REQUIREMENTS FOR USE OF QUICK RESPONSE FIRE SPRINKLERS AND BARRIERS IN LIEU OF ONE-HOUR RATED CONSTRUCTION

(Water Impinge Wall)

(WHEN APPROVED BY AMMC PROCESS)

Effective Date: SJFD Policy since March 31, 2008

1.0 General

1.1 The use of quick-response fire sprinkler heads and barriers (water impinged wall, WIW) in lieu of one-hour rated construction shall be allowed only when an "Alternate Materials or Methods of Construction and/or Design Request (AMMC)" has been submitted and approved.

1.2 Shop quality drawings of the proposed fire sprinkler installation shall be prepared and submitted by a licensed C-16 contractor.

1.3 The use of a WIW as an "alternate" shall not be allowed for Group 'H' occupancies, exterior walls, and area separation walls as defined in the California Building Code. This policy has been use in discussion of implementation of the *Exception* to CBC 705.8.2.

1.4 This handout supplements 2016 NFPA 13 – Section 8.15.26 "Sprinkler-Protected Glazing".

1.4 This handout supplements the San Jose Fire Department's (SJFD) handout "FIRE SPRINKLER SYSTEMS DESIGN, INSTALLATION, AND PLAN SUBMITTAL REQUIREMENTS" (⟨AS⟩ Systems). See ⟨AS⟩ Systems for submittal requirements.

2.0 Requirements

2.1 Non-rated glass walls, inoperable windows, and doors may be permitted by AMMC, in lieu of the prescriptive required fire rated construction provided the conditions of paragraphs 2.2 through 2.9, herein, are complied with.

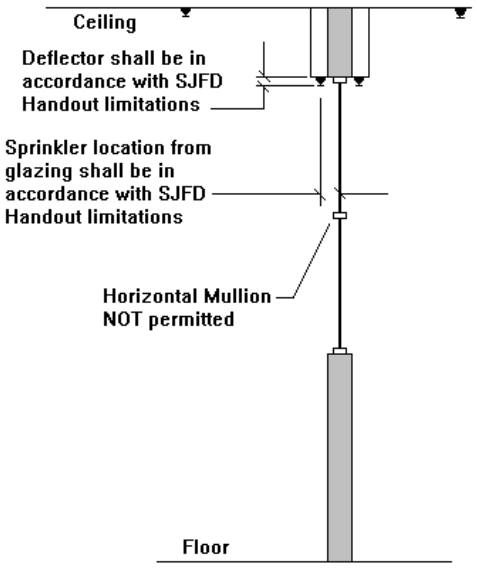
2.2 Automatic quick response sprinklers shall be installed on both sides of the glass walls per the Design and Installation section of this handout (see Figure 1).

2.3 The glass shall be tempered, wired, or laminated held in place by a gasket system that permits the glass framing system to deflect without breaking (loading) the glass before the sprinklers operate. The window frames and mullions (see restrictions indicated in 2.6 & Figure 1 herein) shall be non-combustible.

2.4 If there are glass doors in such walls, they shall also be tempered, wired, or laminated glass installed such that they will resist the passage of smoke. Doors shall be self-closing or automatic-closing and shall properly latch upon detection of smoke.

2.5 The maximum height of the glass wall, window, or door shall be 13 feet.

2.6 Intermediate horizontal mullions that prevent the full wetting of the glass are not allowed (see Figure 1).



WATER IMPINGED WALL
Figure 1

2.7 Blinds or curtains shall not be placed in between the WIW and wall or window glass.

2.8 All fire sprinklers within a compartment containing WIW shall be quick-response rated.

2.9 A permanent placard indicating the location and design data of the WIW shall be installed at the fire sprinkler system riser.

2.10 WIW sprinklers installed per this handout may not be used as the required floor protection. These sprinklers are in addition to the floor protection; baffles shall be installed as required.

3.0 Design and Installation

3.1 Pipe sizes of lines, risers, feed mains, and water supply shall be hydraulically calculated to furnish a minimum of 7 psi at any sprinkler and all sprinklers facing the exposure.

3.2 All sprinklers of the WIW, regardless of orifice size, shall be hydraulically designed to provide a discharge of no less than 3 gpm per lineal foot width of the WIW. The number of sprinklers calculated for this WIW shall be the number in the length corresponding to the length parallel to the branch lines in the hydraulically remote area. The water supply to the WIW shall be added to the water demand of the hydraulic calculations and shall be balanced to the calculated area demand. Hydraulic design calculations shall include a design area selected to include ceiling sprinklers adjacent to the WIW.

3.3 Hydraulic Calculations shall determine that there is no danger of impairing the operation of any other water demand for the building. Per NFPA 13, the water supply duration for the design area that includes the window sprinklers shall not be less than the required rating of the assembly. This is important for projects like High-rises with on-site water supplies.

3.4 Where WIW sprinklers are closer than 6 feet, baffles shall be provided. Where the existing sprinklers in the normal ceiling pattern are closer than 6 feet from the WIW sprinklers, it may be preferable to locate the WIW sprinklers in recessed baffle pockets. When required, the baffles shall be designed in accordance with NFPA 13 - Minimum Distances Between Sprinklers.

3.5 Sprinklers of ½ inch orifice should be used. The WIW sprinklers shall be located not more than 1 foot or less than 6 inches from the glass, and with the automatic sprinklers located so that the entire surface of the glass is wet upon operation of the sprinklers. The WIW sprinklers shall be placed with deflectors on the face of the glass and within 3 inches from the top of the glass (see Figure 1).

EXCEPTIONS:

a) Small orifice sprinklers may be used where the exposure area of coverage is less than 5 feet in width, as described below.

b) Large orifice sprinklers may be used where the exposure area of coverage is 5 to 12 feet in width, as described below.

c) When windows are 3 feet or less in width, a smaller size orifice may be used, but in no case smaller than a ⅜ inch orifice.

d) For windows not exceeding 5 feet wide and protected by small orifice sprinklers, one sprinkler shall be placed on the face of the glass at the center near the top. This sprinkler shall be located such that water discharged will wet the upper part of the WIW panel, and by running down over the sash and glass, wet the entire WIW panel. This may ordinarily be accomplished by placing one sprinkler in the center with the deflector approximately in line with the top of the upper sash within 3 inches from the top of the glass and 7, 8, and 9 inches in front of the glass, for WIW panels that are 3, 4, and 5 feet wide respectively. Where vertical mullions interfere, two or more sprinklers shall be used.

e) For WIW panels up to 6 feet wide, one ½ inch sprinkler at the center of each WIW panel may be used. The installation rules for ½ inch orifice sprinklers indicated prior to the item 3.5 exceptions apply.

f) For WIW panels that are 5 to 7 feet wide, a large orifice sprinkler with a K-Factor of 8.0 or higher at the center of each WIW panel may be used (see item 3.1 above). For WIW panels that are 7 to 9½ feet wide, one large orifice sprinkler at the center of each WIW panel may be used. For panels that are in excess of 9½ feet wide, multiple sprinklers are required.

g) Large orifice sprinklers shall be placed with deflectors 2-inches below the top of the sash and 12 to 15 inches out from the glass, when used. When the face of the glass is close to the exterior wall, cantilever brackets or similar type hangers may be used to maintain the WIW sprinklers 12 to 15 inches out from the glass. Where WIW sprinklers are closer than 8 feet, baffles shall be provided. Where the existing sprinklers in the normal ceiling pattern are closer than 8 feet from the WIW sprinklers, it may be preferable to locate the WIW sprinklers in recessed baffle pockets. When required, the baffles shall be designed in accordance with NFPA 13 - Minimum Distances Between Sprinklers.

4.0 INSPECTIONS

4.1 Inspection shall be scheduled by the installing contractor only. When scheduling for inspection, request for sufficient time to complete a thorough inspection of the work performed. Travel time is included in your inspection time.

5.0 DOCUMENT REVISIONS

5.1 This document is subject to revisions. For general information and to verify that you have the most current document, please call 408-535-7750, and request the current version date.