Design Guideline 084413
Glazed Aluminum Curtain Walls

Scope

This section includes exterior aluminum framing and glazing. Glazing materials and methods are specified in another section. Aluminum entrance doors and windows which may be installed in the curtain wall system are also covered in other sections.

Related Sections

U-M Design Guideline Section:

3.2 – Energy and Water Conservation
1.0 – Codes and Regulatory Agencies
6.1 - 085113 – Aluminum Windows
6.1 - 087100 – Finish Hardware
6.1 - 088000 – Glazing
6.2 - 230000 – Basic Mechanical Requirements

U-M Master Specification Sections: (A digitally accessible version is pending; please email AEC-Digital Accessibility Support if assistance is needed)

084113 – Aluminum-Framed Entrances and Storefronts

Reference Documents:

ASHRAE 90.1-2007, "Energy Standard for Buildings Except Low-Rise Residential Buildings"
AAMA CW-DG1 "Aluminum Curtain Wall Design Guide Manual" National Fenestration Rating Council (NFRC) Technical Documents

Design and Installation Requirements

General

Use curtain wall for all significant window wall installations, including multi-story, vertical spans of greater than twelve feet and extended horizontal lengths.

Single source responsibility - Specify that all of the curtain wall components, including the glazing, windows and doors, be assigned to a single contractor. Further, the curtain wall, windows and doors should be provided by the same manufacturer.

Curtain Wall Requirements

The curtain wall design shall incorporate the following features:

- Pressure-equalized system for managing moisture
- Compliance with the appropriate AAMA and NFRC standards (see "Reference Standards

article in AEC Masterspec Section 08 4413)

Other Considerations

Pay careful attention to specifying and detailing connections to adjacent construction, moisture control and the potential for incorporating enhanced thermal performance. Regardless of Delegated Design requirements (see below) for the curtain wall system, the A/E is responsible for the interface between the curtain wall and the surrounding building (adjacent jamb, head and sill conditions). Perimeter flashing, sealants and insulation, continuity of the air barrier, anchoring and clearances must be thoroughly detailed at head, sill and jamb conditions.

Carefully coordinate the selection of glazing to achieve appropriate U-value and Solar Heat Gain Coefficient (SHGC) of the assembly. Specify total assembly U-values, not center-of-glass. DG 3.2 requires designers to investigate the payback for improved U-values and SHGC.

In buildings with higher than typical humidity, perform a thermal analysis of the curtain wall assembly to ensure that condensation will be avoided on both the frame and the glazing. For buildings with typical humidity criteria it should be adequate to specify a minimum Condensation Resistance Factor (CRF) that takes into account the anticipated interior conditions. Refer to Design Guideline section 220500 for typical mechanical design requirements.

Delegated Design

UM recognizes that it is common practice to specify structural performance criteria for curtain walls and to delegate the actual design needed to meet these criteria to the curtain wall manufacturer. Indicate the design loads and the displacement on the drawings.

Finishes

The preferred finish for most curtain wall work is 2-coat 70% polyvinylidene fluoride paint. For metallic finishes and on doors specify a 3-coat system.

Anodized finishes may also be acceptable for some projects; review with the Design Manager. For anodized finishes specify AAMA 611 Class 1 finish, clear or color anodized, as suited to project.

Testing

UM requires the curtain wall manufacturer to submit documentation of preconstruction testing showing that the designated curtain wall system meets the performance criteria. If standard systems are being used the manufacturer is allowed to submit standard test reports for that system.

In-place field testing is also required for curtain wall installations. U-M will contract with a testing service for witnessing and validating testing, as well as for performing enhanced field inspections. The actual testing will normally be performed by the Contractor. In order to achieve testing of representative workmanship, samples for testing will be selected on a random basis by the A/E and the testing company (not the Contractor). At a minimum, field testing should be done twice; once fairly early in the installation process and again at the completion of the process.