NER-516

LEGACY REPORT

Re-Issued January 1, 2003

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Legacy Report on 2000 *International Building Code* with the 2002 *Accumulative Supplement to the International Codes*, the 2000 *International Residential Code for One- and Two-Family Dwellings* with the 2002 *Accumulative Supplement to the International Codes*, the BOCA *National Building Code/1999*, the 1999 *Standard Building Code*, the 1997 *Uniform Building Code* and the 1998 *One- and Two-Family Dwelling Code*

DIVISION 13 – SPECIAL CONSTRUCTION

Section 13930 – Wet-Pipe Fire Suppression Sprinklers

REPORT HOLDER:

TYCO Fire Products Research and Development
1467 Elmwood Avenue
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EVALUATION SUBJECT:

TYCO FIRE PRODUCTS (TFP)/CENTRAL SPRINKLER COMPANY (CSC) WINDOW SPRINKLER™ MODEL WS™, 1/2 INCH ORIFICE QUICK RESPONSE VERTICAL AND HORIZONTAL SIDEWALL SPRINKLERS SIN TY3388, TY3488, C3388 and C3488

1.0 SUBJECT

Automatic sprinkler system for glazing assemblies located in interior non-load-bearing fire separation assemblies or exterior walls which are installed to establish a fire-resistance rating.

2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT

2.1 Alternative materials, design and method of construction and equipment

2.2 Fire-resistance rating

3.0 DESCRIPTION

3.1 General

The Central Window Sprinkler™ Model WS™ sprinklers are designed to wet the entire surface of a glass non-load-bearing walls assembly in order to provide the fire-resistance rating. The sprinklers shall be located on the inside of the glazing assembly located in exterior walls required to be rated for protection and on both sides of an interior non-load-bearing fire separation assembly. See **Conditions Of Use section 7.5** for exterior wall applications.

The sprinklers are used to achieve a 2 hour fire-resistance rating for interior and exterior non-load-bearing walls comprised of 1/4 inch (6.4 mm) thick or greater heat strengthened glass or tempered glass in a noncombustible frame. The fire-resistance rating was tested in accordance with ASTM E119.

3.2 TFP/CSC Model WS™ Sprinkler Head

The TFP/CSC Model WS™ Sprinkler Head is manufactured for two different orientations. The first type, illustrated in **Figure 1** is a horizontal sidewall that is designed to face the window assembly horizontally. The second type, illustrated in **Figure 2** is a pendent vertical sidewall that is designed to face the window assembly vertically. The Model WS is a quick response sprinkler head that releases once the ambient temperature reaches either 155 or 200° F (68 or 93° C), depending on which rated sprinkler head is installed. The sprinkler heads have an orifice and thread size of 1/2 inch (12.7 mm).

3.3 Glass Fire Separation Assembly

The glass used within the assembly shall be single or double glazed, nominal 1/4 inch (6.4 mm) thick or greater, heat strengthened glass or tempered glass manufactured in accordance with ASTM C1048 or Federal Specification DD-G-1403B. The glass component of the wall assembly shall have a maximum height of 13 feet (3965 mm) with an unlimited horizontal span. The glass assembly shall be retained by a noncombustible frame with a standard molded EPDM rubber gasket serving as the seal. Glass panes that are connected by butt-joints shall be sealed with a silicone construction sealant between the individual panes or by an aluminum mullion.

4.0 INSTALLATION

4.1 Sprinkler Orientation

When locating the TFP/CSC Model WS horizontal sidewall, the deflector shall be placed within the outside edge of the window frame from 1/2 to 4 inches (12.7 to 102 mm) away from the glass and 1 to 3 inches (25 to 76 mm) down from the top of the noncombustible frame as shown in **Figure 1**. The TFP/CSC Model WS vertical sidewall shall be located 4 to 12 inches (102 to 305 mm) from the face of the glass and 1 to 3 inches (25.4 to 76 mm) down from the top of the noncombustible frame as shown in **Figure 2**. All combustible materials shall be kept 2 inches (51 mm) from the face of the glass. This can be accomplished by a 36 inch (914 mm) pony wall. The use of alternate methods of maintaining clearance to combustibles is outside the scope of this report (See **Condition of Use 7.8**).

The maximum distance between window sprinklers shall be 8 feet (2440 mm) center to center. The minimum distance shall be 6 feet (1830 mm) unless the sprinklers are separated by a vertical mullion which acts as a baffle between sprinkler heads. The maximum distance maintained between the sprinkler head and the mullion shall be half the distance required between sprinklers.

4.2 Hydraulic Requirements

The size of the sprinkler pipe that supplies the window sprinklers shall be based on hydraulic calculations performed in accordance with NFPA 13. In a sprinklered building, the hydraulic calculations shall be performed on the hydraulically most remote sprinkler heads contained within 46.5 linear feet (14 183 mm). The window sprinkler demand shall be added to the calculations for the standard wet-type sprinkler system at the point in the system that they connect, as required by NFPA 13. In buildings that are not equipped with an automatic suppression system, all the sprinklers located within the area shall be considered to flow simultaneously for the hydraulic calculations.

The minimum flow per sprinkler shall be based on the horizontal distance of each sprinkler head. Sprinkler heads which are 6 to 8 feet (1830 to 2440 mm) apart shall have a flow of 20 gpm (75.7 L/m) and a pressure of 12.7 psi (87.6 kPa). Sprinkler heads that are less than 6 feet (1830 mm) apart shall be calculated for a flow of 15 gpm (56.8 L/m) and a pressure of 7.0 psi (48.3 kPa).

4.3 Other Documentation

Installation shall comply with this report and a copy of this report shall be available at all times on the job site during installation. Additional details are in the Central, WS, 8-02, Model WS™ Specific Application Window Sprinklers™ Tyco Fire Products, Technical Data Sheet #6-2.0, printed 8-02.

5.0 IDENTIFICATION

All TFP/CSC Window Sprinkler™ Model WS™ sprinklers shall bear a label identifying the manufacturer's name, the product name and the name of the testing agency, UL Testing Laboratories Inc. and this report number NER-516 for field identification.

6.0 EVIDENCE SUBMITTED

6.1 Test report File EX683, Project 94NK27353, August 22, 1995, Underwriters Laboratories Inc., in accordance with ASTM E 119.

6.2 Manufacturer's installation literature; "Central, WS, 8-02, Model WS™ Specific Application Window Sprinklers™ Tyco Fire Products, Technical Data Sheet #6-2.0, printed 8-02".

6.3 Letter report from Donald J. Boehmer, P.E., December 4, 1995, considering design criteria for the rated assembly.

6.4 UL Directory, Fire Protection Equipment 1998.

6.5 Letter from Underwriters Laboratories Inc., dated July 3, 2002, indicating that it is acceptable to install the specific application window sprinkler, TFP/CSC Model WS (SIN C3388, C3488, TY3388 and TY 3488), with double-glazing.

7.0 CONDITIONS OF USE

The National Evaluation Service Committee finds that the TFP/CSC Window Sprinkler™ Model WS™ as described in this report complies with or is a suitable alternative to that specified in the 2000 *International Building Code* with the 2002 *Accumulative Supplement to the International Codes*, the 2000 *International Residential Code for One- and Two-Family Dwellings* with the 2002 *Accumulative Supplement to the International Codes*, the BOCA *National Building Code/1999*, the 1999 *Standard Building Code*, the 1997 *Uniform Building Code* and the 1998 *One- and Two-Family Dwelling Code*, subject to the following conditions:

7.1 Products shall be installed in accordance with this report and the manufacturer's installation instructions as specified in this report. The instructions within this report govern if there are any conflicts between the manufacturer's instructions and this report.

NATIONAL EVALUATION SERVICE, INC.

NES
Product Evaluation Listing

1.0 SUBJECT

2.0 PROPERTY FOR WHICH EVALUATION IS SOUGHT

3.0 DESCRIPTION

4.0 INSTALLATION

5.0 IDENTIFICATION

6.0 EVIDENCE SUBMITTED

7.0 CONDITIONS OF USE

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7.2 Hydraulic calculations shall show a maximum pressure of 175 psi (1207 kPa) on the vertical sidewall sprinkler heads and horizontal sidewall sprinkler heads separated by a vertical mullion. The hydraulic calculation shall show a maximum pressure of 70 psi (483 kPa) for horizontal sidewall sprinkler heads that are not separated by a vertical mullion which acts as a baffle between sprinkler heads shall be shown.

7.3 The glazing assembly shall not have intermediate horizontal mullions.

7.4 The glazing shall not be used in locations that contain materials that represent explosion or detonation hazards.

7.5 In jurisdictions that have adopted the 2000 *International Building Code* with the 2002 *Accumulative Supplement to the International Codes*, *BOCA National Building Code/1999* and the *1999 Standard Building Code*, the TFP/CSC Window Sprinkler™ Model WS™ shall not be used to achieve a fire-resistance rating on glazing assemblies within exterior walls that have a horizontal fire separation distance of less than 5 feet (1525 mm) (the distance from a common property line or assumed property line).

In jurisdictions that have adopted the 2000 *International Residential Code for One- and Two-Family Dwellings* with the 2002 *Accumulative Supplement to the International Codes* and the 1998 *One- and Two-Family Dwelling Code*, the TFP/CSC Window Sprinkler™ Model WS™ shall not be used to achieve a fire-resistance rating on glazing assemblies within exterior walls that have a horizontal fire separation distance of less than 3 feet (915 mm) (the distance from a common property line or assumed property line).

In jurisdictions that have adopted the *1997 Uniform Building Code*, the TFP/CSC Window Sprinkler™ Model WS™ shall not be used to achieve a fire-resistive rating in exterior walls.

7.6 System piping shall be designed, sized and installed in accordance with NFPA 13.

7.7 Glazing Assemblies that incorporate other than wet-type sprinkler systems or load-bearing assemblies are outside the scope of this report.

7.8 All combustible materials shall be kept 2 inches (51 mm) from the face of the glass. This can be accomplished by a 36 inch (914 mm) pony wall.

The evaluation of the use of alternative methods to the pony wall described in this report to maintain a minimum 2 inch (51 mm) clearance of combustibles from the face of the assembly is outside the scope of this evaluation. The use of and alternative method shall be subjected to specific approval by the authority having jurisdiction and evidence supporting the alternative construction shall be submitted to the code official with the application for permit.

7.9 The automatic water supply shall have the capability to supply water to the assembly for a time not less than the rating of the assembly. The maximum fire-resistance rating shall not exceed 2 hours.

7.10 This report is subject to periodic re-examination. For information on the current status of this report, consult the ***NES Product Evaluation Listing*** or contact the **NES**.

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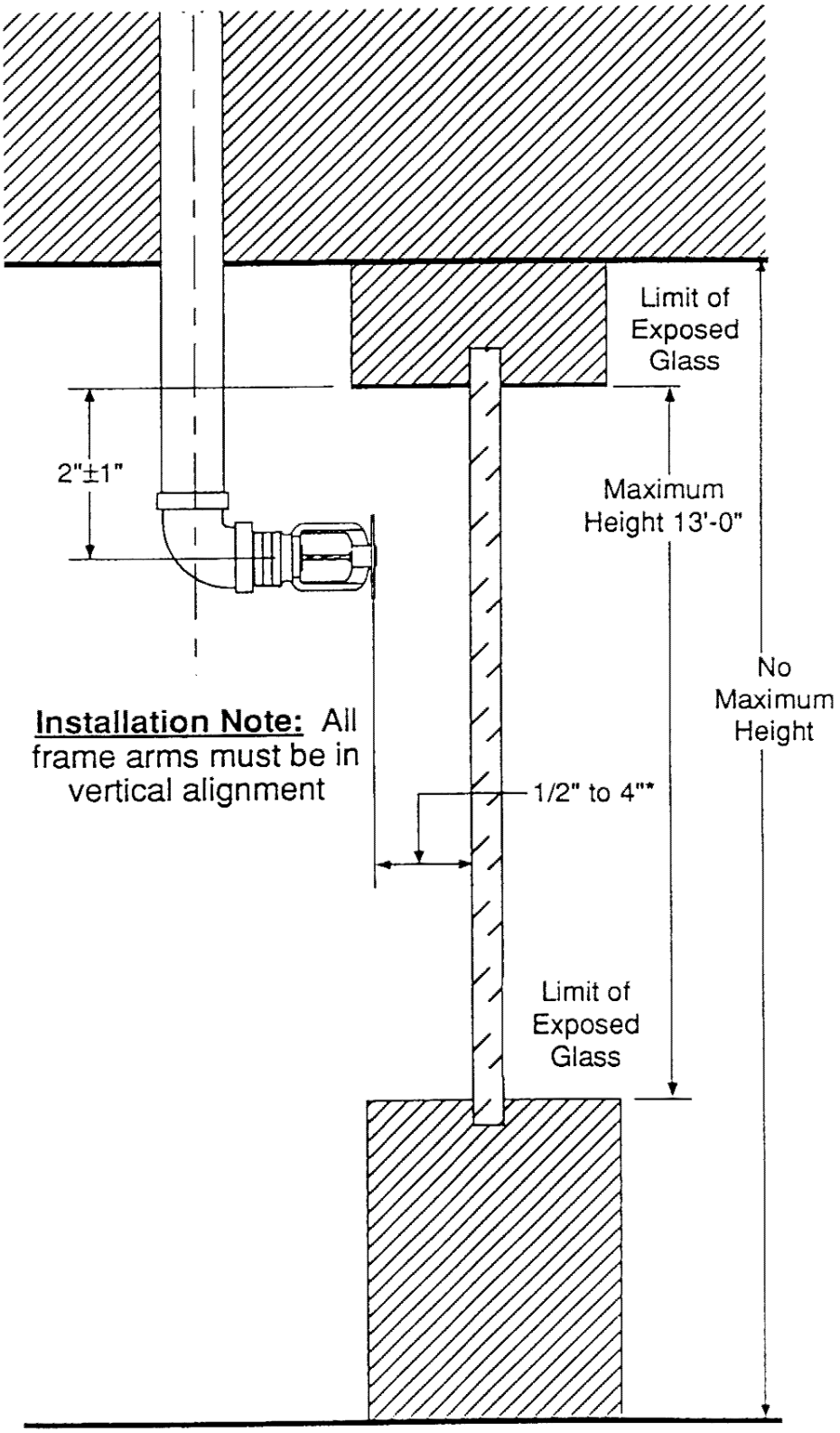
FIGURE 1*
WS™ HORIZONTAL SIDEWALL SPRINKLER INSTALLATION



*Must be within the frame of window.

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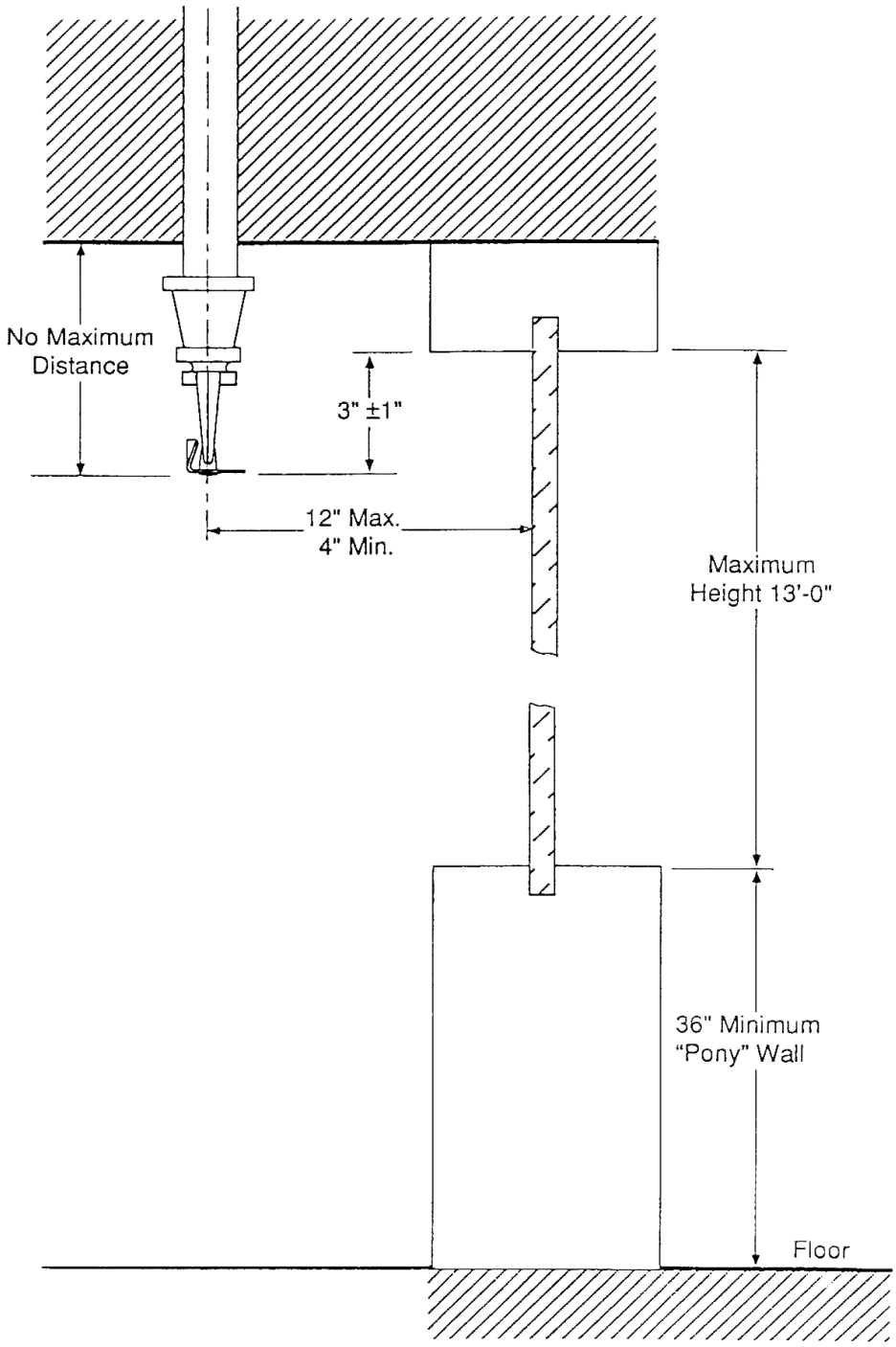
FIGURE 2*
WS™ PENDENT VERTICAL SIDEWALL SPRINKLER INSTALLATION



*THESE DRAWINGS ARE FOR ILLUSTRATION PURPOSES ONLY. THEY ARE NOT INTENDED FOR USE AS CONSTRUCTION DOCUMENTS FOR THE PURPOSE OF DESIGN, FABRICATION OR ERECTION.