Development Services

From Concept to Construction

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APPEAL SUMMARY

Status: Decision Rendered

Appeal ID: 20797	**Project Address:** 1337 E Burnside St
Hearing Date: 8/28/19	**Appellant Name:** Blair Stone
Case No.: B-007	**Appellant Phone:** 206-290-1758
Appeal Type: Building	**Plans Examiner/Inspector:** Chanel Horn, Corey Stanley
Project Type: commercial	**Stories:** 6 **Occupancy:** R-2, M, A-2, S-2 **Construction Type:** III-A over I-A
Building/Business Name: Broadstone Anthem	**Fire Sprinklers:** Yes - Throughout
Appeal Involves: Erection of a new structure	**LUR or Permit Application No.:** 17-240808-CO
Plan Submitted Option: pdf [File 1]	**Proposed use:** Apartments

APPEAL INFORMATION SHEET

Appeal item 1

Code Section	703.2, 703.3
Requires	Code Section 703.2 The fire resistance rating of building elements, components or assemblies shall be determined in accordance with the test procedures set forth in ASTM E119 or UL 263 or in accordance with Section 703.3. Where materials, systems or devices that have not been tested as part of a fire- resistance-rated assembly are incorporated into the building element, component, or assembly, sufficient data shall be made available to the building official to show that the required fire-resistance rating is not reduced. Materials and methods of construction used to protect joints and penetrations in fire-resistance-rated building elements, components or assemblies shall not reduce the required fire- resistance rating. Code Section 703.3. The application of any of the alternative methods listed in this section shall be based on the fire exposure and acceptance criteria specified in ASTM E119 or UL 263. The required fired resistance of a building element, component or assembly shall be permitted to be established by any of the following methods or procedures: Fire-resistance designs documented in sources. Prescriptive designs of fire-resistance-rated building elements, components or assemblies as prescribed in Section 721. Calculations in accordance with Section 722. Engineering analysis based on a comparison of building element, component or assemblies designs having fire-resistance ratings as determined by the test procedures set forth in ASTM E119 or UL 263. Alternative protection methods as allowed by Section 104.11.
Proposed Design	Also see attached PDF with drawings and FPE report. The code requires that primary structural members have a fire resistance rating provided by the individual encasement or alternative

method. The 1337 E. Burnside project has steel beams and columns at Level 2, supporting the Type III-A construction above. The proposed condition replaces the fire-rated gypsum wrapped assemblies at beams and columns in the indicated locations with spray-applied fire resistive materials (SFRM) to the minimum thicknesses recommended by the manufacturer. The beams indicated in plan demonstrate two conditions, at exterior perimeter bearing walls with a 2-hour fire resistance requirement, and as interior primary structural framing with a 1-hour fire resistance requirement per OSSC 2014, Table 601.

The proposed condition will provide 1-hour and 2-hour fire resistance rating at HSS tube steel column locations, with application of SFRM, utilizing UL Design Number Y710, BXUV.Y710. For providing 1-hour and 2-hour fire resistance ratings at wide flange beams, the proposed design utilizes the application of SFRM utilizing UL Design Number X854, BXUV.X854. Per Monokote® manufacturer recommendations, the method of applying the conditions of Wide Flange Columns to Wide Flange Beams is an appropriate conservative method. There is no exact UL match for SFRM at steel beams supporting wood structure. The attached charts for Monokote® Fireproofing MK-6/HY for UL Design Number X854 and Y710 indicates the required thicknesses. In the attached plan beam sizes, fire ratings and thicknesses have been noted.

Per the manufacturer direction, Monokote® Fireproofing should be applied to the wide flange beam at thicknesses from UL Design # X854 taking the W/D of the member as a column. In example, a W8x28 used as a beam has a W/D ratio of 0.819. A similar member used as a column will have a W/D ratio of 0.688 - the smaller number must be used. The rationale behind this judgment is such: a column, when subjected to fire testing, is placed in a furnace where the column is exposed to flames on every side. The coating thicknesses in the column design have been shown to protect the wide-flanged section from a maximum temperature of 1200 °F, and an average temperature of 1000 °F. Based on adherence data developed on the Monokote® Fireproofing on beams, it is assumed that the same temperature protection would also be afforded to a horizontal member under similar fire exposure conditions. Please note that the normal temperature criteria for a beam listed in the Standard, Fire Tests of Building Construction and Materials, ANSI/UL 263 (ASTM E119) are 1100 °F average and 1300 °F maximum; therefore, this judgment results in a conservative level of protection for the beam.

Reason for alternative We are requesting this appeal because it is a standard industry practice to determine SFRM thicknesses of wide flange beams based on steel column calculation resulting in a more conservative methodology. SFRM protection at the steel beam and column locations will simplify the plane of the finished ceiling and provide a slight addition of height to room below.

APPEAL DECISION

Alternate 1 and 2 hour beam assemblies with enginering analysis: Granted as proposed.

The Administrative Appeal Board finds that the information submitted by the appellant demonstrates that the approved modifications or alternate methods are consistent with the intent of the code; do not lessen health, safety, accessibility, life, fire safety or structural requirements; and that special conditions unique to this project make strict application of those code sections impractical.

Pursuant to City Code Chapter 24.10, you may appeal this decision to the Building Code Board of Appeal within 90 calendar days of the date this decision is published. For information on the appeals process, go to www.portlandoregon.gov/bds/appealsinfo, call (503) 823-7300 or come in to the Development Services Center.

THE FIRE PROTECTION INTERNATIONAL CONSORTIUM, INC.

FIRE PROTECTION - LIFE SAFETY - CODE CONSULTING
SECURITY - PERFORMANCE BASED DESIGN
http://www.the-fpi.com

August 19, 2019

Christine R. Hatcher, AIA, LEED AP BD+C
Principal
Encore Architects
1402 Third Avenue, Suite 1000
Seattle, WA 98102
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Reference: Broadstone Anthem Apartment
1337 E. Burnside St., Portland, OR 97209
SFRM Appeal

Dear Ms. Hatcher:

Fire Protection International Consortium, Inc. is pleased to provide the following opinion with regard to the proposed fire proofing of certain steel structural members in the clubroom at the above referenced site.

PROJECT DESCRIPTION

Encore Architects is filing an appeal in Portland, OR with regard to using Spray Applied Fire Resistive material (SFRM) to certain beams in the construction of the above referenced apartment. In the case where a beam rating is needed but no specific UL assembly is available, the use of SFRM thickness associated with appropriate steel column calculations is being proposed.

FPI has been asked to review the proposed SFRM approach.

As discussed in the appeal document prepared by Encore Architects, the building code requires that primary structural members have a fire resistance rating provided by the individual encasement or alternative method. Originally, plans were submitted for permit using fire-rated gypsum board wrapped assemblies for encasement. However, the substitution of SFRM encasement in lieu of gypsum board wrapped assemblies is being proposed.

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BACKGROUND:

This project has steel beams and columns at Level 2, supporting the Type III-A construction above. The SFRM proposed replaces the fire-rated gypsum wrapped assemblies at beams and columns in the indicated locations with spray-applied fire resistive materials (SFRM) to the minimum thicknesses recommended by the manufacturer.

An alternate design is needed for the beams. Per the manufacturer, the Monokote product proposed does not have specific testing for wide flange beams supporting wood structure above.

The use of column designs to protect this beam is common industry practice, and provides a conservative approach to the calculation of fire resistance rating to address a design for which there exists no exact UL match and is proposed for this project.

The manufacturer has recommended that Monokote® Fireproofing be applied to the to the beams at thicknesses from UL Design # X854 taking the W/D of the member as a column. The tables indicating W/D ratios and appropriate SFRM thicknesses are attached for reference.

The rationale behind this judgment is that a column, when subjected to fire testing, is placed in a furnace where the column is exposed to flames on four sides. The coating thicknesses in the column design have been shown to protect the wide-flanged section from a maximum temperature of 1200 °F, and an average temperature of 1000 °F. It is expected that the same temperature protection or better would also be afforded to a horizontal member under the fire test exposure conditions

Structural steel members are installed in a wide range of configurations. From a fire protection standpoint a column installed exposed (not inside a rated wall) on a floor is the worst case physical location. This is because a column is exposed to heat on four sides. A beam has less of its perimeter exposed and has the benefit of the heat lost to the floor assembly in contact with it. Further, since a wide flange column will have a smaller W/D ratio that the same size member used as a beam, selecting the column W/D is conservative.

PROPOSED SFRM FOR WIDE FLANGE BEAMS:

The beams indicated on the architect's plan sheet SK-A-82 (attached) demonstrate two conditions, at exterior perimeter bearing walls with a 2-hour fire resistance requirement, and as interior primary structural framing with a 1-hour fire resistance requirement per OSSC 2014, Table 601. The two different assemblies at the exterior wall are shown as detail 1 on sheet SK-A-83 and detail 1 on sheet SK-A-100.

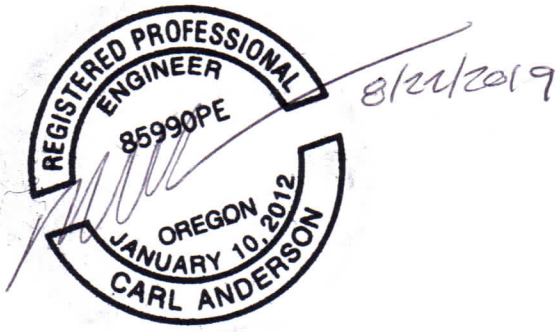
For providing 1-hour and 2-hour fire resistance ratings at wide flange beams, the proposed design utilizes the application of SFRM utilizing UL Design Number X854, BXUV.X854. Per Monokote® manufacturer recommendations, the method of applying the conditions of Wide Flange Columns to Wide Flange Beams is an appropriate conservative method. There is no exact UL match for SFRM at steel beams supporting wood structure. The attached charts for Monokote® Fireproofing MK-6/HY for UL Design Number X854 and Y710 indicates the required thicknesses. In the attached plan beam sizes, fire ratings and thicknesses have been noted.

Per the manufacturer direction, Monokote® Fireproofing should be applied to the wide flange beam at thicknesses from UL Design # X854 taking the W/D of the member as a column.

Based on the above analysis and proposed type and thickness of SFRM proposed, it is our opinion that the alternate design meets or exceeds the prescriptive design being substituted for in this design alternative.

Respectfully submitted,
FIRE PROTECTION INTERNTATIONAL CONSORTIUM, INC

Carl P. Anderson, PE
Registered in CA, WA, OR, UT, AZ, TX, NV, ID, OK and FL



UL DESIGN NUMBER X854: USE UNRESTRAINED COLUMNS (WORST CASE) BASED ON RECOMMENDATION FROM MANUFACTURE SINCE THERE IS 3X WOOD ABOVE.

BXUV.X854
Wide Flange Columns
GCP Applied Technologies Inc. — Types MK-6/HY, MK-6/HY Extended Set, MK-6/GF, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6s, RG, Z-106, Z-106/G, Z-106/HY, MK-1000/HB, MK-1000/HB Extended Set, Z-146, Z-146PC, Z-146T, Z-156, Z-156T and Z-156PC

FULL FLANGE TIP THICKNESS (in.)					Member		HALF FLANGE TIP THICKNESS (in.)				
1 hr	1.5 hr	2 hr	3 hr	4 hr	Size x Wt.	W/D	1 hr	1.5 hr	2 hr	3 hr	4 hr
11/16	1 3/16	1 5/8	2 1/2	3 3/8	W4 x 13	0.556	7/8	1 5/16	1 11/16	2 9/16	3 3/8
11/16	1 3/16	1 5/8	2 1/2	3 3/8	W5 x 16	0.550	7/8	1 5/16	1 11/16	2 9/16	3 3/8
5/8	1 1/8	1 7/16	2 5/16	3 1/8	W5 x 19	0.644	13/16	1 3/16	1 9/16	2 3/8	3 1/8
15/16	1 1/2	2	2 1/2	3 13/16	W6 x 9	0.338	1 1/8	1 5/8	2 1/16	3 1/8	4 3/16
13/16	1 3/8	1 13/16	2 1/2	3 3/4	W6 x 12	0.448	15/16	1 7/16	1 7/8	2 13/16	3 13/16
13/16	1 3/8	1 13/16	2 1/2	3 13/16	W6 x 15	0.431	1	1 7/16	1 15/16	2 7/8	3 7/8
11/16	1 3/16	1 9/16	2 7/16	3 5/16	W6 x 16	0.584	7/8	1 5/16	1 3/4	2 9/16	3 3/8
11/16	1 3/16	1 9/16	2 1/2	3 3/8	W6 x 20	0.563	7/8	1 1/4	1 11/16	2 1/2	3 3/8
5/8	1 1/16	1 3/8	2	2 11/16	W6 x 25	0.696	3/4	1 1/8	1 1/2	2 1/4	2 15/16
13/16	1 3/8	1 7/8	2 1/2	3 13/16	W8 x 13	0.421	1	1 7/16	1 15/16	2 7/8	3 7/8
3/4	1 5/16	1 3/4	2 1/2	3 5/8	W8 x 15	0.481	15/16	1 3/8	1 13/16	2 3/4	3 11/16
3/4	1 1/4	1 11/16	2 1/2	3 1/2	W8 x 18	0.499	15/16	1 3/8	1 13/16	2 11/16	3 9/16
11/16	1 3/16	1 9/16	2 1/2	3 5/16	W8 x 21	0.577	7/8	1 1/4	1 11/16	2 1/2	3 5/16
11/16	1 1/8	1 9/16	2 7/16	3 5/16	W8 x 24	0.591	7/8	1 1/4	1 11/16	2 1/2	3 5/16
5/8	1 1/16	1 3/8	2	2 11/16	W8 x 28	0.688	13/16	1 3/16	1 1/2	2 1/4	2 15/16
5/8	1 1/16	1 7/16	2 5/16	3 1/16	W8 x 31	0.665	13/16	1 3/16	1 9/16	2 5/16	3 1/16
9/16	1	1 5/16	2	2 11/16	W8 x 35	0.749	3/4		1 7/16	2 3/16	2 7/8
9/16	3/4	1 1/8	1 11/16	2 1/2	W8 x 40	0.849	11/16	1	1 3/8	2	2 11/16
1/2	3/4	1	1 11/16	2 5/16	W8 x 48	1.000	5/8	15/16	1 1/4	1 13/16	2 7/16
7/16	3/4	13/16	1 3/8	1 15/16	W8 x 58	1.200	9/16	13/16	1 1/8	1 5/8	2 3/16
3/8	5/8	3/4	1 1/4	1 11/16	W8 x 67	1.370	1/2	3/4	1	1 1/2	2
7/8	1 1/2	2	2 1/2	3 13/16	W10 x 12	0.347	1 1/16	1 9/16	2 1/16	3 1/8	4 3/16
13/16	1 3/8	1 7/8	2 1/2	3 13/16	W10 x 15	0.429	1	1 7/16	1 15/16	2 7/8	3 7/8
3/4	1 5/16	1 3/4	2 1/2	3 5/8	W10 x 17	0.482	15/16	1 3/8	1 13/16	2 3/4	3 11/16
3/4	1 1/4	1 5/8	2 1/2	3 7/16	W10 x 19	0.538	7/8	1 5/16	1 3/4	2 9/16	3 7/16
3/4	1 1/4	1 11/16	2 1/2	3 1/2	W10 x 22	0.523	7/8	1 5/16	1 3/4	2 5/8	3 1/2
11/16	1 1/8	1 1/2	2 3/8	3 1/4	W10 x 26	0.612	13/16	1 1/4	1 5/8	2 7/16	3 1/4
5/8	1 1/16	1 3/8	2	2 11/16	W10 x 30	0.699	3/4	1 1/8	1 1/2	2 1/4	2 15/16
5/8	1 1/16	1 7/16	2 5/16	3 1/8	W10 x 33	0.661	13/16	1 3/16	1 9/16	2 5/16	3 1/8
9/16	1	1 1/4	2	2 11/16	W10 x 39	0.780	3/4	1 1/16	1 7/16	2 1/8	2 13/16
1/2	3/4	1 1/8	1 11/16	2 1/2	W10 x 45	0.888	11/16	1	1 5/16	2	2 5/8
9/16	3/4	1 1/8	1 11/16	2 1/2	W10 x 49	0.840	3/4	1 1/16	1 3/8	2 1/16	2 3/4
1/2	3/4	1 1/16	1 11/16	2 1/2	W10 x 54	0.922	11/16	1	1 5/16	1 15/16	2 9/16
1/2	3/4	1	1 5/8	2 5/16	W10 x 60	1.010	5/8	15/16	1 1/4	1 13/16	2 7/16
7/16	3/4	7/8	1 7/16	2	W10 x 68	1.150	9/16	7/8	1 1/8	1 11/16	2 1/4
7/16	11/16	3/4	1 5/16	1 13/16	W10 x 77	1.280	9/16	13/16	1 1/16	1 9/16	2 1/16
3/8	5/8	11/16	1 3/16	1 5/8	W10 x 88	1.450	1/2	3/4	1	1 7/16	1 15/16
3/8	9/16	11/16	1 1/8	1 1/2	W10 x 100	1.640	7/16	11/16	7/8	1 5/16	1 3/4
5/16	1/2	11/16	1 1/8	1 1/2	W10 x 112	1.810	7/16	5/8	13/16	1 1/4	1 5/8
7/8	1 1/2	2	2 1/2	3 13/16	W12 x 14	0.363	1 1/16	1 9/16	2 1/16	3 1/16	4 1/8
13/16	1 7/16	1 7/8	2 1/2	3 13/16	W12 x 16	0.410	1	1 1/2	1 15/16	2 15/16	3 15/16
3/4	1 5/16	1 3/4	2 1/2	3 5/8	W12 x 19	0.485	15/16	1 3/8	1 13/16	2 11/16	3 5/8
11/16	1 3/16	1 5/8	2 1/2	3 3/8	W12 x 22	0.560	7/8	1 5/16	1 11/16	2 9/16	3 3/8
3/4	1 1/4	1 5/8	2 1/2	3 7/16	W12 x 26	0.531	7/8	1 5/16	1 3/4	2 5/8	3 7/16
11/16	1 1/8	1 1/2	2 7/16	3 1/4	W12 x 30	0.607	13/16	1 1/4	1 5/8	2 7/16	3 1/4
5/8	1 1/16	1 3/8	2	2 11/16	W12 x 35	0.703	3/4	1 1/8	1 1/2	2 1/4	2 15/16
5/8	1	1 5/16	2	2 11/16	W12 x 40	0.734	3/4	1 1/8	1 1/2	2 3/16	2 15/16
9/16	15/16	1 3/16	1 15/16	2 11/16	W12 x 45	0.829	11/16	1 1/16	1 3/8	2 1/16	2 3/4
1/2	3/4	1 1/16	1 11/16	2 1/2	W12 x 50	0.909	11/16	1	1 5/16	1 15/16	2 9/16
9/16	3/4	1 1/8	1 11/16	2 1/2	W12 x 53	0.855	11/16	1	1 3/8	2	2 11/16
1/2	3/4	1 1/16	1 11/16	2 7/16	W12 x 58	0.925	11/16	1	1 5/16	1 15/16	2 9/16
1/2	3/4	1 1/16	1 11/16	2 7/16	W12 x 65	0.925	11/16	1	1 5/16	1 15/16	2 9/16
1/2	3/4	15/16	1 5/8	2 1/4	W12 x 72	1.020	5/8	15/16	1 1/4	1 13/16	2 7/16
7/16	3/4	7/8	1 1/2	2 1/8	W12 x 79	1.110	5/8	7/8	1 3/16	1 3/4	2 5/16
7/16	11/16	13/16	1 3/8	1 15/16	W12 x 87	1.220	9/16	13/16	1 1/16	1 5/8	2 1/8
3/8	11/16	3/4	1 1/4	1 3/4	W12 x 96	1.340	1/2	3/4	1	1 1/2	2
3/8	5/8	11/16	1 3/16	1 5/8	W12 x 106	1.470	1/2	3/4	15/16	1 7/16	1 7/8
5/16	9/16	11/16	1 1/8	1 1/2	W12 x 120	1.650	7/16	11/16	7/8	1 5/16	1 3/4
5/16	1/2	11/16	1 1/8	1 1/2	W12 x 136	1.860	7/16	5/8	13/16	1 3/16	1 9/16
5/16	1/2	11/16	1 1/16	1 7/16	W12 x 152	2.040	3/8	9/16	3/4	1 1/8	1 1/2
1/4	7/16	5/8	15/16	1 5/16	W12 x 170	2.260	3/8	9/16	11/16	1 1/16	1 3/8
1/4	5/16	9/16	7/8	1 3/16	W12 x 190	2.500	5/16	1/2	5/8	15/16	1 1/4
1/4	5/16	1/2	13/16	1 1/8	W12 x 210	2.730	5/16	7/16	5/8	7/8	1 3/16
1/4	5/16	1/2	3/4	1 1/16	W12 x 230	2.960	5/16	7/16	9/16	13/16	1 1/8

BXUV.X854
Wide Flange Columns
GCP Applied Technologies Inc. — Types MK-6/HY, MK-6/HY Extended Set, MK-6/GF, MK-10 HB, MK-10 HB Extended Set, MK-6/HB, MK-6s, RG, Z-106, Z-106/G, Z-106/HY, MK-1000/HB, MK-1000/HB Extended Set, Z-146, Z-146PC, Z-146T, Z-156, Z-156T and Z-156PC

FULL FLANGE TIP THICKNESS (in.)					Member		HALF FLANGE TIP THICKNESS (in.)				
1 hr	1.5 hr	2 hr	3 hr	4 hr	Size x Wt.	W/D	1 hr	1.5 hr	2 hr	3 hr	4 hr
1/4	5/16	7/16	3/4	1	W12 x 252	3.200	5/16	7/16	9/16	13/16	1 1/16
1/4	5/16	7/16	11/16	7/8	W12 x 279	3.500	1/4	3/8	1/2	3/4	15/16
1/4	5/16	3/8	5/8	7/8	W12 x 305	3.760	1/4	3/8	1/2	11/16	15/16
1/4	1/4	3/8	9/16	13/16	W12 x 336	4.060	1/4	5/16	7/16	5/8	7/8
3/4	1 5/16	1 3/4	2 1/2	3 5/8	W14 x 22	0.476	15/16	1 3/8	1 13/16	2 3/4	3 11/16
11/16	1 3/16	1 5/8	2 1/2	3 3/8	W14 x 26	0.559	7/8	1 5/16	1 11/16	2 9/16	3 3/8
11/16	1 3/16	1 9/16	2 1/2	3 3/8	W14 x 30	0.562	7/8	1 1/4	1 11/16	2 1/2	3 3/8
5/8	1 1/8	1 7/16	2 3/8	3 3/16	W14 x 34	0.633	13/16	1 3/16	1 5/8	2 3/8	3 3/16
5/8	1 1/16	1 3/8	2	2 11/16	W14 x 38	0.706	3/4	1 1/8	1 1/2	2 1/4	2 15/16
9/16	1	1 5/16	2	2 11/16	W14 x 43	0.752	3/4	1 1/8	1 7/16	2 3/16	2 7/8
9/16	15/16	1 3/16	1 15/16	2 11/16	W14 x 48	0.835	11/16	1 1/16	1 3/8	2 1/16	2 3/4
1/2	3/4	1 1/16	1 11/16	2 1/2	W14 x 53	0.915	11/16	1	1 5/16	1 15/16	2 9/16
1/2	3/4	1 1/16	1 11/16	2 7/16	W14 x 61	0.928	11/16	1	1 5/16	1 15/16	2 9/16
1/2	3/4	15/16	1 5/8	2 1/4	W14 x 68	1.040	5/8	15/16	1 3/16	1 13/16	2 3/8
7/16	3/4	7/8	1 1/2	2 1/16	W14 x 74	1.120	9/16	7/8	1 1/8	1 11/16	2 1/4
7/16	11/16	13/16	1 3/8	1 7/8	W14 x 82	1.230	9/16	13/16	1 1/16	1 5/8	2 1/8
7/16	3/4	7/8	1 9/16	2 1/8	W14 x 90	1.080	5/8	7/8	1 3/16	1 3/4	2 5/16
7/16	3/4	13/16	1 7/16	2	W14 x 99	1.180	9/16	13/16	1 1/8	1 5/8	2 3/16
7/16	11/16	3/4	1 5/16	1 13/16	W14 x 109	1.290	9/16	13/16	1 1/16	1 9/16	2 1/16
3/8	5/8	3/4	1 3/16	1 11/16	W14 x 120	1.420	1/2	3/4	1	1 7/16	1 15/16
3/8	9/16	11/16	1 1/8	1 9/16	W14 x 132	1.560	1/2	11/16	15/16	1 3/8	1 13/16
3/8	9/16	11/16	1 1/8	1 1/2	W14 x 145	1.640	7/16	11/16	7/8	1 5/16	1 3/4
5/16	9/16	11/16	1 1/8	1 1/2	W14 x 159	1.780	7/16	5/8	13/16	1 1/4	1 5/8
5/16	1/2	11/16	1 1/16	1 1/2	W14 x 176	1.960	3/8	9/16	3/4	1 1/8	1 1/2
5/16	7/16	5/8	1	1 3/8	W14 x 193	2.140	3/8	9/16	3/4	1 1/16	1 7/16
1/4	7/16	5/8	15/16	1 5/16	W14 x 211	2.320	3/8	1/2	11/16	1	1 3/8
1/4	5/16	9/16	7/8	1 3/16	W14 x 233	2.550	5/16	1/2	5/8	15/16	1 1/4
1/4	5/16	1/2	13/16	1 1/8	W14 x 257	2.780	5/16	7/16	5/8	7/8	1 3/16
1/4	5/16	1/2	3/4	1	W14 x 283	3.030	5/16	7/16	9/16	13/16	1 1/16
1/4	5/16	7/16	11/16	15/16	W14 x 311	3.300	1/4	3/8	1/2	3/4	1
1/4	5/16	7/16	5/8	7/8	W14 x 342	3.580	1/4	3/8	1/2	11/16	15/16
1/4	5/16	3/8	5/8	13/16	W14 x 370	3.840	1/4	3/8	7/16	11/16	7/8
1/4	1/4	3/8	9/16	13/16	W14 x 398	4.090	1/4	5/16	7/16	5/8	7/8
1/4	1/4	3/8	9/16	3/4	W14 x 426	4.320	1/4	5/16	7/16	5/8	13/16
1/4	1/4	5/16	1/2	11/16	W14 x 455	4.590	1/4	5/16	3/8	9/16	3/4
1/4	1/4	5/16	1/2	11/16	W14 x 500	4.950	1/4	5/16	3/8	9/16	3/4
1/4	1/4	5/16	7/16	5/8	W14 x 550	5.340	1/4	1/4	3/8	1/2	11/16
1/4	1/4	1/4	7/16	9/16	W14 x 605	5.820	1/4	1/4	5/16	1/2	5/8
1/4	1/4	1/4	3/8	9/16	W14 x 665	6.210	1/4	1/4	5/16	7/16	9/16
1/4	1/4	1/4	3/8	1/2	W14 x 730	6.760	1/4	1/4	5/16	7/16	9/16
3/4	1 1/4	1 11/16	2 1/2	3 1/2	W16 x 26	0.499	15/16	1 3/8	1 13/16	2 11/16	3 9/16
11/16	1 1/8	1 9/16	2 7/16	3 1/4	W16 x 31	0.592	13/16	1 1/4	1 5/8	2 7/16	3 1/4
11/16	1 1/8	1 1/2	2 3/8	3 3/16	W16 x 36	0.617	13/16	1 1/4	1 5/8	2 7/16	3 3/16
5/8	1 1/16	1 3/8	2 1/4	3 1/16	W16 x 40	0.686	13/16	1 3/16	1 9/16	2 5/16	3 1/16
9/16	1	1 1/4	2	2 11/16	W16 x 45	0.767	3/4	1 1/16	1 7/16	2 1/8	2 7/8
9/16	3/4	1 1/8	1 11/16	2 1/2	W16 x 50	0.846	11/16	1 1/16	1 3/8	2 1/16	2 11/16
1/2	3/4	1	1 11/16	2 3/8	W16 x 57	0.963	5/8	15/16	1 1/4	1 7/8	2 1/2
1/2	3/4	1 1/16	1 11/16	2 7/16	W16 x 67	0.936	11/16	1	1 5/16	1 15/16	2 9/16
7/16	3/4	15/16	1 9/16	2 3/16	W16 x 77	1.070	5/8	7/8	1 3/16	1 3/4	2 5/16
7/16	11/16	13/16	1 3/8	1 15/16	W16 x 89	1.220	9/16	13/16	1 1/16	1 5/8	2 1/8
3/8	5/8	3/4	1 1/4	1 11/16	W16 x 100	1.370	1/2	3/4	1	1 1/2	2
11/16	1 1/8	1 1/2	2 7/16	3 1/4	W18 x 35	0.602	13/16	1 1/4	1 5/8	2 7/16	3 1/4
5/8	1 1/16	1 3/8	2	2 11/16	W18 x 40	0.688	13/16	1 3/16	1 1/2	2 1/4	2 15/16
9/16	15/16	1 1/4	2	2 11/16	W18 x 46	0.786	3/4	1 1/16	1 7/16	2 1/8	2 13/16
9/16	1	1 1/4	2	2 11/16	W18 x 50	0.778	3/4	1 1/16	1 7/16	2 1/8	2 13/16
9/16	3/4	1 1/8	1 11/16	2 1/2	W18 x 55	0.850	11/16	1	1 3/8	2	2 11/16
1/2	3/4	1 1/16	1 11/16	2 7/16	W18 x 60	0.923	11/16	1	1 5/16	1 15/16	2 9/16
1/2	3/4	1	1 11/16	2 5/16	W18 x 65	0.997	5/8	15/16	1 1/4	1 13/16	2 7/16
7/16	3/4	7/8	1 9/16	2 1/8	W18 x 71	1.080	5/8	7/8	1 3/16	1 3/4	2 5/16
1/2	3/4	1	1 11/16	2 3/8	W18 x 76	0.971	5/8	15/16	1 1/4	1 7/8	2 1/2
7/16	3/4	7/8	1 9/16	2 1/8	W18 x 86	1.090	5/8	7/8	1 3/16	1 3/4	2 5/16
7/16	11/16	13/16	1 3/8	1 15/16	W18 x 97	1.220	9/16	13/16	1 1/16	1 5/8	2 1/8
3/8	11/16	3/4	1 1/4	1 3/4	W18 x 106	1.330	1/2	3/4	1	1 1/2	2
3/8	5/8	11/16	1 3/16	1 5/8	W18 x 119	1.480	1/2	3/4	15/16	1 7/16	1 7/8

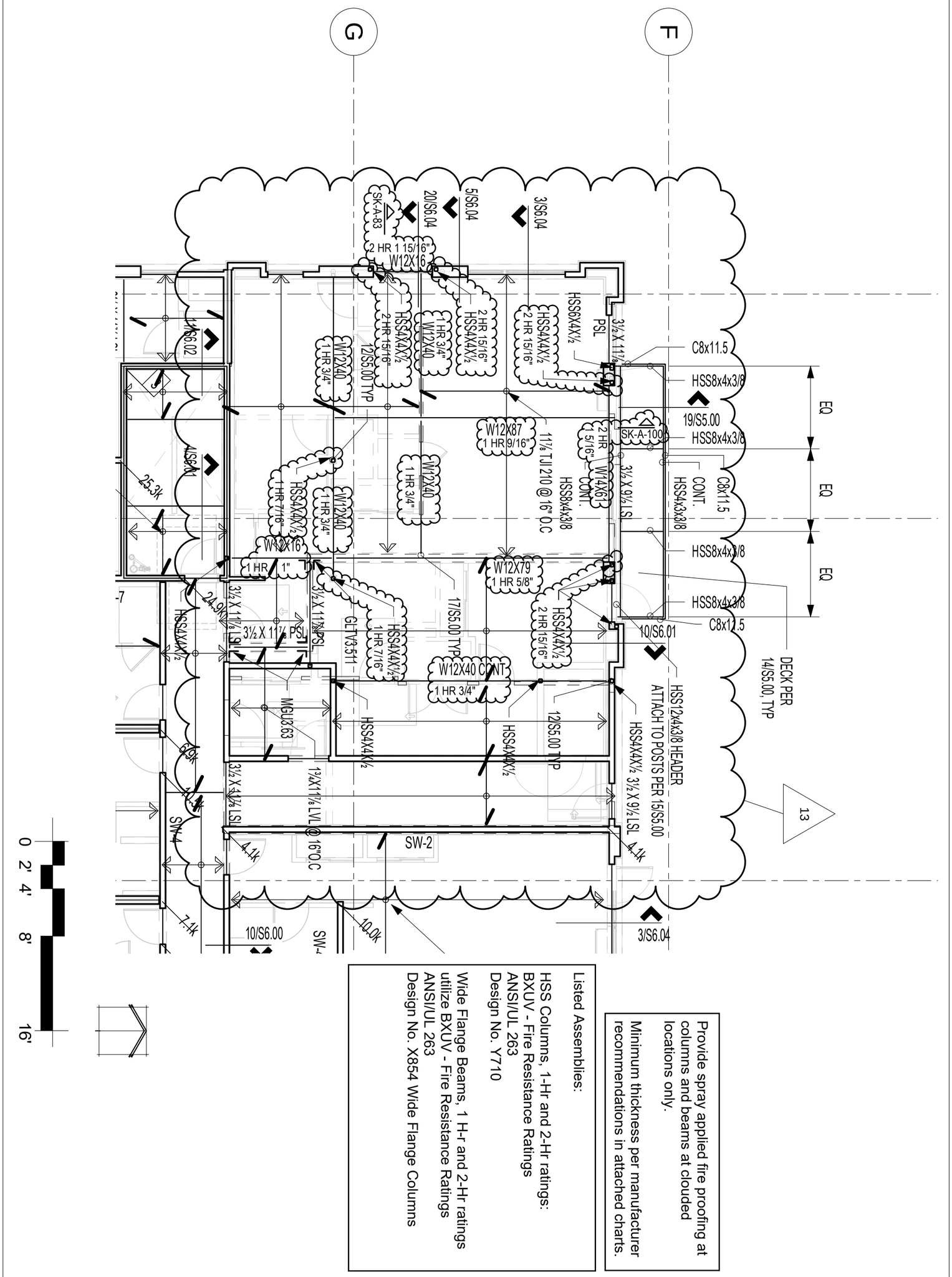
UL DESIGN NUMBER Y710

BXUV.Y710

Square Tube Columns

GCP Applied Technologies Inc. — Types MK-6/HY, MK-10 HB, MK-6s, MK-6 GF, MK-6 GF Extended Set, RG, Z-106, Z-106/G, Z-106/HY, MK-1000/HB, MK-1000/HB Extended Set

Nominal Size	Wall Thickness	A/P (a)	1 hr	1.5 hr	2 hr	3 hr	4 hr
2 x 2	1/4	0.219	7/8	1 3/8	1 7/8	2 15/16	NR
2 x 2	5/16	0.264	11/16	1 1/8	1 9/16	2 7/16	3 1/4
2.5 x 2.5	1/4	0.225	13/16	1 5/16	1 13/16	2 13/16	3 13/16
2.5 x 2.5	5/16	0.273	11/16	1 1/8	1 1/2	2 3/8	3 3/16
3 x 3	3/16	0.176	1	1 11/16	2 5/16	3 9/16	NR
3 x 3	1/4	0.229	13/16	1 5/16	1 13/16	2 13/16	3 3/4
3 x 3	5/16	0.280	11/16	1 1/8	1 1/2	2 5/16	3 1/16
3 x 3	3/8	0.328	9/16	15/16	1 1/4	1 15/16	2 5/8
3 x 3	1/2	0.417	7/16	3/4	1	1 1/2	2 1/16
3.5 x 3.5	3/16	0.177	1	1 11/16	2 5/16	3 9/16	NR
3.5 x 3.5	1/4	0.232	13/16	1 5/16	1 13/16	2 3/4	3 3/4
3.5 x 3.5	5/16	0.285	11/16	1 1/16	1 7/16	2 1/4	3 1/16
3.5 x 3.5	3/8	0.335	9/16	15/16	1 1/4	1 15/16	2 9/16
4 x 4	3/16	0.179	1	1 11/16	2 5/16	3 9/16	NR
4 x 4	1/4	0.234	13/16	1 5/16	1 3/4	2 3/4	3 11/16
4 x 4	5/16	0.288	11/16	1 1/16	1 7/16	2 1/4	3
4 x 4	3/8	0.340	9/16	7/8	1 1/4	1 7/8	2 9/16
4 x 4	1/2	0.438	7/16	11/16	15/16	1 1/2	2
4.5 x 4.5	3/16	0.180	1	1 11/16	2 5/16	3 9/16	NR
4.5 x 4.5	1/4	0.236	13/16	1 1/4	1 3/4	2 11/16	3 11/16
4.5 x 4.5	5/16	0.291	5/8	1 1/16	1 7/16	2 3/16	3
4.5 x 4.5	3/8	0.344	9/16	7/8	1 3/16	1 7/8	2 1/2
4.5 x 4.5	1/2	0.444	7/16	11/16	15/16	1 7/16	1 15/16
5 x 5	3/16	0.180	1	1 11/16	2 5/16	3 9/16	NR
5 x 5	1/4	0.238	13/16	1 1/4	1 3/4	2 11/16	3 5/8
5 x 5	5/16	0.293	5/8	1 1/16	1 7/16	2 3/16	2 15/16
5 x 5	3/8	0.347	9/16	7/8	1 3/16	1 7/8	2 1/2
5 x 5	1/2	0.450	7/16	11/16	15/16	1 7/16	1 15/16
5.5 x 5.5	3/16	0.181	1	1 5/8	2 1/4	3 1/2	NR
5.5 x 5.5	1/4	0.239	13/16	1 1/4	1 3/4	2 11/16	3 5/8
5.5 x 5.5	5/16	0.295	5/8	1	1 7/16	2 3/16	2 15/16
5.5 x 5.5	3/8	0.349	9/16	7/8	1 3/16	1 13/16	2 1/2
6 x 6	3/16	0.182	1	1 5/8	2 1/4	3 1/2	NR
6 x 6	1/4	0.240	13/16	1 1/4	1 3/4	2 11/16	3 5/8
6 x 6	5/16	0.296	5/8	1	1 3/8	2 3/16	2 15/16
6 x 6	3/8	0.352	9/16	7/8	1 3/16	1 13/16	2 7/16
6 x 6	1/2	0.458	7/16	11/16	15/16	1 7/16	1 7/8
6 x 6	5/8	0.560	3/8	9/16	3/4	1 3/16	1 9/16
7 x 7	3/16	0.182	1	1 5/8	2 1/4	3 1/2	NR
7 x 7	1/4	0.241	3/4	1 1/4	1 11/16	2 5/8	3 9/16
7 x 7	5/16	0.299	5/8	1	1 3/8	2 1/8	2 7/8
7 x 7	3/8	0.355	9/16	7/8	1 3/16	1 13/16	2 7/16
7 x 7	1/2	0.464	7/16	11/16	15/16	1 3/8	1 7/8
7 x 7	5/8	0.569	3/8	9/16	3/4	1 1/8	1 9/16
8 x 8	3/16	0.183	1	1 5/8	2 1/4	3 1/2	NR
8 x 8	1/4	0.242	3/4	1 1/4	1 11/16	2 5/8	3 9/16
8 x 8	5/16	0.300	5/8	1	1 3/8	2 1/8	2 7/8
8 x 8	3/8	0.357	9/16	7/8	1 3/16	1 13/16	2 7/16
8 x 8	1/2	0.469	7/16	11/16	7/8	1 3/8	1 7/8
8 x 8	5/8	0.576	3/8	5/8	3/4	1 1/8	1 1/2



Listed Assemblies:

HSS Columns, 1-Hr and 2-Hr ratings:
BXUV - Fire Resistance Ratings
ANSI/UL 263
Design No. Y710

Wide Flange Beams, 1 H-r and 2-Hr ratings
utilize BXUV - Fire Resistance Ratings
ANSI/UL 263
Design No. X854 Wide Flange Columns

Provide spray applied fire proofing at columns and beams at clouded locations only.

Minimum thickness per manufacturer recommendations in attached charts.

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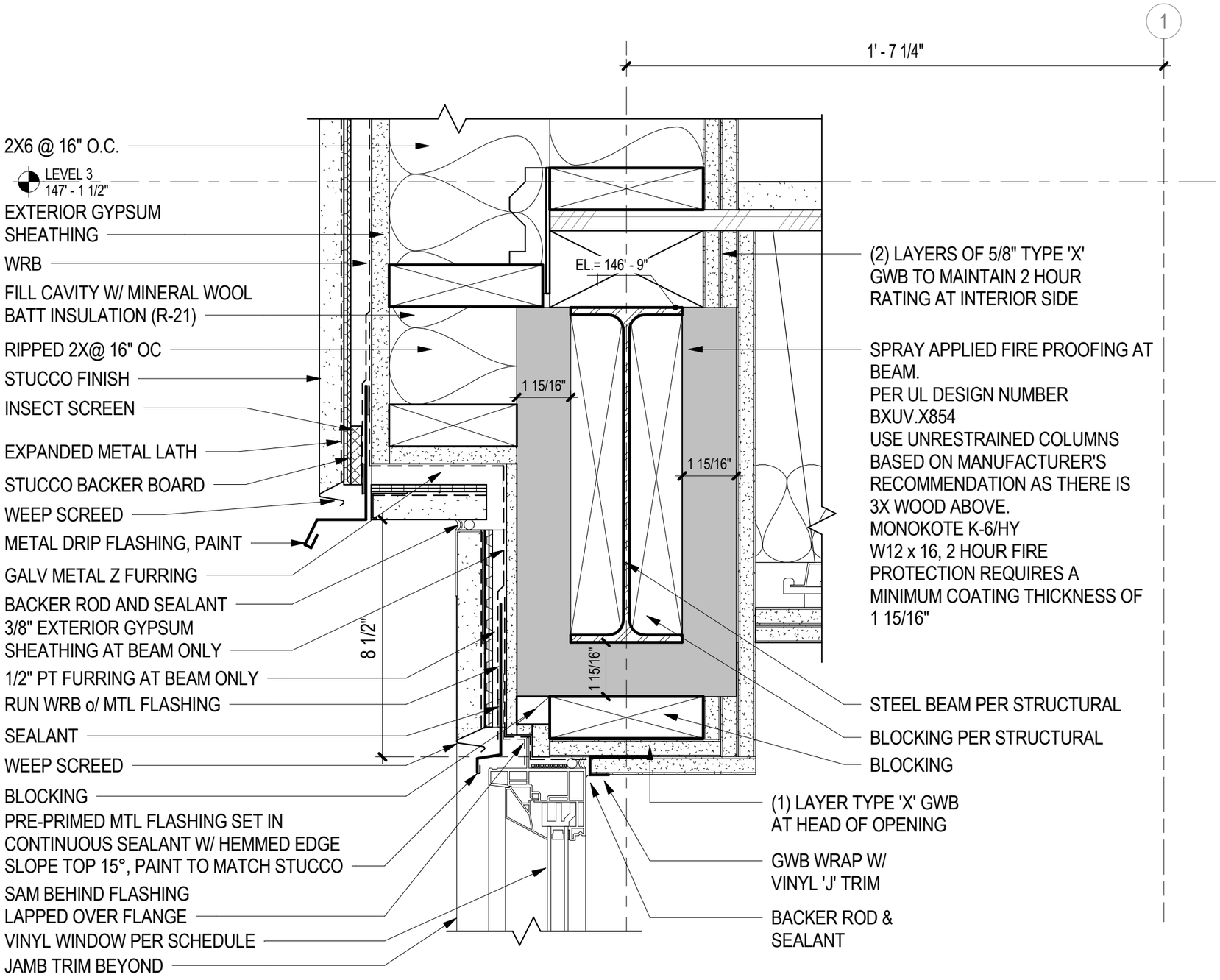
CLUB ROOM 210 - SPRAY APPLIED FIRE PROTECTION AT BEAMS AND COLUMNS

SCALE	SHEET REF.:	ISSUED WITH
		ASI-015/POST PERMIT REV #2

PROJECT NO.	ISSUED	REVISED	SKETCH NUMBER
16120	07/29/19		SK-A-82REV
CHECKED BY	TEAM MEMBER	REVISION NO.	
BB	CRH		



1 BEAM WITH SFRM - CLUB ROOM WEST WINDOW

3" = 1'-0"

RFI-175 / ASI-015; POST PERMIT REV#2

SKETCH NUMBER SK-A-83

BROADSTONE ANTHEM

BEAM WITH SFRM - CLUB ROOM WEST WINDOW

SCALE	3" = 1'-0"
SHEET REF:	
PROJECT NO.	16120
ISSUED	07/31/19
CHECKED BY	BB
TEAM MEMBER	CRH
REVISED	
REVISION NO.	

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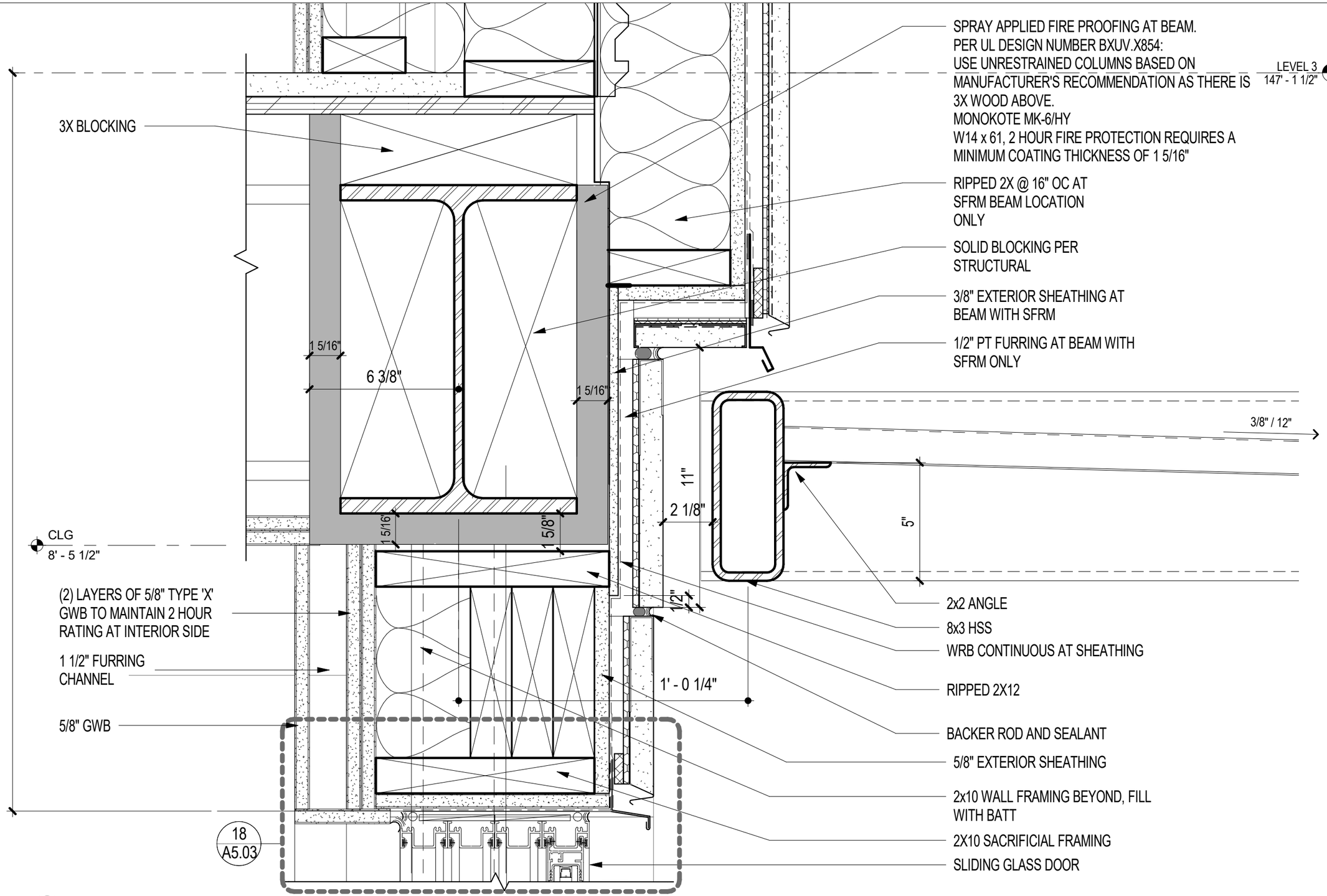

1 BEAM WITH SFRM - CLUB ROOM SLIDING DOOR HEAD

3" = 1'-0"

ORIGINAL SHEET SIZE 11" x 17"

ISSUED WITH
ASI-015; POST PERMIT REV#2
SKETCH NUMBER
SK-A-100

REVISED
REVISION NO.

BROADSTONE ANTHEM

BEAM WITH SFRM - CLUB ROOM SLIDING DOOR HEAD

SCALE	3" = 1'-0"
SHEET REF:	
PROJECT NO.	16120
ISSUED	07/31/19
TEAM MEMBER	CRH
CHECKED BY	BB

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