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APPEAL SUMMARY

Status: Decision Rendered

Appeal ID: 15957	Project Address: 908 E Burnside St
Hearing Date: 10/11/17	Appellant Name: Kegan Flanderka
Case No.: B-018	Appellant Phone: 503.234.2945
Appeal Type: Building	Plans Examiner/Inspector: Jody Orrison
Project Type: commercial	Stories: 6 Occupancy: A-2, R-1, B, S-1 Construction Type: I-A, V-A
Building/Business Name: Jupiter Hotel	Fire Sprinklers: Yes - 100% Coverage
Appeal Involves: Erection of a new structure	LUR or Permit Application No.: 16-138295-CO
Plan Submitted Option: pdf [File 1] [File 2] [File 3]	Proposed use: Hotel

APPEAL INFORMATION SHEET

Appeal item 1

Code Section OSSC 703.2, 703.3, 704.2

Requires The fire-resistance rating of building elements, components, or assemblies shall be determined in accordance with the test procedures set forth in ASTM E 119 or UL 263 or in accordance with Section 703.3.

Proposed Design The proposed design is a six-story hotel building comprised of two floors of Type IA concrete podium with four floors of Type VA wood-framed construction above. The overall building height will be 73 feet to top of parapet. The two lower floors will house a hotel lobby and restaurant along with an indoor event space and upper lounge and courtyard. The entire building will be equipped with an NFPA 13 automatic sprinkler system throughout and there is a 3-Hr separation between the second and third floors, while the upper four floors will meet the fire rating requirements for Type VA construction.

This appeal is regarding (8) HSS columns located within the exterior walls at the northwest of the building. These columns run through the upper four floors of the Type VA portion of the building and were wrapped in accordance with GA Assembly CM 1451 per OSSC 704.2 inside of a 1-Hr rated wall assembly (see attached detail). However, these HSS columns are 4" x 4" x 1/8" and not the 4" x 4" x 3/16" columns as called out in that assembly. The built assemblies meet all other conditions of CM 1451 other than the HSS thickness.

Using OSSC 703.3 Item #4, a Fire-Engineer's report was produced illustrating 1-Hr equivalency of the assembly in question through comparative analysis (see attached report).

Reason for alternative Being a presently installed and loaded condition, the HSS columns would be very difficult to remove and replace. While technically still an option, the review of the assembly through

comparative analysis provided in the Fire-Engineer's report clearly illustrates 1-Hr equivalency. It is through this report, that the applicant is asking for this assembly to remain as presently installed and be approved as code equivalent per the use of comparative engineering analysis under Item #4 of 703.3.

APPEAL DECISION

Alternate one hour HSS column assembly 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 180 calendar days of the date this decision is published. For information on the appeals process and costs, including forms, appeal fee, payment methods and fee waivers, go to www.portlandoregon.gov/bds/appealsinfo, call (503) 823-7300 or come in to the Development Services Center.

Letter

Date:	October 6, 2017	
To:	Works Partnership Architecture 811 SE Stark Street, S210 Portland, OR 97214 Sent via email	
Attention:	Kegan Flanderka Associate	
From:	David Gessert, P. E. Fire Protection Engineer	
Subject/Project:	Jupiter Hotel Hollow Structural Steel Column Fire Protection Opinion of Fire Resistance	
Job No.:	2017-50	

Total Pages: 5

Introduction/Executive Summary

Hollow Structural Steel (HSS) 4x4x1/8 columns are protected by two layers of ½ inch Type X gypsum board at the Jupiter Hotel project. The two gypsum board layers easily provide one-hour of fire resistance based on comparison to GA File No. WP 1204 and analysis of the W/D ratios for the column and the steel stud specified in GA File No. WP 1204. The W/D ratio is weight per linear foot of the steel section divided by the heated perimeter. This ratio is a value that corresponds to how fast a steel member will increase in temperature when exposed to heat. The higher the ratio the slower the member will heat.

HSS Column Fire Protection – Opinion of Fire Resistance

Refer to detail 11, a0.03, Jupiter Hotel, Typical 1Hr Rated Column Detail @ Exterior Walls. This detail shows a HSS 4x4x1/8" column covered on four sides with two layers of ½ inch Type X gypsum board. This entire assembly is inside an exterior wall that has one-hour fire resistance construction from both sides. See Appendix for detail.

Determination of fire resistance is allowed by engineering analysis based on comparison. See *Oregon Structural Specialty Code (OSSC) 2014 Edition 703.3 Item 4*. See Appendix for code section.

Refer to GA File No. WP 1204. This assembly shows two layers of ½ inch Type X gypsum board over 3 ½ inch 20 gage steel studs 24 inch o. c. The head line of this file shows 1-hour fire resistance but in the body of the description it is noted that the assembly passed the 90-minute fire test and is load bearing. See Appendix for GA File No. WP 1204.

For the HSS 4x4x1/8 column its W/D ratio is 0.38 per the W/D, M/D, A/P Tables published by the Carboline Company.

A published W/D ratio for the 3 ½ inch 20 gage steel stud is not available. A calculated W/D ratio is provided here:



For the 3 ½ inch 20 gage steel stud:

Web = 3 ½ inches
Flange = 1 ¼ inches
Lip Return = ¼ inch

$$W \text{ calculated} = [(3 \frac{1}{2} + 1 \frac{1}{4} + \frac{1}{4}) \times 12] / 144 \times 1.5 = 0.625$$

$$W = \text{Weight of steel section (lb/ft)} = 0.6273 \text{ per supplier}$$

Engineer's Note: Use supplier's value

D = Heated perimeter of steel section in inches

$$D = 2 \times (3 \frac{1}{2} + 1 \frac{1}{4} + \frac{1}{4}) = 10 \text{ inches}$$

$$W/D \text{ for the } 3 \frac{1}{2} \text{ inch 20 gage steel stud} = 0.6273 / 10 = 0.063$$

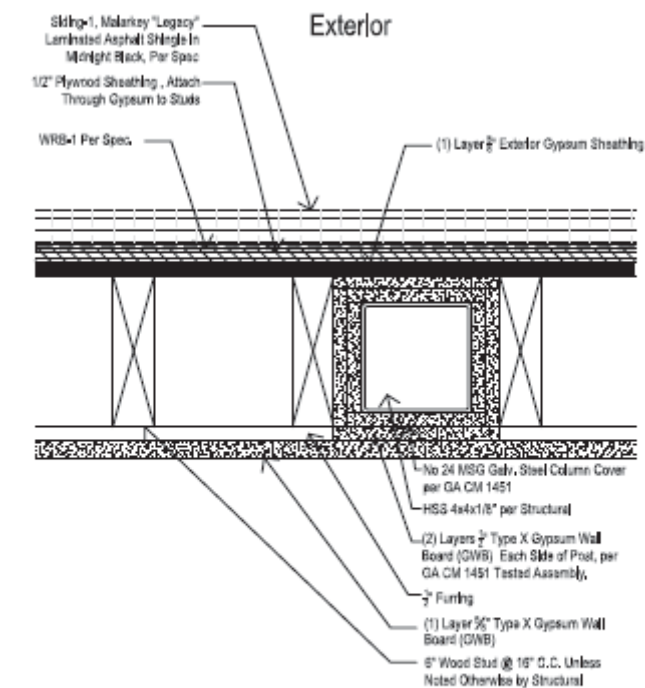
When comparing the W/D ratios for the HSS 4x4x1/8 (0.38) and for the steel stud (0.063) we see that the HSS column will increase in temperature much slower than the steel stud when exposed to fire conditions. This is a positive attribute in the comparison and supports the conclusion that the 2 layers of gypsum board provide more than one hour of fire resistance for the HSS column.

Conclusion

Per analysis of GA File No. WP 1204 and the W/D ratios, 2 layers of ½ inch Type X gypsum board easily provides one hour of fire resistance for the HSS column.

Appendix

Detail 11, a0.03, Jupiter Hotel Typical 1Hr Rated Column Detail @ Exterior Walls



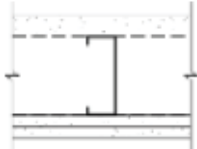
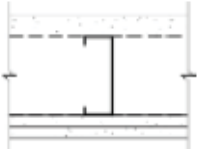
OSSC-2014 703.3

703.3 Alternative methods for determining fire resistance.

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 E 119 or UL 263. The required *fire resistance* of a building element, component or assembly shall be permitted to be established by any of the following methods or procedures:

1. Fire-resistance designs documented in sources.
2. Prescriptive designs of fire-resistance-rated building elements, components or assemblies as prescribed in Section 721.
3. Calculations in accordance with Section 722.
4. 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 E 119 or UL 263.
5. Alternative protection methods as allowed by Section 104.11.

GA File No. WP 1204

GA FILE NO. WP 1204	GENERIC	1 HOUR FIRE	40 to 44 STC SOUND
GYPSUM WALLBOARD, STEEL STUDS Base layer 1/2" type X gypsum wallboard or gypsum veneer base applied parallel to each side of 3 1/2" 20 gage steel studs 24" o.c. with 1 5/8" Type S-12 drywall screws 12" o.c. Face layer 1/2" type X gypsum wallboard or gypsum veneer base applied parallel to each side with 1 5/8" Type S-12 drywall screws 12" o.c. Studs attached to each side of floor and ceiling runners by welding or with 1/2" Type S-12 pan head screws. Joints staggered 24" each layer and side. Bracing: Lateral bracing spaced not over 40" o.c. shall be 1" by 18 gage steel straps attached to each side or channel bracing attached to each stud with a clip angle. For studs with holes or punch-outs in the web the "Q" factor shall be determined by means of stub column tests. Tested at 100 percent of design load. (Passed 90 minute fire test.) (LOAD-BEARING)			
		Thickness: 5 1/2" Approx. Weight: 9 psf Fire Test: UL NC 505-1, 7-29-82, UL Design U425 Sound Test: See WP 1615 (NGC 2250, 1-3-68)	

References

Detail 11, a0.03, Jupiter Hotel, Typical 1Hr Rated column Detail @ Exterior Walls, As emailed on 10/04/17, Works Partnership Architecture, Portland, Oregon

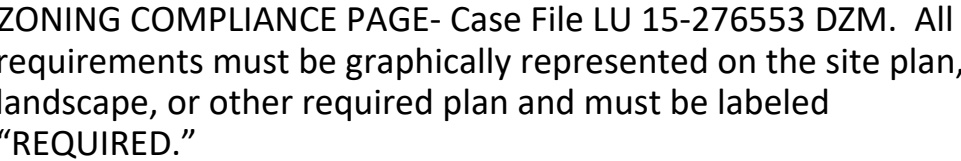
Fire Resistance Design Manual, 19th Edition, GA-600-2009, Gypsum Association, Hyattsville, Maryland

Gauge and Weight Chart for Sheet Steel, Galvanized Steel, Stainless Steel and Aluminum, 2017, Greenheck, Schofield, Wisconsin

Oregon Structural Specialty Code, 2014 Edition, International Code Council, Country Club Hills, Illinois

W/D, M/D, A/P Tables, June 7, 2007, Carbolite Fireproofing Division, St. Louis, Missouri

End of Report



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W.PA job number: 1170

Revisions:	Date:	Issue:
	09.25.2017	△ CCD #3
	09.25.2017	△ ASI #2b
	05.12.2017	△ ASI #5
	05.12.2017	△ ASI #6
	05.16.2017	△ ASI #7
	06.22.2017	
100% CD Set		12.14.2016

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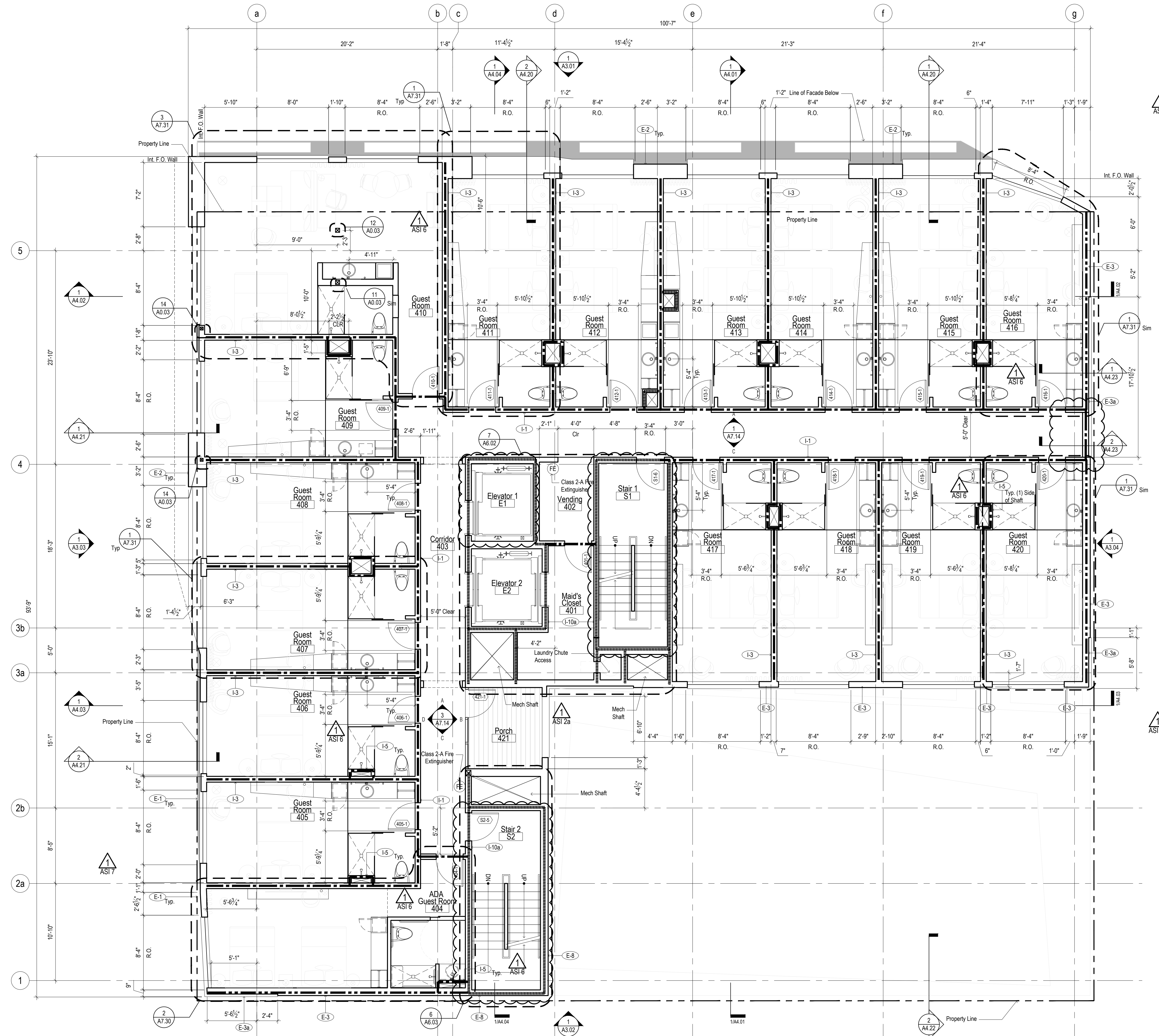
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Third Floor Plan

Sheet Number: _____

ASI 5 CCD 3

a2.03



ZONING COMPLIANCE PAGE- Case File LU 15-276553 DZM. All requirements must be graphically represented on the site plan, landscape, or other required plan and must be labeled "REQUIRED."

1
ASI 7

1
ASI 20

- General Plan Notes:
1. Reference Sheet g0.01 for Dimensioning Standards and Abbreviations.
 2. Grid Dimensions to Centerline of Structure U.N.O.
 3. Reference Sheet g0.01 for Accessibility Standards and Device Locations.
 4. Reference Sheets a0.01 & a0.02 for Wall and Ceiling Types.
 5. Reference Sheet a0.03 for Door Types and Schedule
 6. Reference Sheet a0.04 for Window Types and Schedule
 7. Reference Sheet a4.20-a4.23 for Wall Sections, Exterior Wall Assemblies and Glazing Systems
 8. Reference Building Elevations for Window Type Locations
 9. Reference Structural Drawings for Structural Framing Sizes and Details
 10. Reference a7.00s for Enlarged Plans and Elevations
 11. Reference Spec for Product Information and Installation Requirements

Fire Rated Separations

1 HR FIRE BARRIER

2 HR FIRE BARRIER

3 HR FIRE BARRIER

1
a2.04 Fourth Floor Plan (17 Rooms)
3/16"=1'-0"

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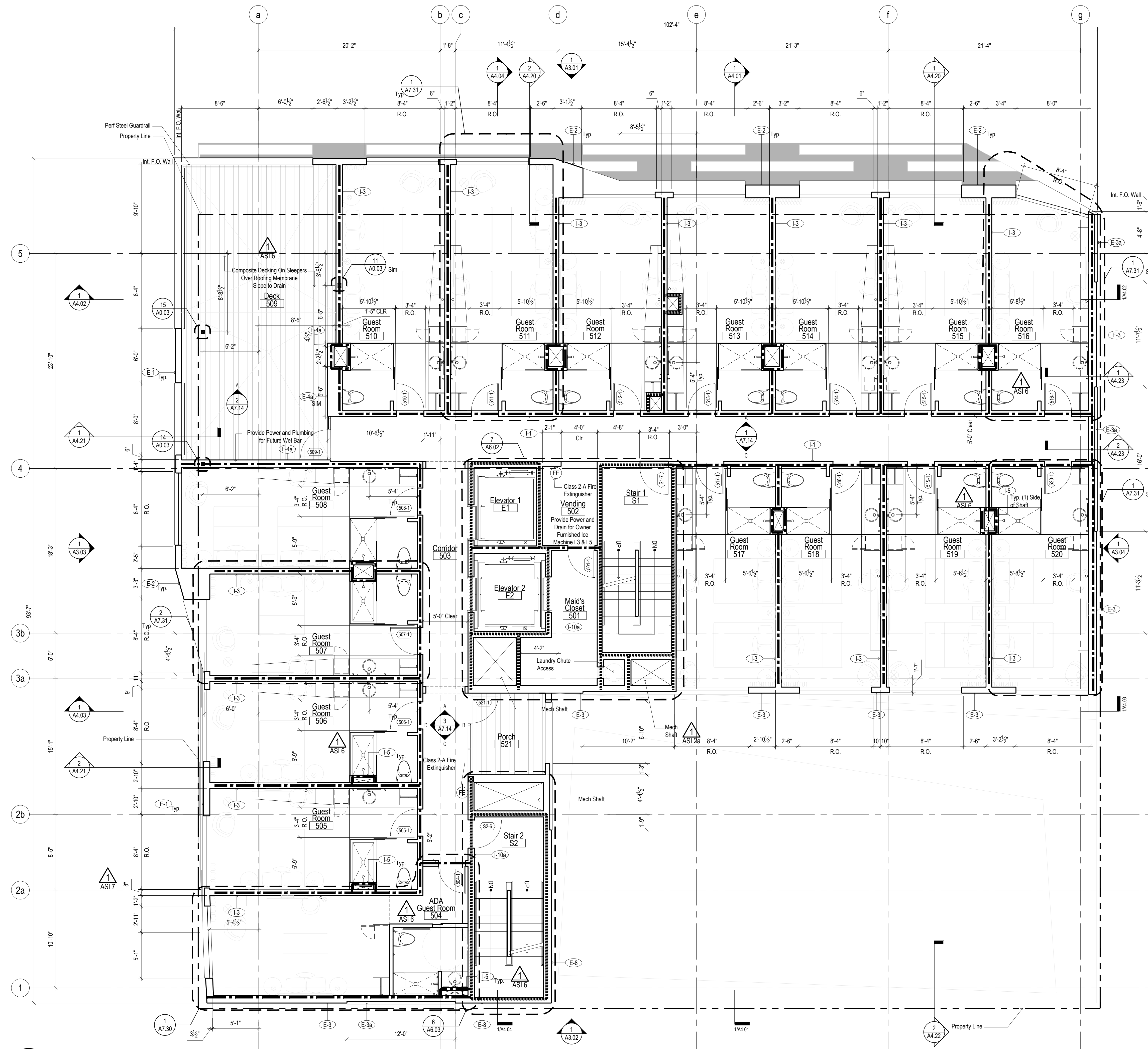
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Revisions:	Issue:	100% CD Set
Date:	09.25.2017	12.14.2016
	05.02.2017	
	05.12.2017	
	05.16.2017	
	06.22.2017	

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Sheet Title:
Fourth Floor Plan
Sheet Number:

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CCI 3
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Fire Rated Separations

1 HR FIRE BARRIER

2 HR FIRE BARRIER

3 HR FIRE BARRIER

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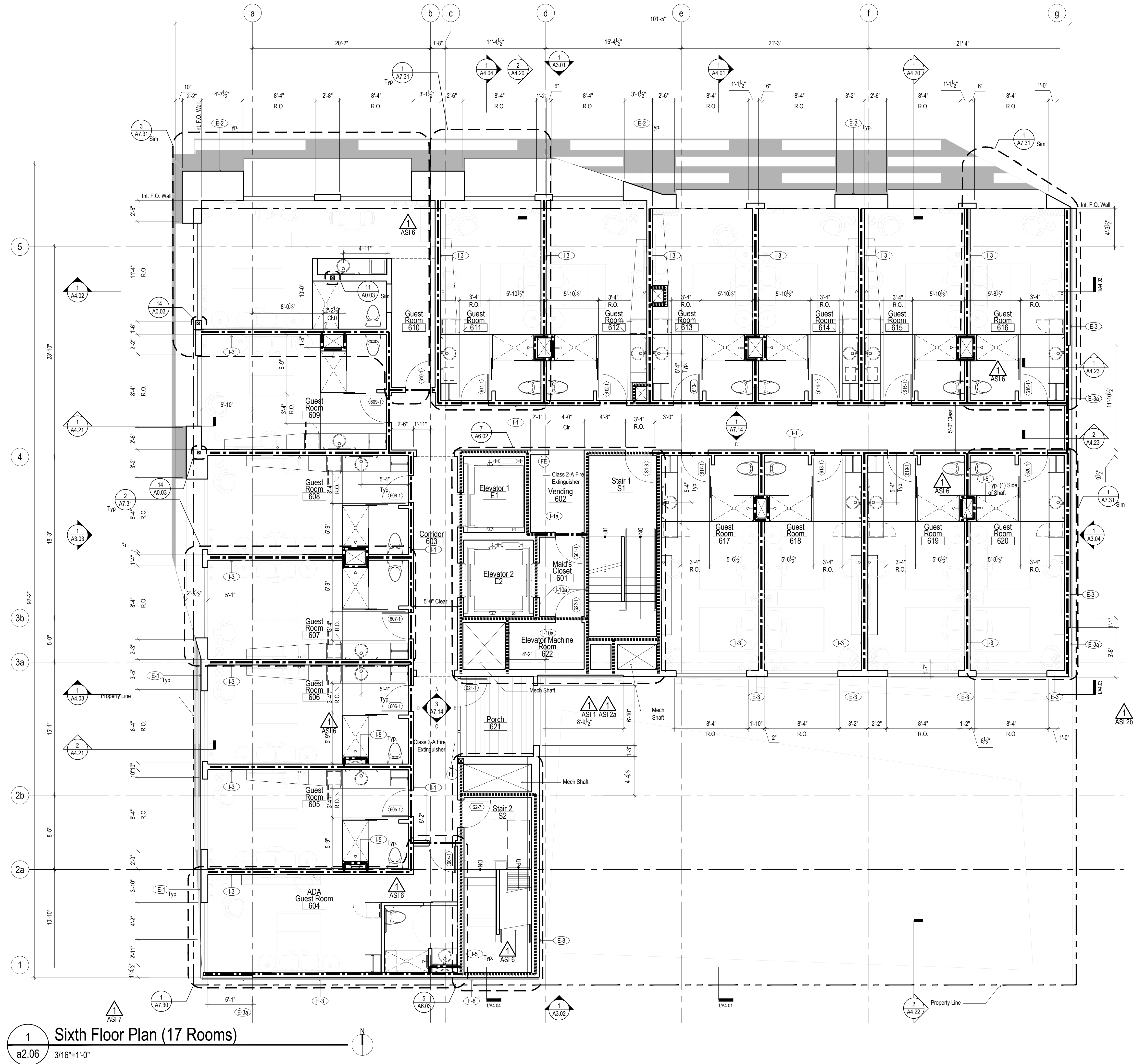
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09.25.2017	1 A4.02
05.02.2017	2 A7.14
05.12.2017	3 A4.21
05.16.2017	4 A7.31
06.22.2017	5 A3.04

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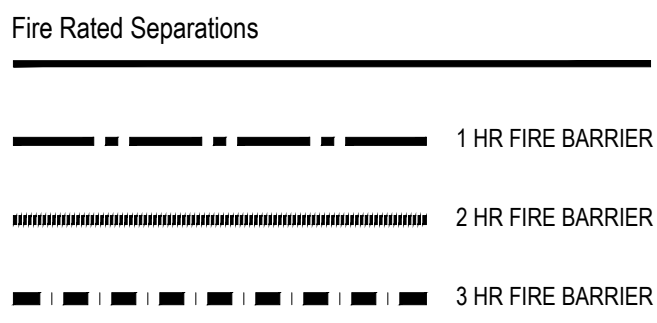
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Fifth Floor Plan
Sheet Number:

a2.05



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09.22.2017	CCD #3	
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05.12.2017	ASI #5	
05.16.2017	ASI #6	
06.22.2017	ASI #7	

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Sheet Title:
Sixth Floor Plan
Sheet Number:

1
ASI 5
2
CCD 3
a2.06

