
USACE / NAVFAC / AFCEA UFGS-12490 (June 2005)

Preparing Activity: USACE Superseding
UFGS-12490 (July 2004)

UNIFIED FACILITIES GUIDE SPECIFICATIONS

References are in agreement with UMRL dated 23 June 2005

Latest change indicated by CHG tags

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06/05

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SECTION 12490

WINDOW TREATMENT 06/05

NOTE: This guide specification covers the requirements for window blinds, shades, and curtain hardware.

Comments and suggestions on this guide specification are welcome and should be directed to the technical proponent of the specification. A listing of technical proponents, including their organization designation and telephone number, is on the Internet.

Recommended changes to a UFGS should be submitted as a Criteria Change Request (CCR).

Use of electronic communication is encouraged.

Brackets are used in the text to indicate designer choices or locations where text must be supplied by the designer.

PART 1 GENERAL

1.1 REFERENCES

NOTE: Issue (date) of references included in project specifications need not be more current than provided by the latest change to this guide specification. Use of SpecsIntact automated reference checking is recommended for projects based on older guide specifications.

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

NATIONAL FIRE PROTECTION ASSOCIATION (NFPA)

NFPA 701

(1999) Fire Tests for Flame Propagation of
Textiles and Films

U.S. GENERAL SERVICES ADMINISTRATION (GSA)

FS AA-V-00200

(Rev B) Venetian Blinds

1.2 SUBMITTALS

NOTE: Submittals must be limited to those necessary for adequate quality control. The importance of an item in the project should be one of the primary factors in determining if a submittal for the item should be required.

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 projects.

Submittal items not designated with a "G" are considered as being for information only for Army projects and for Contractor Quality Control approval for Navy projects.

Government approval is required for submittals with a "G" designation; submittals not having a "G" designation are [for Contractor Quality Control approval.] [for information only. When used, a designation following the "G" designation identifies the office that will review the submittal for the Government.] The following shall be submitted in accordance with Section 01330 SUBMITTAL PROCEDURES

SD-02 Shop Drawings

Drapery Hardware[; G][; G, [____]]

Drawings showing fabrication and installation details. Drawings shall show layout and locations of track, direction of draw,

mounting heights, and details.

SD-03 Product Data

Window Blinds[; G][; G, [____]]
Window Shades[; G][; G, [____]]
Drapery Hardware[; G][; G, [____]]

Manufacturer's data composed of catalog cuts, brochures, product information, and maintenance instructions.

SD-04 Samples

Window Blinds[; G][; G, [____]]
Window Shades[; G][; G, [____]]
Drapery Hardware[; G][; G, [____]]

Samples of each type and color of window treatment. Blind slats or louvers shall be 150 mm 6 inches in length for each color. Track shall be 150 mm 6 inches in length. Shade material shall be minimum 150 x 150 mm6 x 6 inches in size.

**NOTE: Coordinate with the drapery hardware
specified for the project.**

SD-06 Test Reports

Window Shades

Fire resistance

SD-08 Manufacturer's Instructions

Window Blinds[; G][; G, [____]]
Window Shades[; G][; G, [____]]
Drapery Hardware[; G][; G, [____]]

SD-10 Operation and Maintenance Data

Window Blinds[; G][; G, [____]]
Window Shades[; G][; G, [____]]
Drapery Hardware[; G][; G, [____]]

1.3 GENERAL

Window treatment shall be provided, complete with necessary brackets, fittings, and hardware. Each window treatment type shall be a complete unit provided in accordance with paragraph WINDOW TREATMENT PLACEMENT SCHEDULE. Equipment shall be mounted and operated as per manufacturer's instructions. Windows to receive a treatment shall be completely covered. The Contractor shall take measurements at the building and shall be responsible for the proper fitting and hanging of the equipment.

1.4 DELIVERY, STORAGE, AND HANDLING

Components shall be delivered to the jobsite in the manufacturer's original packaging with the brand or company name, item identification, and project

reference clearly marked. Components shall be stored in a dry location that is adequately ventilated and free from dust, water, or other contaminants and shall have easy access for inspection and handling. Materials shall be stored flat in a clean dry area with temperature maintained above 10 degrees C 50 degrees F. Do not open containers until needed for installation unless verification inspection is required.

1.5 FIELD MEASUREMENTS

The Contractor shall become familiar with details of the work, verify dimensions in the field, and shall advise the Contracting Officer of any discrepancy before performing the work.

1.6 WARRANTY

Manufacturer's standard performance guarantees or warranties that extend beyond a 1 year period shall be provided.

PART 2 PRODUCTS

2.1 WINDOW BLINDS

Each blind, including hardware, accessory items, mounting brackets and fastenings, shall be provided as a complete unit produced by one manufacturer. All parts shall be one color unless otherwise indicated, and match the color of the blind slat. Steel features shall be treated for corrosion resistance.

2.1.1 Horizontal Blinds

NOTE: Typically horizontal blinds are fabricated to fill the openings from head-to-sill and jamb-to-jamb with inside mounted brackets. A clearance of 6 mm (1/4 inch) should be allowed at each jamb. This typical mounting procedure may not be appropriate under certain conditions for Type II slats and for windows in special frames, sliding glass doors, or windows in doors. Check specifications of glass manufacturer for recommended clearances when detailing the mounting

Horizontal blinds shall conform to FS AA-V-00200, [Type I (50 mm 2 inch slats)] [Type II (25 mm 1 inch slats)], [_____] except as modified below. Blind units shall be capable of nominally 180 degree partial tilting operation and full-height raising. Blinds shall be [inside] [outside] mount. Tapes for Type I slats shall be longitudinal reinforced vinyl plastic in 1-piece turn ladder construction. Tapes for Type II slats should be braided polyester or nylon.

2.1.1.1 Head Channel and Slats

NOTE: For clarification purposes, .006 inch refers to .006 gauge and .008 refers to .008 gauge. For Type II venetian blinds, aluminum slats should be specified, unless justification exists for using steel. Steel slats have a tendency to cut the

thin-line tape used with 25 mm one inch slats.

Head channel shall be steel or aluminum with corrosion-resistant finish nominal [0.46 mm 0.018 inch for Type I] [0.61 mm 0.024 inch for Type II]. Slats shall be aluminum, not less than [0.203] [0.152] mm [0.008] [0.006] inch thick, and of sufficient strength to prevent sag or bow in the finished blind. A sufficient amount of slats shall be provided to assure proper control, uniform spacing, and adequate overlap. All hardware shall be enclosed in the headrail.

2.1.1.2 Controls

The slats shall be tilted by a transparent tilting wand, hung vertically by its own weight, and shall swivel for easy operation. The tilter control shall be of enclosed construction. Moving parts and mechanical drive shall be made of compatible materials which do not require lubrication during normal expected life. The tilter shall tilt the slats to any desired angle and hold them at that angle so that any vibration or movement of ladders and slats will not drive the tilter and change the angle of slats. A mechanism shall be included to prevent over tightening. The wand shall be of sufficient length to reach to within 1500 mm 5 feet of the floor.

2.1.1.3 Intermediate Brackets

NOTE: Appropriate spacing for placement of intermediate brackets at 1200 mm (48 inches) and 1500 mm (60 inches) are typical for Type II blinds and 2100 mm (84 inches) for Type I blinds.

Intermediate brackets shall be provided for installation of blinds over [1200] [1500] [2100] mm [48] [60] [84] inches wide and shall be installed as recommended by the manufacturer.

2.1.1.4 Bottom Rail

Bottom rail shall be a minimum of steel, corrosion-resistant, with baked-on polyester paint, color coordinated with slats. The bottom rail shall be formed with a double-lock seam into a closed oval shape for optimum strength. End caps shall provided and match the rail in color.

2.1.1.5 Braided Ladders

Ladders shall be braided of 100 percent polyester yarn of a color to match the slat color. Spacing of ladders shall be a maximum of and a minimum 15.2 slats per foot of drop and spaced in order to provide a uniform overlap of the slats in a closed position.

2.1.1.6 Hold-Down Brackets

NOTE: Holddown brackets should not be specified for windows except where air movement may cause the blinds to sway excessively.

Universal type hold-down brackets for sill or jamb mount shall be provided were indicated on placement list.

2.1.1.7 Audio Visual Blinds

NOTE: Audio visual blinds are special purpose blinds to be used only when a greater than ordinary exclusion of light is required. Manufactures recommendations for color selection should be used or careful selection of the color for optical properties must be considered in audio visual applications.

In addition to requirements for blinds, each unit shall include light traps at sides, and sill. Privacy blinds shall provide light enhancing capabilities by means of hidden slat holes. Construct light traps from aluminum or sheet steel, not less than 0.5 mm 0.020 inch thick, U-shaped, with legs not less than [45 mm 1.75 inches long for Type I blinds.] [20 mm 0.75 inches long for Type II blinds.] Edges in contact with blinds shall be rounded or beaded. Finish inside surfaces of light traps in a dull gray or black color.

2.1.2 Vertical Blinds

NOTE: Typically vertical blinds will be wall mounted with outside brackets, sill length. Certain instances will call for different installation methods. When selecting a ceiling mount with inside brackets, the designer should verify that the window recess will accommodate this type installation.

Vertical blind units shall be capable of nominally 180 degree partial tilting operation and full stackback. The blinds shall be listed by the manufacturer as designed for heavy duty strength applications including heavy duty hardware. Vertical blinds shall be [ceiling] [wall] mounted with [outside] [inside] brackets. Blinds shall be [sill] [floor] length. Outside mount type installation shall provide adequate overlap to control light and privacy.

2.1.2.1 Louvers

NOTE: Fabric louvers are freehanging and different from groover louvers. Groovers are vinyl louvers with fabric inserts included. Edit accordingly and do not use groovers and fabric louvers together.

Generally, 88.9 mm (3-1/2 inch) blinds will be specified because they are more economical. In some cases, 50 mm (2 inch) blinds will be more aesthetically pleasing because of the window size.

Typically, a bottom chain will be provided when blinds need extra control from movement, over an air vent or operable window.

[Solid vinyl louvers shall be fire resistant, UV stable, and impact resistant. Louvers shall [have a bottom chain] [hang without a bottom chain].] [Fabric louvers shall be flame retardant. The louvers shall have straight, flat, unfrayed edges and shall be flat, without noticeable twists. A weight shall be provided at the bottom of the louver. The insert shall not discolor the fabric. Louvers shall [have a bottom chain] [not have a bottom chain].] [Groovers shall be extruded from solid vinyl with clear non-yellowing channel lips to accept fabric inserts. Fabric inserts shall be flame retardant and colorfast.] [Louvers that are 88.9 mm 3-1/2 inch shall overlap not less than 10 mm 3/8 inch] [louvers that are 50 mm 2 inch shall overlap not less than 6 mm 1/4 inch] and shall be dimensionally stable.

2.1.2.2 Carriers

Carriers shall be provided to support each louver. Carriers shall be of molded plastic and shall transverse on self-fabricated wheels for smooth, easy operation. The hook of the carrier shall have an automatic latch to permit easy installation and removal of the louver, and shall securely lock the louver for tilting and traversing.

2.1.2.3 Headrail System

Headrail system shall be not less than 1.19 mm 0.047 inch thick and shall be made of anodized aluminum alloy or 0.635 mm 0.027 inch thick phosphate treated steel with a baked on ivory gloss enamel paint finish. The headrail shall extend the full width of the blind and each end shall be closed with an end cap. One cap shall contain the traversing and tilting controls. The opposite cap shall house the pulley for the traversing cord.

2.1.2.4 Valance

Manufacturers standard valance shall be attached to the headrail by metal or plastic holders which grip the top and bottom edge of the valance and shall [accept an insert of the same material as the slats]. There shall be sufficient clearance behind the valance to permit the louvers to tilt without interference. The headrail cover shall extend the full width of the blind. [Returns shall be provided].

2.1.2.5 Controls

NOTE: Typically a tilting control baton is used because it is unobtrusive. Control mechanisms generally are on the right side, but window placement may require the controls to be placed on the left side for ease of operation.

Select which direction the vertical blind will traverse in the Placement Schedule. Considering there must be adequate space for the width of the stack without concealing any electrical or mechanical components.

Tilting control and traversing controls shall hang compactly at the side of the blinds and shall reach within 1500 mm 5 feet of the floor. The

[tilt/traverse control] [bead chain tilting control] shall tilt all vanes simultaneously to any desired angle and hold them at that angle. The louvers shall traverse [one way to the right] [one way to the left] [two-way split]. [The traversing control cord shall be minimum 1.78 mm 0.070 inch in diameter with a minimum breaking strength of 556 N. 125 pounds]. The cord shall be anchored to a lead carrier which shall be linked to all adjacent carriers. The louvers shall be traversed along the headrail by pulling one side of the looped cord it shall be [fastened to a cord tension pulley] [or] [a fiberglass wand shall tilt the louvers by turning the wand and shall traverse the louvers by using the wand as a drapery control]. Sliding glass doors shall have a one way draw with stackback occurring opposite door openings.

2.1.2.6 Connectors and Spacers

The connector shall be flexible, smooth and flat to slide unhindered when carriers move independently of each other, and to nest compactly when carriers are stacking. The length of the links shall relate to the louver width in order to equally space the traversing louvers, to maintain uniform and adequate overlap of louvers, and to fully cover the width of the opening.

2.1.2.7 Intermediate Brackets

Intermediate installation brackets shall be furnished for blinds over 1575 mm 62 inches wide.

2.2 WINDOW SHADES

NOTE: Light filtering shades are translucent and softly diffuse light to the amount that the fabric selected by the designer allows. Room darkening (black-out) shades are opaque and block out light completely. The designer should specify a complete room darkening system only if total light block is necessary, as in an audio visual application. A room darkening shade is typically made of a vinyl coated fiberglass cloth. Do not specify cotton cambric fabric for room darkening shades since it cannot provide total light block. Coordinate maximum unit sizes available with the window sizes.

Roller tube shall operate smoothly and be of sufficient diameter and thickness to prevent excessive deflection. Brackets shall be provided that are appropriate for [inside] [outside] [ceiling] mount. The shade cloth shall meet the performance described in NFPA 701, small scale test. Steel features shall be treated for corrosion resistance.

2.2.1 Light Filtering Shades

Light filtering shades shall conform to the following: Roller tube shall be [wood] [steel] and shall operate by [spring] [clutch and bead operation] mechanism. Fascia mounting brackets shall be steel to support roller tube and fascia panel. The fascia panel shall be channel shaped extruded aluminum with standard enamel finish. The shade shall be made from a single piece of [PVC coated fiberglass cloth] [_____].

2.2.2 Room Darkening Shades

Room darkening (black-out) window shades shall conform to the following: Roller tube shall be aluminum and shall be controlled by [webbing tape] [crank operated gear box with steel rods]. Light traps shall be shop fabricated, and shall consist of a head box to house the shade roller, and U-shaped channels to serve as guides for the shade along the sides and to receive the bottom edge of the shade along the sill. Light trap shall be made of sheet steel having a minimum thickness of 0.85 mm (22 gauge) 22 gauge or anodized, extruded, aluminum. The legs of the channels shall be not less than 44 mm 1-3/4 inches long and separated by the minimum distance that will permit free operation of the shade. Edges of light trap coming into contact with the shade cloth shall be smooth pile light seal. The exposed face of the head box shall be hinged or removable for access to the shade roller. The interior or unexposed surfaces of the light trap shall have a finish coat of flat black enamel. The exposed portions of the light trap shall have a factory-applied [priming coat of gray paint. Finish painting is specified in Section 09900 PAINTING, GENERAL.] [anodized bronze or clear finish as shown.] Shade roller shall be manufacturer's standard product. Cloth shall be of type for blackout purposes. The shade shall be made from a single piece of [canvas duck cloth laminated to vinyl] [_____]. When not finished with a selvage, the vertical edges of the shade shall be bound or hemmed using a high-grade thread. Needle holes shall be made lightproof by applying a suitable filler. The bottom edge of the shade shall be fitted with a steel operating bar. Shades will engage positively with bottom rail through operating bar or chain pull. Bars shall be painted with flat black enamel. Pull cords shall be made of No. 4 braided nylon or beaded chain having not less than 335 N 175 pounds breaking strength.

2.3 DRAPERY HARDWARE

NOTE: Unless both stationary and traverse rods or tracks are required, delete the type not to be used. When traverse, indicate whether two or one-way draw; when one-way, select whether left-to-right or right-to-left. Permit Contractor's option of steel or aluminum rods and tracks unless the desired finish cannot be provided with both materials or the installation dictates the use of one particular material.

Drapery hardware shall be [stationary] [and] [traverse] [wall-mounted rods] [and] [ceiling mounted tracks] of heavy-duty type. Rods and tracks shall be cold-rolled, commercial quality steel minimum 0.42 mm 0.0165 inch thick or extruded aluminum minimum 1.27 mm 0.050 inch thick. Rod and track cross section width and depth shall be sufficient to carry the drapery without sagging. Track configuration (number of channels) shall be such so as to permit drapery operation as specified or indicated. Finish steel components with a [white] [_____] baked enamel, vinyl, or epoxy coating as standard with the manufacturer. Finish aluminum components with [an anodic [clear (natural)] [bronze] [_____] coating] [a baked enamel, vinyl, or epoxy coating] as standard with the manufacturer. Provide smooth and non-sticking sliding surfaces. Provide one-piece rod and track up to 4875 mm 16 feet long. Provide steel brackets and intermediate supports. Provide one manufacturer's design throughout.

2.3.1 Track Sets

Include ceiling track, sliding or rolling carriers, and caps for stationary draperies; ceiling track, sliding or rolling carriers, master sliding or rolling carriers, ball bearing end pulleys, and traverse cord with cord [tassels] [tension pulleys] for traverse draperies.

2.3.2 Rod Sets

Include wall-hung rod, sliding or rolling carriers, brackets, and intermediate supports with 65 to 90 mm 2 1/2 to 3 1/2 inch projection for stationary draperies; wall-hung rod, sliding or rolling carriers, master sliding or rolling carriers, ball bearing end pulleys, brackets, intermediate supports with 65 to 90 mm 2 1/2 to 3 1/2 inch projection, and traverse cord with cord [tassels] [tension pulleys] for traverse draperies.

2.3.3 Traverse Cord

**NOTE: When traverse draperies are required, select
cord tassels or tension pulleys.**

Draw cords shall be size No. 4 with fiberglass core. Provide cord [tassel with lead weight center and plastic coating] [tension pulley, metal tube type or plastic housing type, with mounting bracket, helical spring, and ball bearing pulley wheel]. Finish color, white or off-white.

2.3.4 Hand Traverse Cordless Track System

Extra heavy duty track assembly with baton on roomside of draperies where it is readily visible and easily used. [Ceiling mounted] [side-wall mounted] in extruded aluminum track anodized in [clear (aluminum)] [white] finish.

2.3.5 Snap-Tape System Track

Dovetail slots in clear folding linkage. Carriers shall be one-piece molded plastic snap tab type to mate with snap-on components sewn to drapery heading.

2.3.6 Fasteners

Zinc or cadmium plated.

2.4 COLOR

**NOTE: Editing of color reference sentence(s) shall
be coordinated with the Government. Generally the
09915 Color Schedule or drawings are used when the
project is designed by an Architect or Interior
designer. Color shall be selected from
manufacturers standard colors or identified as a
manufacturers color in this specification only when
the project has minimal finishes.**

When the government directs that color be located in the drawings a note shall be added that states:
"Where color is shown as being specific to one manufacturer, an equivalent color by another manufacturer may be submitted for approval. Manufacturers and materials specified are not intended to limit the selection of equal colors from other manufacturers. The word "color" as used herein includes surface color and pattern."

When more than one type, pattern or color is specified identify location.

When a manufacturer's name, stock number, pattern, and color is specified for color, be certain that the product conforms to the specification, as edited.

Color, pattern and texture shall be [in accordance with Section 09915 COLOR SCHEDULE.] [as indicated on the drawings.] [selected from manufacturers standard colors.] [[____].] Color listed is not intended to limit the selection of equal colors from other manufacturers.]

PART 3 EXECUTION

3.1 WINDOW TREATMENT PLACEMENT SCHEDULE

NOTE: The Window Treatment Placement Schedule will be provided at the designer's option when it will clarify placement of the treatments. When all exterior windows are to receive a window treatment, a note can be made to this effect instead of filling out the schedule completely. The location should be clearly defined within this specification. The Placement Schedule will be completely filled out with the room number/name, window covering type, drapery draw type/direction, window type and quantity.

[All exterior windows shall include [____].]

[Window covering shall be provided as follows:

Room Number/Name	Window Covering Type	Drapery Draw Type/Direction	Window Type	Quantity
[____]	[____]	[____]	[____]	[____]

3.2 IDENTIFICATION

NOTE: Projects requiring large quantities of window treatments or a variety of window treatment types may need a numbering plan.

In accordance with the numbering plan, mark each opening and the

corresponding window treatment with identical numbers. For multiple windows separated by mullions, the space required by each blind shall be numbered separately. Use brass, aluminum, plastic, durable paper plates, or stamp to place corresponding numbers on unexposed surfaces of openings and inside or on top of the headrail track.

3.3 INSTALLATION

3.3.1 Window Blinds

Installation shall be in accordance with the approved detail drawings and manufacturer's installation instructions. Units shall be level, plumb, secure, and at proper height and location relative to window units. The Contractor shall furnish and install supplementary or miscellaneous items in total, including clips, brackets, or anchorages incidental to or necessary for a sound, secure, and complete installation. Installation shall not be initiated until completion of room painting and finishing operations.

3.3.2 Audio Visual Blinds

Installation shall be in accordance with the approved detail drawings and manufacturer's installation instructions. Units shall be level, plumb, secure, and at proper height and location relative to window units. The Contractor shall furnish and install supplementary or miscellaneous items in total, including clips, brackets, or anchorages incidental to or necessary for a sound, secure, and complete installation. Installation shall not be initiated until completion of room painting and finishing operations.

3.3.3 Vertical Blinds

Installation shall be in accordance with the approved detail drawings and manufacturer's installation instructions. Units shall be level, plumb, secure, and at proper height and location relative to window units. The Contractor shall furnish and install supplementary or miscellaneous items in total, including clips, brackets, or anchorages incidental to or necessary for a sound, secure, and complete installation. Installation shall not be initiated until completion of room painting and finishing operations.

3.3.4 Window Shades

Installation shall be in accordance with the approved detail drawings and manufacturer's installation instructions. Units shall be level, plumb, secure, and at proper height and location relative to window units. The Contractor shall furnish and install supplementary or miscellaneous items in total, including clips, brackets, or anchorages incidental to or necessary for a sound, secure, and complete installation. Installation shall not be initiated until completion of room painting and finishing operations.

3.3.5 Drapery Hardware

Install in accordance with the manufacturer's printed instructions and as specified herein. [Install ceiling tracks parallel to walls and windows, fasten at each end, at 400 mm 16 inches from each end and with additional intermediate fasteners spaced not more than 1200 mm 48 inches apart]. [Install wall rods with end brackets and provide intermediate support

brackets 600 mm 24 inches from each end with additional intermediate support brackets spaced not more than 1200 mm 48 inches apart].

3.3.6 Valance

Installation shall be in accordance with the approved detail drawings and manufacturer's installation instructions. Units shall be level, plumb, secure, and at proper height and location relative to window units. The Contractor shall furnish and install supplementary or miscellaneous items in total, including clips, brackets, or anchorages incidental to or necessary for a sound, secure, and complete installation. Installation shall not be initiated until completion of room painting and finishing operations.

3.4 Clean-Up

Upon completion of the installation, window treatments shall be adjusted for form and appearance, shall be in proper operating condition, and shall be free from soiling, damage or blemishes. Damaged units shall be repaired or replaced by the Contractor as directed by the Contracting Officer. Isolate metal parts from direct contact with concrete, mortar, or dissimilar metals. Ensure blinds installed in recessed pockets can be removable without disturbing the pocket. The entire blind, when retracted, shall be contained behind the pocket. For blinds installed outside the jambs and mullions, overlap each jamb and mullion 20 mm 0.75 inch or more when the jamb and mullion sizes permit. Include all hardware, brackets, anchors, fasteners, and accessories necessary for a complete, finished installation.

-- End of Section --