft (138 kPa) wind load to be limited to 144 sq ft (13.378 sq m) when supported on all four sides. Area may be increased to 250 sq ft (23.226 sq m) when an intermediate stiffener is incorporated as an additional supporting member near the middle of the panel and span is no longer than 10 ft (3.05 m). Maximum height to be 20 ft (6.10 m) and maximum width to be 25 ft (7.62 m) except where the Uniform Building Code limits height and width to 15 ft (4.57 m).

Interior wall panels using Standard Series, 3 7/8 inch (100 mm) thick block to be limited to 250 sq ft (23.226 sq m). Maximum height to be 25 ft (7.62 sq m) and maximum width to be 25 ft (7.62 m) except where the Uniform Building Code limits height and width to 15 ft (4.57 m).

Exterior or interior wall panels using Thinline Series 3-1/8 inch (80 mm) thick block, exposed to 20 lbs per sq ft (138 kPa) wind load or less to be limited to 85 sq ft (7.897 sq m) when supported on all four sides. Area may be increased to 150 sq ft (13.935 sq m) when an intermediate stiffener is incorporated as an additional supporting member near the middle of the panel. Maximum height is limited to 10 ft (3.05 m) for exterior and 20 ft (6.10 m) for interior installations. Maximum width is limited to 25 ft (7.62 m) for exterior and interior.

Check governing building code for additional details.

Contact manufacturer for design of glass block panels subjected to a wind load greater than 20 lbs per sq ft (138 kPa) for design of free standing exterior panels.

A. Head and Jamb Channel: 14 gauge, 0.785 inch (2 mm) steel.
   1. Standard Series: 1-1/2 x 4-1/2 inch (38 x 114 mm).
   2. Thinline Series: 1-1/2 x 3-3/4 inch (38 x 95 mm).
   3. Exterior Installations: Hot dip galvanized steel or non-ferrous metal.

B. Glass Block Panels:
   1. Non-load bearing, isolated from surrounding structures/walls with 3/8 inch (10 mm) thick glass fiber or white polyethylene foam expansion strips at jambs and head.
   2. Sill coated with asphalt emulsion bond breaker.

Fire Ratings: Gypsum Board Construction:

Glass block in non-masonry walls with panel anchor construction.

Fire Rating: 45 or 60 minutes.

Steel Studs Below Sill: 20 gauge, 0.040 inch (1 mm), 3-5/8 inch (92 mm) on 8 inch (203 mm) centers; maximum length of 36 inch (914 mm).

Runner Channel: 20 gauge, 0.040 inch (1 mm), 3-5/8 inch (92 mm) to create base for glass block.

Jambs: 20 gauge, 0.040 inch (1 mm), 3-5/8 inch (92 mm) steel stud and runner channel. Gypsum board to be installed between stud and runner channel.

Head: Two, 20 gauge, 0.040 inch (1 mm), 3-5/8 inch (92 mm) studs with two runner channels.

Panel Anchors:

Locate above first course and in every other joint above., and last course.
Secure panel anchor with two, self-drilling, self-tapping screw fasteners.
Fasteners to be located at top of slots and immediately above the bend of the panel anchor.
Locate panel anchors at head in every other vertical mortar joint.

Horizontal mortar joints with panel anchors to be reinforced with stainless steel wire. Overlap panel anchor a minimum of 6 inch (152 mm).

Fill space between glass block and channel with glass fiber, mineral wool or polyethylene and seal with appropriate fire retardant type sealant.

Glass block in non-masonry walls with channel construction.

Fire Rating: 45 or 60 minutes.

Steel Studs Below Sill: 20 gauge, 0.040 inch (1 mm), 3-5/8 inch (92 mm) on 8 inch (203 mm) centers; maximum length of 36 inch (914 mm).

Runner Channel: 20 gauge, 0.040 inch (1 mm), 3-5/8 inch (92 mm) to create base for glass block.

Jambs: 20 gauge, 0.040 inch (1 mm), 3-5/8 inch (92 mm) steel stud and runner channel with 14 gauge, 0.078 inch (2 mm) channel secured on 16 inch (406 mm) centers.

Head conditions similar to jamb for interior installations. Channel at sill is optional.

Horizontal Reinforcing: Minimum spacing of 18 inch (457 mm) on center, i.e. every third joint for 6 inch (152 mm) block and every other joint for 8 inch (203 mm) block.

Glass block to be placed 1 inch (25 mm) deep into recess. Recess to be formed of 1-3/4 inch (44 mm) deep steel channel. Steel channel to be 14 gage, 0.08 inch (2 mm) hollow metal. Do not use channel at sill for exterior installations.

Fill space between glass block and channel with glass fiber, mineral wool or polyethylene and seal with appropriate fire retardant type sealant.

Fire Ratings: Masonry Construction:

Glass block in masonry walls with panel anchor construction.

Fire Rating: 45 or 60 minutes.

Panel Anchors:

Locate above first course and in every other joint above, and last course.

Secure panel anchor with two, self-drilling, self-tapping screw fasteners.

Fasteners to be located at top of slots and immediately above the bend of the panel anchor.

Locate panel anchors at head in every other vertical mortar joint.

Horizontal mortar joints with panel anchors to be reinforced with stainless steel wire. Overlap panel anchor a minimum of 6 inch (152 mm).

Sill to be coated with asphalt emulsion to serve as bond breaker.

Fill space between glass block and channel with glass fiber, mineral wool or polyethylene and seal with appropriate fire retardant type sealant.

Glass block in masonry walls with channel construction.

Fire Rating: 45, 60 or 90 minutes.

Horizontal Joint Reinforcing: Horizontal reinforcing to have a maximum spacing of 18 inch (457 mm) on center, i.e. every third joint for 6 inch (152 mm) block and every other joint for 8 inch (203 mm) block.

Glass block at head and jambs to be placed 1 inch (25 mm) into 1-1/2 inch (38 mm) deep recess.

Recess formed of masonry or 1-3/4 inch (44 mm) deep steel channel. Steel channel to be 14 gauge, 0.075 inch (1.9 mm) hollow metal for 45 or 60 minute openings and steel channel, C5 x 6.7 (C130 x 10) for 90 minute openings.

Do not use channel at sill for exterior installations.

Sill to be coated with asphalt emulsion to serve as bond breaker.

Fill space between glass block and channel with glass fiber, mineral wool or polyethylene and seal with appropriate fire retardant type sealant.

2.4 GLASS BLOCK UNITS

Edit the following paragraphs to indicate desired glass block product.

A. Product: [_____.]

B. Size: [___x __] inches x [__] inches thick ([___x] mm x [ ] mm thick).

C. Pattern: [_____.]

D. Performance Requirements:
   1. R value: [.]
   2. Light transmission: [ ] percent.
   3. Shading coefficient: [ ] percent.
   4. Sound loss, decibels: [.]

Retain the following if fire-rated assemblies are required.

E. Fire Rating per NFPA 257: [ ] minutes.

2.5 ACCESSORIES

A. Joint Reinforcing:
   1. Ladder type. 2 to 9 gauge; 0.258 to 0.114 inches (6.54 to 2.91 mm) diameter.
   2. Material: Stainless steel.

B. Panel anchors: 1-3/4 x 16 inches (44 x 406 mm) with staggered perforations.
   1. Thickness: 20 gauge; 0.04 inch (1 mm).
   2. Material: Stainless steel.

C. Perimeter Chase: Masonry recess, [aluminum] [steel] channel.

D. Asphalt Emulsion: Karnak 100 or equivalent.

E. Expansion Strips: 3/8 x 3-1/2 inches (9.5 x 89 mm), polyethylene foam or glass fiber.

F. Joint Sealer: Specified in Section [07 92 00.] [_____.]

G. Mortar Materials: ASTM C270, Type S, using the Proportion Method:
   1. Portland cement (Type 1): 1 part, [gray.] [white.]
   2. Lime: 1 part.
   3. Sand: 2-12 to 3 parts sand passing No. 20 sieve, free of iron compounds.

H. Mortar Mix:
   1. Mortar color: [____.] [To be selected.]
   2. Mix mortar drier than normal in amounts that will be used in 1/2 to 1 hour.
   3. Do not use re-tempered mortar.
   4. Do not use antifreeze compounds or accelerators.

Retain the following for colored mortar.

   5. Add mortar color per manufacturer's instructions.

Retain the following for exterior locations.

   6. Add waterproofing additive recommended by glass block manufacturer.

PART 3 EXECUTION

3.1 EXAMINATION

A. Examine substrates, structure and installation conditions. Do not proceed with masonry work until conditions are acceptable.

B. Verify items provided by other trades are properly sized and located.

C. Verify that items to be built into masonry are in proper location and ready for roughing into masonry work.

3.2 PREPARATION

A. Clean substrate surfaces prior to installation.

B. Verify that pocket recesses or chases are accurately located and sized.

C. Establish lines, levels and coursing. Verify anchors and flashings are correctly located and installed.

D. Furnish temporary bracing during installation of masonry work. Maintain in place until building structure provides permanent support.

E. Prepare surfaces using methods recommended by masonry manufacturer.

3.3 INSTALLATION

A. Install masonry units in accordance with manufacturer's instructions and approved submittals, in proper relationship with adjacent construction.

B. Arrange coursing pattern to provide consistent joint work throughout.

C. Locate and secure perimeter metal chase.

D. Coat sill under units with asphalt emulsion.

E. Place units with full mortar joints; furrowing not permitted.

F. Tool joints to concave joint.

G. Place panel reinforcing in horizontal joint above first course of block and not more than 18 inches (457 mm) on center for Standard Series and every other course for Thinline Series.

H. Place panel anchors in same joints as reinforcing.

I. Isolate panel from adjacent construction on sides and top with expansion strips. Keep expansion joints clear of mortar.

J. Maintain uniform 1/4 inch (6 mm) joint width plus or minus 1/8 inch (3 mm); For Vistabrik maintain uniform 3/8” (10mm) joint width plus or minus 1/8” (3mm)

K. Do not tap glass block with steel tools.

L. When mortar has set, place backer rod and joint sealer in jamb and head channels.

3.4 CLEANING

A. Remove excess mortar from glass surfaces using damp cloth, before set occurs.

B. Use No. 4 (0000) steel wool to remove remaining mortar and dried film.

3.5 PROTECTION

A. Protect top of wall until covered or capped to waterproof condition by subsequent construction.

B. Prevent grout, mortar, and soil from staining masonry.

END OF SECTION