UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated October 2010
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DIVISION 04 - MASONRY

SECTION 04 23 00

GLASS MASONRY UNITS

11/09

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USACE / NAVFAC / AFCESA / NASA | UFGS-04 23 00 (November 2009)

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UFGS-04 23 00 (April 2006)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

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SECTION 04 23 00

GLASS MASONRY UNITS
11/09

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NOTE: This guide specification covers the requirements for glass block unit masonry work.

Edit this guide specification for project specific requirements by adding, deleting, or revising text. For bracketed items, choose applicable items(s) or insert appropriate information.

Remove information and requirements not required in respective project, whether or not brackets are present.

Comments, suggestions and recommended changes for this guide specification are welcome and should be submitted as a Criteria Change Request (CCR).
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PART 1 GENERAL

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NOTE: The following information will be shown on the project drawings:

1. Head, jamb, sill, and intermediate support construction details.

2. Clearances required for deflection and expansion.

Refer to manufacturers data for glass block unit panel size restrictions, limitations, and details. CAUTION: 1) Single wythe construction is not recommended for areas subject to severe wind-driven rain exposure; 2) avoid removable panel construction; and 3) avoid large expanses of exterior walls subject to high wind pressures, wide thermal variations, and differential movements
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1.1 REFERENCES

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NOTE: This paragraph is used to list the publications cited in the text of the guide specification. The publications are referred to in the text by basic designation only and listed in this paragraph by organization, designation, date, and title.

Use the Reference Wizard's Check Reference feature when you add a RID outside of the Section's Reference Article to automatically place the reference in the Reference Article. Also use the Reference Wizard's Check Reference feature to update the issue dates.

References not used in the text will automatically be deleted from this section of the project specification when you choose to reconcile references in the publish print process.

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The publications listed below form a part of this specification to the extent referenced. The publications are referred to within the text by the basic designation only.

ASTM INTERNATIONAL (ASTM)

ASTM A 153/A 153M	(2009) Standard Specification for Zinc Coating (Hot-Dip) on Iron and Steel Hardware
ASTM A 82/A 82M	(2007) Standard Specification for Steel Wire, Plain, for Concrete Reinforcement
ASTM C 144	(2004) Standard Specification for Aggregate for Masonry Mortar
ASTM C 270	(2010) Standard Specification for Mortar for Unit Masonry
ASTM E 119	(2010a) Standard Test Methods for Fire Tests of Building Construction and Materials

1.2 SUBMITTALS

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NOTE: Review submittal description (SD) definitions in Section 01 33 00 SUBMITTAL PROCEDURES and edit the following list to reflect only the submittals required for the project. Submittals should be kept to the minimum required for adequate quality control.

A "G" following a submittal item indicates that the submittal requires Government approval. Some submittals are already marked with a "G". Only delete an existing "G" if the submittal item is not

complex and can be reviewed through the Contractor's Quality Control system. Only add a "G" if the submittal is sufficiently important or complex in context of the project.

For submittals requiring Government approval on Army projects, a code of up to three characters within the submittal tags may be used following the "G" designation to indicate the approving authority. Codes for Army projects using the Resident Management System (RMS) are: "AE" for Architect-Engineer; "DO" for District Office (Engineering Division or other organization in the District Office); "AO" for Area Office; "RO" for Resident Office; and "PO" for Project Office. Codes following the "G" typically are not used for Navy, Air Force, and NASA projects.

Choose the first bracketed item for Navy, Air Force and NASA projects, or choose the second bracketed item for Army projects.

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Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are for [Contractor Quality Control approval.] [information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] Submit the following in accordance with Section 01 33 00 SUBMITTAL PROCEDURES:

SD-03 Product Data

Glass Block
Waterproofing Agent
Horizontal Joint Reinforcement
Panel Anchors
Expansion Strip

SD-04 Samples

Glass Block
Horizontal Joint Reinforcement
Panel Anchors
Expansion Strip

SD-07 Certificates

Glass Block

1.3 DELIVERY, STORAGE, AND HANDLING

Deliver cement, lime, and other cementitious materials to the site in unbroken containers, labeled with the manufacturers' names and brands. Store mortar materials in a manner to prevent the inclusion of foreign materials and damage by water or dampness. Avoid chipping and breakage of masonry units. Protect glass block materials from contact with earth and exposure to the weather, and keep dry until used. Do not use materials containing frost or ice.

1.4 ENVIRONMENTAL REQUIREMENTS

Do not lay glass block when the air temperature is 5 degrees C 40 degrees F and falling, or when it appears probable that temperatures below 5 degrees C 40 degrees F will be encountered before the mortar has set, unless protection is provided to prevent freezing. Protection shall consist of maintaining the temperature of glass block and mortar materials between 5 and 50 degrees C 40 and 160 degrees F. After erection, maintain air temperature above 5 degrees C 40 degrees F on both sides of glass block for not less than 72 hours. Do not work with or on frozen materials. Glass block work may be started at 1 degree C 34 degrees F on a rising thermometer. Coordinate glass block work with the work of other trades to accommodate built-in items.

PART 2 PRODUCTS

2.1 GLASS BLOCK UNITS

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NOTE: The desired physical characteristics (Light transmittance, reflectivity, pattern, size, etc.) should be described. Drawings will clearly show the clearances required for deflection and expansion.
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Provide glass block units of type[s], size, pattern and style specified. Do not change source of supply for material which will affect the appearance of the finished work after work has started. Keep on hand extra units amounting to [5] [_____] percent of the number of units incorporated in the work. Use extra units to replace units found to be defective. Provide units made of clear colorless glass, polyvinyl butyral edge coating, and [75] [_____] percent light transmission allowance. Provide ventilators and accessories recommended by glass block manufacturer. Submit certificates of compliance stating that the materials meet the specified requirements.

2.1.1 Exterior Glass Block Units

Provide [DECORA] [VUE] [ARGUS] [_____] pattern [with LX] [without] fibrous glass insert, [_____] texture, sized [197 by 197] [_____] by 98 mm [7-3/4 by 7-3/4] [_____] by 3-7/8 inches. Units designated as "reflective glass block" shall have a highly reflective oxide surface coating of a [gray] [_____] color.

2.1.2 Interior Glass Block Units

Provide [VUE] [_____] pattern, [197 by 197] [_____] by 76 mm [7-3/4 by 7-3/4] [_____] by 3-1/8 inches.

2.1.3 Solid Glass Block Units

Units shall be [VISTABRIK] [_____], 194 by 194 by 76 mm 7-5/8 by 7-5/8 by 3 inches.

2.1.4 Fire Rated Glass Block Units

Walls and partitions indicated on the drawings to be fire rated and containing glass block units shall use approved units that have been fire tested in accordance with ASTM E 119 to the indicated rating.

2.2 MORTAR

2.2.1 Mortar Mix

ASTM C 270, Type S, white portland cement.

2.2.2 Aggregates

ASTM C 144, clean, white quartzite type sand, not less than 100 percent passing a No. 8 sieve.

[2.2.3 Waterproofing

Provide metallic-stearate-type waterproofing agent. Omit waterproofing agent if portland cement containing waterproofing agent is used.

]2.2.4 Admixtures

Do not use accelerators or anti-freeze compounds.

2.2.5 Prepackaged Mortar Mix

ASTM C 270, Type S, white portland cement.

2.3 ACCESSORIES

2.3.1 Horizontal Joint Reinforcement

Fabricate from cold drawn steel wire, ASTM A 82/A 82M. Wire shall be zinc coated after fabrication by the hot-dip process conforming to ASTM A 153/A 153M, Class B-2. Reinforcement shall consist of two or more parallel longitudinal wires not lighter than 9 gauge (3.40 mm 0.1483 inch) weld connected with cross wires not lighter than 14 gauge (2.03 mm 0.0800 inch) at not greater than 200 mm 8 inches on center. Provide at least one longitudinal wire for each face of glass block, out-to-out spacing approximately 37 mm 1-1/2 inches less than the actual width of the block. Provide joint reinforcement in flat sections, not less than 2400 mm 8 feet long, except that corner reinforcements and other special shapes may be shorter.

2.3.2 Panel Anchors

2.3.2.1 Strip Anchor

Perforated steel strip not less than 0.9 mm 20 gauge, minimum of 45 mm wide by 600 mm long 1-3/4 inches wide by 24 inches long and galvanized after fabrication.

2.3.2.2 Wire-Type Anchor

Steel wire not less than 3.4 mm 9 gauge of approved design suitable for use with the panel stiffener provided and galvanized after fabrication.

2.3.3 Expansion Strip

Dense fibrous glass batt or material as recommended by the glass block manufacturer.

2.3.4 Packing

Polyethylene foam, neoprene, or filler as recommended by the sealant manufacturer.

PART 3 EXECUTION

3.1 INSTALLATION

3.1.1 Workmanship

Carry glass block work up level and plumb all around. Build in window frames and doors as work progresses. Handle glass block with care to avoid damage. Anchor walls and partitions to adjoining construction to provide lateral stability. Anchoring shall permit unrestricted deflection of construction above.

3.1.2 Mortar Mixing

ASTM C 270. Hand mixing may be used only when specifically approved by the Contracting Officer. Keep mortar boxes, pans, and mixer drums clean and free of debris and dried mortar. Do not retemper mortar. Do not use mortar which has not been placed in final position within 1 5-hours after the initial mixing.

3.1.3 Mortar Joints

Mortar joints shall be accurately spaced, uniform in thickness and average thickness of 10 mm 5/16 inch. Fill joints completely and evenly. Remove loose and excess mortar. Horizontal joints shall be level; vertical joints shall be plumb. Paint surfaces upon which first course of glass blocks is to be laid with heavy asphalt emulsion before spreading first mortar bed. Emulsion shall be thoroughly dry prior to spreading mortar. When asphalt is dry, place full mortar bed joint. Furrowed or raked joints will not be allowed.

3.1.4 Care During Laying

Do not damage glass block while laying or otherwise. Lay block with [stacked bond] [_____]. Form bed joints of a thick layer of mortar, smooth on top, not furrowed. Form head joints by applying a full coat of mortar on the entire end, or on the entire side, of the block to be laid and then shoving the mortar-covered end or side of the block tightly against the block laid previously. The practice of buttering at the corners of block and then throwing mortar or scrapings into the empty joints will not be permitted. Lay closure blocks with a bed joint and with head joints, and place the block carefully without disturbing the block previously laid. Dry or butt joints will not be permitted.

3.1.5 Reinforcing

Embed horizontal reinforcing in mortar joints on approximately [600 mm center for 98 mm 24 inch centers for 3 7/8 inch thick glass block] [and] [400 mm centers for 76 mm 16 inch centers for 3 1/8 inch and 3 inch thick glass block], and in the first joint above and below all openings. Run reinforcing continuously from end to end of panel, except at expansion joints, and lap not less than 150 mm 6 inches where more than one length is used.

3.1.6 Panel Anchors

Crimp in expansion joints, placed 600 mm 24 inches apart (in same joint as panel reinforcing), and completely embed in the mortar joint. Build anchors into adjacent masonry and concrete or welded to steel framing members as appropriate. At the option of the Contractor, suitable anchors may be fastened to masonry and concrete and to steel framing by means of powder-actuated fasteners in lieu of being built-in or welded.

3.1.7 Expansion Allowance

Provide space indicated to permit expansion at heads and jambs, and fill void with expansion strip.

3.1.8 Tooling

After initial set of mortar, tool exposed joints and compress with a rounded jointer. Finished surface of joint shall be slightly concave, smooth, and non-porous.

3.1.9 Packing and Sealing

After final set of mortar, provide packing in space between glass block panel head, jamb and intermediate support construction and seal with sealant specified in Section 07 92 00 JOINT SEALANTS.

3.2 CLEANING

3.2.1 Protection

Protect work which may be damaged, stained, or discolored during cleaning operations.

3.2.2 Pointing

Upon completion of glass block work, cut out defective mortar joints and tuck point joints solidly with mortar.

3.2.3 Cleaning

Remove excess mortar from glass block with damp cloth or sponge before set occurs. Clean exposed surfaces with clear water and stiff fiber brushes, and rinse with clear water. Where stains, mortar, or other soil remain, continue cleaning with warm water and soap. Do not use abrasive cleaners (steel wool, wire brush) or acids in conjunction with removing mortar or dirt from the glass block faces. Restore damaged, stained, or discolored work to original condition or provide new work.

-- End of Section --