

# Development Services

## From Concept to Construction

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### APPEAL SUMMARY

**Status:** Decision Rendered - Held over from ID 21898, items 1 and 5 (9/18/19), for additional information

**Appeal ID:** 21924

**Project Address:** 1725 SW Salmon St

**Hearing Date:** 9/25/19

**Appellant Name:** Tom Jaleski

**Case No.:** B-017

**Appellant Phone:** 9712385266

**Appeal Type:** Building

**Plans Examiner/Inspector:** Brian McCall, Joe Thornton, Corey Stanley

**Project Type:** commercial

**Stories:** 8 **Occupancy:** R-2 **Construction Type:** III-A, I-A

**Building/Business Name:** 18S Apartments

**Fire Sprinklers:** Yes - Throughout

**Appeal Involves:** Erection of a new structure, Reconsideration of appeal

**LUR or Permit Application No.:** 19-106743-CO

**Plan Submitted Option:** pdf [File 1] [File 2] [File 3] [File 4] [File 5] [File 6] [File 7]

**Proposed use:** Mixed use multi-family housing

### APPEAL INFORMATION SHEET

#### Appeal item 1

**Code Section** 2014 OSSC 703.3, 704.3 704.10

#### Requires

Reconsideration Appeal #21898, Item #1

Original Text

704.3 requires individual encasement for primary structural frame.

704.10 requires that load-bearing structural members in exterior walls of type IIIA construction be provided with 2-hr fire protection.

703.3 addresses alternative methods for determining fire resistance. The section allows that the fire resistance of a building element, component or assembly be established by any of the following methods:

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

Original Text

The building design is comprised of type IIIA wood construction over a type IA concrete podium and is protected by a full NFPA 13 sprinkler system. In limited areas in the IIIA construction steel

structural members are utilized in and supporting 2-hr rated exterior walls. Per table 601 and section 704.10 these members require 2-hr fire protection. The fire protection is provided by intumescent fireproofing.

For HSS and wide flange beams intumescent fireproofing is being used to meet the 2-hr protection requirements of 704.3 and 704.10. Listed assemblies for steel columns are being utilized to determine the intumescent coating thickness for beams. Refer to exhibit 1.A for project details of the conditions in question. Refer to exhibit 1.B for supporting documentation from the manufacturer showing application thicknesses to achieve 2-hr protection for corresponding steel member types. Refer to the attached tested assemblies for design 180-2 for wide flange columns and 180-3 for HSS columns.

\*\*\* (Reconsideration Text) \*\*\*

The building design is comprised of type IIIA wood construction over a type IA concrete podium and is protected by a full NFPA 13 sprinkler system. In limited areas in the IIIA construction steel structural members are utilized in and supporting 2-hr rated exterior walls. Per table 601 and section 704.10 these members require 2-hr fire protection. The fire protection is provided by intumescent fireproofing.

For HSS and wide flange beams intumescent fireproofing is being used to meet the 2-hr protection requirements of 704.3 and 704.10. Listed assemblies for steel columns are being utilized as a basis for comparison to the required intumescent coating thickness for beams.

Fireproofing for the referenced beams will match Intertek design CC-IF180-01 with the exception that the top surface of the beam is adjacent to wood blocking as opposed to the concrete decking as in the tested assembly. Additionally, the intumescent fireproofing will be provided on all faces and Type X GWB membrane protection will be provided to conceal and increase the fire protection for the members.

Refer to attached Engineering Judgement letter (EJ#1) from an Oregon licensed Fire Protection Engineer for analysis. Additionally, see architectural plan attachments with annotations identifying where EJ#1 is relevant.

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**Reason for alternative** (Original Text)

Neither standard UL encasement assemblies, nor standard UL assemblies for intumescent fire protection are available for HSS and wide flange beams integrated into wood construction. As a conservative measure, the proposed design uses listed column assemblies for intumescent coating at these beams. Fire testing for columns assumes fire exposure on all sides, where testing for beams assumes some protection or heat sink provided by the floor assembly above. In terms of structural loading, columns are considered a worst-case situation for vulnerability to failure in a fire. As a result, the prescribed thickness of intumescent coating is greater for listed column designs than for beams. For the beams in question here, the documentation in exhibit 1.B establishes a conservative approach to equivalence to standard UL listed assemblies by utilizing column designs for beams. Using this approach, the proposed intumescent fireproofing design provides equivalent if not greater protection for the steel members.

\*\*\* (Reconsideration Text) \*\*\*

The protection of the proposed beams are equivalent or superior as shown by comparison to Intertek listed assembly Design No. CC/IF 180-01. The difference between the proposed design and the listed assembly are (See EJ): Fig 1A, wood has been substituted in the proposed assembly for the concrete floor above in the listed design. With additional membrane protection below and wood above, the proposed assembly is far superior to the tested assembly. Fig. 1B, Although the Intertek design has not tested an HSS beam in the horizontal/ loaded configuration, the proposed design will far exceed the performance of a similar weighted wide

flange member as evaluated above.

Fig 1C, the proposed design utilized members lighter than the tested design. With additional membrane protection below, as well as wood and compressed mineral wool, the proposed assembly is far superior to the tested assembly.

Therefore, as detailed in the attached EJ#1, the proposed protection of the beams will meet the minimum required 2-hour rating per OSSC.

## Appeal item 2

<b>Code Section</b>	2014 OSSC 703.3, 704.3 704.10
<b>Requires</b>	<p>Reconsideration Appeal#21898, Item #5 (Original Text)</p> <p>704.3 requires individual encasement for primary structural frame.</p> <p>704.10 requires that load-bearing structural members in exterior walls of type IIIA construction be provided with 2-hr fire protection.</p>
<b>Proposed Design</b>	<p>Original Text)</p> <p>The building design is comprised of type IIIA wood construction over a type IA concrete podium and is protected by a full NFPA 13 sprinkler system. As part of a building feature in the IIIA construction, a glulam beam connects to a 4x4 HSS and is proposed supporting 2-hr rated construction.</p> <p>Per table 601 and section 704.10 both elements and their connection requires 2-hr fire protection. The protection of the 4x4 HSS is described in item 1 of this appeal. The protection of the glulam beam is described in item 4 of this appeal.</p> <p>The required fire protection of the connection is provided per exhibit 5.A. Please see exhibit 0.B for connection location.</p> <p>*** (Reconsideration Text) ***</p> <p>A steel beam support assembly is incorporated in the design of Glulam beams. They are required by OSSC Section 704.3 to be individually encased on all sides by 2-hour fire-resistant construction.</p> <p>The connection of the Glulam beam support is required to have 2-hour protection on all sides, equivalent to an encased structural member since it is supporting a primary structural member. The assembly is constructed with a 1/4" x 4 x 9 vertical knife plate, welded to a 1/4" x 6" x 4" horizontal bearing plate. An evaluation is provided to calculate an equivalent W/D ratio for the assembly. The assembly is then compared to a Intertek tested beam assembly heated on all exposed sides. See attached EJ#2 developed by an Oregon Licensed Fire Protection Engineer.</p>
<b>Reason for alternative</b>	<p>Original Text)</p> <p>Standard UL encasement assemblies are not provided for connections of differing systems. As no UL assemblies exist for this condition, this appeal proposes using the protection provided by the structural members themselves to provide protection for the connection.</p> <p>*** (Reconsideration Text) ***</p> <p>The protection of the proposed connection is equivalent to an encased structural member as shown by comparison. The proposed assembly consists of steel knife plate bearing member inserted into a Glulam Beam. The wood, through NDS evaluation, provides roughly of 90 minutes of fire resistance through charring, while the 2 layers of GWB provide an additional 60 minutes on</p>

the sides. The bottom bearing play will be protected with more than 2 hours of Intumescent protection. The top of the bolt holes, attaching knife plates, shall be filled with fire caulking to complete protection of gaps.

Therefore, as detailed in the attached EJ#2., the proposed protection of the bearing plate member will exceed the minimum required 2-hour rating per OSSC.

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## APPEAL DECISION

**1. Alternate 2 hour fire rated steel beam assemblies with engineering analysis: Granted as proposed.**

**2. Alternate 2 hour fire rated glulam beam support connection with engineering 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](http://www.portlandoregon.gov/bds/appealsinfo), call (503) 823-7300 or come in to the Development Services Center.





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## Steel Beam Protection-EJ#1 Reconsideration of Item #1

Client Name: SERA Architects, Inc.

Client Address: 338 NW 5th Ave., Portland, OR 97209

Date: 9/22/2019

## PROJECT OVERVIEW

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The 18th & Salmon building is a new 8-story, residential apartment of Type I-A and III-A construction that is protected throughout with an automatic sprinkler system.

Steel components of Beams supporting primary structural members are required to be individually encased on all sides with materials having a 2-hour fire-resistance rating.

Code Unlimited has been asked to provide Engineering Judgment letter for these conditions. The scope of our evaluation is limited to the analysis of the required fire-resistance for the proposed beam assemblies previously submitted under Appeal # 21898, (Item# 1).

## APPLICABLE CODES, STANDARDS, AND REFERENCES

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- 2014 Oregon Structural Specialty Code (OSSC)
- Chapter 16 of ANSI/AF&PA *National Design Specification for Wood Construction (NDS)*
- *Technical Report No. 10, Calculating the Fire Resistance of Exposed Wood Member*, American Wood Council, 2015

## APPROACH

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- Referenced beams will be protected with Intertek ASTM E119 designs on all sides (including concealed faces). See Fireproofing Schedule. (Table 1)
- Three beams require additional evaluation as tested data is not available: W10x15, W10x12, HSS 8x4x3/8. Fire Protection equivalency analysis is performed on the thinnest of these W-members, the W10x12 as well as the HSS Beam.
- The proposed beams are analyzed in accordance with OSSC Chapter 7
- The protection of the beams is compared to the requirements for OSSC Section 704
- The beam assembly is reviewed with partial exposure and additional membrane protection, then compared with the Intertek assembly.

## PROPOSED FIREPROOFING

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Fireproofing for the referenced beams will match Intertek design CC-IF180-01 with the exception that the top surface of the beam is adjacent to wood blocking as opposed to the concrete decking as in the tested assembly. Additionally, the intumescent fireproofing will be provided on all faces and Type X GWB membrane protection will be provided to conceal and increase the fire protection for the members.

**Fireproofing Schedule**

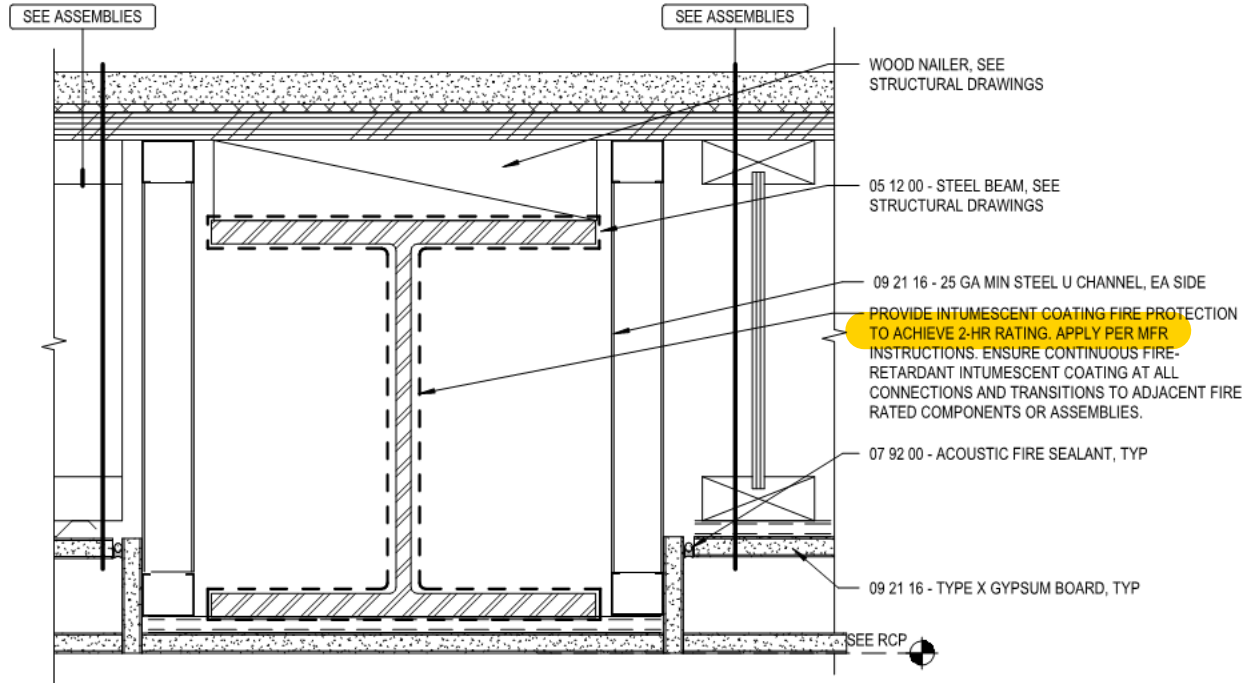
Member	W/D Ratio	Rating(min)	Mils	mm	Basis Design Intertek	Notes
<b>Columns</b>						
HSS 6x6x1/4	0.77	120	410	10.4	CC/IF 180-03	Equivalent
HSS 6x4x1/4	0.76	120	410	10.4	CC/IF 180-03	Equivalent
HSS 4x4x1/4	0.76	120	410	10.4	CC/IF 180-03	Equivalent
HSS 6x4x3/8	1.14	120	330	8.4	CC/IF 180-03	Equivalent
<b>Beams</b>						
W8x18	0.499	120	380	9.7	CC/IF 180-01	See Section#1A
W12x79	1.11	120	240	6.2	CC/IF 180-01	See Section#1A
W10x26	0.612	120	340	8.7	CC/IF 180-01	See Section#1A
W10x15	0.43	120	410	10.3	CC/IF 180-01	See Section#1C
W10x12	0.347	120	410	10.3	CC/IF 180-01	See Section#1C
HSS 8x4x3/8	1.44	120	210	5.3	CC/IF 180-01	See Section#1B

Carboline Thermo-Lag E100- Thin Film Intumescent

\*\*Column Data included for Reference only.

**Table 1: Fireproofing Schedule****PROPOSED DESIGN****Proposed Design 1A**

Three typical steel beam assemblies are incorporated in the design (W8x18, W12x79, W10x26). They are required by OSSC Section 704.3 to be individually encased on all sides by 2-hour fire-resistant construction. A typical steel beam is shown in Figure 1A.



## 8 2-HR STEEL BEAM PROTECTION

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Figure 1A: Typical steel beam above ceiling

### ASSEMBLY ANALYSIS-FIG. 1A

The protection of the beam members far exceeds the 2-hour Intertek design as the beam will have intumescent fire proofing on all faces, 1 hour of additional protection from the FRT wood blocking on the top surface and a 1 hour ceiling membrane below the beam delaying exposure to heat from below.

It should be noted the Intertek design is an unrestrained beam, exposed directly to heat for 2 hours while supporting a concrete deck. While the concrete above provides a thermal heat sink, drawing heat away from the beam and delaying failure. The beneficial effects of the concrete, after 30 minutes, are minimal as the concrete will absorb heat from the fire also.

## Proposed Design 1B

Typical steel HSS 8x4x3/8 beam assemblies are incorporated in the design at the exterior wall. They are required by OSSC Section 704.3 to be individually encased on all sides by 2-hour fire-resistant construction. A typical steel beam is shown in Figure 1B.

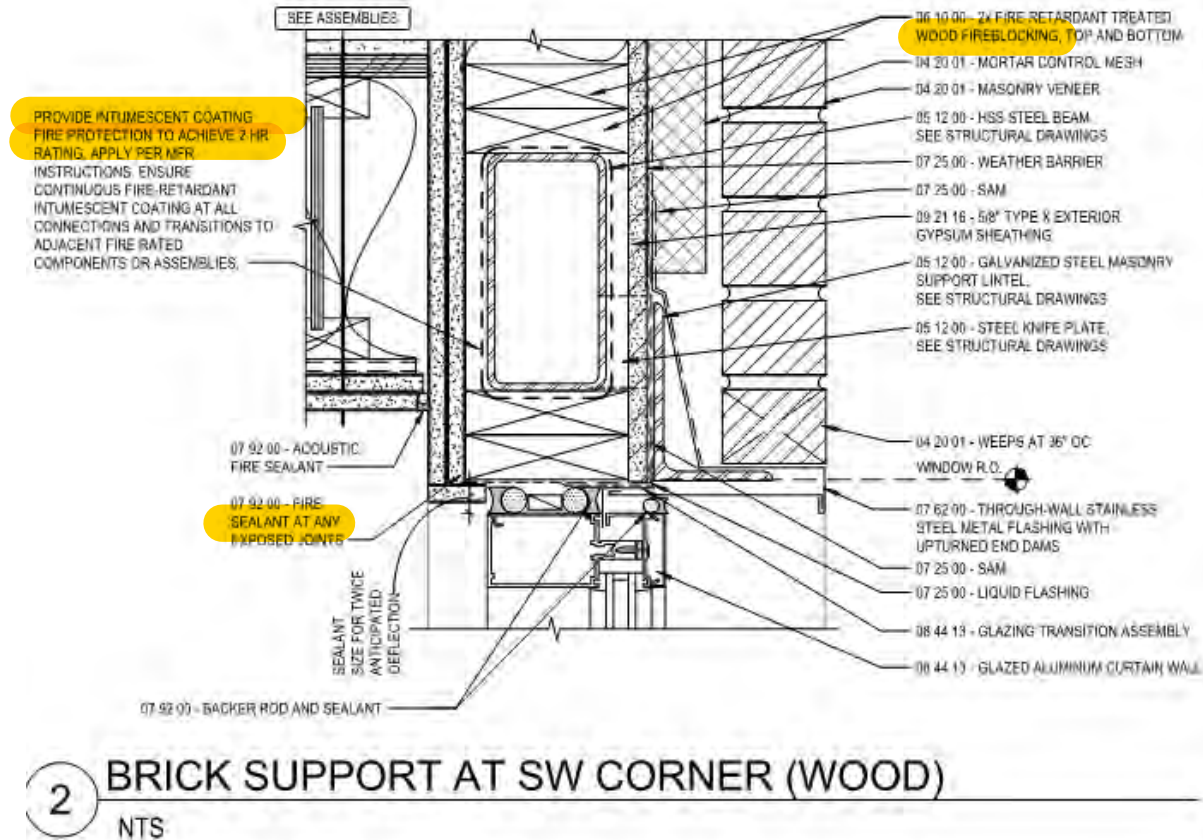


Figure 1B: Typical HSS steel beam above ceiling

## ASSEMBLY ANALYSIS-FIG. 1B

The protection of the beam members significantly exceeds the 2-hour Intertek design as the beam will have intumescent fire proofing on all faces, 2 hour of additional protection (assume 1.5"/Hr nominal per NDS) from the FRT wood blocking on the top surface and below and a 1 hour membrane (per component additive method of OSSC) on left side. The right side of the assembly is facing the exterior of the building and will not be subjected to heat from an assumed fire directly below the beam. The beam heating will be delayed, while the intumescent thickness applied will match a similar weight wide flanged beam per W/D comparison.

It should be noted the Intertek design is an unrestrained beam, exposed directly to heat for 2 hours while supporting a concrete deck. While the concrete above provides a thermal heat sink, drawing heat away from the beam and delaying failure. The beneficial effects of the concrete, after 30 minutes, are minimal as the concrete will absorb heat from the fire also.



### Proposed Design 1C

Typical steel beam assemblies are incorporated in the design at the spandrel head. They are required by OSSC Section 704.3 to be individually encased on all sides by 2-hour fire-resistant construction. A typical steel beam is shown in Figure 1A.

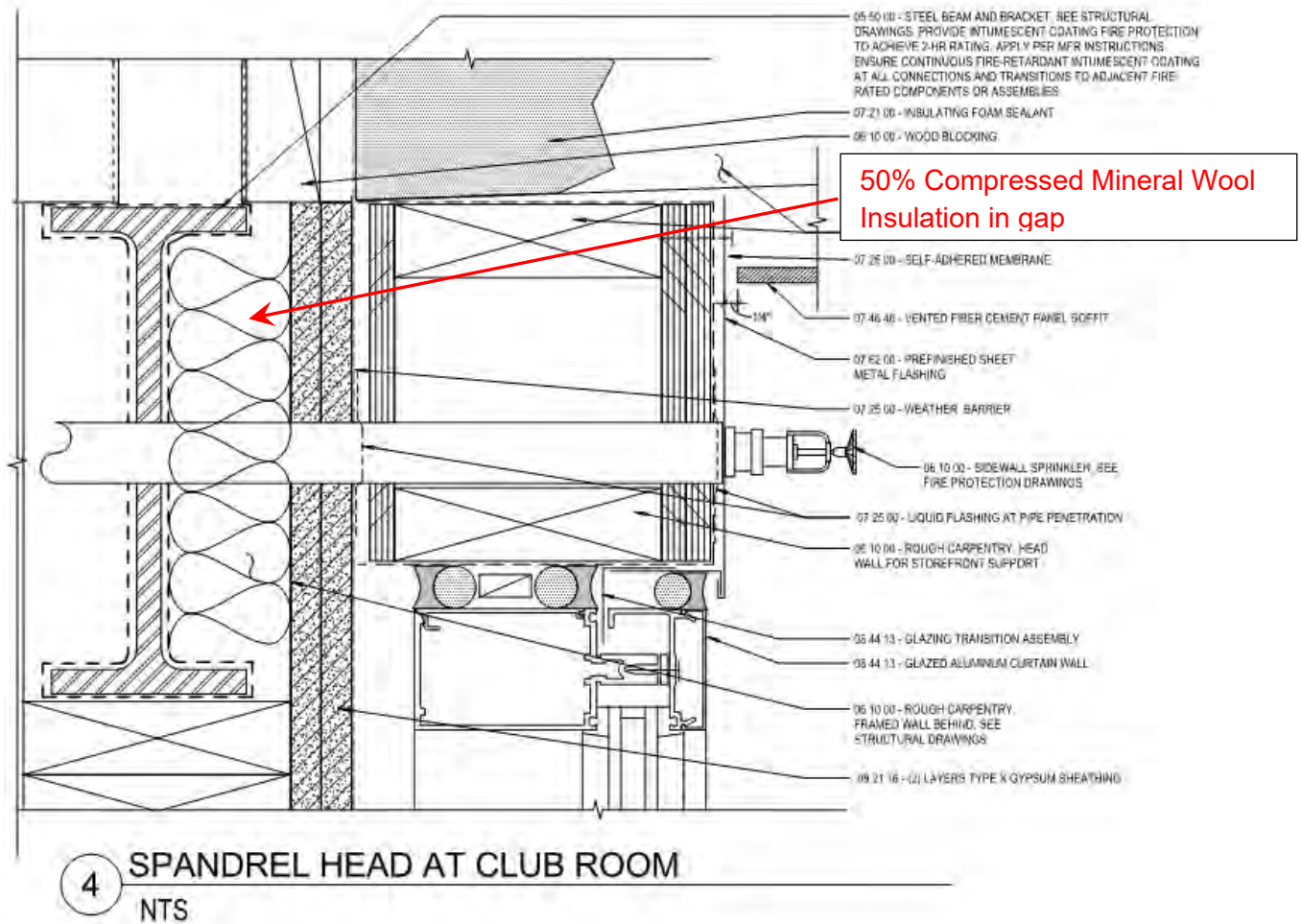


Figure 1C: Typical steel beam at Spandrel Head

### ASSEMBLY ANALYSIS-FIG. 1C

The protection of the beam members exceeds the 2-hour Intertek design as the beam will have intumescent fire proofing on all faces, 2 hour of additional protection (assume 1.5"/Hr nominal per NDS) from the FRT wood blocking on the bottom surface and a 2 hour membrane to the right. The top side of the assembly is supporting a roof. The heating of the beam will be delayed on the bottom and right sides, while the intumescent thickness applied would match a similar wide flanged beam per W/D comparison heated on 2 faces. (see below for W/D analysis). The analysis below is focusing on the W10x12 beam, while the W10x15

beam ( $W/D=0.43$ ) is assumed to be sufficiently protected as the  $W/D$  ratio is only 2.25% less than thinnest beam tested ( $W/D=0.44$ ) for the fully exposed tested beam.

It should be noted the Intertek design is an unrestrained beam, exposed directly to heat for 2 hours while supporting a concrete deck. While the concrete above provides a thermal heat sink, drawing heat away from the beam and delaying failure. The beneficial effects of the concrete, after 30 minutes, are minimal as the concrete will absorb heat from the fire also.

#### W/D Ratio Analysis (W10x12)

##### **W10x12.**

Weight per lineal ft. = 12.0

Heated Perimeter as Proposed (Left and Top Sides) = 17.3

Effective  $W/D$  Ratio = 0.69

As a conservative measure, protect the beam with an applied thickness for  $W/D = 0.44$  beam.

## CONCLUSION

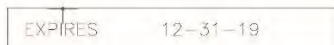
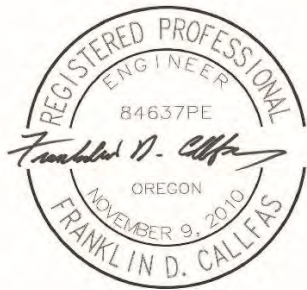
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The protection of the proposed beams are equivalent or superior as shown by comparison to Intertek listed assembly Design No. CC/IF 180-01. The difference between the proposed design and the listed assembly are: Fig 1A, wood has been substituted in the proposed assembly for the concrete floor above in the listed design. With additional membrane protection below and wood above, the proposed assembly is far superior to the tested assembly.

Fig. 1B, Although the Intertek design has not tested an HSS beam in the horizontal/ loaded configuration, the proposed design will far exceed the performance of a similar weighted wide flange member as evaluated above.

Fig 1C, the proposed design utilized members lighter than the tested design. With additional membrane protection below, as well as wood and compressed mineral wool, the proposed assembly is far superior to the tested assembly.

Therefore, as detailed above, the proposed protection of the beams (see Table 1) above will be meet the minimum required 2-hour rating per OSSC.



*Franklin Callfas*  
Principal/Fire Protection Engineer  
Code Unlimited





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## Steel Beam Protection-EJ#2 Reconsideration of Item #5

Client Name: SERA Architects, Inc.

Client Address: 338 NW 5th Ave., Portland, OR 97209

Date: 9/22/2019

## PROJECT OVERVIEW

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The 18th & Salmon building is a new 8-story, residential apartment of Type I-A and III-A construction that is protected throughout with an automatic sprinkler system.

Steel components of Beams supporting primary structural members are required to be individually encased on all sides with materials having a 2-hour fire-resistance rating.

Code Unlimited has been asked to provide Engineering Judgment letter for these conditions. The scope of our evaluation is limited to the analysis of the required fire-resistance for the proposed beam support assembly previously submitted under Appeal # 21898, (Item# 5).

## APPLICABLE CODES, STANDARDS, AND REFERENCES

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- 2014 Oregon Structural Specialty Code (OSSC)
- Chapter 16 of ANSI/AF&PA *National Design Specification for Wood Construction (NDS)*
- *Technical Report No. 10, Calculating the Fire Resistance of Exposed Wood Member*, American Wood Council, 2015

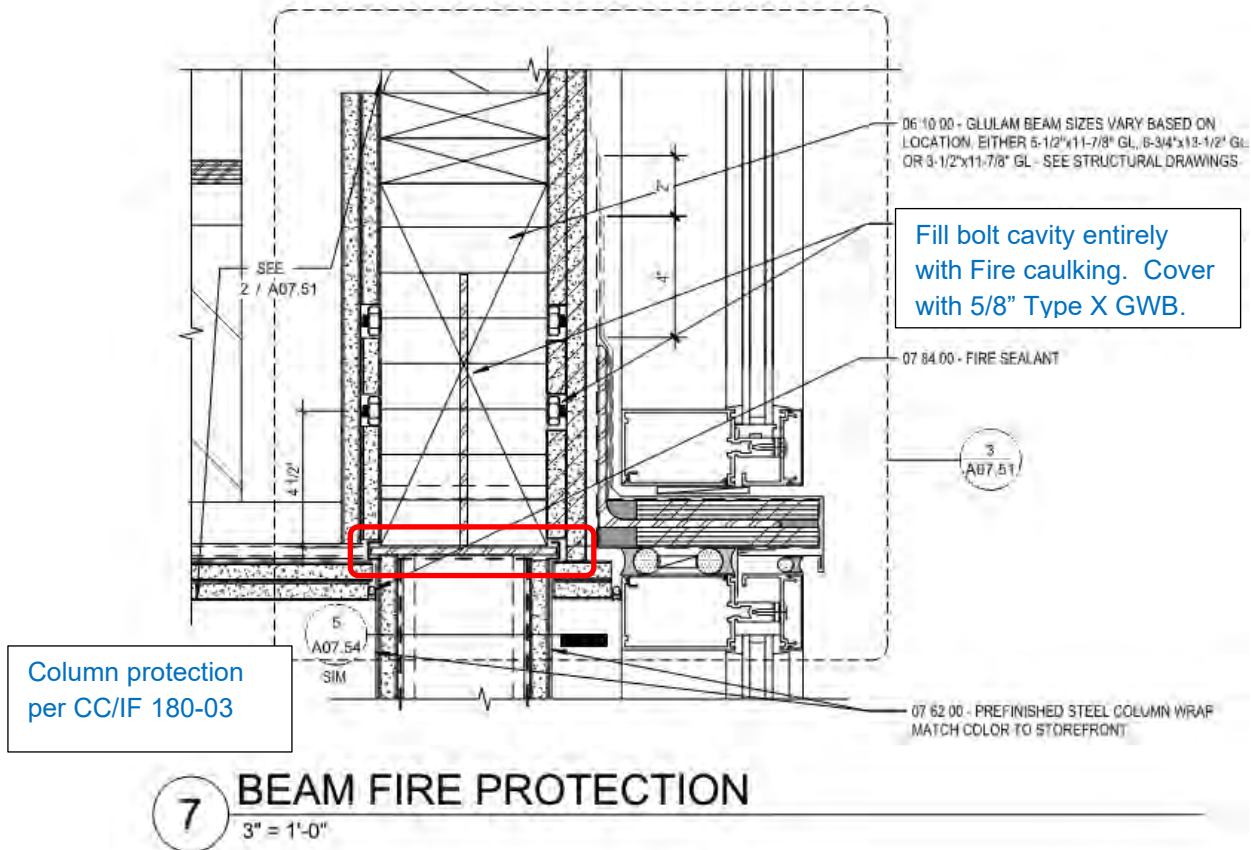
## APPROACH

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- Referenced beam support will be protected with Intertek ASTM E119 designs on exposed sides.
- Glulam Beam supports require additional evaluation as comparable test designs are not available.
- The proposed members are analyzed in accordance with OSSC Chapter 7
- The protection of the members are compared to the requirements for OSSC Section 704
- The member protection is reviewed with partial exposure, then compared with the Intertek assembly.

## PROPOSED DESIGN

A steel beam support assembly is incorporated in the design of Glulam beams. They are required by OSSC Section 704.3 to be individually encased on all sides by 2-hour fire-resistant construction. A typical steel support is shown in Figure 1.



**Figure 1: Steel beam support at HSS connection**

EJ#2 Intumescent on exposed steel.

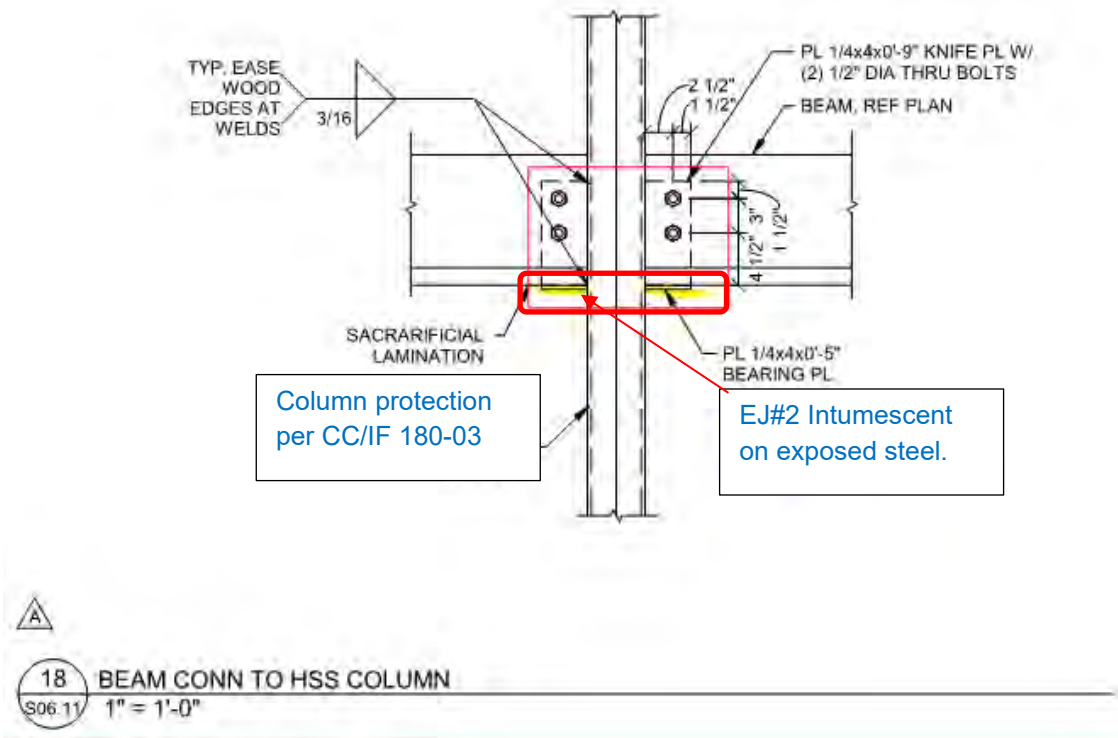


Figure 2: Steel beam support at HSS connection (Cross-Section)

## ASSEMBLY ANALYSIS

The connection of the Glulam beam support is required to have 2-hour protection on all sides, equivalent to an encased structural member since it is supporting a primary structural member. The assembly is constructed with a 1/4" x 4 x 9 vertical knife plate, welded to a 1/4" x 6" x 4" horizontal bearing plate. An evaluation is provided below to calculate an equivalent W/D ratio for the assembly. The assembly is then compared to a tested beam assembly heated on all exposed sides. See Table 1 below for analysis from each face.

It should be noted the Intertek design is an unrestrained beam, exposed directly to heat for 2 hours while supporting a concrete deck. While the concrete above provides a thermal heat sink, drawing heat away from the beam and delaying failure. The beneficial effects of the concrete, after 30 minutes, are minimal as the concrete will absorb heat from the fire also.

W/D Ratio Analysis (Bearing plate)

**Knife Plate.**

$$\text{Area} = .2475 \text{ Ft}^2 (10.2 \text{ lb/ft}^2) = 2.52 \text{ lbs}$$

**Bearing Plate.**

$$\text{Area} = .165 \text{ Ft}^2 (10.2 \text{ lb/ft}^2) = 1.68 \text{ lbs}$$

$$\text{Total Weight} = 4.275 \text{ lbs}$$

$$\text{Total length} = 4" \text{ or } .33 \text{ ft.}$$

$$\text{Lineal Weight} = 12.75 \text{ lb/ft}$$

$$\text{Heated Perimeter as Proposed (Bottom Side)} = 6"$$

$$\text{Effective W/D Ratio} \Rightarrow 12.75/6 = \mathbf{2.12}$$

As a conservative measure, protect the beam with the same thickness as required for the HSS Column (Intertek design CC/IF 180-03) (410 Mils).

This will provide continuity of intumescent thickness for the direct attachment to the column. The applied thickness will be twice the minimum required for the W/D ratio of 2.12 per the Intertek design CC/IF 180-01.

Table 1: Comparison of the member directional fire resistance

Location	Proposed Design	Fire Resistance
1. Top of Assembly	More than 4" of Wood the that is covered by (2) layers of 5/8" Type X GWB Membrane	More than 120 Minutes (Per NDS & CAM-OSSC)
2. Sides of assembly	2.75" of Wood, (2) layers of 5/8" Type X GWB. Fill bolt holes with fire caulking and cover with (1) layer of 5/8" Type X GWB.	More than 120 Minutes (Per NDS & CAM-OSSC).
3. <b>Exposed</b> Base Plate (Recessed into the GLB.)	410 Mils of Intumescent Paint, then covered by 1 layer of GWB.	More than 120 Minutes (See evaluation above)
<b>Fire-Resistance Rating</b>	<b>Minimum 2-hours</b>	<b>Exceeds 2-hours</b>

## CONCLUSION

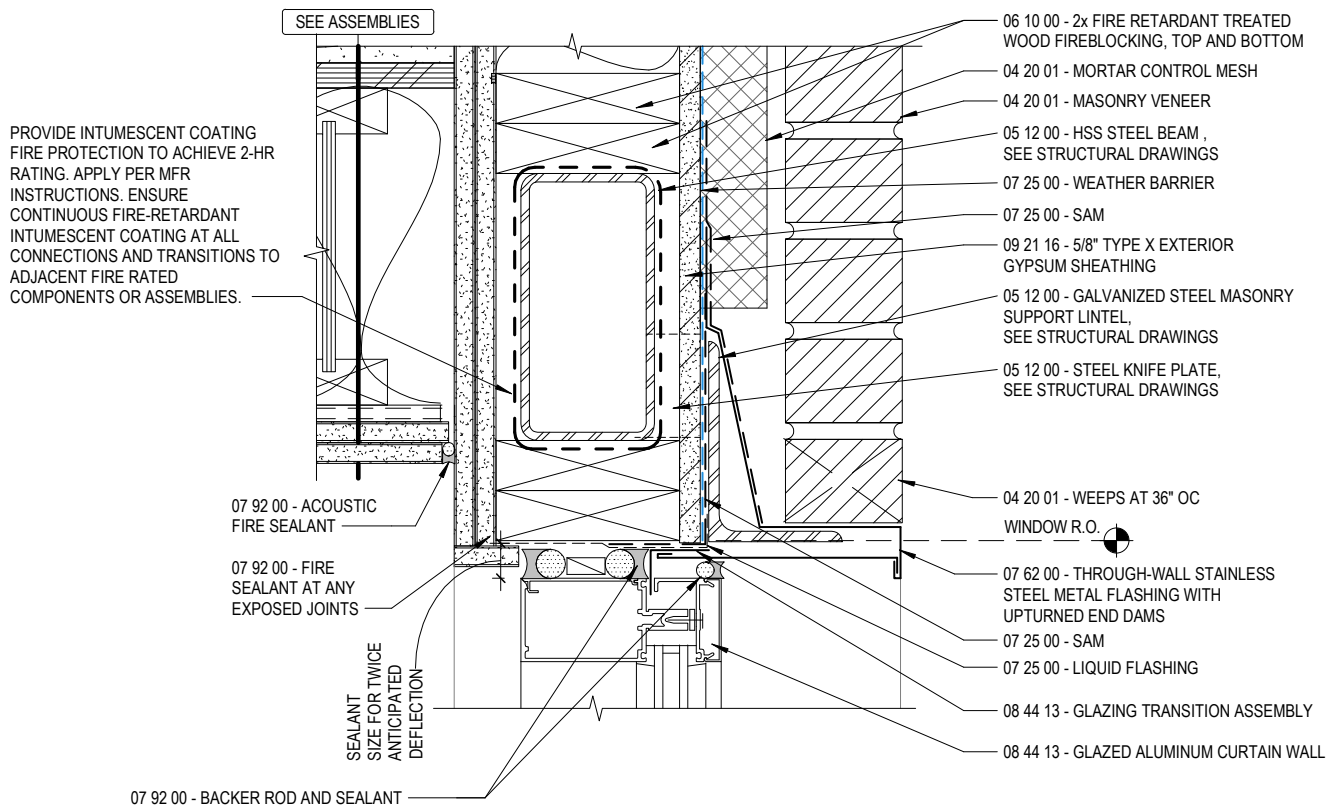
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The protection of the proposed connection is equivalent to an encased structural member as shown by comparison in Table 1. The proposed assembly consists of steel knife plate bearing member inserted into a Glulam Beam. The wood, through NDS evaluation, provides roughly of 90 minutes of fire resistance through charring, while the 2 layers of GWB provide an additional 60 minutes on the sides. The bottom bearing play will be protected with more than 2 hours of Intumescent protection. The top of the bolt holes, attaching knife plates, shall be filled with fire caulking to complete protection of gaps.

Therefore, as detailed above, the proposed protection of the bearing member (see Table 1 above) will exceed the minimum required 2-hour rating per OSSC.



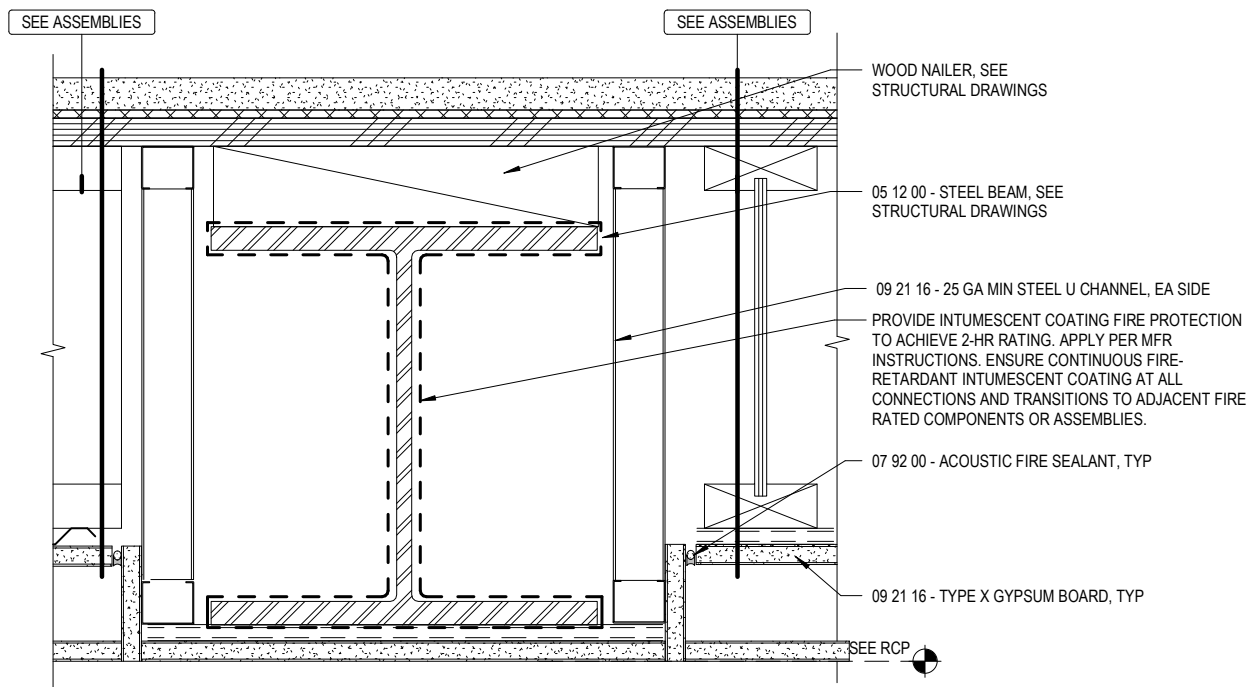
*Franklin Callfas*  
Principal/Fire Protection Engineer  
Code Unlimited



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## BRICK SUPPORT AT SW CORNER (WOOD)

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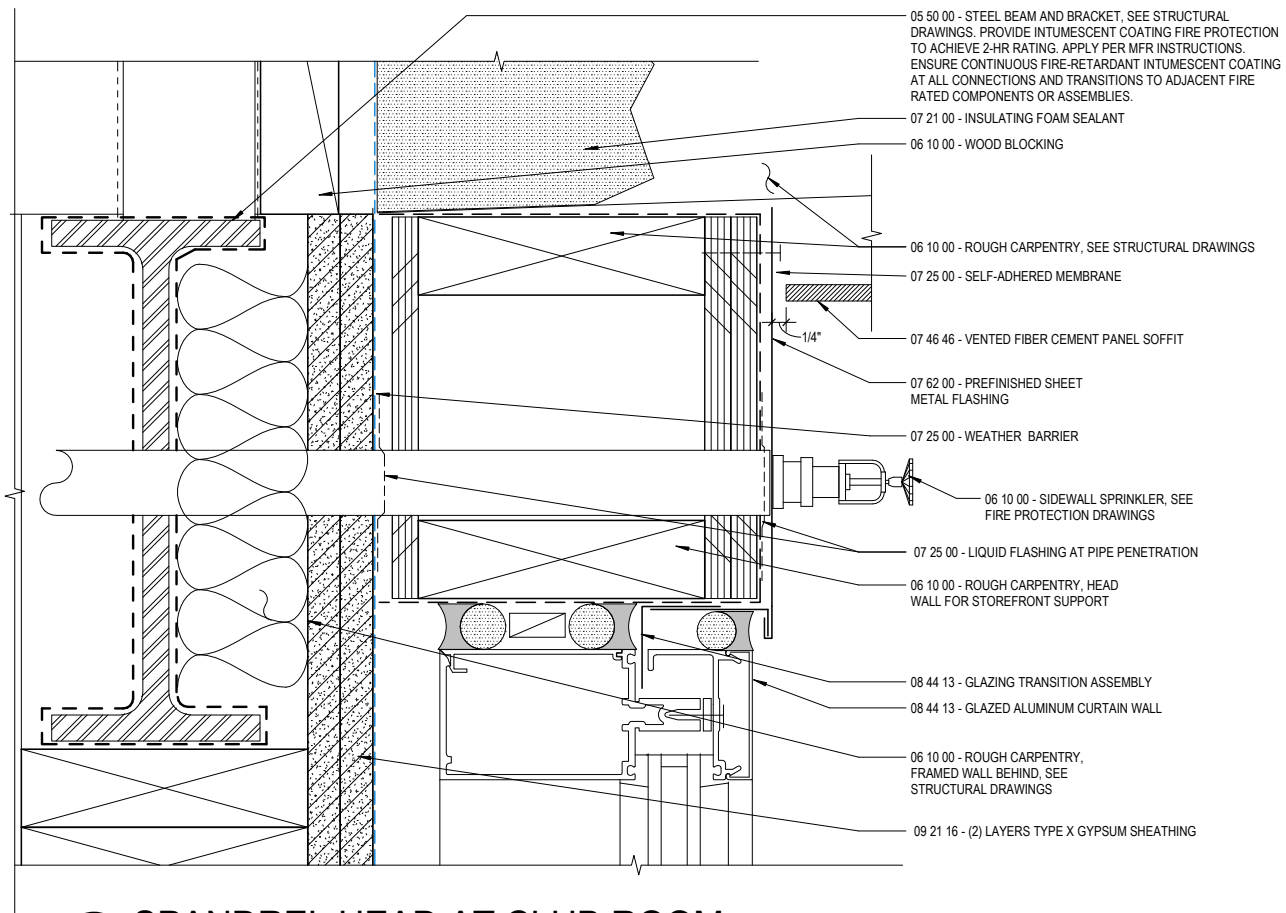


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## 2-HR STEEL BEAM PROTECTION

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#### 4 SPANDREL HEAD AT CLUB ROOM

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[illegible]

Plan view of a bridge structure showing various components and dimensions. The diagram includes labels for structural elements such as HSS6X4X3/8, HSS8X4X3/8, and W12X79. It also shows dimensions like 38, 27, 33, and 38, along with notes like "OPP" and "BEAM". The structure is labeled with "TJL-580D" and "2'-0\" OC".

[illegible]

ROOF



PROJECT DIRECTORY

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	ATTN: John Murphy, Project Manager john@basicfire.com
INTERIOR DESIGNER	Vida Design 107 SE Washington St., Ste 263 Portland, OR 97214 TEL: (503) 208-2530 x13
	ATTN: Ken Morgan, Project Manager ken@vida-design.net



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18S  
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1715 SW Salmon St.  
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REVISIONS		
1	ADDENDUM 1	05/03/2019
2	ADDENDUM 2	05/09/2019

CHECKED BY:	Checker
ISSUE DATE:	15 APR 2019
PROJECT NO:	1803002

COVER SHEET

G00.01

Bid Set





**1 FLOOR PLAN - LEVEL 8**  
1/8" = 1'-0"

**GENERAL NOTES - FLOOR PLAN**

- A. FLOOR PLAN KEYNOTES APPLY TO SHEETS A01.01-A01.10. ALL KEYNOTES MAY NOT OCCUR ON THIS SHEET AND DO NOT APPLY TO ANY OTHER SHEETS EXCEPT THOSE NOTED.
- B. ARCHITECTURAL REFERENCE ELEVATION 100'-0" = 100.00' ON SURVEY AND CIVIL DOCUMENTS
- C. SEE A00.01- A00.04 FOR ASSEMBLIES
- D. GRIDS ARE FOR REFERENCE ONLY. CONTRACTOR TO SET CONTROL POINTS FOR LAYOUT.
- E. REFERENCE INTERIORS DRAWINGS FOR DETAILS OF TRANSITIONS BETWEEN FLOORING MATERIALS
- F. REFERENCE SHEET G08.01-G08.02 FOR ACCESS INFORMATION AND REQUIREMENTS

**KEYNOTES - FLOOR PLANS**

- 1 ALIGN
- 2 NOT USED
- 3 CHAIN LINK FENCE - 86" TALL
- 4 14 45 00 - MECHANICAL STACKING PARKING SYSTEMS
- 5 SLUMP BASIN AND PUMP. SLOPE PIT FLOOR TO DRAIN PER PLUMBING PLANS
- 6 08 33 23 - HIGH SPEED ROLL UP DOOR
- 7 08 33 23 - ROLL UP DOOR
- 8 TRASH COMPACTOR
- 9 10 44 00 - FIRE EXTINGUISHER
- 10 NOT USED
- 11 21 12 00 - FIRE PROTECTION STANDPIPE
- 12 KNOX BOX
- 13 CALL BOX
- 14 CONCRETE PARKING STOP
- 15 09 21 16 - RC CHANNEL OR RSIC CLIP ON INSIDE FACE OF SHAFT ASSEMBLY. SHEAR WALL PANEL TO BE INSTALLED OPPOSITE OF ACOUSTIC TREATMENT UNLESS OTHERWISE NOTED. SEE STRUCTURAL
- 16 SMOKE PARTITION IS IN COMPLIANCE WITH OSCC 404.6
- 17 ENCLOSURE RAIL
- 18 DESIGN BUILD STAIR INTERRUPTION GATE

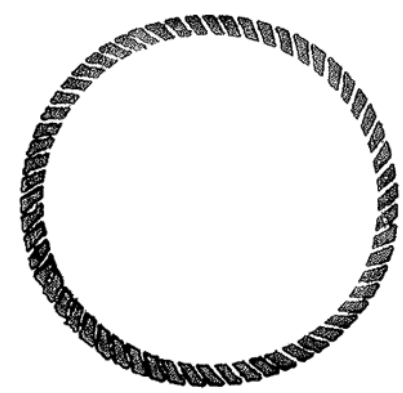
**LEGEND - FLOOR PLAN**

- 09 21 16 - HATCH INDICATES SIDE OF WALL TO UTILIZE ACOUSTIC RESILIENT CHANNEL OR ACOUSTIC ISOLATION CLIP. PER WALL ASSEMBLY. SHEAR WALL PANEL TO BE INSTALLED OPPOSITE OF ACOUSTIC TREATMENT UNLESS OTHERWISE NOTED. SEE STRUCTURAL
- 03 30 00 - EXPOSED CONCRETE SLAB ON GRADE, BROOM FINISH



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2 ADDENDUM 2 05/09/2019  
A PERMIT RESPONSE 1 06/03/2019

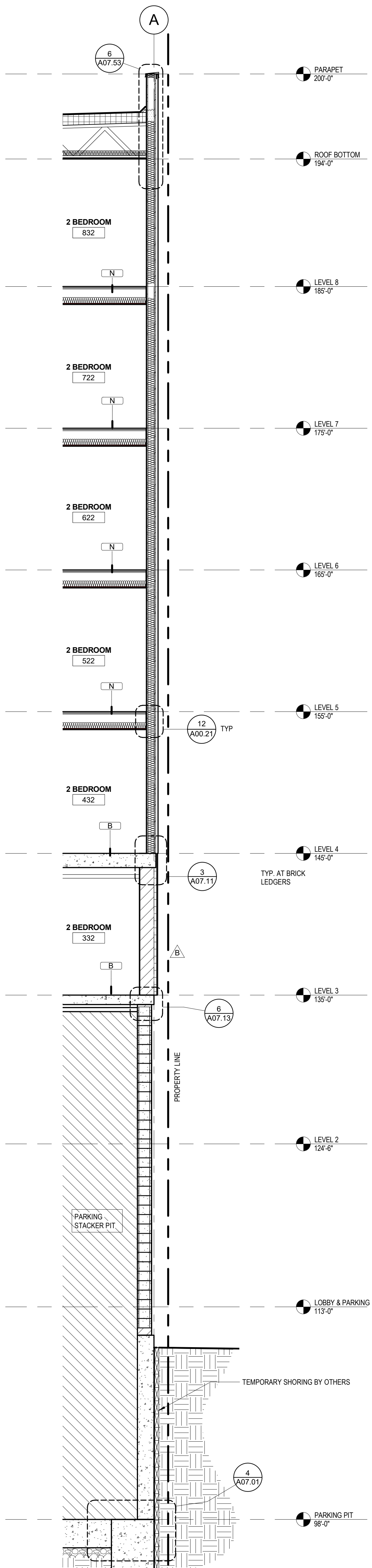
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**FLOOR PLAN  
LEVEL 8  
A01.08**

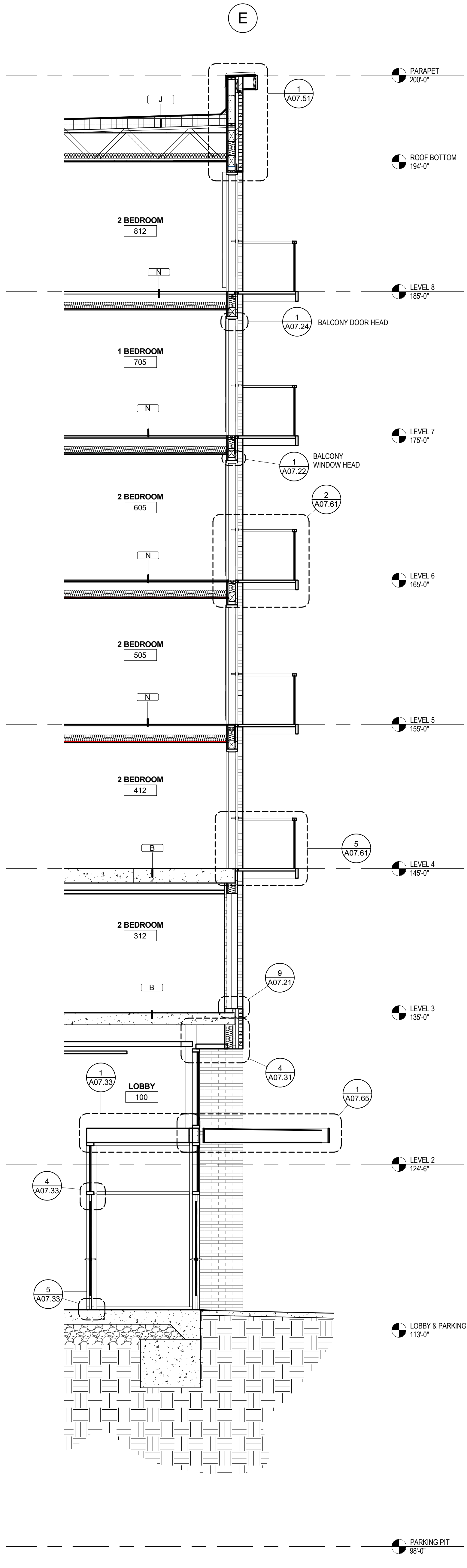
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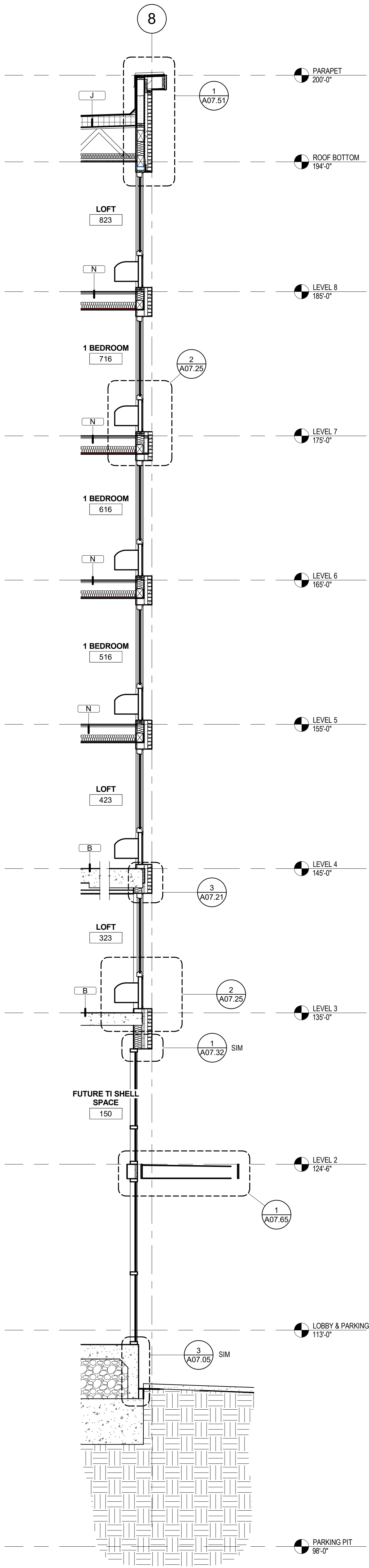
4 SECTION - NORTH FACADE  
1/4" = 1'-0"



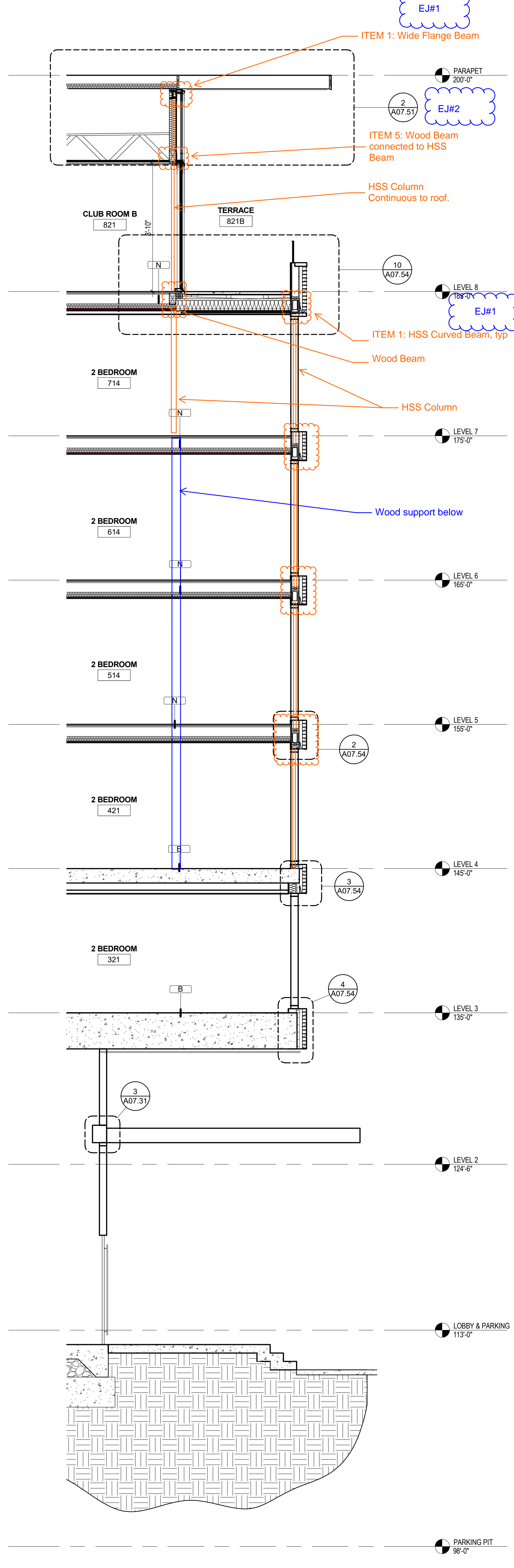
3 SECTION - LOBBY ENTRY  
1/4" = 1'-0"



2 SECTION - WEST FACADE  
1/4" = 1'-0"

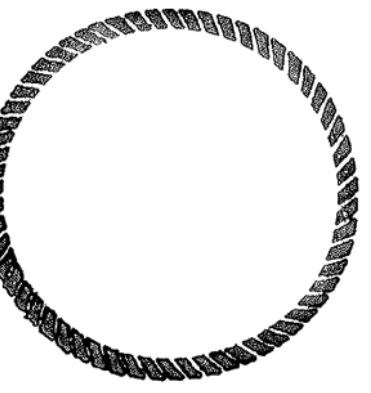


1 SECTION - SW CORNER  
1/4" = 1'-0"



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WALL SECTIONS  
A04.51

Bid Set



### BEARING WALL SCHEDULE

MARK	4TH FLOOR WALL STUD SIZE AND GRADE	5TH FLOOR WALL STUD SIZE AND GRADE	6TH FLOOR WALL STUD SIZE AND GRADE	7TH FLOOR WALL STUD SIZE AND GRADE	8TH FLOOR WALL STUD SIZE AND GRADE
W1	2x DF#2 @ 16" OC	2x DF#2 @ 16" OC	2x DF#2 @ 16" OC	2x DF#2 @ 16" OC	2x DF#2 @ 16" OC
W2	(2) 2x6 DF#2 @ 16" OC	2x6 DF#2 @ 16" OC	2x6 DF#2 @ 16" OC	2x6 DF#2 @ 16" OC	2x6 DF#2 @ 16" OC
W3	(2)2x6 DF#2 @ 12" OC	(2) 2x6 DF#2 @ 12" OC	2x6 DF#2 @ 12" OC	2x6 DF#2 @ 12" OC	2x6 DF#2 @ 12" OC
W4	(3) 2x4 DF#2 @ 12" OC	(2) 2x4 DF#2 @ 12" OC	(2) 2x4 DF#2 @ 12" OC	2x4 DF#2 @ 12" OC	2x4 DF#2 @ 16" OC

1. TYPICAL BEARING WALLS TO BE TYPE "W1" UNLESS OTHERWISE NOTED



### KEYED NOTES

- 4 ALL WOOD FRAMING IN EXTERIOR WALLS TO BE FIRE RETARDANT TREATED.
- 72 COLUMN SHOULD BE (5) 2x6 DF #2 BUILT-UP POST ON FLOORS 4-6 AND HSS4x1/4 ON FLOOR 7
- 79 SHEATHING TO BE INSTALLED ON THIS SIDE OF SHEARWALL.

### FLOOR FRAMING PLAN NOTES

- A FOR A COMPLETE LEGEND OF ALL CALLOUTS AND SYMBOLS REF COVER SHEET AND SCHEDULES.
- B FLOORS SHALL HAVE A 1" GYPCRETE TOPPING SLAB OVER THE SHEATHING.
- C REFERENCE DETAIL 4/S06.20 FOR TYPICAL DOUBLE TOP PL SPLICE CONNECTION.
- D REFERENCE S05.01 & S05.02 SHEETS FOR STAIR FRAMING.
- E ALL POSTS FOR GIRDER TRUSSES, BEAMS, HEADERS AND / OR PURLINS SHALL CONTINUE DOWN FLOOR TO FLOOR TO PT SLAB, FOUNDATION OR LOWER BEAM / HEADER.
- F STUD BEARING WALLS SHALL BE FRAMED PER BEARING WALL SCHEDULE AND DETAILS 5, 6, & 7/S06.02.
- G VERIFY SIZE AND LOCATION OF ALL MECHANICAL AND WALL PENETRATIONS.
- H REFERENCE ARCHITECTURAL FOR ALL EDGE OF SLAB DIMENSIONS.
- I PROVIDE HEADER TYPE H1 AT ALL OPENINGS. TYP AT BEARING WALLS UNO. REF DETAIL 1/S06.20 FOR TYPICAL HEADER CONSTRUCTION. UNO.
- J REFERENCE SCHEDULE ON S00.05 FOR CONTINUOUS THREADED ROD SYSTEM CONNECTIONS TO FLOOR JOISTS.
- L REFERENCE ARCHITECTURAL FOR FACE OF WALL TO BE SHEATHED WITH OSB AT ALL SHEAR WALLS.

### SHEAR WALL SCHEDULE

TYPE	APA RATED SHEATHING	PANEL NAILING	FRAMING THICKNESS AT ADJOINING PANEL EDGES	SOLE PL CONNECTION TO DBL TOP PLATE	MUD SILL AND ANCHOR BOLTS (REF NOTE 1, 5)	COMMENTS
A	15/32" OSB SHTH (1) SIDE	0.148" DIA x 3" NAILS AT 6" OC FOR PANEL EDGES, 12" OC FIELD	2x	2x SOLE PLATE W/ SIMPSON SDWS 0.220" DIA x 6" SCREW AT 16" OC	3x SILL PL W/ 5/8" DIA AB AT 48" OC (EMBEDMENT = 7")	USE GALV FASTENERS AT ALL FRT LUMBER LOCATIONS USE GALV FASTENERS AT ALL FRT LUMBER LOCATIONS
B	15/32" OSB SHTH (1) SIDE	0.148" DIA x 3" NAILS AT 4" OC FOR PANEL EDGES, 12" OC FIELD	3x	2x SOLE PLATE W/ SIMPSON SDWS 0.220" DIA x 6" SCREW AT 10" OC	3x SILL PL W/ 5/8" DIA AB AT 36" OC (EMBEDMENT = 7")	USE GALV FASTENERS AT ALL FRT LUMBER LOCATIONS
C	15/32" OSB SHTH (1) SIDE	0.148" DIA x 3" NAILS AT 3" OC FOR PANEL EDGES, 12" OC FIELD	3x	2x SOLE PLATE W/ SIMPSON SDWS 0.220" DIA x 6" SCREW AT 8" OC	3x SILL PL W/ 5/8" DIA AB AT 30" OC (EMBEDMENT = 7")	USE GALV FASTENERS AT ALL FRT LUMBER LOCATIONS
D	15/32" OSB SHTH (1) SIDE	0.148" DIA x 3" NAILS AT 2" OC FOR PANEL EDGES, 12" OC FIELD	3x	3x SOLE PLATE W/ (2) ROWS OF SIMPSON SDWS 0.220" DIA x 6" SCREWS AT 10" OC	3x SILL PL W/ 5/8" DIA AB AT 24" OC (EMBEDMENT = 7")	USE GALV FASTENERS AT ALL FRT LUMBER LOCATIONS

**SHEAR WALL GENERAL NOTES (APPLICABLE TO ALL SHEAR WALL TYPES):**

- IF ANCHOR BOLT SPACING IS GREATER THAN SHEAR WALL LENGTH INSTALL (1) ANCHOR WITHIN 12" OF EACH END.
- SHEAR WALLS ARE TO BE BLOCKED AT ALL PANEL EDGES UNLESS NOTED OR DETAILED OTHERWISE.
- GALVANIZED NAILS SHALL BE USED FOR THE NAILS INTO PT OR FRT LUMBER.
- ANCHOR BOLTS SHALL BE GALVANIZED AND SHALL HAVE A 1/4"x3"x3" GALVANIZED PLATE WASHER BETWEEN THE SILL PL AND NUT. REFERENCE SHEAR WALL DETAIL 3/S08.01 FOR PLACEMENT REQUIREMENTS OF AB AND PL WASHER.
- PENETRATIONS - NO BLOCKING REQUIRED AT 4 1/2" x 4 1/2" MAXIMUM OPENINGS PROVIDED OPENINGS ARE SEPARATED BY 8" MINIMUM. HOLE IS CIRCULAR OR SQUARE CUT WITH RADIUS CORNERS. NO OVERCUTTING. HOLES ARE NOT WITHIN LAST 16" OF SHEARWALL LENGTH. AND ACCUMULATED LENGTH OF THE OPENINGS IN THE SHEARWALL DOES NOT EXCEED THE LESSER OF 20% OF THE WALL LENGTH AND 18". OPENINGS BEYOND THESE PARAMETERS REQUIRE APPROVAL BY THE ENGINEER OF RECORD PRIOR TO CUTTING AND DRILLING.
- PENETRATIONS - BLOCKING REQUIRED AT 9" x 9" MAXIMUM OPENINGS PROVIDED OPENINGS ARE SEPARATED BY 16" MINIMUM. HOLE IS CIRCULAR OR SQUARE CUT WITH RADIUS CORNERS. NO OVERCUTTING. HOLES ARE NOT WITHIN LAST 16" OF SHEARWALL LENGTH. AND ACCUMULATED LENGTH OF THE OPENINGS IN THE SHEARWALL DOES NOT EXCEED THE LESSER OF 20% OF THE WALL LENGTH AND 18". 2x BLOCKING SHALL BE PROVIDED ABOVE AND BELOW THE OPENING. FOR THE WIDTH OF THE STUD BAY. SHEAR WALL SHEATHING SHALL BE EDGE NAILED TO THIS BLOCKING. OPENINGS BEYOND THESE PARAMETERS REQUIRE APPROVAL BY THE ENGINEER OF RECORD PRIOR TO CUTTING AND DRILLING.
- REFERENCE THE HOLDOWN SCHEDULE OR CONTINUOUS THREADED ROD HOLDOWN SCHEDULE (WHICHEVER APPLIES) FOR END POST REQUIREMENTS AT EACH END OF SHEAR WALLS. EDGE NAIL SHEATHING TO END POSTS.



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2 ADDENDUM 2 5/9/2019  
A PERMIT RESPONSE 1 6/03/2019  
B PERMIT RESPONSE 2 7/26/2019

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SHEAR WALL  
PLAN LEVEL 4  
**S01.04SW**





## FLOOR FRAMING PLAN NOTES

- FOR A COMPLETE LEGEND OF ALL CALLOUTS AND SYMBOLS REF COVER SHEET AND SCHEDULES.
- FLOORS SHALL HAVE A 1" GYPCRETE TOPPING SLAB OVER THE SHEATHING.
- REFERENCE DETAIL 4/S06.20 FOR TYPICAL DOUBLE TOP PL. SPLICE CONNECTION.
- REFERENCE S05.01 & S05.02 SHEETS FOR STAIR FRAMING.
- ALL POSTS FOR GIRDER TRUSSES, BEAMS, HEADERS AND / OR PURLINS SHALL CONTINUE DOWN FLOOR TO FLOOR TO PT. SLAB, FOUNDATION OR LOWER BEAM / HEADER.
- STUD BEARING WALLS SHALL BE FRAMED PER BEARING WALL SCHEDULE AND DETAILS 5, 6 & 7/S06.02.
- VERIFY SIZE AND LOCATION OF ALL MECHANICAL AND WALL PENETRATIONS.
- REFERENCE ARCHITECTURAL FOR ALL EDGE OF SLAB DIMENSIONS.
- PROVIDE HEADER TYPE H1 AT ALL OPENINGS. TYP AT BEARING WALLS UNO. REF DETAIL 1/S06.20 FOR TYPICAL HEADER CONSTRUCTION. UNO.
- REFERENCE SCHEDULE ON S00.05 FOR CONTINUOUS THREADED ROD SYSTEM.
- REFERENCE DETAIL 2/S06.20 FOR TYPICAL INTERIOR NON-BEARING WALL CONNECTIONS TO FLOOR JOISTS.
- REFERENCE ARCHITECTURAL FOR FACE OF WALL TO BE SHEATHED WITH OSB AT ALL SHEAR WALLS.

## KEYED NOTES

- 7/8" APA RATED SHEATHING WITH 1" MAX GYPCRETE WITH BLOCKED EDGES. PROVIDE 2x4 FLAT BLOCKING ALONG ALL UNSUPPORTED PANEL EDGES. ATTACH SHEATHING TO FRAMING AND BLOCKING WITH 0.148 DIA x 3" NAILS AT 6" OC PANEL EDGES, 12" OC FIELD.
- ALL WOOD FRAMING IN EXTERIOR WALLS TO BE FIRE RETARDANT TREATED.
- SIMPSON CS14 COIL STRAP x AS SHOWN. STRAP TO BE NAILED 6'-0" W/ 0.148" x 2 1/2" NAILS EVERY HOLE. REFERENCE DETAIL 22/S06.21.
- SIMPSON CSM14 COIL STRAP x 12'-0" LONG. STRAP TO BE NAILED 2'-0" WITH 0.162" DIA x 2 1/2" NAILS TO TOP OF DOUBLE TOP PLATE AND NAILED 10'-0" TO 3x T&G DECKING AT CORRIDOR AND 3x JOIST BLOCKING AT 3" OC. REFERENCE DETAIL 22/S06.21.
- SIMPSON CSM14 COIL STRAP x 7'-0" LONG. STRAP TO NAILED TO TOP OF DOUBLE TOP PLATE WITH 0.162" DIA x 2 1/2" EVERY 6" AND NAILED WITH 0.162" DIA x 2 1/2" NAILS AT 6" OC STAGGERED ON TOP OF JOISTS AND 3x JOIST BLOCKING BETWEEN JOIST.
- SIMPSON CSM14 COIL STRAP x AS SHOWN. STRAP TO NAILED TO 3x JOIST BLOCKING EVERY 6" OC STAGGERED AND NAILED 3'-0" AT ENDS WITH 0.162" DIA x 2 1/2" NAILS EVERY HOLE.
- SIMPSON CSM14 COIL STRAP x 8'-0" LONG. CENTER STRAP ON WALL AND NAILED WITH 0.162" DIA x 2 1/2" NAILS ON TOP OF 3x JOIST BLOCKING AND TO TOP DOUBLE TOP PLATE. REFERENCE DETAIL 34/S06.21.
- SIMPSON CSM14 COIL STRAP x 8'-0" LONG. CENTER STRAP ON WALL AND NAIL WITH 0.162" DIA x 2 1/2" NAILS ON TOP CHORD OF JOISTS. REFERENCE DETAIL 19/S06.21.
- SIMPSON CSM14 COIL STRAP x 50'-0" LONG. STRAP TO BE NAILED 6'-0" WITH 0.162" DIA x 2 1/2" NAILS EVERY HOLE TO 3x JOIST BLOCKING AND NAILED ON TOP OF 4x T&G BLOCKING AT THE CORRIDOR.
- SIMPSON CSM14 COIL STRAP x 8'-0" LONG. STRAP TO BE CENTERED AT WALL AND NAILED TO TOP OF FLOOR JOIST AND 3x JOIST BLOCKING WITH 0.162" DIA x 2 1/2" NAILS.
- SIMPSON CSM14 COIL STRAP x 25'-0" LONG. STRAP TO BE NAILED WITH 0.162" x 2 1/2" NAILS TO 3x JOIST BLOCKING AND 3x T&G DECKING AND TO BE NAILED TO TOP OF DOUBLE TOP PLATE AT THE END AS SHOWN.
- SIMPSON CSM14 COIL STRAP x 8'-0" LONG. STRAP TO BE CENTERED ON BEAM AND NAILED WITH 0.162" DIA x 2 1/2" NAILS TO TOP OF BEAM AND TOP OF DOUBLE TOP PLATE.
- SIMPSON CSM14 COIL STRAP x 8'-0" LONG. STRAP TO BE WELDED 1'-0" TO THE SIDE OF HSS BEAM AND NAILED TO THE SIDE OF DOUBLE TOP PLATE. STRAP TO BE CENTERED AT DOUBLE TOP PLATE.
- SIMPSON CCO COLUMN CAP WITH TABS TO BE SKEWED TO MATCH BEAM ANGLE.
- SIMPSON CSM14 COIL STRAP x 8'-0" LONG. STRAP TO BE CENTERED AND NAILED TO THE TOP OF BEAM AND TOP OF DOUBLE TOP CHORD AND NAILED WITH 0.162" DIA x 2 1/2" NAILS.
- 3 1/2 x 11 7/8 GL DRAG BEAM. ALIGN BEAM OVER SHEAR WALL AND EDGE NAIL SHEATHING TO BEAM.
- 3 1/2 x 11 7/8 GL DRAG BEAM. EDGE NAIL SHEATHING TO BEAM.
- SIMPSON CSM14 COIL STRAP x 6'-0" LONG. CENTER STRAP ON WALL AND NAIL WITH 0.162" DIA x 2 1/2" NAILS TO TOP OF BEAM AND TO 3x BLOCKING BETWEEN JOISTS. REFERENCE DETAIL 19/S06.21.
- SIMPSON CSM14 COIL STRAP x 6'-0" LONG. CENTER STRAP OVER WALL AND NAIL WITH 0.162" DIA x 2 1/2" NAILS TO TOP OF EACH BEAM. REFERENCE DETAIL 39/S06.22.
- SIMPSON CSM14 COIL STRAP x AS SHOWN. STRAP TO BE NAILED 4'-0" WITH 0.162" DIA x 2 1/2" NAILS ON TOP OF BEAM ALL HOLES AND NAILED TO 3x JOIST BLOCKING EVERY OTHER HOLE.
- SIMPSON CSM14 COIL STRAP x 6'-0" LONG. STRAP TO BE CENTERED AT WALL AND NAILED WITH 0.162" DIA x 2 1/2" NAILS TO THE DOUBLE TOP PLATE AND TO THE TOP OF BEAM.
- SIMPSON CSM14 COIL STRAP x 8'-0" LONG. STRAP TO BE NAILED 4'-0" FROM WALL SPLICE WITH 0.162" DIA x 2 1/2" NAILS TO DOUBLE TOP PLATE AND TO 3x JOIST BLOCKING WHERE NEEDED.
- SIMPSON CSM14 COIL STRAP x 10'-0" LONG. CENTER STRAP OVER WALL AND NAIL WITH 0.162" DIA x 2 1/2" NAILS TO DOUBLE TOP PLATE AND AND TO 3x JOIST BLOCKING WHERE NEEDED.
- SIMPSON CSM14 COIL STRAP x 40'-0" LONG. STRAP TO BE NAILED 6'-0" WITH 0.162" DIA x 2 1/2" NAILS TO BEAM AND TO 3x JOIST BLOCKING WHERE NEEDED AND 3x T&G DECKING. EVERY OTHER HOLE.
- SIMPSON CSM14 COIL STRAP x 6'-0" LONG. CENTER STRAP OVER WALL AND NAIL WITH 0.162" DIA x 2 1/2" NAILS TO TOP OF DOUBLE TOP PLATE AND TOP OF BEAM. REFERENCE DETAIL 30/S06.21.
- SIMPSON CSM14 COIL STRAP x 4'-0" LONG. STRAP TO BE CENTERED AT WALL AND NAILED WITH 0.162" DIA x 2 1/2" NAILS TO THE DOUBLE TOP PLATE AND TO THE TOP OF BEAM.
- SIMPSON CSM14 COIL STRAP x 4'-0" LONG. STRAP TO BE CENTERER AT WALL NAILED WITH 0.162" DIA x 2 1/2" NAILS TO TOP OF BEAM AND TO TOP OF JOIST R.
- COLUMN SHOULD BE (5) 2x6 DF #2 BUILT-UP POST ON FLOORS 4-6 AND HSS4x4x1/4 ON FLOOR 7.
- SIMPSON CSM14 COIL STRAP x 4'-0" LONG. STRAP TO BE CENTERED ON HSS COLUMN. REFERENCE DETAIL 3/S05.22. PROVIDE 3x JOIST BLOCKING. PROVIDE STRAP AT FLOOR/ROOF DIAPHRAGM WHERE HSS COLUMN SUPPORTING BALCONY OCCURS. STRAP REQUIREMENTS TYPICAL AT ALL BALCONIES SUPPORTED BY HSS COLUMNS. REF SHEET S05.21.

## BEAM SCHEDULE

MARK	BEAM SIZE	COLUMN TYPE (UNO PER PLAN)	HANGERS	COMMENTS
H1	4x8 DF #2	(1) 2x TRIMMER (1) 2x KING		
H2	4x10 DF #2	(1) 2x6 TRIMMER (1) 2x KING		
H3	FRT 4x10 DF #2	REF DETAIL 1/S06.20		
H4	FRT 6x10 DF #1	REF DETAIL 1/S06.20		
H5	5 1/2"x13 1/2" GL	REF DETAIL 1/S06.20		
H6	5 1/2"x15" GL	REF DETAIL 1/S06.20		
H7	FRT 6x12 DF#1	REF DETAIL 1/S06.20		
B1	3 1/2"x11 7/8" GL	(2) 2x STUD MIN		
B2	5 1/2"x11 7/8" GL	(2) 2x STUD MIN		
B3	6 3/4"x11 7/8" GL	6x6 DF #1		
B4	5 1/2"x13 1/2" GL	REF PLAN		
B5	6 3/4"x13 1/2" GL	REF PLAN		
B6	5 1/2" x 7 1/2" GL	(2) 2x STUD MIN		
B7	8 3/4" x 11 7/8" GL	REF PLAN		

## BEAM SCHEDULE NOTES

- HANGERS ARE TO BE USED AT LOCATIONS WHERE THE BEAM FRAMES INTO AN ADJACENT BEAM ONLY.
- A SUFFIX OR PREFIX OF 'PT' INDICATES PRESERVATIVE TREATMENT. ALL HARDWARE (CONNECTORS, BOLTS, ETC) IN CONTACT WITH THESE MEMBERS SHALL USE HOT DIPPED GALVANIZED.
- HU & HUC HANGERS SHALL BE INSTALLED WITH "MAX" NAILING NOTED BY MANUFACTURER.
- A SUFFIX OR PREFIX OF 'FRT' INDICATES FIRE-RETARDANT TREATMENT. REF ARCH.
- TYPICAL INTERIOR HEADERS SHALL BE TYPE 'H1'.
- TYPICAL EXTERIOR HEADERS SHALL BE TYPE 'H3'.

## JOIST SCHEDULE

DEPTH (SIZE)	EQUIVALENT TRUSS - JOIST PRODUCT	MIN SHEAR CAPACITY (LBS)	MIN EI CAPACITY x106 (LBS-IN <sup>2</sup> )	MIN FLEXURAL CAPACITY (FT-LBS)
11 7/8"	TJI-210	1655	347	4215
11 7/8"	TJI-560	2050	636	9500

## NOTES

- AT WOOD BEAM CONDITIONS HANGERS ARE TO BE SIMPSON ITS HANGERS UNO. REF DETAIL 23/S06.21. UNO, WHERE SCREWED CONNECTION IS REQUIRED, PROVIDE JOIST WEB STIFFENER AND USE SIMPSON LBV SCREWED HANGERS.
- AT STEEL BEAM CONDITIONS HANGERS ARE TO BE SIMPSON LBV HANGERS UNO. REF DETAIL 33/S06.11. UNO.
- WEB STIFFENERS ARE REQUIRED AT ALL SCREWED JOIST HANGERS AND WHERE NOTED ON PLAN. REFER TO JOIST MANUFACTURER FOR WEB STIFFENER MATERIAL, SIZE AND ATTACHMENT RECOMMENDATIONS.

## COLUMN SCHEDULE

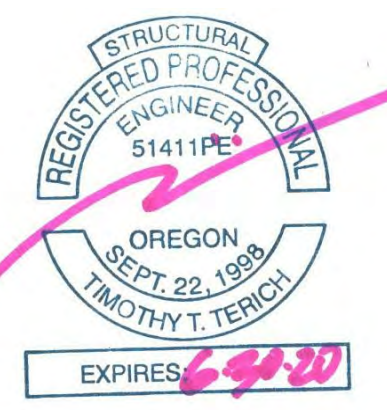
MARK	8TH FLOOR	7TH FLOOR	6TH FLOOR	5TH FLOOR	4TH FLOOR
C1		6x6 DF #1	6x6 DF #1	6x6 DF #1	6x6 DF #1
C2	6x8 DF #1	5 1/2 x 7 1/2 GL	5 1/2 x 7 1/2 GL	5 1/2 x 9 GL	5 1/2 x 10 1/2 GL
C3	6x6 DF #1	6x6 DF #1	6x6 DF #1	6x8 DF #1	6x8 DF #1
C4		6x8 DF #1	5 1/2 x 7 1/2 GL	5 1/2 x 9 GL	5 1/2 x 10 1/2 GL
C5		6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1

1. TYPICAL INTERIOR COLUMN SHALL BE TYPE C3



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## REVISIONS

1	ADDENDUM 1	5/3/2019
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FLOOR  
FRAMING  
PLAN LEVELS  
5 TO 7

S01.05

Bit Set





### FLOOR FRAMING PLAN NOTES

- A FOR A COMPLETE LEGEND OF ALL CALLOUTS AND SYMBOLS REF COVER SHEET AND SCHEDULES.
- B FLOORS SHALL HAVE A 1" GYPCRETE TOPPING SLAB OVER THE SHEATHING.
- C REFERENCE DETAIL 4/S06.20 FOR TYPICAL DOUBLE TOP PL. SPLICE CONNECTION.
- D REFERENCE S05.01 & S05.02 SHEETS FOR STAIR FRAMING.
- E ALL POSTS FOR GIRDER TRUSSES, BEAMS, HEADERS AND / OR PURLINS SHALL CONTINUE DOWN FLOOR TO FLOOR TO PT. SLAB, FOUNDATION OR LOWER BEAM / HEADER.
- F STUD BEARING WALLS SHALL BE FRAMED PER BEARING WALL SCHEDULE AND DETAILS 5, 6, & 7/S06.02.
- G VERIFY SIZE AND LOCATION OF ALL MECHANICAL AND WALL PENETRATIONS.
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- J REFERENCE SCHEDULE ON S05.05 FOR CONTINUOUS THREADED ROD SYSTEM CONNECTIONS TO FLOOR JOISTS.
- L REFERENCE ARCHITECTURAL FOR FACE OF WALL TO BE SHEATHED WITH OSB AT ALL SHEAR WALLS.

### KEYED NOTES

- 1 7/8" APA RATED SHEATHING WITH 1" MAX GYPCRETE WITH BLOCKED EDGES, PROVIDE 2x4 FLAT BLOCKING ALONG ALL UNSUPPORTED PANEL EDGES, ATTACH SHEATHING TO FRAMING AND BLOCKING WITH 0.148 DIA x 3" NAILS AT 6" OC PANEL EDGES, 12" OC FIELD.
- 4 ALL WOOD FRAMING IN EXTERIOR WALLS TO BE FIRE RETARDANT TREATED.
- 35 SIMPSON CS14 COIL STRAP x AS SHOWN. STRAP TO BE NAILED 6'-0" W/ 0.148" x 2 1/2" NAILS EVERY HOLE. REFERENCE DETAIL 22/S06.21.
- 36 SIMPSON CSM14 COIL STRAP x 12'-0" LONG. STRAP TO BE NAILED 2'-0" WITH 0.162" DIA x 2 1/2" NAILS TO TOP OF DOUBLE TOP PLATE AND NAILED 10'-0" TO 3x T&G DECKING AT CORRIDOR AND 3x JOIST BLOCKING AT 3' OC. REFERENCE DETAIL 22/S06.21.
- 38 SIMPSON CSM14 COIL STRAP x 7'-0" LONG. STRAP TO BE NAILED TO TOP OF DOUBLE TOP PLATE WITH 0.162" DIA x 2 1/2" EVERY HOLE AND NAILED WITH 0.162" DIA x 2 1/2" NAILS AT 6" OC STAGGERED ON TOP OF JOISTS AND 3x JOIST BLOCKING BETWEEN JOIST.
- 39 SIMPSON CSM14 COIL STRAP x AS SHOWN. STRAP TO BE NAILED TO 3x JOIST BLOCKING EVERY 6' OC STAGGERED AND NAILED 3'-0" AT ENDS WITH 0.162" DIA x 2 1/2" NAILS EVERY HOLE.
- 40 SIMPSON CSM14 COIL STRAP x 8'-0" LONG. CENTER STRAP ON WALL AND NAILED WITH 0.162" DIA x 2 1/2" NAILS ON TOP OF 3x JOIST BLOCKING AND TO DOUBLE TOP PLATE. REFERENCE DETAIL 34/S06.21.
- 41 SIMPSON CSM14 COIL STRAP x 8'-0" LONG. CENTER STRAP ON WALL AND NAIL WITH 0.162" DIA x 2 1/2" NAILS ON TOP CHORD OF JOISTS. REFERENCE DETAIL 19/S06.21.
- 43 SIMPSON CSM14 COIL STRAP x 5'-0" LONG. STRAP TO BE NAILED 6'-0" WITH 0.162" DIA x 2 1/2" NAILS EVERY HOLE TO 3x JOIST BLOCKING AND NAILED ON TOP OF 4x T&G BLOCKING AT THE CORRIDOR.
- 44 SIMPSON CSM14 COIL STRAP x 8'-0" LONG. STRAP TO BE CENTERED AT WALL AND NAILED TO TOP OF FLOOR JOIST AND 3x JOIST BLOCKING WITH 0.162" DIA x 2 1/2" NAILS.
- 45 SIMPSON CSM14 COIL STRAP x 25'-0" LONG. STRAP TO BE NAILED WITH 0.162" x 2 1/2" NAILS TO 3x JOIST BLOCKING AND 3x T&G DECKING AND TO BE NAILED TO TOP OF DOUBLE TOP PLATE AT THE END AS SHOWN.
- 46 SIMPSON CSM14 COIL STRAP x 8'-0" LONG. STRAP TO BE CENTERED ON BEAM AND NAILED WITH 0.162" DIA x 2 1/2" NAILS TO TOP OF BEAM AND TOP OF DOUBLE TOP PLATE.
- 47 SIMPSON CSM14 COIL STRAP x 8'-0" LONG. STRAP TO BE WELDED 1'-0" TO THE SIDE OF HSS BEAM AND NAILED TO THE SIDE OF DOUBLE TOP PLATE. STRAP TO BE CENTERED AT DOUBLE TOP PLATE.
- 72 COLUMN SHOULD BE (5) 2x6 DF #2 BUILT-UP POST ON FLOORS 4-8 AND HSS4x4x1/4 ON FLOOR 7.
- 82 SIMPSON CSM14 COIL STRAP x 4'-0" LONG. STRAP TO BE CENTERED ON HSS COLUMN. REFERENCE DETAIL 3/S05.22. PROVIDE 3x JOIST BLOCKING. PROVIDE STRAP AT FLOOR/ROOF DIAPHRAGM WHERE HSS COLUMN SUPPORTING BALCONY OCCURS. STRAP REQUIREMENTS TYPICAL AT ALL BALCONIES SUPPORTED BY HSS COLUMNS. REF SHEET S05.21.

### JOIST SCHEDULE

DEPTH (SIZE)	EQUIVALENT TRUSS - JOIST PRODUCT	MIN SHEAR CAPACITY (LBS)	MIN EI CAPACITY x106 (LBS-IN <sup>2</sup> )	MIN FLEXURAL CAPACITY (FT-LBS)
11 7/8"	TJI-210	1655	347	4215
11 7/8"	TJI-560	2050	636	9500

#### NOTES:

1. AT WOOD BEAM CONDITIONS HANGERS ARE TO BE SIMPSON ITS HANGERS UNO. REF DETAIL 23/S06.21. UNO, WHERE SCREWED CONNECTION IS REQUIRED, PROVIDE I-JOIST WEB STIFFENER AND USE SIMPSON LBV SCREWED HANGERS.
2. AT STEEL BEAM CONDITIONS HANGERS ARE TO BE SIMPSON LBV HANGERS UNO. REF DETAIL 33/S06.11. UNO.
3. WEB STIFFENERS ARE REQUIRED AT ALL SCREWED JOIST HANGERS AND WHERE NOTED ON PLAN. REFER TO JOIST MANUFACTURER FOR WEB STIFFENER MATERIAL, SIZE AND ATTACHMENT RECOMMENDATIONS.

### BEAM SCHEDULE

MARK	BEAM SIZE	COLUMN TYPE (UNO PER PLAN)	HANGERS	COMMENTS
H1	4x8 DF #2	(1) 2x TRIMMER		
H2	4x10 DF #2	(1) 2x KING		
H3	FRT 4x10 DF #2	REF DETAIL 1/S06.20		
H4	FRT 6x10 DF #1	REF DETAIL 1/S06.20		
H5	5 1/2"x13 1/2" GL	REF DETAIL 1/S06.20		
H6	5 1/2"x15" GL	REF DETAIL 1/S06.20		
H7	FRT 6x12 DF #1	REF DETAIL 1/S06.20		
B1	3 1/2"x11 7/8" GL	(2) 2x STUD MIN		
B2	5 1/2"x11 7/8" GL	(2) 2x STUD MIN		
B3	6 3/4"x11 7/8" GL	6x6 DF #1		
B4	5 1/2"x13 1/2" GL	REF PLAN		
B5	6 3/4"x13 1/2" GL	REF PLAN		
B6	5 1/2"x7 1/2" GL	(2) 2x STUD MIN		
B7	8 3/4" x 11 7/8" GL	REF PLAN		

#### BEAM SCHEDULE NOTES:

1. HANGERS ARE TO BE USED AT LOCATIONS WHERE THE BEAM FRAMES INTO AN ADJACENT BEAM ONLY.
2. A SUFFIX OR PREFIX OF 'PT' INDICATES PRESERVATIVE TREATMENT. ALL HARDWARE (CONNECTORS, BOLTS, ETC) IN CONTACT WITH THESE MEMBERS SHALL USE HOT DIPPED GALVANIZED.
3. HU & HUG HANGERS SHALL BE INSTALLED WITH "MAX" NAILING NOTED BY MANUFACTURER.
4. A SUFFIX OR PREFIX OF 'FRT' INDICATES FIRE-RETARDANT TREATED, REF ARCH.
5. TYPICAL INTERIOR HEADERS SHALL BE TYPE 'H1'.
6. TYPICAL EXTERIOR HEADERS SHALL BE TYPE 'H3'.

### COLUMN SCHEDULE

MARK	8TH FLOOR	7TH FLOOR	6TH FLOOR	5TH FLOOR	4TH FLOOR
C1	6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1
C2	6x8 DF #1	5 1/2 x 7 1/2 GL	5 1/2 x 7 1/2 GL	5 1/2 x 9 GL	5 1/2 x 10 1/2 GL
C3	6x6 DF #1	6x6 DF #1	6x6 DF #1	6x6 DF #1	6x6 DF #1
C4	6x6 DF #1	6x6 DF #1	5 1/2 x 7 1/2 GL	5 1/2 x 9 GL	5 1/2 x 10 1/2 GL
C5	6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1

#### NOTES:

1. TYPICAL INTERIOR COLUMN SHALL BE TYPE C3



ARCHITECTURE  
URBAN DESIGN + PLANNING  
INTERIOR DESIGN

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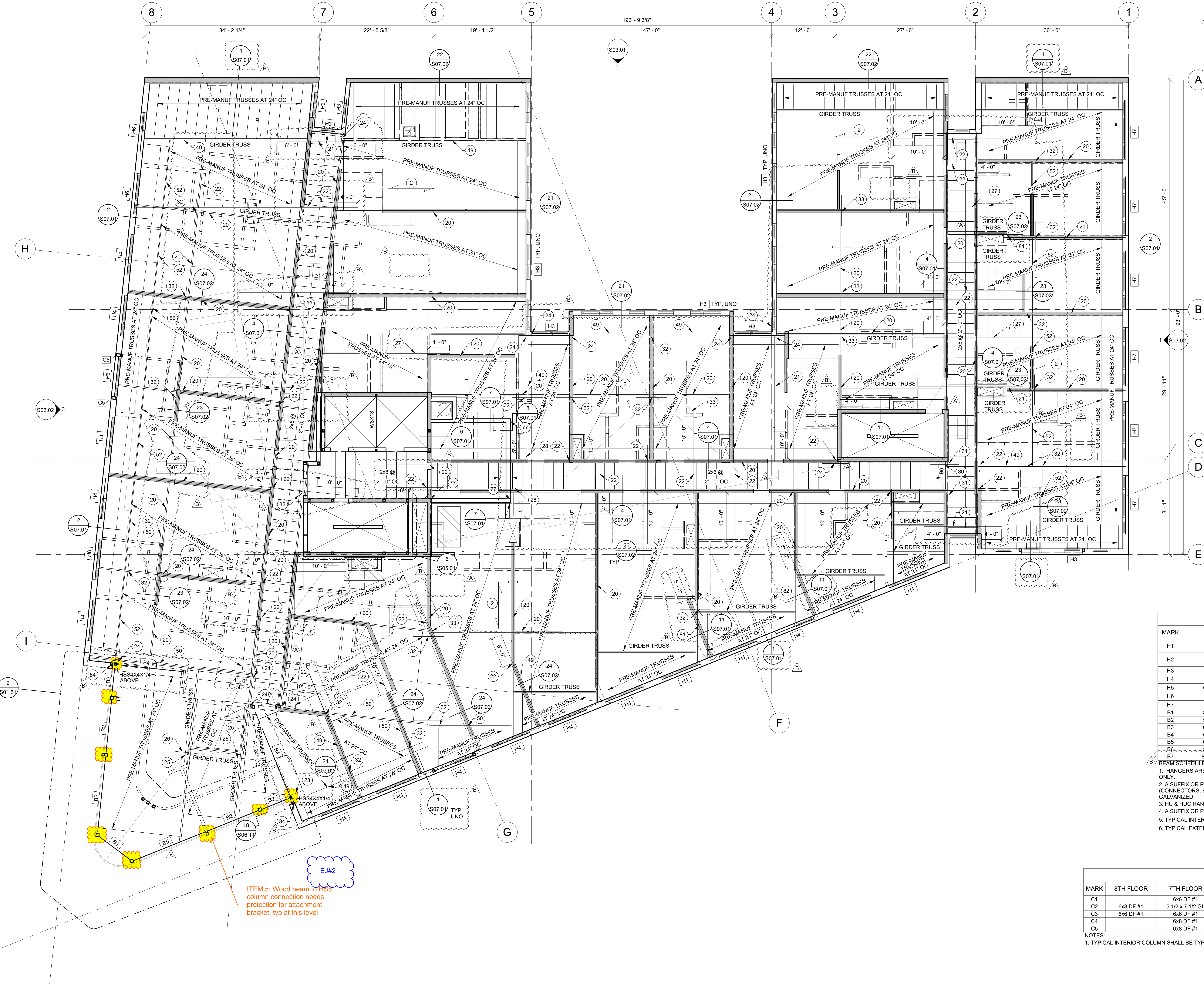
18S  
GREYSTAR  
1715 SW Salmon St  
Portland, OR 97205

REVISIONS  
1 ADDENDUM 1 5/3/2019  
2 ADDENDUM 2 5/9/2019  
A PERMIT RESPONSE 1 6/03/2019  
B PERMIT RESPONSE 2 7/26/2019

CHECKED BY: PROJECT NO.  
ISSUE DATE: 15 APR 2019  
CHECKER: 1803002

FLOOR FRAMING  
LEVEL 8  
S01.08





### ROOF FRAMING PLAN NOTES

- FOR A COMPLETE LEGEND OF ALL CALLOUTS AND SYMBOLS REF COVER SHEET AND SCHEDULES.
- REFERENCE DETAIL 4/506.20 FOR TYPICAL DOUBLE TOP PL SPLICE CONNECTION.
- ALL POSTS FOR GIRDER TRUSSES, BEAMS, HEADERS AND / OR PURLINS SHALL CONTINUE DOWN FLOOR TO FLOOR TO FT SLAB, FOUNDATION OR LOWER BEAM / HEADER.
- VERIFY SIZE AND LOCATION OF ALL MECHANICAL AND WALL PENETRATIONS.
- TRUSS MANUFACTURER TO REVIEW ALL DETAILS AND PLANS TO ACCOUNT FOR SPECIFIC CONDITIONS.
- ALL GIRDER TRUSSES SHALL BE SECURED TO SUPPORTING POSTS BELOW WITH SIMPSON LGT TIEDOWNS. 2-PLY GIRDER TRUSSES WILL REQUIRE A MINIMUM SUPPORT POST SIZE (3) 2x6 DF#2. 3-PLY GIRDER TRUSSES WILL REQUIRE A MINIMUM SUPPORT POST SIZE (3) 2x6 DF#2, ETC. REF DETAIL 27/507.02.
- PROVIDE HEADER TYPE H1 AT ALL OPENINGS, TYP AT BEARING WALLS UNO. REF DETAIL 1/506.20 FOR TYPICAL HEADER CONSTRUCTION, UNO.
- CONTRACTOR TO COORDINATE LOCATION OF FALL PROTECTION WITH TRUSS MANUF. REF DETAIL 26/507.02 FOR CONNECTION AND REQUIRED TRUSS LOADING.
- REFERENCE DETAIL 26/507.02 FOR TYPICAL INTERIOR NON-BEARING WALL CONNECTIONS TO ROOF TRUSSES.
- TRUSS MANUFACTURER TO COORDINATE ALL MECHANICAL LOADS WITH MECHANICAL DRAWINGS.

### KEYED NOTES

- 5/8" APA RATED SHEATHING WITH 2x4 FLAT BLOCKING ALONG ALL UNSUPPORTED PANEL EDGES. ATTACH SHEATHING TO FRAMING AND BLOCKING WITH 0.146 DIA x 3" NAILS AT 6" OC PANEL EDGES, 12" OC FIELD. REF DETAIL 8/506.20.
- PRE-MANUFACTURED DRAG/GIRDER TRUSS ALIGNED WITH WALL BELOW AND AT CORRIDOR LOCATION. DRAG/GIRDER TRUSS TO RUN ENTIRE LENGTH OF CORRIDOR. TRUSS TO BE DESIGNED FOR A SHEAR LOAD 250 PLF/A.
- SIMPSON CS14 COIL STRAP x AS SHOWN NAILED THROUGH SHEATHING IN TO GIRDER TRUSSES AND 2x CORRIDOR JOIST. REFERENCE DETAIL 04/507.01.
- SIMPSON CS14 COIL STRAP x AS SHOWN NAIL TO GIRDER TRUSS AND ROOF TRUSS BLOCKING. REFERENCE DETAIL 04/507.01 AND DETAIL 30/507.03.
- SIMPSON CS14 COIL STRAP x 6" LONG NAILED TOP OF BEAM AND BOTTOM OF ROOF TRUSS. REFERENCE DETAIL 12/507.01.
- SIMPSON CSM14 COIL STRAP x 8" LONG NAILED ON TOP OF SHEATHING W/ 0.162" DIA x 2 1/2" NAILS TO TOP OF DBL TOP PL OR TOP OF BEAM AND TO BOTTOM OF ROOF TRUSS. REFERENCE DETAIL 12/507.01.
- SIMPSON CSM14 COIL STRAP x 8" LONG NAILED ON TOP OF SHEATHING W/ 0.162" DIA x 2 1/2" NAILS TO TOP OF DOUBLE TOP PLATE AND BOTTOM OF GIRDER TRUSS. REFERENCE DETAIL 12/507.01.
- SIMPSON CSM14 COIL STRAP x 8" LONG NAILED ON TOP OF SHEATHING W/ 0.162" DIA x 2 1/2" NAILS TO TOP OF TRUSSES. REFERENCE DETAIL 24/507.02.
- SIMPSON CS14 COIL STRAP x AS SHOWN NAIL W/ 0.162" x 2 1/2" NAIL TO TOP OF SHEATHING ON GIRDER TRUSS AND NAIL TO 3x BLOCKING. REF DETAILS 04/507.01 AND 30/507.03.
- SIMPSON CSM14 COIL STRAP x 10" LONG. NAIL W/ 0.162" DIA x 2 1/2" NAILS TO TOP OF SHEATHING ON TOP OF GIRDER DRAG ROOF TRUSS AND CORRIDOR JOISTS. REFERENCE DETAIL 04/507.01.
- SIMPSON CS14 COIL STRAP x 6" LONG. NAIL W/ 0.162" DIA x 2 1/2" NAILS ON BOTTOM OF ROOF TRUSS AND TO TOP OF BEAM. ALIGN TRUSS WITH WALL BELOW. REFERENCE DETAIL 12/507.01.
- SIMPSON CS14 COIL STRAP x 6" LONG. NAIL W/ 0.162" DIA x 2 1/2" NAILS TO TOP OF SHEATHING ON TOP OF TRUSSES RUNNING PERPENDICULAR TO GIRDER DRAG TRUSS. REFERENCE DETAIL 24/507.02.
- SIMPSON CS14 COIL STRAP x AS SHOWN. NAIL W/ 0.162" DIA x 2 1/2" NAIL TO TOP OF DRAG TRUSSES. REFERENCE DETAIL 30/507.03.
- PRE-MANUFACTURED DRAG/GIRDER TRUSS. DRAG TRUSS TO BE DESIGNED FOR A LOAD OF 2,500 LBS TO TRANSFER FROM TOP CHORD TO BOTTOM CHORD. EDGE NAIL SHEATHING TO DRAG TRUSSES.
- PRE-MANUFACTURED DRAG/GIRDER TRUSS. DRAG TRUSS TO BE DESIGNED FOR A LOAD OF 1,500 LBS TO TRANSFER FROM TOP CHORD TO BOTTOM CHORD. EDGE NAIL SHEATHING TO DRAG TRUSSES.
- TRUSS MANUFACTURER TO DESIGN TRUSS FOR 3750LB POINT LOAD FOR HOT WATER TANKS.
- SIMPSON CS14 COIL STRAP x 6" LONG NAILED TO DBL TOP PL AND TO CORRIDOR JOISTS AS SHOWN. REFERENCE DETAIL 4/507.01.
- SIMPSON CS14 COIL STRAP x AS SHOWN NAILED TO TOP OF TRUSS BLOCKING. REFERENCE DETAIL 11/507.01 AND DETAIL 30/57.03.
- SIMPSON CSM14 COIL STRAP x 4" LONG. STRAP TO BE CENTERED ON HSS COLUMN. REFERENCE DETAIL 3/505.22. PROVIDE 3x JOIST BLOCKING. PROVIDE STRAP AT FLOOR/ROOF DIAPHRAGM WHERE HSS COLUMN SUPPORTING BALCONY OCCURS. STRAP REQUIREMENTS TYPICAL AT ALL BALCONIES SUPPORTED BY HSS COLUMNS. REF SHEET 505.21.
- STRAP BEAM TO COLUMN USING SIMPSON MST20 STRAP ON EITHER SIDE OF THE BEAM.

### BEAM SCHEDULE

MARK	BEAM SIZE	COLUMN TYPE (UNO PER PLAN)	HANGERS	COMMENTS
H1	4x8 DF #2	(1) 2x TRIMMER (1) 2x KING		
H2	4x10 DF #2	(1) 2x6 TRIMMER (1) 2x KING		
H3	FRT 4x10 DF #2	REF DETAIL 1/506.20		
H4	FRT 6x10 DF #1	REF DETAIL 1/506.20		
H5	5 1/2"x13 1/2" GL	REF DETAIL 1/506.20		
H6	5 1/2"x15" GL	REF DETAIL 1/506.20		
H7	FRT 6x12 DF#1	REF DETAIL 1/506.20		
B1	3 1/2"x11 7/8" GL	(2) 2x STUD MIN		
B2	5 1/2"x11 7/8" GL	(2) 2x STUD MIN		
B3	5 3/4"x11 7/8" GL	6x8 DF #1		
B4	5 1/2"x13 1/2" GL	REF PLAN		
B5	6 3/4"x13 1/2" GL	REF PLAN		
B6	5 1/2" x 7 1/2" GL	(2) 2x STUD MIN		
B7	5 3/4" x 11 7/8" GL	REF PLAN		

### BEAM SCHEDULE NOTES:

- HANGERS ARE TO BE USED AT LOCATIONS WHERE THE BEAM FRAMES INTO AN ADJACENT BEAM ONLY.
- A SUFFIX OR PREFIX OF "PT" INDICATES PRESERVATIVE TREATMENT. ALL HARDWARE (CONNECTORS, BOLTS, ETC) IN CONTACT WITH THESE MEMBERS SHALL USE HOT DIPPED GALVANIZED.
- HU & HUC HANGERS SHALL BE INSTALLED WITH "MAX" NAILING NOTED BY MANUFACTURER.
- A SUFFIX OR PREFIX OF "FRT" INDICATES FIRE-RETARDANT TREATMENT. REF ARCH.
- TYPICAL INTERIOR HEADERS SHALL BE TYPE "H1".
- TYPICAL EXTERIOR HEADERS SHALL BE TYPE "H3".

### COLUMN SCHEDULE

MARK	8TH FLOOR	7TH FLOOR	6TH FLOOR	5TH FLOOR	4TH FLOOR
C1		6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1
C2	6x8 DF #1	5 1/2 x 7 1/2 GL	5 1/2 x 7 1/2 GL	5 1/2 x 9 GL	5 1/2 x 10 1/2 GL
C3	6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1
C4	6x8 DF #1	6x8 DF #1	5 1/2 x 7 1/2 GL	5 1/2 x 9 GL	5 1/2 x 10 1/2 GL
C5	6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1	6x8 DF #1

### NOTES:

- TYPICAL INTERIOR COLUMN SHALL BE TYPE C3

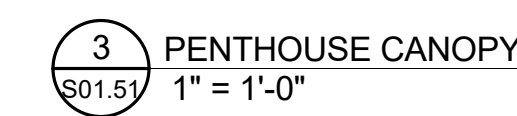
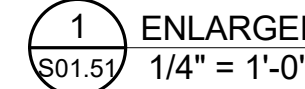


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2 Roof Framing Plan - Canopy  
S01.51 1/4" = 1'-0"



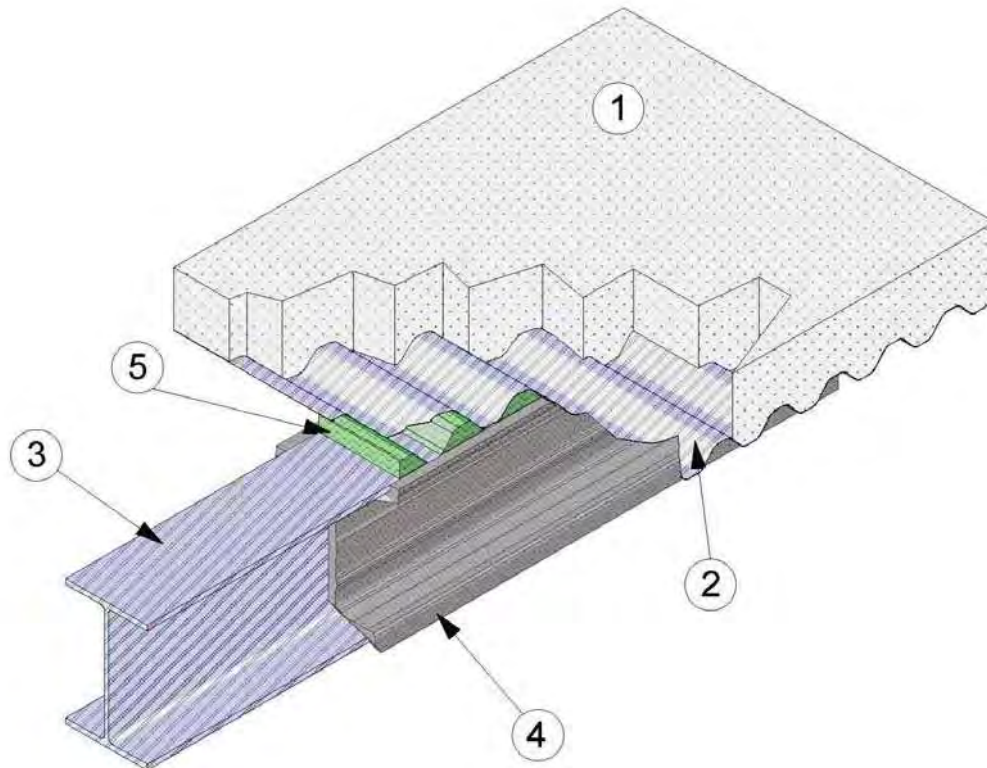
ENLARGED  
PENTHOUSE  
ROOF  
FRAMING  
PLAN  
**S01.51**

### Bid Set

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Carboline Company  
CC/IF 180-01  
Restrained or Unrestrained Beam  
Thermo-Lag E100, Thermo-Lag E100 S  
ASTM E119-12a  
CAN/ULC S101-07 Restricted Load Maximum 65% of design load  
Assembly Rating – See Table CC/IF 180-01

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1. **FLOOR/CEILING ASSEMBLY** - Use a fire-rated floor/ceiling assembly consisting of normal weight or lightweight (minimum 105 pcf, 1682 kg/m<sup>3</sup>) reinforced concrete. Thickness of concrete Floor ceiling assembly must comply with designated fire resistive rating.
2. **FLUTED STEEL FLOOR UNITS** – Corrugated steel decking, minimum 1-1/2 inch deep (38 mm), minimum 20 Ga.
3. **STEEL STRUCTURAL BEAM** – Use steel sections, I-beam or W-beam, sized in accordance with the Table CC/IF 180-01.

4. **FIRE-RESISTIVE COATING** – Refer to Table CC/IF 180-01 for specific application thickness of fire resistive coating.

CERTIFIED MANUFACTURER:  
Carboline Company

CERTIFIED PRODUCT: Fire-  
resistive Coating

MODEL: Thermo-Lag E100,  
Thermo-Lag E100 S

**Intumescent Fireproofing** - Spray  
or paint in one or more coats  
according to manufacturer's



instructions to the required thickness.

MODEL: Any Intertek certified mineral wool or ceramic fiber blanket model that meets the criteria below.

5. LISTED MANUFACTURER: Any Intertek certified mineral wool or ceramic fiber blanket manufacturer that meets the criteria below.

CERTIFIED PRODUCT: Insulation

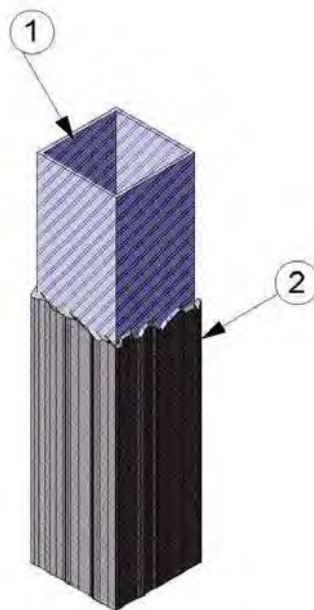
**FLUTE FILLER** – Completely fill the flutes between steel structural beam (Item 3) and the fluted steel floor unit (Item 2) with 4 pcf mineral wool or 4 pcf ceramic fiber blanket.

Table CC/IF 180-01											
HP/A	W/D	60 min.		90 min.		120 min.		150 min.		180 min.	
1/m	lb/ft/in	mm	in	mm	in	mm	in	mm	in	mm	in
30	4.46	3.0	0.12	3.0	0.12	3.0	0.12	3.0	0.12	3.3	0.13
40	3.34	3.0	0.12	3.0	0.12	3.0	0.12	3.5	0.14	4.2	0.17
50	2.67	3.0	0.12	3.0	0.12	3.3	0.13	4.2	0.17	5.0	0.20
60	2.23	3.0	0.12	3.0	0.12	3.8	0.15	4.8	0.19	5.8	0.23
70	1.91	3.0	0.12	3.2	0.13	4.3	0.17	5.4	0.21	6.5	0.26
75	1.78	3.0	0.12	3.3	0.13	4.5	0.18	5.7	0.22	6.8	0.27
80	1.67	3.0	0.12	3.5	0.14	4.7	0.19	5.9	0.23	7.2	0.28
85	1.57	3.0	0.12	3.7	0.15	4.9	0.19	6.2	0.24	7.5	0.30
90	1.49	3.0	0.12	3.8	0.15	5.1	0.20	6.5	0.26	7.8	0.31
95	1.41	3.0	0.12	3.9	0.15	5.3	0.21	6.7	0.26	8.1	0.32
100	1.34	3.0	0.12	4.1	0.16	5.5	0.22	6.9	0.27	8.4	0.33
110	1.22	3.0	0.12	4.3	0.17	5.9	0.23	7.4	0.29	8.9	0.35
120	1.11	3.0	0.12	4.6	0.18	6.2	0.24	7.8	0.31	9.4	0.37
130	1.03	3.1	0.12	4.8	0.19	6.5	0.26	8.2	0.32	9.9	0.39
140	0.95	3.3	0.13	5.0	0.20	6.8	0.27	8.6	0.34	10.3	0.41
150	0.89	3.4	0.13	5.2	0.20	7.1	0.28	8.9	0.35	10.7	0.42
160	0.84	3.6	0.14	5.4	0.21	7.3	0.29	9.2	0.36	11.2	0.44
170	0.79	3.7	0.15	5.6	0.22	7.4	0.29	9.5	0.37	11.6	0.46
180	0.74	3.9	0.15	5.8	0.23	7.7	0.30	9.8	0.39	12.0	0.47
190	0.70	4.0	0.16	6.0	0.24	8.0	0.31	10.1	0.40	12.3	0.48
200	0.67	4.1	0.16	6.2	0.24	8.2	0.32	10.4	0.41	12.7	0.50
210	0.64	4.2	0.17	6.3	0.25	8.5	0.33	10.6	0.42	13.0	0.51
220	0.61	4.3	0.17	6.5	0.26	8.7	0.34	10.9	0.43	13.4	0.53
230	0.58	4.5	0.18	6.7	0.26	8.9	0.35	11.1	0.44	13.7	0.54
240	0.56	4.6	0.18	6.9	0.27	9.1	0.36	11.4	0.45	14.0	0.55
250	0.53	4.7	0.19	7.0	0.28	9.3	0.37	11.7	0.46	14.3	0.56
260	0.51	4.8	0.19	7.2	0.28	9.5	0.37	11.9	0.47	14.6	0.57
270	0.50	4.9	0.19	7.3	0.29	9.7	0.38	12.2	0.48	14.9	0.59
280	0.48	5.0	0.20	7.4	0.29	9.9	0.39	12.4	0.49	15.1	0.59
290	0.46	5.0	0.20	7.6	0.30	10.1	0.40	12.6	0.50	15.1	0.59
300	0.45	5.1	0.20	7.7	0.30	10.3	0.41	12.8	0.50	15.4	0.61
302	0.44	5.2	0.20	7.7	0.30	10.3	0.41	12.9	0.51	15.5	0.61

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Carboline Company  
CC/IF 180-03  
Column  
Thermo-Lag E100 and Thermo-Lag E100 S  
ASTM E119-16  
CAN/ULC S101-14  
Assembly Rating – See Table CC/IF 180-03

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1. **HOLLOW RECTANGULAR STRUCTURAL STEEL COLUMN** – Use hollow steel sections, rectangular-shape, having nominal Hp/A, W/D, or A/P section factors based on four sided exposure. Refer to Table CC/IF 180-03 for specific application thickness of intumescent mastic fireproofing (Item 2B) based on nominal Hp/A or W/D section factors. This table is applicable for circular-shape hollow steel sections as well.
2. **FIRE-RESISTIVE COATING** – Refer to Table CC/IF 180-03 for specific application thickness of fire resistive coating.

CERTIFIED MANUFACTURER:  
Carboline Company

CERTIFIED PRODUCT: Fire-resistive  
Coating

MODEL: Thermo-Lag E100 and  
Thermo-Lag E100 S

INTUMESCENT FIREPROOFING –  
Spray or paint in one or more coats  
according to manufacturer's instructions  
to required final thickness.

Table CC/IF 180-03											
HP/A	W/D	60 min.		90 min.		120 min.		150 min.		180 min.	
1/m	lb/ft/in	mm	in	mm	in	mm	in	mm	in	mm	in
22	6.08	3.2	0.13	3.2	0.13	3.2	0.13	3.3	0.13	4.3	0.17
25	5.35	3.2	0.13	3.2	0.13	3.2	0.13	3.7	0.15	4.8	0.19
30	4.46	3.2	0.13	3.2	0.13	3.2	0.13	4.3	0.17	5.6	0.22
35	3.82	3.2	0.13	3.2	0.13	3.5	0.14	4.9	0.19	6.4	0.25
40	3.34	3.2	0.13	3.2	0.13	3.9	0.15	5.5	0.22	7.1	0.28
45	2.97	3.2	0.13	3.2	0.13	4.2	0.17	6.0	0.24	7.8	0.31
50	2.67	3.2	0.13	3.2	0.13	4.6	0.18	6.5	0.26	8.5	0.33
55	2.43	3.2	0.13	3.2	0.13	5.0	0.20	7.0	0.28	9.1	0.36
60	2.23	3.2	0.13	3.2	0.13	5.3	0.21	7.5	0.30	9.7	0.38
65	2.06	3.2	0.13	3.2	0.13	5.6	0.22	8.0	0.31	10.3	0.41
70	1.91	3.2	0.13	3.4	0.13	5.9	0.23	8.4	0.33	10.9	0.43
75	1.78	3.2	0.13	3.6	0.14	6.2	0.24	8.8	0.35	11.4	0.45
80	1.67	3.2	0.13	3.8	0.15	6.5	0.26	9.2	0.36	11.9	0.47
85	1.57	3.2	0.13	3.9	0.15	6.8	0.27	9.6	0.38	12.4	0.49
90	1.49	3.2	0.13	4.1	0.16	7.0	0.28	9.9	0.39	12.9	0.51
95	1.41	3.2	0.13	4.2	0.17	7.3	0.29	10.3	0.41	13.3	0.52
100	1.34	3.2	0.13	4.4	0.17	7.5	0.30	10.6	0.42	13.8	0.54
110	1.22	3.2	0.13	4.6	0.18	8.0	0.31	11.3	0.44	14.6	0.57
120	1.11	3.2	0.13	4.9	0.19	8.4	0.33	11.9	0.47	15.4	0.61
130	1.03	3.2	0.13	5.1	0.20	8.8	0.35	12.4	0.49	16.1	0.63
140	0.95	3.2	0.13	5.3	0.21	9.2	0.36	13.0	0.51	16.8	0.66
150	0.89	3.2	0.13	5.5	0.22	9.5	0.37	13.5	0.53	17.4	0.69
160	0.84	3.2	0.13	5.7	0.22	9.8	0.39	13.9	0.55	18.0	0.71
170	0.79	3.2	0.13	5.9	0.23	10.1	0.40	14.4	0.57	18.6	0.73
180	0.74	3.2	0.13	6.1	0.24	10.4	0.41	14.8	0.58	19.1	0.75
190	0.7	3.2	0.13	6.2	0.24	10.7	0.42	15.2	0.60	19.6	0.77
200	0.67	3.2	0.13	6.4	0.25	10.9	0.43	15.5	0.61		
210	0.64	3.2	0.13	6.5	0.26	11.2	0.44	15.9	0.63		

## SELECTION & SPECIFICATION DATA

<b>Generic Type</b>	A two component, 100% solids epoxy intumescent fireproofing.
<b>Description</b>	An epoxy intumescent fireproofing for commercial and light industrial applications. It was specifically designed with an advanced formulation to provide 1-3 hour cellulosic fire protection for structural steel beams, I-section columns, tubular columns and pipes without the need for reinforcing mesh. It provides a fast curing, aesthetically pleasing fire protection solution and is rated for both exterior and interior applications.
<b>Features</b>	<ul style="list-style-type: none"> <li>• Certified to UL 263 / ASTM E119 / NFPA 251</li> <li>• Exterior and interior rated</li> <li>• High quality aesthetic finish</li> <li>• Does not require reinforcing mesh</li> <li>• Low thickness requirements</li> <li>• High build, fast recoat</li> <li>• Saves application time, lowering installation cost</li> <li>• Rugged durable material suitable for onsite or offsite applications</li> <li>• LEED compliant, low VOC</li> <li>• Low outgassing properties for clean room environments</li> </ul>
<b>Color</b>	Grey
<b>Finish</b>	Slightly Textured
<b>Primer</b>	<p>Must be applied over a compatible primer. If the steel has already been coated with an existing primer, refer to Carboline Technical Service for advice before applying. Contact Carboline Technical Service for a complete list of approved primers.</p> <p>Carboline approved primers must be sufficiently cured prior to application of Thermo-Lag E100. The general requirement for epoxy primers is a 24 hour cure. Material must be applied after 24 hours and not to exceed the approved primer's maximum recoat window.</p>
<b>Film Build</b>	60-200 mils (1.5-5 mm)
<b>Solids Content</b>	By Volume 100%
<b>Theoretical Coverage Rates</b>	1604 ft² at 1 mil (149 m² at 25 microns)
<b>VOC Values</b>	<b>As Supplied</b> : 0.11 lb/gal (13 g/L)
<b>Limitations</b>	Not recommended for steelwork subject to long-term surface temperatures over 175°F (79°C) in normal use.
<b>Topcoats</b>	For interior conditioned space, topcoats are optional. For interior general purpose and exterior use, Carboline approved topcoats are required. Product must be applied to the specified DFT prior to applying a topcoat. The choice of topcoat will depend on project requirements. Contact Carboline Technical Service for a complete list of approved topcoats.

## SUBSTRATES & SURFACE PREPARATION

<b>General</b>	Remove all oil or grease from the surface to be coated using Thinner 2 or Carboline Surface Cleaner 3.
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## SUBSTRATES & SURFACE PREPARATION

<b>Steel</b>	The general requirement for steel preparation before the application of an approved primer should meet SSPC-SP6, with a 1.5-2.0 mil (37-50 micron) angular profile. Contact Carboline Technical Service for recommendations and specific primer requirements.
<b>Galvanized Steel</b>	The general requirement for steel preparation before priming should meet SSPC-SP7. 1.5-2.0 mil (37-50 micron) angular profile required. Prime with Carboline approved primer. Contact Carboline Technical Service for recommendations.
<b>Non-Ferrous Metals</b>	Contact Carboline Technical Service for recommendations.

## PERFORMANCE DATA

Test Method	Results
ASTM D2240 Hardness	> 40 Shore D
ASTM D256 Impact Resistance	0.75 ft*lbs/in
ASTM D4541 Bond Strength	600-1200 psi (4.14-8.27 MPa)
ASTM D4541 Bond Strength	Typical Field Value 300 psi (2.07 MPa)
ASTM D695 Compressive Strength	> 2,330 psi (> 16.0 MPa)
ASTM D790 Flexural Strength	> 1,220 psi (> 8.4 MPa)
ASTM E84 Surface Burning	Class A

All values derived under controlled laboratory conditions unless otherwise noted.

## MIXING & THINNING

<b>Mixer</b>	Use 1/2" electric or air driven drill with a slotted paddle mixer. Must be 300 rpm under load (minimum).
<b>Mixing</b>	<p><b>Plural Component Application:</b> For plural component applications, the part A and part B components must be pre-mixed separately before introduction into the plural equipment.</p> <p><b>Trowel Application:</b> The product is supplied in 9 gallon (34.0 liter) kits. The product must be mixed in equal volumes of part A and part B. It is recommended to split each kit in half and mix 2.25 gallons (8.5 liters) of part A and 2.25 gallons (8.5 liters) of part B to achieve a maximum mixing volume of 4.5 gallons (17.0 liters). Add up to 1 quart (1 liter) of Carboline Plasite Thinner 19, Thinner 242E or Carboline approved equivalent to part B and mix until fully incorporated. Thinning is not required for this application and material should only be thinned as necessary to achieve the desired working time and consistency. Stage material by adding part B on top of part A.</p> <p>Mix staged material with slotted paddle mixing blade for approximately 2 minutes or until completely blended and consistent color is achieved. Once mixed, material should be immediately poured out of mass onto a clean table or flat working surface to extend the pot life. Mixed material left in the pail will begin to exotherm and diminish pot life. For small areas, equal volumes of part A and part B can be mixed as needed. Trowel application should commence immediately after mixing.</p>
<b>Thinning</b>	<p><b>Plural Component Application:</b> Do not thin</p> <p><b>Trowel Application:</b> Only thin as required with Plasite Thinner 19, Thinner 242E or Carboline approved equivalent – Maximum 1 quart (1 liter) per 4.5 gallon (17.0 liter) kit.</p>
<b>Ratio</b>	1:1 (by volume)



## MIXING & THINNING

<b>Working Time</b>	30-45 minutes @ 75°F (25°C)
	15-20 minutes @ 100°F (38°C)

## APPLICATION EQUIPMENT GUIDELINES

Listed below are general equipment guidelines for the application of this product. Job site conditions may require modifications to these guidelines to achieve the desired results.

<b>General</b>	Thermo-Lag E100 is applied by plural component application. Use only plural component equipment specifically designed for epoxy based PFP. Consult the manufacturers for specific information and models: <b>AirTech Spray Systems</b> <b>ECCO</b> <b>Spray Quip</b> <b>Spray Pump Services</b> <b>Graco</b> <b>WIWA</b>
<b>Spray Gun</b>	WIWA 500F PFP or equivalent Must have non-wetted spring assembly.
<b>Gun Swivel</b>	5,000 psi (34.4 MPa) 1/2" - 3/8" (12.7 mm - 9.5 mm)
<b>Spray Tips</b>	0.027-0.035" (Use heavy duty RAC non diffuser tips and housing)
<b>Fan Size</b>	6-10" (152-254 mm) depending on section being sprayed
<b>Static Mixer</b>	Standard Static 12 turn 3/4" (19 mm) I.D.
<b>Material Hose</b>	<b>Plural Component:</b> 100' (30.4 m) heated hose bundle with 3/4" (19 mm) I.D. minimum and 3/4" (19 mm) mixer manifold
<b>Whip Hose</b>	20' (6.1 m) of 1/2" (12.7 mm) I.D. minimum
<b>Compressor</b>	185 cfm @ 100 psi (6.9 kPa) minimum

## APPLICATION PROCEDURES

<b>General</b>	<p><b>Plural Component Application:</b> Prior to introduction into the plural component equipment, the product must be preheated to 70-100°F (21-38°C). Perform at least two ratio checks per day and also after any equipment maintenance. Apply first coat at 60-200 mils (1.5-5 mm). Lighter coats will achieve a smoother finish for higher quality aesthetics. Allow material to gel for 15 minutes before backrolling (only if required). If backrolling, use solvent resistant mohair rollers. Use Carboline Plasite Thinner 19, Thinner 242E or approved equal as rolling solvent to mist down rollers to prevent them from sticking to the material. Allow material to cure for approximately 30 minutes (depending upon temperature) between coats. Continue building material at 60-200 mils (1.5-5 mm) per coat to specified thickness.</p> <p><b>Trowel Application:</b> Prior to trowel application, the material must be preheated to a minimum of 70°F (21°C) to achieve a workable consistency. Once material is mixed, it must be poured out of mass onto a clean table or flat working surface to extend the pot life. The material can then be divided into workable amounts. Trowel apply first coat at 60-200 mils (1.5-5 mm). Allow material to gel for 15 minutes before</p>
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### APPLICATION PROCEDURES

backrolling (only if required). If backrolling, use Carboline Plasite Thinner 19, Thinner 242E or approved equal as rolling solvent to mist down rollers to prevent them from sticking to the material. Allow material to set up sufficiently to support the next trowel applied coat. This will range between 1-4 hours between coats. Continue building material at 60-200 mils (1.5-5 mm) per coat to specified thickness.

**Avoid using excessive solvent when backrolling as this can lead to solvent entrapment and lengthen the cure time of the material.** Use solvent moistened rollers to back roll material after each subsequent coat to improve finish and level surface if required. Lighter coats will achieve a smoother finish. Contact Carboline Technical Service or refer to the product application manual for more detailed information.

**Wet Film Thickness** Frequent thickness measurements with a wet film gauge are recommended during the application process to ensure uniform thickness.

**Dry Film Thickness** For recommended methods of thickness determination and tolerances refer to: AWCI Technical Manual 12-B (Standard Practice for the Testing and Inspection of Field Applied Thin Film Intumescent Fire Resistive Materials) or SSPC-PA 2 (The Society for Protective Coatings Paint Application Standard No. 2).

### APPLICATION CONDITIONS

Condition	Material	Surface	Ambient	Humidity
Minimum	70°F (21°C)	41°F (5°C)	41°F (5°C)	0%
Maximum	140°F (60°C)	125°F (52°C)	110°F (43°C)	85%

Air and substrate temperature must be at least 41°F (5°C) and rising. Steel surface temperature should be a minimum of 5°F (3°C) above the dew point. The maximum humidity is 85%. Material must be protected from direct rain until it has reached sufficient cure.

### CURING SCHEDULE

Surface Temp.	Touch	Handle	Minimum Recoat Time	Maximum Recoat Time	Minimum Topcoat Time	Maximum Topcoat Time
50°F (10°C)	1 Hour	24 Hours	1 Hour	7 Days	24 Hours	7 Days
70°F (21°C)	30 Minutes	24 Hours	30 Minutes	7 Days	10 Hours	7 Days
95°F (35°C)	30 Minutes	24 Hours	30 Minutes	7 Days	10 Hours	7 Days

\*Above cure times are based on 50% relative humidity. Curing times are dependent upon temperature, air movement and humidity. Lower temperatures will slow down the curing process and increase recoat intervals, higher temperatures will speed up the curing process and shorten the recoat intervals. The material can be heated to achieve a quicker recoating and curing schedule. For optimum curing, it is recommended to apply coats at 60-200 mils (1.5-5 mm) wet per coat. If maximum recoat or topcoat times are exceeded, the surface must be mechanically abraded and solvent wiped prior to applying additional coats. Consult Carboline Technical Service for specific details.

### CLEANUP & SAFETY

#### Cleanup

Flush static mixer, whip hose, gun and tips with hot water or Carboline approved thinner immediately after each use (depending on pump set up). Use Carboline Plasite Thinner 19, Thinner 242E or approved equal for cleaning solvent. Break down static mixer, gun and tip assembly and hand clean.

## CLEANUP & SAFETY

<b>Safety</b>	Read and follow all caution statements on this product data sheet and on the SDS for this product. Employ normal workmanlike safety precautions. Use adequate ventilation. Keep container closed when not in use.
<b>Overspray</b>	All adjacent and finished surfaces shall be protected from damage and overspray.
<b>Ventilation</b>	When used in enclosed areas, thorough air circulation must be used during and after application until the coating is cured. The ventilation system should be capable of preventing the solvent vapor concentration from reaching the lower explosion limit for the solvents used. User should test and monitor exposure levels to insure all personnel are below guidelines. If not sure or if not able to monitor levels, use MSHA/NIOSH approved respirator.

## MAINTENANCE

<b>General</b>	For patches and repairs, the material can be applied by spray or trowel. Repair areas must be abraded back to a firm edge by sanding or scraping. Remove product from areas in need of repair back to solidly adhered material. Ensure that the primer system is still intact as well. If not, the primer system shall be reinstated to its original specification. All edges can be left as butt joints at a 90 degree angle or beveled at a 45 degree angle. The topcoat should be abraded back by 1" (25.4 mm) from the repair area. All edges must be solvent cleaned and allowed to dry before commencing application. It is important that the patch area blends into the existing material to achieve a uniform appearance. The product shall then be troweled or spray applied to the appropriate thickness based on the project specification and fire test certification. Once the material has been allowed to sufficiently cure, the specified topcoat system shall be applied, based on the original specification, in strict accordance with Carboline's written instructions.
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## TESTING / CERTIFICATION / LISTING

<b>Underwriters Laboratories, Inc.</b>	This product has been tested in accordance with the UL Environmental Test Program and is listed and classified by UL for both exterior and interior use.
<b>Intertek</b>	This product has been tested in accordance with ASTM E-119 at Intertek Laboratories and is listed in the following designs: <b>Wide Flange Columns:</b> CC/IF 180-02 <b>HSS Columns:</b> CC/IF 180-03 <b>Restrained / Unrestrained Beams:</b> CC/IF 180-01
<b>City of Los Angeles</b>	Report: RR 25484

## PACKAGING, HANDLING & STORAGE

<b>Packaging</b>	<b>Full Kits:</b> 9.0 gallons (34.0 liters) Part A: 4.5 gallons (17.0 liters) Part B: 4.5 gallons (17.0 liters)
<b>Shelf Life</b>	12 Months Shelf life when kept at recommended storage conditions and in original unopened containers.
<b>Storage</b>	Store indoors in a dry environment between 32-120°F (0-49°C). Can be stored down to 20°F (-7°C) for no longer than 30 days. 0-100% Relative Humidity

# Thermo-Lag<sup>®</sup> E100

## PRODUCT DATA SHEET

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### PACKAGING, HANDLING & STORAGE

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<b>Shipping Weight (Approximate)</b>	11 lb. per gallon (1.3 kg per liter)
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<b>Flash Point (Setaflash)</b>	Part A: 185°F (85°C) Part B: >200°F (>93°C)
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### WARRANTY

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To the best of our knowledge the technical data contained herein is true and accurate on the date of publication and is subject to change without prior notice. User must contact Carboline Company to verify correctness before specifying or ordering. No guarantee of accuracy is given or implied. We guarantee our products to conform to Carboline quality control. We assume no responsibility for coverage, performance, injuries or damages resulting from use. Carbolines sole obligation, if any, is to replace or refund the purchase price of the Carboline product(s) proven to be defective, at Carbolines option. Carboline shall not be liable for any loss or damage. NO OTHER WARRANTY OR GUARANTEE OF ANY KIND IS MADE BY CARBOLINE, EXPRESS OR IMPLIED, STATUTORY, BY OPERATION OF LAW, OR OTHERWISE, INCLUDING MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE. All of the trademarks referenced above are the property of Carboline International Corporation unless otherwise indicated.