

Oregon Seismic Status Report - 2019



Oregon law requires school districts and education service districts to provide DOGAMI with notice of construction projects that may affect a school's seismic risk.

This report was generated by DOGAMI from submitted data.

School District/ESD: Portland 1J

County: MULTNOMAH

Contact Name: Steve Kasel

Contact Email: skasel@pps.net

Structures Replaced? No

Name and Address:

Kind of Structure:

Type of
Replacement:

Max Occupancy:

Date Occupied:

Structures Modified? Yes

Name and Address: Beverly Cleary Fernwood Middle School, 1915 NE 33rd Ave, Portland, OR 97212

Kind of Structure: This project was a roof replacement and roof-level seismic upgrade that took place in 2018.

Type of Modification: Structural reinforcement at roof/parapet walls.

Date Re-occupied: 08/20/18

Optional:

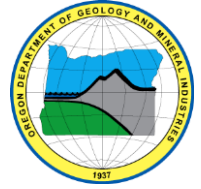
Engineering Report? No *If yes, attachments are appended to this report.*

Cost of Rehab: Approx \$2,750,000

Method of Funding: Taxpayer voted bond funds

Notes:

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School District/ESD: Portland 1J

County: MULTNOMAH

Contact Name: Marina Cresswell

Contact Email: mcresswell@pps.net

Structures Replaced? Yes

Name and Address: Grant High School, 2245 NE 36th Ave., Portland, OR 97212

Kind of Structure: Main Gym, Science Bld., Library, and the Portable buildings.

Type of Replacement: There was 67,626 sf of the school that was demolished, and it was replaced by 44,054 sf (the new gym) of Type IIB construction, and 47,672 sf (the addition) of Type IA construction.

Max Occupancy: The maximum occupancy of the new structure is unknown. What is known is that the total sf of the new and remodeled structure combined is 293,450, and the total maximum non-simultaneous occupant load for the entire building is 5005 occupants.

Date Occupied: 08/28/19

Structures Modified? Yes

Name and Address: Grant High School, 2245 NE 36th Ave., Portland, OR 97212

Kind of Structure: The main building and the old Auxiliary Gym.

Type of Modification: Full seismic upgrade including all new fire sprinkler, plumbing, HVAC, electrical, and solar array systems, and all new interior finishes.

Date Re-occupied: 08/28/19

Optional:

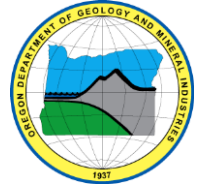
Engineering Report? No *If yes, attachments are appended to this report.*

Cost of Rehab: I don't have this information readily available since the steel and concrete work was a combination of new construction and seismic rehabilitation of the existing structure.

Method of Funding: The total cost of the project was approx \$158 million. \$3 million came from SRGP grants and the rest was funded by the 2012 Bond.

Notes:

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School District/ESD: Portland 1J

County: MULTNOMAH

Contact Name: Steve Kasel

Contact Email: skasel@pps.net

Structures Replaced? No

Name and Address:

Kind of Structure:

Type of
Replacement:

Max Occupancy:

Date Occupied:

Structures Modified? Yes

Name and Address: Hayhurst Elementary School, 5037 SW Iowa St, Portland, OR 97221

Kind of Structure: 2 Year Project (2019 and 2020). 2019: Interior-level seismic upgrade of entire north wing of classrooms (13) and gym.

Type of Modification: Structural reinforcement

Date Re-occupied: 08/20/19

Optional:

Engineering Report? Yes *If yes, attachments are appended to this report.*

Cost of Rehab: \$3,184,000

Method of Funding: Funded through a grant provided by The Seismic Rehabilitation Grant Program

Notes:



PORTLAND PUBLIC SCHOOLS HAYHURST ELEMENTARY SCHOOL

PORTLAND PUBLIC SCHOOL DISTRICT
5037 SW IOWA ST.
PORTLAND, OR 97221

SEISMIC EVALUATION AND CONCEPTUAL SEISMIC STRENGTHENING DESIGN

JANUARY 5, 2018

KPFF PROJECT No. 10021701183



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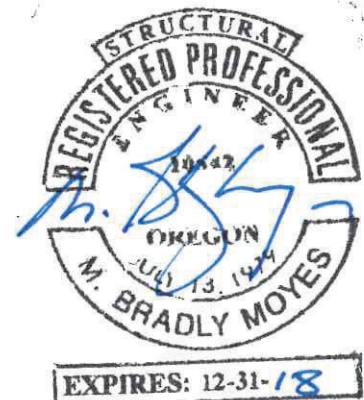


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Table 1: Project Summary Information						
Building Part	Building Part Name	Included in Retrofit	Year Built	Building Type	Nonstructural Retrofits Included in Scope Y/N	Previous Seismic Retrofit Y/N (Year if Yes)
A	Classroom Wings and Entry Hall	Y	1954	W2	Y	Y (2015)
B	Gymnasium	Y	1954	URM	Y	Y (2015)
C	Cafetorium	Y	1954	C2	Y	Y (2015)
Total Retrofit Cost		\$3,695,101				
Retrofit Square Feet		48,409				
Retrofit Cost per Square Foot		\$76.33				
Is the campus within a tsunami, FEMA flood zone or other high hazard area?						No

PROJECT SUMMARY

Introduction and Project Scope

Hayhurst Elementary School is located in Portland, Oregon at 5037 SW Iowa Street. The school consists of a single, one-story building constructed in 1954. KPFF Consulting Engineers was contracted to perform a seismic investigation of the structure and to provide a conceptual strengthening scheme for pricing. American Society of Civil Engineers (ASCE) Standard 41-13, *Seismic Evaluation and Retrofit of Existing Buildings* was used to complete the evaluation and strengthening scheme.

KPFF used an ASCE 41-13 Tier 1 Screening as an evaluation tool and as a guideline to develop the conceptual seismic strengthening scheme. The recommended strengthening scheme provides rehabilitation of the seismic resisting system to an Immediate Occupancy Performance Level and mitigation of nonstructural hazards to a Position Retention Performance Level.

The seismic evaluation included a review of the original structural drawings and an assessment of observable structural conditions. Our review and the findings presented herein are limited to those conditions and components for which sufficient information could be found within the original structural drawings and confirmed on-site by the visual observations of KPFF personnel.

Observations, analyses, conclusions, and recommendations contained within this report reflect our engineering judgment. Concealed problems with the construction of the building may exist that cannot be revealed through drawings and photos alone. Therefore, KPFF can in no way warrant or guarantee the condition of the existing construction of the building, or the future building performance.

Building Description

Hayhurst Elementary School consists of a one-story building constructed in 1954. The building is U-shaped in plan with two classroom wings. The portion of the building which connects the two wings contains a gymnasium and a cafeteria. There are no immediate adjacent structures to the school.

The classroom wings roof framing consists of glu-lam beams oriented in the east-west direction supporting 2x wood joists and 1x diagonal sheathing. The glu-lam beams are supported by wood posts. At the exterior wall of the wings, the joists are supported by wood headers over the window spanning between wood posts. The floor of the teaching wing is a concrete slab-on-grade.

The gymnasium and cafeteria roof framing consists of wood trusses supporting wood joists and diagonal sheathing with plywood overlay added in 2015. The trusses are supported by concrete pilasters at the perimeter of these areas. The exterior walls of the gym are ungrouted concrete masonry units (CMU). The exterior walls of the cafeteria are reinforced concrete. The floor of the gymnasium and cafeteria is a concrete slab-on-grade.

Throughout the building, foundations consist of concrete stem walls supported by concrete strip footings, both of which contain steel reinforcing. The floor is a 4-inch thick concrete slab-on-grade with welded wire fabric reinforcing.

A site survey of the building revealed that the existing documents for the building are generally accurate for the original construction. Alterations to the original structure appear to be minor.

Figure 1 indicates the building parts as reported for the BCA, the designation is as follows:

- Part A – Remaining
- Part B – Gymnasium
- Part C – Cafetorium

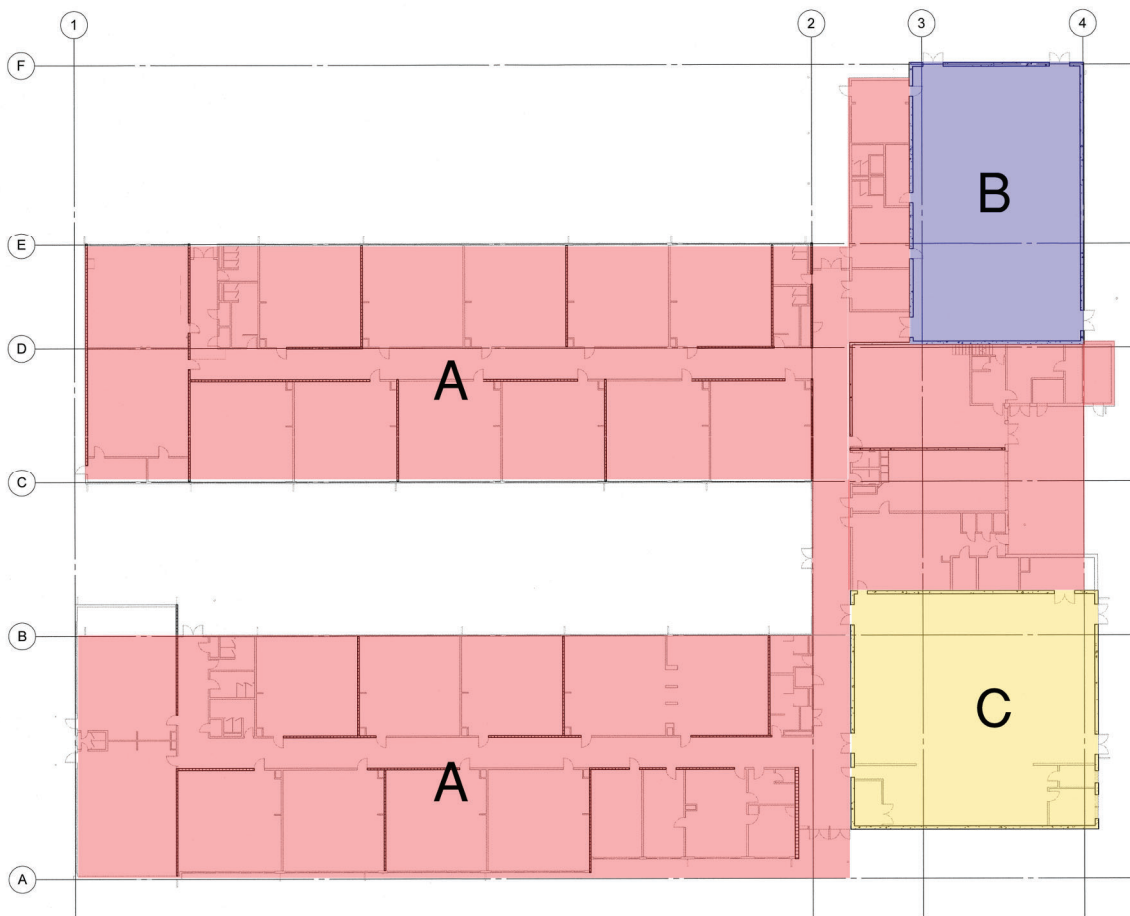


Figure 1 – Building Parts



South Elevation 1



West Elevation



South Elevation 2



East Elevation

OBSERVATIONS

Site Reconnaissance

KPFF conducted a site survey of the school to verify the general conformance of the existing documents and general building condition. The existing drawings appear to be generally accurate based on the visual observation of construction readily accessible to view.

Document Review

The following documents were available for review:

Drawings

- 1954 – Elizabeth Hayhurst School, dated 3/19/54
- 1997 – Hayhurst Elementary School – PPS Facilities Improvement Program, dated 4/17/00
- 2015 - Hayhurst Elementary School – PPS Facilities Improvement Program 2015, dated 3/4/15

Reports

- 1999 - FEMA 178 Study of Hayhurst School, by Miller Consulting Engineers, (excerpts only)
- 2002 - Hayhurst Elementary School: Facility Record Binder, by James G. Pierson, Inc., dated 2002.
- 2009 - Portland Public Schools: Historic Building Assessment, by Entrix, dated 10/09
- 2010 - Portland Public Schools: Roof Assessment (excerpts for Hayhurst), by Professional Roof Consultants, Inc., dated 2010

STRUCTURAL EVALUATIONS

Hayhurst Elementary School was evaluated using ASCE 41-13, *Seismic Evaluation and Retrofit of Existing Buildings*. ASCE 41-13 defines two levels of ground motions (BSE-1E and BSE-1N). The BSE-1E ground motions are lower than the BSE-1N ground motions and are intended to be used for existing buildings since they will likely have a shorter continued life span than a new building. In the Portland area, there is an approximate 40% reduction from the BSE-1N values down to the BSE-1E values. The City of Portland and the Seismic Rehabilitation Grant Program has placed a 25% cap on the reduction in ground motions that can be taken from the BSE-1N level.

The target for rehabilitation was to achieve an Immediate Occupancy Performance Level for the BSE-1E event. This performance level assumes the following from a design earthquake event:

- (a) Post-earthquake damage state in which only very limited structural damage has occurred.
- (b) Basic vertical and lateral-force-resisting systems of the building retain nearly all of their pre-earthquake strength and stiffness.
- (c) Risk of life-threatening injury as a result of structural damage is very low, and although some minor structural repairs might be appropriate, these would generally not be required prior to re-occupancy.
- (d) Continued use of the building will not be limited by its structural condition.

The basis for this performance level evaluation comes from ASCE 41-13 which approaches the evaluation with a three-tier process. For this report, a Tier 1 Screening was performed. The three tiers are as follows:

Tier 1 – Screening: This procedure includes completing checklists for the structure and nonstructural items (reference Appendix A). During this phase, a review is performed utilizing available construction documents. In addition to the construction plans, a site visit is made to assess the condition for the existing structure for deterioration of the structure and finishes, and compare the existing structure to the information provided in available drawings.

Tier 2 – Deficiency-Based Evaluation: The Tier 2 deficiency-based evaluation is an option which includes additional analysis and evaluation of all the potential deficiencies identified with a Tier 1 Screening. A Tier 2 evaluation was beyond the scope of this project.

Tier 3 – Systematic Evaluation: The Tier 3 systematic procedure involves an analysis of the entire building and is required for building exceeding a certain height for a particular building Type. A Tier 3 evaluation was not required for this building.

Analyses performed as part of the Tier 1 screening process are limited to Quick Checks. Quick Checks are simple analysis procedures used to calculate the stiffness and strength of certain building components. Some of the Quick Checks utilize a total seismic force, termed the *Pseudo Seismic Force*, by ASCE 41-13 for Tier 1. Calculation of the *Pseudo Seismic Force* is based on a formula that utilizes geographic seismicity, mass of the building, stiffness, and structural building type. The base shear is then distributed to each level of the structure based on a weighted proportion of each level's mass and height above the ground.

The seismic analysis considers the following spectral response accelerations with Site Class D soils:

- 75% of BSE-1N:
 - $S_{xs, BSE-1N_{75\%}} = 0.549g$
 - $S_{x1, BSE-1N_{75\%}} = 0.338g$

The site is classified as having a High Level of Seismicity per ASCE 41-13.

ASCE 41-13 Evaluation Findings

Structural Performance

The building's seismic performance was assessed in accordance with ASCE 41-13. The classroom wings of the building are classified as wood light frames (Building Type W1). The gymnasium portion of the building is classified as unreinforced masonry with flexible diaphragms (Building Type URM). The cafetorium is classified as Concrete Shear Walls with Flexible Diaphragms (Building Type C2A). The appropriate Tier 1 checklists for this building type in a high seismicity region are provided in Appendix A of this report. Below is a summary of the items that were found to be nonconforming in the classroom wings, gymnasium and cafetorium along with comments and/or recommendations. In accordance with an ASCE 41-13 assessment, these items require mitigation.

1: Masonry Anchors (Gymnasium and Cafetorium)

Masonry veneer shall be connected to the back-up system with corrosion-resistant ties. The condition of the brick ties is unknown. It is recommended to add helical anchors to tie the stone back to the structure to prevent a falling hazard in select locations around exits.

2: Shear Walls (Classroom Wings)

- 2a. Shear Stress Check – This criterion requires there to be enough length of existing shear walls to resist the lateral forces. Additional shear walls should be added to resist the total seismic load. The strengthening scheme adds new shear wall elements.
- 2b. Diagonally Sheathed and Unblocked Diaphragms – This criterion requires that all diagonally sheathed diaphragms shall have horizontal spans less than 30 feet. Both classroom wing roof diaphragms are diagonally sheathed and exceed this span criterion. The strengthening scheme adds shear wall elements to reduce the diaphragm spans to acceptable distances.

3: Gymnasium Walls

- 3a. Shear Stress Check – This criterion requires there to be enough length of existing shear walls to resist the lateral forces. Shear walls should be reinforced for shear. The strengthening scheme adds FRP reinforcement to all four walls.
- 3b. Proportions – This criterion requires the height to thickness ratio of the shear walls be less than 13 to avoid out-of-plane failures of the wall framing. The height of the existing CMU walls does not meet this requirement. The strengthening scheme will retrofit the walls by adding vertical reinforcement in the wall.
- 3c. Truss Supports – This criterion requires that there be an independent secondary column supporting roof trusses. The roof trusses are not supported by independent framing. The strengthening scheme will retrofit the walls by adding vertical reinforcement in the wall.

4: Infill Wall Table Pockets (Cafetorium)

Wall Reinforcement at Openings – This criterion requires trim reinforcement around all wall openings. FRP reinforcement should be installed around all exterior wall window openings. Dowel and infill wall table pockets in exterior walls.

5: Collector Detail

Collectors are required to transfer shear forces to new exterior shear walls.

6: Boiler Room Mezzanine

Mezzanines – This criterion requires that mezzanines are braced independently or tied to the main structure's seismic resisting system. Reinforcement of the boiler room mezzanine west wall (adding plywood to the west wall) and connections to the roof diaphragm is required.

7: Lower Roof Diaphragm

Wall Anchorage – This criterion requires that there be adequate anchorage of roof diaphragms to exterior concrete or masonry walls. Connections of classroom low roof diaphragms to gym and cafetorium exterior walls requires reinforcement.

8: Gym Roof Diaphragm

Diaphragm Shear Strength – The existing diaphragm is required to resist increased loading for Immediate Occupancy Performance Level. The Gymnasium and Cafeteria roof diaphragms were upgraded to a Life Safety Performance Level in 2015. The north and south sections of the gym roof should be reinforced for the increased shear demand to the Immediate Occupancy Performance Objective.

9: Gym Roof Diaphragm Connections

Reinforcement of the in-plane shear connections at the north and south walls supporting the upgraded roof diaphragm is required to meet the Immediate Occupancy Performance Objective.

Geologic Site Hazards

The building's Geologic and Site Hazards were evaluated based on visual observations of the site and experience with other projects in the general area. The appropriate Tier 1 checklist is provided in Appendix A of this report. KPFF Consulting Engineers recommends completing a geotechnical report prior to final design.

Nonstructural Components

The building's nonstructural components were evaluated based on the requirements of ASCE 41-13. The appropriate Tier 1 checklists are provided in Appendix A of this report and a summary of the findings are listed below:

- Fall-Prone Contents and Equipment – Unbraced equipment included boilers and a tank in the boiler room. Items weighing more than 20 pounds with a center of mass more than 4 ft. above the adjacent floor will be seismically braced.
- Light Supports – Light fixtures shall be supported independently of the suspended ceiling system.
- Lens Covers – Lens covers shall be attached with safety devices.
- Suspended Contents and Equipment – Items suspended without lateral bracing are free to swing from or move with the structure without damaging itself or adjoining components.
- Heavy Equipment – Floor or platform supported equipment weighing more than 400 lb shall be anchored to the structure.
- Conduit Couplings – Fluid and gas piping and electrical conduits greater than 2.5 in. shall have flexible couplings or connections.
- Fluid and Gas Piping – Fluid and gas piping is anchored and braced to the structure.
- C-Clamps – One-sided C-clamps that support piping larger than 2.5 in. shall be restrained.
- Duct Bracing and Support – Rectangular ducts larger than 6 ft² in area and round ducts larger than 28 in. diameter are braced at a spacing not exceeding 30 ft. transversely and 60 ft. longitudinally. Ducts shall not be supported by piping or electrical equipment.

GENERAL SUMMARY AND RECOMMENDATIONS

Based on the ASCE 41-13 Tier 1 screening, Hayhurst Elementary School presently has deficiencies that could result in localized hazards, or partial or total collapse of the structure in a major seismic event. Significant deficiencies include: in-plane shear failure of wood shear walls at the classroom wings, in-plane shear failure of unreinforced masonry at the gymnasium and out-of-plane failure of unreinforced masonry at the gymnasium.

KPFF Consulting Engineers recommends strengthening the structure to an Immediate Occupancy Performance Level. Refer to Appendix B for the proposed strengthening scheme. All of the seismic deficiencies are included in the retrofit scope of work and all of the retrofit's scope of work elements are included in the cost estimate.

The proposed details contained in this report represent a cost effective solution for the Hayhurst Elementary School seismic upgrade.

The BCA spreadsheet fragility curves were adjusted for all portions of the building to account for the diaphragm strengthening work that occurred in 2015. The slight damage and moderate damage states were adjusted to reflect this strengthening. Due to the nature of the remaining deficiencies, particularly in the URM porting of the building, the diaphragm strengthening alone does not change the extensive and complete damage states.

APPENDIX A

ASCE 41-13 CHECKLISTS

ASCE 41-13 Tier 1 Checklists

FIRM:	KPFF Consulting Engineerings
PROJECT NAME:	PPS Hayhurst ES
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21701183
COMPLETED BY:	JR
DATE COMPLETED:	December 18, 2017
REVIEWED BY:	
REVIEW DATE:	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

16.1 Basic Checklist

Very Low Seismicity

Structural Components

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)	

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16.1.2IO Immediate Occupancy Basic Configuration Checklist

Very Low Seismicity

Building System

General

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LOAD PATH: The structure shall contain a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation. (Commentary: Sec. A.2.1.1. Tier 2: Sec. 5.4.1.1)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 4% of the height of the shorter building. This statement need not apply for the following building types: W1, W1A, and W2. (Commentary: Sec. A.2.1.2. Tier 2: Sec. 5.4.1.2)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)	Mezzanine floor at boiler room does not have adequate seismic support on west side. Wall sheathing and reinforcement of diaphragm attachments required.

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Building Configuration

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction shall not be less than 80% of the strength in the adjacent story above. (Commentary: Sec. A.2.2.2. Tier 2: Sec. 5.4.2.1)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	SOFT STORY: The stiffness of the seismic-force-resisting system in any story shall not be less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above. (Commentary: Sec. A.2.2.3. Tier 2: Sec. 5.4.2.2)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines. (Commentary: Sec. A.2.2.5. Tier 2: Sec. 5.4.2.4)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	MASS: There is no change in effective mass more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension. (Commentary: Sec. A.2.2.7. Tier 2: Sec. 5.4.2.6)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Low Seismicity

Geologic Site Hazards

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary: Sec. A.6.1.1. Tier 2: 5.4.3.1)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such failures or is capable of accommodating any predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)	

Moderate and High Seismicity

Foundation Configuration

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Project Name _____

Project Number _____

C	NC	N/A	U	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C. (Commentary: Sec. A.6.2.2. Tier 2: Sec. 5.4.3.4)

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

ASCE 41-13 Tier 1 Checklists

FIRM:	KPFF Consulting Engineers
PROJECT NAME:	PPS Hayhurst ES
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21701183
COMPLETED BY:	JR
DATE COMPLETED:	December 18, 2017
REVIEWED BY:	
REVIEW DATE:	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

16.310 Immediate Occupancy Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

Very Low Seismicity

Seismic-Force-Resisting System

RATING				DESCRIPTION	COMMENTS								
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)									
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	<p>SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1):</p> <table style="width: 100%; border: none;"> <tr> <td style="padding-left: 20px;">Structural panel sheathing</td> <td style="text-align: right;">1,000 lb/ft</td> </tr> <tr> <td style="padding-left: 20px;">Diagonal sheathing</td> <td style="text-align: right;">700 lb/ft</td> </tr> <tr> <td style="padding-left: 20px;">Straight sheathing</td> <td style="text-align: right;">100 lb/ft</td> </tr> <tr> <td style="padding-left: 20px;">All other conditions</td> <td style="text-align: right;">100 lb/ft</td> </tr> </table>	Structural panel sheathing	1,000 lb/ft	Diagonal sheathing	700 lb/ft	Straight sheathing	100 lb/ft	All other conditions	100 lb/ft	
Structural panel sheathing	1,000 lb/ft												
Diagonal sheathing	700 lb/ft												
Straight sheathing	100 lb/ft												
All other conditions	100 lb/ft												
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)									
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used as shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building. (Commentary: Sec. A.3.2.7.3. Tier 2: Sec. 5.5.3.6.1)									

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor. (Commentary: Sec. A.3.2.7.5. Tier 2: Sec. 5.5.3.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-2. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec. A.3.2.7.7. Tier 2: Sec. 5.5.3.6.4)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces. (Commentary: Sec. A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input checked="" type="checkbox"/>	HOLD-DOWN ANCHORS: All shear walls have hold-down anchors, constructed per acceptable construction practices, attached to the end studs. (Commentary: Sec. A.3.2.7.9. Tier 2: Sec. 5.5.3.6.6)	Install anchorages with additional shear walls.

Connections

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec. A.5.3.3. Tier 2: Sec. 5.7.3.3)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Foundation System

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil. (Commentary: Sec.A.6.2.3.)	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
C	NC	N/A	U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another shall not exceed one story high. (Commentary: Sec. A.6.2.4)	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Low, Moderate, and High Seismicity

Seismic-Force-Resisting System

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 1.5-to-1 are not used to resist seismic forces. (Commentary: Sec. A.3.2.7.4. Tier 2: Sec. 5.5.3.6.1)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Diaphragms

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. Wood commercial and industrial buildings may have rod-braced systems. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Connections

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: Sec. A.5.3.7. Tier 2: Sec. 5.7.3.3)	Sill bolts are typically at 5' spacing. Install compliant sill bolts with new shear walls.
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

ASCE 41-13 Tier 1 Checklists

FIRM:	KPFF Consulting Engineers
PROJECT NAME:	PPS Hayhurst ES
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21701183
COMPLETED BY:	JR
DATE COMPLETED:	December 18, 2017
REVIEWED BY:	
REVIEW DATE:	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

16.10IO Immediate Occupancy Structural Checklist for Building Types C2: Concrete Shear Walls with Stiff Diaphragms and C2a: Concrete Shear Walls with Flexible Diaphragms

Very Low Seismicity

Seismic-Force-Resisting System

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	COMPLETE FRAMES: Steel or concrete frames classified as secondary components form a complete vertical-load-carrying system. (Commentary: Sec. A.3.1.6.1. Tier 2: Sec. 5.5.2.5.1)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	SHEAR STRESS CHECK: The shear stress in the concrete shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in. ² or $2\sqrt{f'_c}$. (Commentary: Sec. A.3.2.2.1. Tier 2: Sec. 5.5.3.1.1)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C	NC	N/A	U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. The spacing of reinforcing steel is equal to or less than 18 in. (Commentary: Sec. A.3.2.2.2. Tier 2: Sec. 5.5.3.1.3)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Connections

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	WALL ANCHORAGE AT FLEXIBLE DIAPHRAGMS: Exterior concrete or masonry walls that are dependent on flexible diaphragms for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec.A.5.1.1. Tier 2: Sec. 5.7.1.1)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of loads to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation, and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Foundation System

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	DEEP FOUNDATIONS: Piles and piers are capable of transferring the seismic forces between the structure and the soil. (Commentary: Sec. A.6.2.3.)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story high. (Commentary: Sec. A.6.2.4)	

Low, Moderate, and High Seismicity

Seismic-Force-Resisting System

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	DEFLECTION COMPATIBILITY: Secondary components have the shear capacity to develop the flexural strength of the components and are compliant with the following items: COLUMN-BAR SPLICES, BEAM-BAR SPLICES, COLUMN-TIE SPACING, STIRRUP SPACING, and STIRRUP AND TIE HOOK in the Immediate Occupancy Structural Checklist for Building Type C1. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	FLAT SLABS: Flat slabs or plates not part of seismic-force-resisting system have continuous bottom steel through the column joints. (Commentary: Sec. A.3.1.6.3. Tier 2: Sec. 5.5.2.5.3)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	COUPLING BEAMS: The stirrups in coupling beams over means of egress are spaced at or less than $d/2$ and are anchored into the confined core of the beam with hooks of 135 degrees or more. The ends of both walls to which the coupling beam is attached are supported at each end to resist vertical loads caused by overturning. Coupling beams have the capacity in shear to develop the uplift capacity of the adjacent wall. (Commentary: Sec.A.3.2.2.3. Tier 2: Sec. 5.5.3.2.1)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	OVERTURNING: All shear walls have aspect ratios less than 4-to-1. Wall piers need not be considered. (Commentary: Sec. A.3.2.2.4. Tier 2: Sec. 5.5.3.1.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	CONFINEMENT REINFORCING: For shear walls with aspect ratios greater than 2-to-1, the boundary elements are confined with spirals or ties with spacing less than $8d_b$. (Commentary: Sec. A.3.2.2.5. Tier 2: Sec. 5.5.3.2.2)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	WALL REINFORCING AT OPENINGS: There is added trim reinforcement around all wall openings with a dimension greater than three times the thickness of the wall. (Commentary: Sec. A.3.2.2.6. Tier 2: Sec. 5.5.3.1.5)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C	NC	N/A	U	WALL THICKNESS: Thicknesses of bearing walls is not less than 1/25 the unsupported height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.2.7. Tier 2: Sec. 5.5.3.1.2)	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Connections

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps; the pile cap reinforcement and pile anchorage are able to develop the tensile capacity of the piles. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Diaphragms (Flexible or Stiff)

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and shall not have expansion joints. (Commentary: Sec. A.4.1.1. Tier 2: Sec. 5.6.1.1)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)	

Flexible Diaphragms

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft and have aspect ratios less than 4-to-1. (Commentary: Sec. A.4.3.1. Tier 2: Sec. 5.6.3)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

ASCE 41-13 Tier 1 Checklists

FIRM:	KPFF Consulting Engineers
PROJECT NAME:	PPS Hayhurst ES
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21701183
COMPLETED BY:	JR
DATE COMPLETED:	December 18, 2017
REVIEWED BY:	
REVIEW DATE:	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

16.16IO Immediate Occupancy Structural Checklist for Building Types URM: Unreinforced Masonry Bearing Walls with Flexible Diaphragms and URMA: Unreinforced Masonry Bearing Walls with Stiff Diaphragms

Very Low Seismicity

Seismic-Force-Resisting System

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	SHEAR STRESS CHECK: The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than 30 lb/in. ² for clay units and 70 lb/in. ² for concrete units. (Commentary: Sec. A.3.2.5.1. Tier 2: Sec. 5.5.3.1.1)	

Connections

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections shall have adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.1.1. Tier 2: Sec. 5.7.1.1)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.4)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	GIRDER-COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	

Foundation System

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	DEEP FOUNDATIONS: Piles and piers are capable of transferring the seismic forces between the structure and the soil. (Commentary: Sec. A.6.2.3.)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C	NC	N/A	U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story high. (Commentary: Sec. A.6.2.4)	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Low, Moderate, and High Seismicity

Seismic-Force-Resisting System

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than the following (Commentary: Sec. A.3.2.5.2. Tier 2: Sec. 5.5.3.1.2): Top story of multi-story building 9 First story of multi-story building 15 All other conditions 13	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C	NC	N/A	U	MASONRY LAYUP: Filled collar joints of multiwythe masonry walls have negligible voids. (Commentary: Sec. A.3.2.5.3. Tier 2: Sec. 5.5.3.4.1)	
<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Diaphragms (Flexible or Stiff)

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 4 ft long. (Commentary: A.4.1.6. Tier 2: Sec. 5.6.1.3)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities. (Commentary: Sec. A.4.1.7. Tier 2: Sec. 5.6.1.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension. (Commentary: Sec. A.4.1.8. Tier 2: Sec. 5.6.1.5)	

Flexible Diaphragms

RATING				DESCRIPTION	COMMENTS
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	SPANS: All wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft and aspect ratios less than or equal to 3-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft and have aspect ratios less than 4-to-1. (Commentary: Sec. A.4.3.1. Tier 2: Sec. 5.6.3)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Connections

RATING				DESCRIPTION	COMMENTS
C	NC	N/A	U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. before engagement of the anchors. (Commentary: Sec. A.5.1.4. Tier 2: Sec. 5.7.1.2)	
<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		
C	NC	N/A	U	BEAM, GIRDER, AND TRUSS SUPPORTS: Beams, girders, and trusses supported by unreinforced masonry walls or pilasters have independent secondary columns for support of vertical loads. (Commentary: Sec. A.5.4.5. Tier 2: Sec. 5.7.4.4)	
<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>		

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

ASCE 41-13 Tier 1 Checklists

FIRM:	KPFF Consulting Engineers
PROJECT NAME:	PPS Hayhurst ES
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21701183
COMPLETED BY:	JR
DATE COMPLETED:	December 18, 2017
REVIEWED BY:	
REVIEW DATE:	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

16.17 Nonstructural Checklist

The Performance Level is designated LS for Life Safety or PR for Position Retention. The level of seismicity is designated as “not required” or by L, M, or H, for Low, Moderate, and High.

All Seismicity Levels

Life Safety Systems

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. FIRE SUPPRESSION PIPING: Fire suppression piping is anchored and braced in accordance with NFPA-13. (Commentary: Sec. A.7.13.1. Tier 2: Sec. 13.7.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. FLEXIBLE COUPLINGS: Fire suppression piping has flexible couplings in accordance with NFPA-13. (Commentary: Sec. A.7.13.2. Tier 2: Sec. 13.7.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. EMERGENCY POWER: Equipment used to power or control life safety systems is anchored or braced. (Commentary: Sec. A.7.12.1. Tier 2: Sec. 13.7.7)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints. (Commentary: Sec. A.7.14.1. Tier 2: Sec. 13.7.6)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. SPRINKLER CEILING CLEARANCE: Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13. (Commentary: Sec. A.7.13.3. Tier 2: Sec. 13.7.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-LMH. EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced. (Commentary: Sec. A.7.3.1. Tier 2: Sec. 13.7.9)	

Hazardous Materials

RATING		DESCRIPTION		COMMENTS	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. HAZARDOUS MATERIAL EQUIPMENT: Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers. (Commentary: Sec. A.7.12.2. Tier 2: 13.7.1)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. HAZARDOUS MATERIAL STORAGE: Breakable containers that hold hazardous material, including gas cylinders, are restrained by latched doors, shelf lips, wires, or other methods. (Commentary: Sec. A.7.15.1. Tier 2: Sec. 13.8.4)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. HAZARDOUS MATERIAL DISTRIBUTION: Piping or ductwork conveying hazardous materials is braced or otherwise protected from damage that would allow hazardous material release. (Commentary: Sec. A.7.13.4. Tier 2: Sec. 13.7.3 and 13.7.5)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. SHUT-OFF VALVES: Piping containing hazardous material, including natural gas, has shut-off valves or other devices to limit spills or leaks. (Commentary: Sec. A.7.13.3. Tier 2: Sec. 13.7.3 and 13.7.5)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, has flexible couplings. (Commentary: Sec. A.7.15.4, Tier 2: Sec.13.7.3 and 13.7.5)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. PIPING OR DUCTS CROSSING SEISMIC JOINTS: Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements. (Commentary: Sec. A.7.13.6. Tier 2: Sec.13.7.3, 13.7.5, and 13.7.6)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Partitions

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft in Low or Moderate Seismicity, or at most 6 ft in High Seismicity. (Commentary: Sec. A.7.1.1. Tier 2: Sec. 13.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. HEAVY PARTITIONS SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system. (Commentary: Sec. A.7.2.1. Tier 2: Sec. 13.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. DRIFT: Rigid cementitious partitions are detailed to accommodate the following drift ratios: in steel moment frame, concrete moment frame, and wood frame buildings, 0.02; in other buildings, 0.005. (Commentary A.7.1.2 Tier 2: Sec. 13.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system. (Commentary: Sec. A.7.2.1. Tier 2: Sec. 13.6.2)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints. (Commentary: Sec. A.7.1.3. Tier 2. Sec. 13.6.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. TOPS: The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft. (Commentary: Sec. A.7.1.4. Tier 2. Sec. 13.6.2)	

Ceilings

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-LMH. SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft ² of area. (Commentary: Sec. A.7.2.3. Tier 2: Sec. 13.6.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-LMH. SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft ² of area. (Commentary: Sec. A.7.2.3. Tier 2: Sec. 13.6.4)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft ² , and ceilings of smaller areas that are not surrounded by restraining partitions, are laterally restrained at a spacing no greater than 12 ft with members attached to the structure above. Each restraint location has a minimum of four diagonal wires and compression struts, or diagonal members capable of resisting compression. (Commentary: Sec. A.7.2.2. Tier 2: Sec. 13.6.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft ² have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in.; in High Seismicity, 3/4 in. (Commentary: Sec. A.7.2.4. Tier 2: Sec. 13.6.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. CONTINUITY ACROSS STRUCTURE JOINTS: The ceiling system does not cross any seismic joint and is not attached to multiple independent structures. (Commentary: Sec. A.7.2.5. Tier 2: Sec. 13.6.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. EDGE SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft ² are supported by closure angles or channels not less than 2 in. wide. (Commentary: Sec. A.7.2.6. Tier 2: Sec. 13.6.4)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. SEISMIC JOINTS: Acoustical tile or lay-in panel ceilings have seismic separation joints such that each continuous portion of the ceiling is no more than 2500 ft ² and has a ratio of long-to-short dimension no more than 4-to-1. (Commentary: Sec. A.7.2.7. Tier 2: 13.6.4)	
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Light Fixtures

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. INDEPENDENT SUPPORT: Light fixtures that weigh more per square foot than the ceiling they penetrate are supported independent of the grid ceiling suspension system by a minimum of two wires at diagonally opposite corners of each fixture. (Commentary: Sec. A.7.3.2. Tier 2: Sec. 13.6.4 and 13.7.9)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. PENDANT SUPPORTS: Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft and, if rigidly supported, are free to move with the structure to which they are attached without damaging adjoining components. (Commentary: A.7.3.3. Tier 2: Sec. 13.7.9)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. LENS COVERS: Lens covers on light fixtures are attached with safety devices. (Commentary: Sec. A.7.3.4. Tier 2: Sec. 13.7.9)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

Cladding and Glazing

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. CLADDING ANCHORS: Cladding components weighing more than 10 lb/ft ² are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft. (Commentary: Sec. A.7.4.1. Tier 2: Sec. 13.6.1)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. CLADDING ISOLATION: For steel or concrete moment frame buildings, panel connections are detailed to accommodate a story drift ratio of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02. (Commentary: Sec. A.7.4.3. Tier 2: Section 13.6.1)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02. (Commentary: Sec. A.7.4.4. Tier 2: Sec. 13.6.1)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. PANEL CONNECTIONS: Cladding panels are anchored out-of-plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections. (Commentary: Sec. A.7.4.5. Tier 2: Sec. 13.6.1.4)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel. (Commentary: Sec. A.7.4.6. Tier 2: Sec. 13.6.1.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel. (Commentary: Sec. A.7.4.7. Tier 2: Sec. 13.6.1.4)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes over 16 ft ² in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked. (Commentary: Sec. A.7.4.8: Tier 2: Sec. 13.6.1.5)	

Masonry Veneer

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. TIES: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft ² , and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in.; for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (Commentary: Sec. A.7.5.1. Tier 2: Sec. 13.6.1.2)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. SHELF ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor. (Commentary: Sec. A.7.5.2. Tier 2: Sec. 13.6.1.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. WEAKENED PLANES: Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing. (Commentary: Sec. A.7.5.3. Tier 2: Sec. 13.6.1.2)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup. (Commentary: Sec. A.7.7.2. Tier 2: Section 13.6.1.1 and 13.6.1.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. STUD TRACKS: For veneer with metal stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. on center. (Commentary: Sec. A.7.6.1. Tier 2: Section 13.6.1.1 and 13.6.1.2)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. ANCHORAGE: For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof. (Commentary: Sec. A.7.7.1. Tier 2: Section 13.6.1.1 and 13.6.1.2)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing. (Commentary: Sec. A.7.5.6. Tier 2: Section 13.6.1.2)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. OPENINGS: For veneer with metal stud backup, steel studs frame window and door openings. (Commentary: Sec. A.7.6.2. Tier 2: Sec. 13.6.1.1 and 13.6.1.2)	

Parapets, Cornices, Ornamentation, and Appendages

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. URM PARAPETS OR CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5. (Commentary: Sec. A.7.8.1. Tier 2: Sec. 13.6.5)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. CANOPIES: Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft; for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft. (Commentary: Sec. A.7.8.2. Tier 2: Sec. 13.6.6)	
C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-LMH. CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement. (Commentary: Sec. A.7.8.3. Tier 2: Sec. 13.6.5)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-LMH. APPENDAGES: Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft. This checklist item does not apply to parapets or cornices covered by other checklist items. (Commentary: Sec. A.7.8.4. Tier 2: Sec. 13.6.6)	

Masonry Chimneys

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. URM CHIMNEYS: Unreinforced masonry chimneys extend above the roof surface no more than the following: for Life Safety in Low or Moderate Seismicity, 3 times the least dimension of the chimney; for Life Safety in High Seismicity and for Position Retention in any seismicity, 2 times the least dimension of the chimney. (Commentary: Sec. A.7.9.1. Tier 2: 13.6.7)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. ANCHORAGE: Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof. (Commentary: Sec. A.7.9.2. Tier 2: 13.6.7)	
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Stairs

RATING		DESCRIPTION		COMMENTS	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. STAIR ENCLOSURES: Hollow-clay tile or unreinforced masonry walls around stair enclosures are restrained out-of-plane and have height-to-thickness ratios not greater than the following: for Life Safety in Low or Moderate Seismicity, 15-to-1; for Life Safety in High Seismicity and for Position Retention in any seismicity, 12-to-1. (Commentary: Sec. A.7.10.1. Tier 2: Sec. 13.6.2 and 13.6.8)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-LMH; PR-LMH. STAIR DETAILS: In moment frame structures, the connection between the stairs and the structure does not rely on shallow anchors in concrete. Alternatively, the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.5.3.1 without including any lateral stiffness contribution from the stairs. (Commentary: Sec. A.7.10.2. Tier 2: 13.6.8)	

Contents and Furnishings

RATING		DESCRIPTION		COMMENTS	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-MH; PR-MH. INDUSTRIAL STORAGE RACKS: Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/MH 16.1 as modified by ASCE 7 Chapter 15. (Commentary: Sec. A.7.11.1. Tier 2: Sec. 13.8.1)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-H; PR-MH. TALL NARROW CONTENTS: Contents more than 6 ft high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other. (Commentary: Sec. A.7.11.2. Tier 2: Sec. 13.8.2)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-H; PR-H. FALL-PRONE CONTENTS: Equipment, stored items, or other contents weighing more than 20 lb whose center of mass is more than 4 ft above the adjacent floor level are braced or otherwise restrained. (Commentary: Sec. A.7.11.3. Tier 2: Sec. 13.8.2)	Monitor in Room 20
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. ACCESS FLOORS: Access floors more than 9 in. high are braced. (Commentary: Sec. A.7.11.4. Tier 2: Sec. 13.8.3)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. EQUIPMENT ON ACCESS FLOORS: Equipment and other contents supported by access floor systems are anchored or braced to the structure independent of the access floor. (Commentary: Sec. A.7.11.5. Tier 2: Sec. 13.7.7 and 13.8.3)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. SUSPENDED CONTENTS: Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components. (Commentary. A.7.11.6. Tier 2: Sec. 13.8.2)	
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Mechanical and Electrical Equipment

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-H; PR-H. FALL-PRONE EQUIPMENT: Equipment weighing more than 20 lb whose center of mass is more than 4 ft above the adjacent floor level, and which is not in-line equipment, is braced. (Commentary: A.7.12.4. Tier 2: 13.7.1 and 13.7.7)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-H; PR-H. IN-LINE EQUIPMENT: Equipment installed in-line with a duct or piping system, with an operating weight more than 75 lb, is supported and laterally braced independent of the duct or piping system. (Commentary: Sec. A.7.12.5. Tier 2: Sec. 13.7.1)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-H; PR-MH. TALL NARROW EQUIPMENT: Equipment more than 6 ft high with a height-to-depth or height-to-width ratio greater than 3-to-1 is anchored to the floor slab or adjacent structural walls. (Commentary: Sec. A.7.12.6. Tier 2: Sec. 13.7.1 and 13.7.7)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-MH. MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01. (Commentary: Sec. A.7.12.7. Tier 2: Sec. 13.6.9)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. SUSPENDED EQUIPMENT: Equipment suspended without lateral bracing is free to swing from or move with the structure from which it is suspended without damaging itself or adjoining components. (Commentary: Sec. A.7.12.8. Tier 2: Sec. 13.7.1 and 13.7.7)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. VIBRATION ISOLATORS: Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning. (Commentary: Sec. A.7.12.9. Tier 2: Sec. 13.7.1)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb is anchored to the structure. (Commentary: Sec. A.7.12.10. Tier 2: 13.7.1 and 13.7.7)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input checked="" type="checkbox"/>	NC <input type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure. (Commentary: Sec. A.7.12.11. Tier 2: 13.7.7)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. CONDUIT COUPLINGS: Conduit greater than 2.5 in. trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections. (Commentary: Sec. A.7.12.12. Tier 2: 13.7.8)	

Piping

RATING		DESCRIPTION		COMMENTS	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings. (Commentary: Sec. A.7.13.2. Tier 2: Sec. 13.7.3 and 13.7.5)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. FLUID AND GAS PIPING: Fluid and gas piping is anchored and braced to the structure to limit spills or leaks. (Commentary: Sec. A.7.13.4. Tier 2: Sec. 13.7.3 and 13.7.5)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. C-CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. in diameter are restrained. (Commentary: Sec. A.7.13.5. Tier 2: Sec. 13.7.3 and 13.7.5)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. PIPING CROSSING SEISMIC JOINTS: Piping that crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements. (Commentary: Sec. A.7.13.6. Tier 2: Sec.13.7.3 and Sec. 13.7.5)	

Ducts

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. DUCT BRACING: Rectangular ductwork larger than 6 ft ² in cross-sectional area and round ducts larger than 28 in. in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft. The maximum spacing of longitudinal bracing does not exceed 60 ft. (Commentary: Sec. A.7.14.2. Tier 2: Sec. 13.7.6)	
C <input type="checkbox"/>	NC <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. DUCT SUPPORT: Ducts are not supported by piping or electrical conduit. (Commentary: Sec. A.7.14.3. Tier 2: Sec. 13.7.6)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. DUCTS CROSSING SEISMIC JOINTS: Ducts that cross seismic joints or isolation planes or are connected to independent structures have couplings or other details to accommodate the relative seismic displacements. (Commentary: Sec. A.7.14.5. Tier 2: Sec. 13.7.6)	
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Elevators

RATING				DESCRIPTION	COMMENTS
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-H; PR-H. RETAINER GUARDS: Sheaves and drums have cable retainer guards. (Commentary: Sec. A.7.16.1. Tier 2: 13.8.6)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-H; PR-H. RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight. (Commentary: Sec. A.7.16.2. Tier 2: 13.8.6)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored. (Commentary: Sec. A.7.16.3. Tier 2: 13.8.6)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/min or faster are equipped with seismic switches that meet the requirements of ASME A17.1 or have trigger levels set to 20% of the acceleration of gravity at the base of the structure and 50% of the acceleration of gravity in other locations. (Commentary: Sec. A.7.16.4. Tier 2: 13.8.6)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking. (Commentary: Sec. A.7.16.5. Tier 2: 13.8.6)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1. (Commentary: Sec. A.7.16.6. Tier 2: 13.8.6)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. BRACKETS: The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1. (Commentary: Sec. A.7.16.7. Tier 2: 13.8.6)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

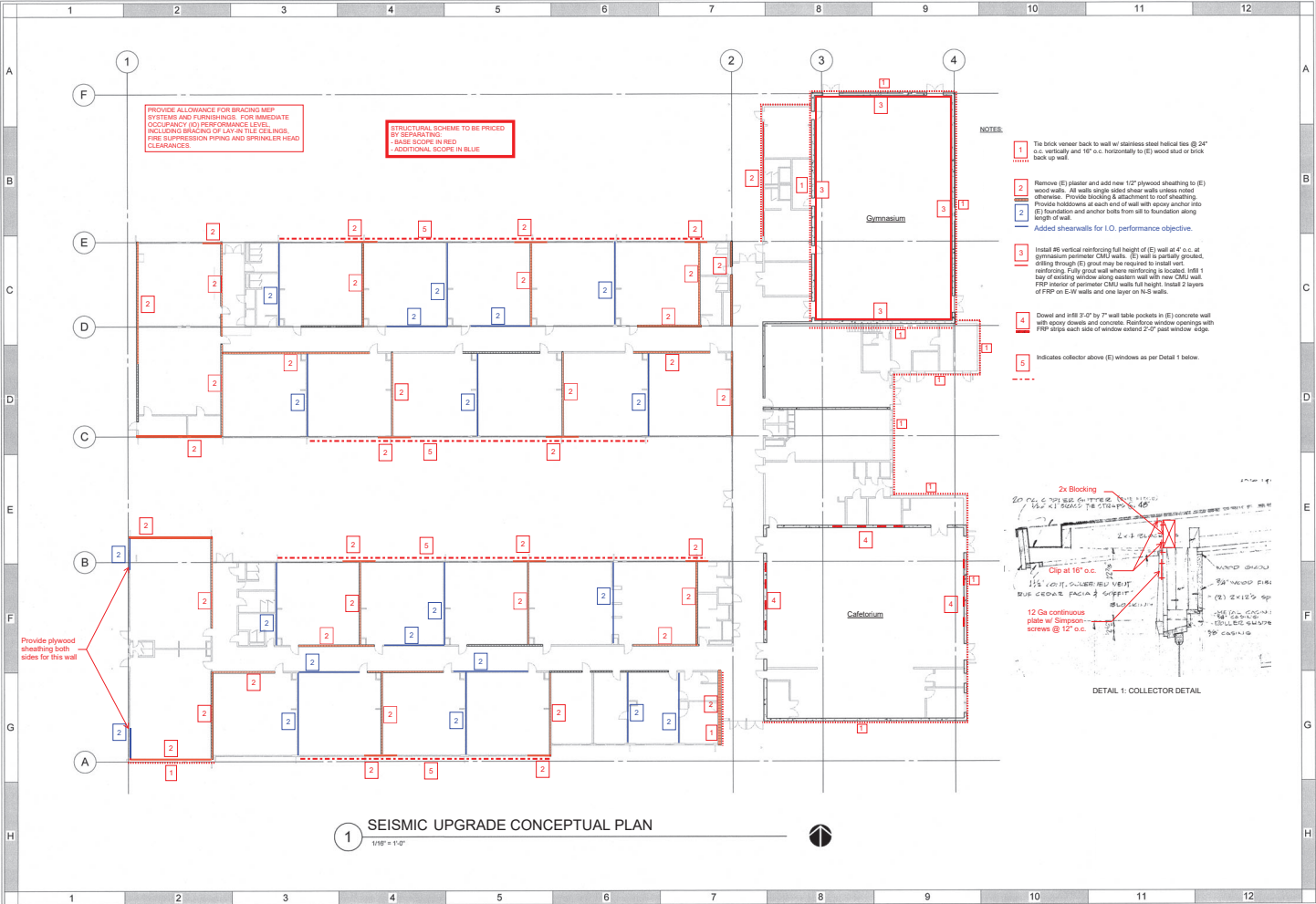
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. SPREADER BRACKET: Spreader brackets are not used to resist seismic forces. (Commentary: Sec. A.7.16.8. Tier 2: 13.8.6)	
C <input type="checkbox"/>	NC <input type="checkbox"/>	N/A <input checked="" type="checkbox"/>	U <input type="checkbox"/>	LS-not required; PR-H. GO-SLOW ELEVATORS: The building has a go-slow elevator system. (Commentary: Sec. A.7.16.9. Tier 2: 13.8.6)	

Legend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown

APPENDIX B

STRENGTHENING SCHEME

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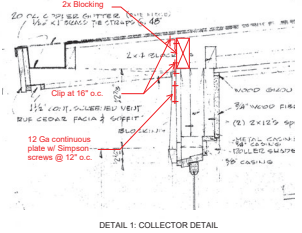


PROVIDE ALLOWANCE FOR BRACING MEP SYSTEMS AND FURNISHINGS FOR IMMEDIATE OCCUPANCY (O) PERFORMANCE LEVEL INCLUDING BRACING OF LIFT AND TILE CEILING, FIRE SUPPRESSION PIPING AND SPRINKLER HEAD CLEARANCES.

STRUCTURAL SCHEME TO BE PRICED BY SEPARATING:
 - BASE SCOPE IN RED
 - ADDITIONAL SCOPE IN BLUE

NOTES:

- 1 The brick veneer back to wall w/ stainless steel helical ties @ 24" o.c. vertically and 16" o.c. horizontally to (E) wood stud or brick back up wall.
- 2 Remove (E) plaster and add new 1/2" plywood sheathing to (E) wood walls. All walls along added shear walls unless noted otherwise. Provide blocking & attachment to roof sheathing. Provide hold-downs at each end of wall with epoxy anchor into (E) foundation and anchor bolts from sill to foundation along length of wall.
- 3 Added shearwalls for I.O. performance objective.
- 4 Install 8# vertical reinforcing full height of (E) wall at 4' o.c. at 6" maximum perimeter CMU walls. (E) wall is partially grouted, drilling through (E) grout may be required to install vert. reinforcing. Fully grout wall where reinforcing is located. Install 1 bar of existing rebar along basement wall with new CMU wall. FRP interior of perimeter CMU walls full height. Install 2 layers of FRP on E-W walls and one layer on N-S walls.
- 5 Dowel and fill 3" x 7" w/ wall table pockets in (E) concrete wall with epoxy dowels and concrete. Reinforce window openings with FRP spine each side of window extend 2' of past window edge.
- 6 --- Indicates collector above (E) windows as per Detail 1 below.



1 SEISMIC UPGRADE CONCEPTUAL PLAN
 1/8" = 1'-0"



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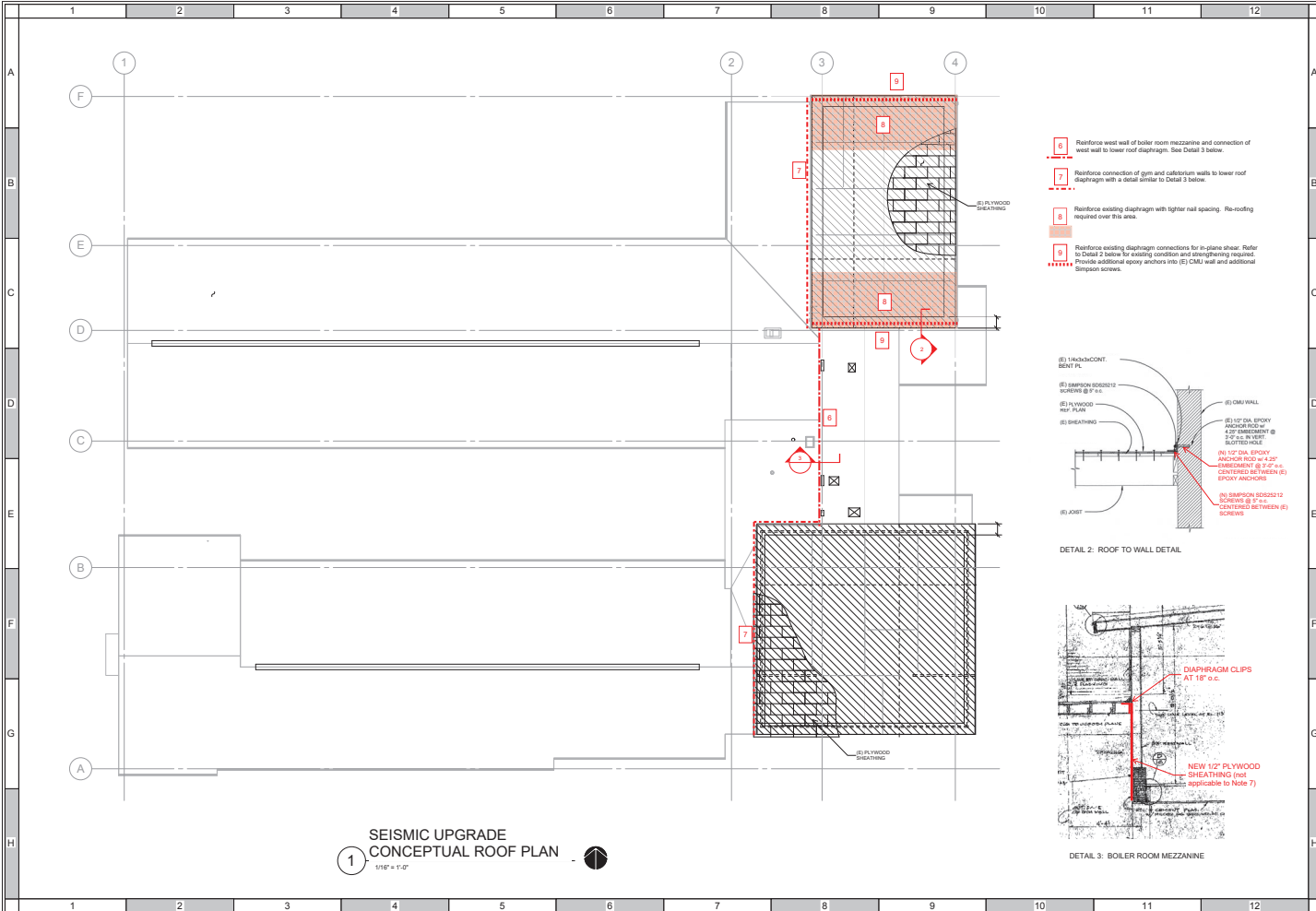
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HAYHURST SCHOOL
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 PORTLAND PUBLIC SCHOOLS
 SEISMIC UPGRADE CONCEPTUAL PLAN

DRAWN: AFV
 REVIEWED: BK
 REVISIONS:
 DATE: 12/14/2017
 FILE:
 SHEET NUMBER
SK-1

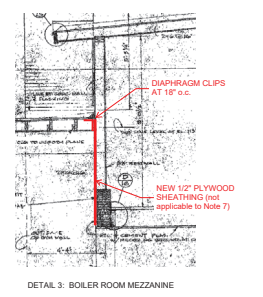
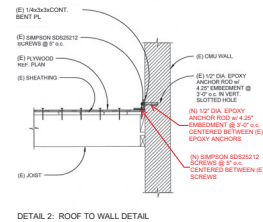
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SEISMIC UPGRADE
CONCEPTUAL ROOF PLAN
1/18" = 1'-0"

- 6 Reinforce west wall of boiler room mezzanine and connection of west wall to lower roof diaphragm. See Detail 3 below.
- 7 Reinforce connection of gym and cafeteria walls to lower roof diaphragm with a detail similar to Detail 3 below.
- 8 Reinforce existing diaphragm with tighter nail spacing. Re-roofing required over this area.
- 9 Reinforce existing diaphragm connections for in-plane shear. Refer to Detail 2 below for existing condition and strengthening required. Provide additional epoxy anchors into (E) CMU wall and additional Simpson screws.



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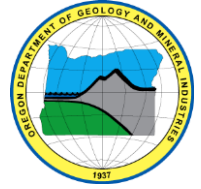
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PORTLAND PUBLIC SCHOOLS
SEISMIC UPGRADE CONCEPTUAL PLAN

DRAWN: APV
REVIEWED: EK
REVISED:
DATE: 12/15/2018
FILE:
JOB NUMBER: 214298.20
SHEET NUMBER SK-2

12/15/2018 4:28:12 PM

Oregon Seismic Status Report - 2019



Oregon law requires school districts and education service districts to provide DOGAMI with notice of construction projects that may affect a school's seismic risk.

This report was generated by DOGAMI from submitted data.

School District/ESD: Portland 1J

County: MULTNOMAH

Contact Name: Steve Kasel

Contact Email: skasel@pps.net

Structures Replaced? No

Name and Address:

Kind of Structure:

Type of
Replacement:

Max Occupancy:

Date Occupied:

Structures Modified? Yes

Name and Address: King Elementary School, 4906 NE 6th Ave, Portland, OR 97211

Kind of Structure: Total roof replacement with roof-level seismic upgrade.

Type of Modification: Roof level structural reinforcement at roof and parapet walls.

Date Re-occupied: 08/23/18

Optional:

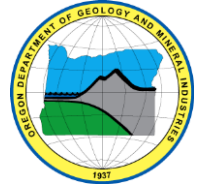
Engineering Report? No *If yes, attachments are appended to this report.*

Cost of Rehab: \$6,271,000

Method of Funding: Funded through taxpayer bond

Notes:

Oregon Seismic Status Report - 2019



Oregon law requires school districts and education service districts to provide DOGAMI with notice of construction projects that may affect a school's seismic risk.

This report was generated by DOGAMI from submitted data.

School District/ESD: Portland 1J

County: MULTNOMAH

Contact Name: Steve R Kasel

Contact Email: skasel@pps.net

Structures Replaced? No

Name and Address:

Kind of Structure:

Type of
Replacement:

Max Occupancy:

Date Occupied:

Structures Modified? Yes

Name and Address: Lewis Elementary School, 4401 SE Evergreen St, Portland, OR 97206. THIS PROJECT WAS STARTED AND COMPLETED IN 2018-2019

Kind of Structure: All classrooms, library, boiler room, gym, and cafeteria

Type of Modification: Interior-level structural reinforcement of one-story building. Instead of an engineering report, I have attached a picture of PPS' SRGP Grant Plaque mounted at the school.

Date Re-occupied: 08/23/18

Optional:

Engineering Report? Yes *If yes, attachments are appended to this report.*

Cost of Rehab: \$2,920,000

Method of Funding: Funded through a grant from the Seismic Rehabilitation Grant Program

Notes:



PPS NEWS & INFORMATION

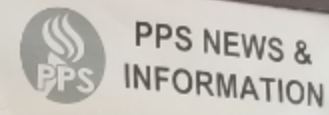
PPS McKinney-Vento (Title X) Homeless Program

Who can help a child in foster care? You can!
¿Quién puede ayudar a un niño en crianza temporal? ¡Usted puede!

Learn all of the ways you can help: helpofosterchild.oregon.gov

Descubre todas las maneras en que puede ayudar: helpofosterchild.oregon.gov

NDHS Oregon Department of Health Services

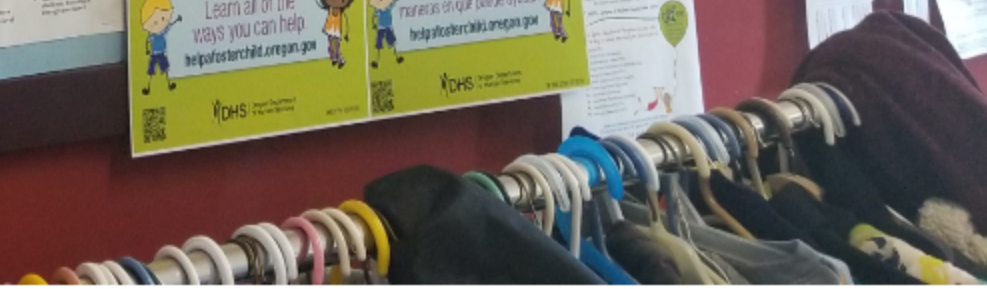


PPS McKinney-Vento (Title X) Homeless Program

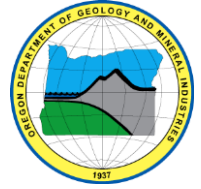
PPS McKinney-Vento Homeless Program

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Oregon Seismic Status Report - 2019



Oregon law requires school districts and education service districts to provide DOGAMI with notice of construction projects that may affect a school's seismic risk.

This report was generated by DOGAMI from submitted data.

School District/ESD: Portland 1J

County: MULTNOMAH

Contact Name: Steve Kasel

Contact Email: skasel@pps.net

Structures Replaced? No

Name and Address:

Kind of Structure:

Type of
Replacement:

Max Occupancy:

Date Occupied:

Structures Modified? Yes

Name and Address: Rigler Elementary School, 5401 NE Prescott St, Portland, OR 97211

Kind of Structure: Re-roof of majority of building and 4 detached portables. Roof-level seismic upgrades performed at roof and parapet walls. No seismic upgrades to portables.

Type of Modification: Structural reinforcement at roof level and parapet walls

Date Re-occupied: 08/21/19

Optional:

Engineering Report? No *If yes, attachments are appended to this report.*

Cost of Rehab: Approx \$4,000,000

Method of Funding: Funded through use of taxpayer bond funds.

Notes: