## SEISMIC ASSESSMENTS FOR THE BEAVERTON SCHOOL DISTRICT

(VOLUME 3 OF 4)

KPFF PROJECT No. 10021800125

APRIL 12, 2019



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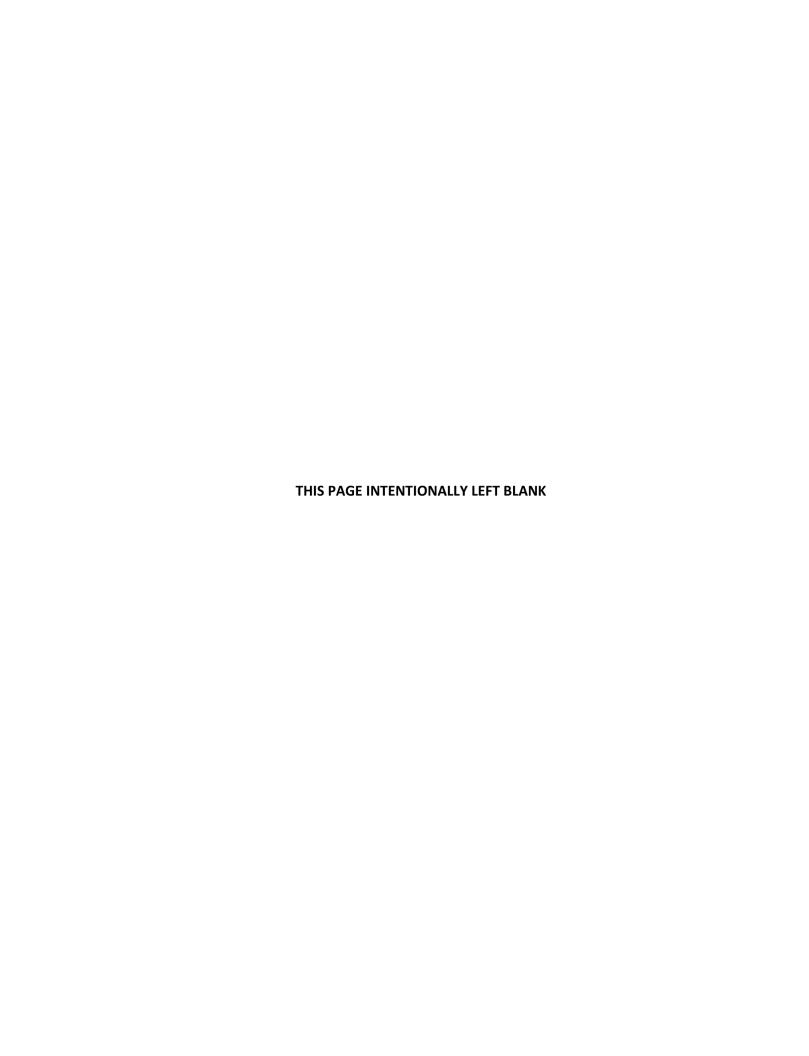
## SEISMIC ASSESSMENTS FOR THE BEAVERTON SCHOOL DISTRICT

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## Appendix B

Middle Schools - ASCE 41-13 Checklists



35\_Cedar Park Middle Project Name

Project Number 10021800125

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	35_Cedar Park Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

## 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	LOAD PATH: The structure shall contain a complete, well-defined load path, including	
	X			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)	
С	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry	
	X			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)	

## 16.1.2LS Life Safety Basic Configuration Checklist

**Low Seismicity Building System** General

RA	TING			DESCRIPTION	COMMENTS
С	NC X	N/A	U	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 <b>x</b>	NC	N/A	U	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)	
С	NC	N/A X	U	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)	

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

## **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
c	NC	N/A	U	WEAK STORY: The sum of the shear strengths of	
X				the seismic-force-resisting system in any story in each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec.	
				A2.2.2. Tier 2: Sec. 5.4.2.1)	
				COET CTORY TI VIII CH V V	
C	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force- resisting system in any story is not less than 70%	
X				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)	
С	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in	
			_	the seismic-force-resisting system are continuous	
X			Ш	to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)	
				2. 300. 3. 1.2.3)	
				CEOMETRY. The way are also as a six and a six as	
C	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-	
X				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)	
				/1.2.2.3. Hel 2. 3ec. 3.7.2.7)	

					Project Name Project Number	35_Cedar Park Middle 10021800125	
<b>x</b>	NC	N/A	U	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)			ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	υ	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)			MIDDLE SCHOOLS
Geol		Seisn	-		COMMENTS  It is assumed to be infurther exploration ship geotechincal enginee	ould be conducted by a	HIGH SCHOOLS
				Sec. A.6.1.1. Tier 2: 5.4.3.1)			> °
С	NC	N/A	U <b>X</b>	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)	It is assumed to be in further exploration sh geotechincal enginee	ould be conducted by a	OPTION SCHOOLS
							RT ES

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	It is assumed to be in compliance, however
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	further exploration should be conducted by a geotechincal engineer.
				5.4.3.1)	

#### **High Seismicity**

### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
C <b>X</b>	NC	N/A	U	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	Assumed to be in compliance.
				TIES RETWEEN FOLINDATION ELEMENTS: The	
C	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic	
	X			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)	

35\_Cedar Park Middle Project Name

Project Number 10021800125

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	35_Cedar Park Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

# 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

	<b>.</b> .	
LOW	Seism	ICIT V
	0013111	

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry	
	X			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)	

#### **Moderate Seismicity**

Seismic-Force-Resisting System

	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls	
<b>x</b>				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)	
С	NC x	N/A	υ <u></u>	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in.² or 2√fc. (Commentary: Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)	Assumed to be non compliant with the narrow shear walls in the classroom wings.

					Project Name Project Number	35_Cedar Park Middle 10021800125	
<b>K</b>	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. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3)			ELEMENTARY SCHOOLS
C <b>X</b>	NC	N/A	U	WALL THICKNESS: Thicknesses of bearing walls shall not be less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2)			MIDDLE SCHOOLS
<b>Diap</b> i	hragn	us ms	<u></u>				
-	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)			SCHOOLS HIGH
Conn	ection	ınç					(n)
	TING			DESCRIPTION	COMMENTS		ON OLS
C <b>x</b>	NC	N/A	U	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. 5.7.1.3)			OPTION SCHOOLS
egend	: C = (	Comp	bliant,	, NC = Noncompliant, N/A = Not Applicable, U = Unk			SUPPORT FACILITIES

3

С	NC x	N/A	U	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)  TOPPING SLAB TO WALLS OR FRAMES: Reinforced	
C	NC	N/A	U	concrete topping slabs that interconnect the	
		X		precast concrete diaphragm elements are	
				doweled for transfer of forces into the shear wall	
				or frame elements. (Commentary: Sec. A.5.2.3. Tier	
				2: Sec. 5.7.2)	
c	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a	
				positive connection using plates, connection	
X		Ш		hardware, or straps between the girder and the	
				column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	
				3.0.1.1.1/	
	l .		1	1	

### **High Seismicity**

#### Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
c	NC	N/A	U	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the	
		X		shear capacity to develop the flexural strength of	
				the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	
				2. 302. 3.3.2.3.2.	

					Project Name Project Number	35_Cedar Park Middle 10021800125	
C **	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)			ELEMENTARY SCHOOLS
Diapi	hraqı	ns					
	TING			DESCRIPTION	COMMENTS		ဟု
C **	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)			MIDDLE
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			SCHOOLS SCHOOLS
C **	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			OPTION SCHOOLS
	: C = 0	Comp	oliant,	, NC = Noncompliant, N/A = Not Applicable, U = Unk	nown		SUPPORT FACILITIES

C <b>x</b>	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)	
С	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)	Tectum in the gymnasium

#### Connections

D.A.	RATING DESCRIPTION COMMENTS							
KA	HING			DESCRIPTION	COMMENTS			
С	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each	Walls are not connected to the foundation			
	X			precast wall panel into the diaphragm elements.				
				(Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)				
C	NC	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation. (Commentary: Sec.				
	X			A.5.3.6. Tier 2: Sec. 5.7.3.4)				

C NC N/A U UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile	Project Name Project Number	35_Cedar Park Middle 10021800125	rary JLS
			ELEMEN. SCHOC
C NC N/A U GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)			MIDDLE
			iH OLS

Project Name Project Number 10021800125

36\_Conestoga Middle

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	36_Conestoga Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

## 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
C **	NC	N/A	U	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	NC	N/A	υ	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)	

## 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	LOAD PATH: The structure shall contain a complete, well-defined load path, including	
X				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)	
С	NC	N/A	U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any	
		X		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)	
С	NC	N/A	U	MEZZANINES: Interior mezzanine levels are	
		X		braced independently from the main structure or	
		<u> </u>		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)	

### **Building Configuration**

	Building Configuration								
RA	TING	,		DESCRIPTION	COMMENTS	I₹			
C	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec.		ELEMENTARY			
				A2.2.2. Tier 2: Sec. 5.4.2.1)  SOFT STORY: The stiffness of the seismic-force-					
С	NC	N/A X	U	resisting system in any story is not 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)		MIDDLE			
С	NC	N/A	U	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)		HBH			
С	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)		NOILION			

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

С	NC	N/A X	υ	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)	
С	NC	N/A	U X	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)	Likely non-compliant as there are no seismic joints between wings.

### **Moderate Seismicity**

## Geologic Site Hazards

RATING DESCRIPTION COMMENTS							
С	NC	N/A	U <b>x</b>	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)	Likely not an issue. This criterion should be further explored in the future.		
C **	NC	N/A	υ	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)	The site does not slope - non issue.		

					Project Name Project Number	36_Conestoga Middle 10021800125	
С	NC	N/A	U <b>X</b>	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)	Likely not an issue. Th further explored in th	nis criterion should be e future.	ELEMENTARY SCHOOLS
High	Seisr	 nicity	,				
•		-		ration			ျှုတ
	TING			DESCRIPTION	COMMENTS		밀
с П	NC	N/A	U	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)			MIDDLE
				TIES BETWEEN FOUNDATION ELEMENTS: The			SH SOLS
<b>X</b>	NC	N/A	υ	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)			SCHOOLS HIGH
							LS LS
							OPTION SCHOOLS
							SUPPORT FACILITIES

Project Name Project Number 10021800125

36\_Conestoga Middle

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	36_Conestoga Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

36\_Conestoga Middle Project Name Project Number 10021800125

## 16.3LS Life Safety Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

Low	and	Mod	derate	Seism	icity

Lateral Seismic-Force-Resisting System										
RA	RATING DESCRIPTION COMMENTS									
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal						
X				to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)						
С	NC	N/A	U X	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): Structural panel sheathing 1,000 lb/ft Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft All other conditions 100 lb/ft	Assumed to be in compliance					
С	NC	N/A	U	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)						
С	NC	N/A	U	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is						
<b>x</b>				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

С	NC	N/A	U	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)	Some wall segments exceed allowable aspect ratios and may leave other lateral elements undersized. With further analysis, this potential deficiency may prove to be adequate.
С	NC	N/A	U	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)	
С	NC	N/A	U	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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)	
С	NC	N/A	U	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)	

					Project Name Project Number	36_Conestoga Middle 110021800125	
С	NC	N/A	U	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)			ELEMENTARY SCHOOLS
Conn	ectio	ns					
	TING			DESCRIPTION	COMMENTS		၂၂၂ တု
С	NC	N/A	U	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)			MIDDLE
C <b>X</b>	NC	N/A	U	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)			SCHOOLS HIGH
С	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)			OPTION SCHOOLS
egend	· C = (	Comp	liant	NC = Noncompliant, N/A = Not Applicable, U = Unk	nown		SUPPORT FACILITIES

#### Project Name Project Number 10021800125

## **High Seismicity**

υ	Diapnragms							
	RA	TING			DESCRIPTION	COMMENTS		
	<b>∠</b>	NC	N/A	U	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)			
	С	NC	N/A	U	ROOF CHORD CONTINUITY: All chord elements			
					are continuous, regardless of changes in roof			
	X				elevation. (Commentary: Sec. A.4.1.3. Tier 2: Sec. 5.6.1.1)			
	C	NC	N/A	U	DIAPHRAGM REINFORCEMENT AT OPENINGS:			
	X				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)			

STRAIGHT SHEATHING: All straight sheathed

diaphragms have aspect ratios less than 2-to-1 in

the direction being considered. (Commentary:

Sec. A.4.2.1. Tier 2: Sec. 5.6.2)

NC N/A

X

C

					Project Name  Project Number	10021800125	
C <b>X</b>	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 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)			ELEMENTARY SCHOOLS
С	NC x	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		diaphragm span. With otential deficiency may	MIDDLE SCHOOLS
C <b>x</b>	NC	N/A	υ	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)			STOOH2S HIGH
Conn	ectio	ns					
	TING			DESCRIPTION	COMMENTS		
C x	NC	N/A	U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: A.5.3.7. Tier 2: Sec. 5.7.3.3)			OPTION SCHOOLS
egend	: C = 0	Comp	liant,	NC = Noncompliant, $N/A = Not Applicable$ , $U = Unk$	nown		SUPPORT FACILITIES

Project Name Project Number 10021800125

36\_Conestoga Middle

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	36_Conestoga Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

and SCHOOL OF COLOR

## 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Low and Moderate Seismicity
Seismic-Force-Resisting System

	RATING DESCRIPTION COMMENTS								
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal					
X				to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)					
С	NC	N/A	U <b>x</b>	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1)	Assumed to be in compliance.				
<b>x</b>	NC	N/A	υ	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)					

## Project Name

Stiff Diaphragms

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous	
		x		reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	

#### Connections

COIIII	onnections								
RA	TING			DESCRIPTION	COMMENTS				
С	NC	N/A	U	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)					
C	NC	N/A	U	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. 5.7.1.3)					
С	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the					
X				shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)					

					Project Number	10021800125	
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)			ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)			MIDDLE SCHOOLS
С	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)			STOOHOS HIGH
High	Seisr	nicity					
		ragm	S				
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	COMMENTS		OPTION SCHOOLS
egend	: C = 0	Comp	liant,	NC = Noncompliant, N/A = Not Applicable, U = Unkno	own		SUPPORT FACILITIES

С	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:	
<b>x</b>				Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than	
	Ш			8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.	
				5.6.1.3)	

Flexible Diaphragms

FIEXI	Flexible Diaphragms								
RA	TING			DESCRIPTION	COMMENTS				
C	NC	N/A	U	CROSS TIES: There are continuous cross ties					
				between diaphragm chords. (Commentary: Sec.					
X		Ш	Ш	A.4.1.2. Tier 2: Sec. 5.6.1.2)					
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm					
<b>X</b>				openings immediately adjacent to the shear walls are less than 25% of the wall length.					
	Ш	ш		(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)					
				,					
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to					
X				exterior masonry shear walls are not greater than					
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.					
				5.6.1.3)					

					Project Name Project Number	10021800125	
c	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			MIDDLE
c	NC X	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		diaphragm span. With potential deficiency may	SCHOOLS HIGH
C	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm shall 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)			OPTION SCHOOLS
							SUPPORT FACILITIES

#### Connections

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)	

37\_Five Oaks Middle S

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	37_Five Oaks Middle School
SEISMICITY LEVEL:	HIGH
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

Project Name 37\_Five Oaks Middle Strain 10021800125

#### 16.1 Basic Checklist

#### **Very Low Seismicity**

#### Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC X	N/A	U	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)	Load path for adequate bracing of walls out-of-plane and connection of shear walls to foundation elements does not exist.
С	NC x	N/A		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)	

### 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	LOAD PATH: The structure shall contain a	
	X		П	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)	
				,	
С	NC	N/A	U	ADJACENT BUILDINGS: The clear distance	Likely compliant
			X	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	NC	N/A	U	MEZZANINES: Interior mezzanine levels are	
X				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)	

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

#### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
c	NC	N/A	U	WEAK STORY: The sum of the shear strengths of	
X				the seismic-force-resisting system in any story in each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec.	
				A2.2.2. Tier 2: Sec. 5.4.2.1)	
				COET CTORY TI VIII CH V V	
C	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force- resisting system in any story is not less than 70%	
X				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)	
С	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in	
			_	the seismic-force-resisting system are continuous	
X			Ш	to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)	
				2. 300. 3. 1.2.3)	
				CEOMETRY. The way are also as a six and a six as	
C	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-	
X				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)	
				/1.2.2.3. Hel 2. 3ec. 3.7.2.7)	

					Project Number  Project Number  37_Five Oaks Middle Site 10021800125	
C x	NC	N/A	U	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)		ELEMENTARY SCHOOLS
С	NC	N/A	U x	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)	Center of stiffness and mass not calculated as a part of this assessment. Assumed to be in compliance.	MIDDLE
Mode	erate	Seisn	nicity			
		ite Ha	azard			S
RA	TING			DESCRIPTION	COMMENTS	드리
С	NC	N/A	U <b>x</b>	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.	HIGH SCHOOI
						N N
С	NC	N/A	U <b>x</b>	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.	OPTION SCHOOLS

Project Name 37\_Five Oaks Middle ST 10021800125

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	It is assumed to be in compliance, however
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	further exploration should be conducted by a geotechincal engineer.
				5.4.3.1)	

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal	
X				dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than 0.6S <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The	Slabs are not directly connected to
	X			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)	foundations.

37\_Five Oaks Middle S

# ELEMENTARY SCHOOLS

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	37_Five Oaks Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 37\_Five Oaks Middle Start 10021800125

# 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

#### **Low Seismicity**

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	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)	Joist pockets don't show out of plane connection for diaphragm to wall. connection grouted in, so some resistance is provided, but not through weld to anchor plates.

#### **Moderate Seismicity**

Seismic-Force-Resisting System

00.011	odishile i di da nasisting oystani							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls				
				in each principal direction is greater than or equal				
X		ш	Ш	to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)				
				3.3.1.1)				
С	NC	N/A	U	WALL SHEAR STRESS CHECK: The shear stress in	Wall shear stress calculations not completed			
			X	the precast panels, calculated using the Quick Check procedure of Section 4.5.3.3, is less than	as a part of this assessment. Assumed to be in			
	Ш	ш	_	the greater of 100 lb/in. <sup>2</sup> or $2\sqrt{f}$ c. (Commentary:	compliance.			
				Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)				

					Project Name Project Number	37_Five Oaks Middle \$\frac{1}{2}\$	
<b>K</b>	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. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3)			ELEMENTARY SCHOOLS
C <b>X</b>	NC	N/A	U	WALL THICKNESS: Thicknesses of bearing walls shall not be less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2)			MIDDLE SCHOOLS
Diap	 hragn	ms					
-	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)			SCHOOLS HIGH
Conn	ll nection	ne ne					
	TING			DESCRIPTION	COMMENTS		N N
С	NC	N/A	U	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. 5.7.1.3)			OPTION SCHOOLS
egend	l: C = (	Comp	bliant,	, NC = Noncompliant, N/A = Not Applicable, U = Unk			SUPPORT FACILITIES

Project Name 37\_Five Oaks Middle S+1
Project Number 10021800125

С	NC X	N/A	U	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)	Details are inconsistent in showing direct transfer of in plane loads to shear walls. some elements grouted into place only, some utilize anchors in continuous angles. Non-compliant for in-plane and out-of-plane loading.
c	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced	
		X		concrete topping slabs that interconnect the precast concrete diaphragm elements are	
	Ш			doweled for transfer of forces into the shear wall	
				or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)	
С	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a	
X		$ \Box $		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)	

#### **High Seismicity**

Seismic-Force-Resisting System

R/	TING			DESCRIPTION	COMMENTS
C	NC	N/A	U	DEFLECTION COMPATIBILITY FOR RIGID	
			X	DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of	
				the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	
				2. 300. 3.3.2.3.2)	

					Project Name Project Number	37_Five Oaks Middle S	
C <b>x</b>	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)			ELEMENTARY SCHOOLS
Diap	hragn	ms					
-	TING			DESCRIPTION	COMMENTS		၂၂ တု
С	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)			MIDDLE
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			SCHOOLS SCHOOLS
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			OPTION SCHOOLS
				.NC = Noncompliant, N/A = Not Applicable, U = Unk			SUPPORT FACILITIES

Project Name 37\_Five Oaks Middle ST 10021800125

С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)	
C	NC x	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)	Tectum roof over the gymnasium.

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each	
X				precast wall panel into the diaphragm elements. (Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)	
С	NC	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation. (Commentary: Sec.	
	X			A.5.3.6. Tier 2: Sec. 5.7.3.4)	

c	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	Project Name Project Number	37_Five Oaks Middle Sal 10021800125	
C x	NC	N/A	U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)			

37\_Five Oaks Middle S

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	37_Five Oaks Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

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16.15LS Life Safety Structural Checklist for Building Types RM1:
Reinforced Masonry Bearing Walls with Flexible Diaphragms and
RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Low and Moderate Seismicity

Seismic-Force-Resisting System

	RATING DESCRIPTION COMMENTS						
				REDUNDANCY: The number of lines of shear walls	- OOMMEN 13		
C	NC	N/A	U	in each principal direction is greater than or equal			
X				to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec.			
	ш	ш	ш	5.5.1.1)			
				J.J.1.1 <i>)</i>			
С	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the	Assumed to be in compliance.		
	IVC	IN/ A	U	reinforced masonry shear walls, calculated using	Assumed to be in compliance.		
			X	the Quick Check procedure of Section 4.5.3.3, is			
				less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1.			
				Tier 2: Sec. 5.5.3.1.1)			
				REINFORCING STEEL: The total vertical and			
C	NC	N/A	U	horizontal reinforcing steel ratio in reinforced			
X				masonry walls is greater than 0.002 of the wall			
		ш	Ш	with the minimum of 0.0007 in either of the two			
				directions; the spacing of reinforcing steel is less			
				than 48 in., and all vertical bars extend to the top			
				of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2:			
				Sec. 5.5.3.1.3)			

37\_Five Oaks Middle S Project Number 10021800125

Project Name

#### Stiff Diaphragms

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous	Slabs not precast
		X		reinforced concrete topping slab. (Commentary:	
				Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	

#### Connections

	UIIIGELIUIIS						
RA	TING			DESCRIPTION	COMMENTS		
С	NC x	N/A	υ <u></u>	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)	Joist pockets don't show out of plane connection for diaphragm to wall. connection grouted in, so some resistance is provided, but not through weld to anchor plates. Assumed to be insufficient.		
С	NC	N/A X	U	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. 5.7.1.3)			
С	NC x	N/A	>	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)			

					Project Number	10021800125	
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)			ELEMENTARY SCHOOLS
С	NC *	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)			MIDDLE
С	NC X	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)			SCHOOLS HIGH
High		•					
Stiff L			ıs				
C X	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	COMMENTS		OPTION SCHOOLS
egend	: C = (	Comp	liant,	NC = Noncompliant, N/A = Not Applicable, U = Unkn	own		SUPPORT FACILITIES

Project Name 37\_Five Oaks Middle S Project Number 10021800125

С	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to	
X				exterior masonry shear walls are not greater than	
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.	
				5.6.1.3)	

Flexi	Flexible Diaphragms						
RA	TING			DESCRIPTION	COMMENTS		
С	NC x	N/A	υ <u></u>	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)			
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)			
C x	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)			

				Project Name Project Number	37_Five Oaks Middle S11 10021800125	
C NO	C N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			ELEMENTARY SCHOOLS
C NO	C N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			MIDDLE
C NO	C N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)			STOOHOS HIGH
C NO	C N/A	U	OTHER DIAPHRAGMS: The diaphragm shall 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)			OPTION SCHOOLS
egend: C:	= Comp	liant	NC = Noncompliant. N/A = Not Applicable. U = Unkr	nown		SUPPORT FACILITIES

Project Name 37\_Five Oaks Middle Strain 10021800125

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural	
		X		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)	

Project Name 38\_Highland Park Mid 10021800125

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	38_Highland Park Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

HIGH SCHOOLS

CHOOLS

ACILITIES

Project Name 38\_Highland Park Mid# 10021800125

#### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	
С	NC *	N/A	o □	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)	

# 800125 >

### 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC *	N/A	U	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 **	NC	N/A	U	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)	
С	NC	N/A *	υ	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)	

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

Project Name 38\_Highland Park Mid# 10021800125

#### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in	
X				each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	
				7.2.2.1.10. 2.500.5.11.2.11,	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-	
X		П		resisting system in any story is not 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)	
С	NC	N/A	U	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)	
	NC	NI/A	U	GEOMETRY: There are no changes in the net	
C	NC	N/A		horizontal dimension of the seismic-force-	
X				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)	

					Project Name Project Number	38_Highland Park Mid 10021800125	
C x	NC	N/A	U	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)			ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	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)			MIDDLE
Mode Geold			-		COMMENTS		S
С	NC	N/A	U X	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)	It is assumed to be in	ould be conducted by a	HIGH SCHOOI
							⊸ S.
С	NC	N/A	U X	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)	It is assumed to be in further exploration sh geotechincal enginee	ould be conducted by a	OPTION SCHOOLS
							RT IES

Project Name 38\_Highland Park Mid 11 10021800125

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	It is assumed to be in compliance, however
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	further exploration should be conducted by a geotechincal engineer.
				5.4.3.1)	

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
C **	NC	N/A	U	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	Assumed to be in compliance.
С	NC *	N/A	υ	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)	

Project Name 38\_Highland Park Mid 10021800125

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	38_Highland Park Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

HIGH SCHOOLS

CHOOLS

ACILITIES

Project Name 38\_Highland Park Mid 10021800125

# 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

	A :	
$I \cap W$	Seism	IICIT V
	301311	iicicy

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry	
	X			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)	

#### **Moderate Seismicity**

Seismic-Force-Resisting System

00.011	ousine or or co-nosisting bystem							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls				
X				in each principal direction is greater than or equal				
			Ш	to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)				
				3.3.1.1)				
C	NC	N/A	U	WALL SHEAR STRESS CHECK: The shear stress in	Assumed to be non compliant with the			
	X			the precast panels, calculated using the Quick Check procedure of Section 4.5.3.3, is less than	narrow shear walls in the classroom wings.			
			Ш	the greater of 100 lb/in. <sup>2</sup> or $2\sqrt{f}$ c. (Commentary:				
				Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)				

					Project Name Project Number	38_Highland Park Mid 110021800125	
C X	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. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3)			ELEMENTARY SCHOOLS
C <b>X</b>	NC	N/A	U	WALL THICKNESS: Thicknesses of bearing walls shall not be less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2)			MIDDLE SCHOOLS
Diapl	hragn	ms					
-	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)			SCHOOLS HIGH
Conn	ection	ıns					(n)
	TING			DESCRIPTION	COMMENTS		ON OLS
C <b>x</b>	NC	N/A	U	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. 5.7.1.3)			OPTION SCHOOLS
egend	: C = (	Comp	bliant,	NC = Noncompliant, $N/A = Not Applicable$ , $U = Unk$			SUPPORT FACILITIES

Project Name 38\_Highland Park Mid 11 10021800125

C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the	
	X			shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec.	
				5.7.2)	
				3.7.27	
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced	
	IVC	ואירו		concrete topping slabs that interconnect the	
		X		precast concrete diaphragm elements are	
				doweled for transfer of forces into the shear wall	
				or frame elements. (Commentary: Sec. A.5.2.3. Tier	
				2: Sec. 5.7.2)	
				CIDDED COLLIAMS CONSIGNATION. The area in a	
C	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection	
x				hardware, or straps between the girder and the	
	Ш		ш	column support. (Commentary: Sec. A.5.4.1. Tier 2:	
				Sec. 5.7.4.1)	
				, , , , , , , , , , , , , , , , , , , ,	

#### **High Seismicity**

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
c	NC	N/A	U	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the	
		X		shear capacity to develop the flexural strength of	
				the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	
				2. 302. 3.3.2.3.2.	

					Project Name Project Number	38_Highland Park Mid # 10021800125	
C <b>x</b>	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)			ELEMENTARY SCHOOLS
Dian	hragn	ms	<u> </u>				
-	TING			DESCRIPTION	COMMENTS		၂၂ တု
C <b>x</b>	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)			MIDDLE
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			HIGH SCHOOLS
C x	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			OPTION SCHOOLS
egend	l: C = 1	Comr		.NC = Noncompliant, N/A = Not Applicable, U = Unk	nown		SUPPORT FACILITIES

Project Name 38\_Highland Park Mid 11 10021800125

C <b>x</b>	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)	
С	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)	Tectum in the gymnasium

#### Connections

• • • • • • • • • • • • • • • • • • • •	, compositions							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each	Walls are not connected to the foundation			
	X			precast wall panel into the diaphragm elements.				
				(Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)				
С	NC	N/A	U	PRECAST WALL PANELS: Precast wall panels are				
	X			connected to the foundation. (Commentary: Sec. A.5.3.6. Tier 2: Sec. 5.7.3.4)				
		1						

С	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	Project Name Project Number	38_Highland Park Mid 110021800125	ELEMENTARY SCHOOLS
С	NC	N/A	U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)			MIDDLE
							H H

39\_Meadow Park Mid

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	35_Meadow Park Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

Project Name	39_Meadow Park M
Project Number	10021800125

ELEMENTARY SCHOOLS

#### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	
С	NC x	N/A	υ	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

39\_Meadow Park Mid

### 16.1.2LS Life Safety Basic Configuration Checklist

**Low Seismicity Building System** General

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	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 <b>x</b>	NC	N/A	υ	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)	
С	NC	N/A x	U	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)	

39\_Meadow Park Mid Project Name Project Number 10021800125

Ruilding Configuration

	Building Configuration					
RA	TING			DESCRIPTION	COMMENTS	1 <u>4</u> 2
<b>x</b>	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)		ELEMENTARY SCHOOLS
C	NC	N/A	U	SOFT STORY: The stiffness of the seismic-forceresisting system in any story is not 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)		MIDDLE
C <b>X</b>	NC	N/A	U	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)		HIGH
C **	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)		OPTION SCHOOLS

Project Name 39\_Meadow Park Mid 10021800125

C **	NC	N/A	υ	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 <b>x</b>	NC	N/A	U	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)	

#### **Moderate Seismicity**

#### Geologic Site Hazards

	TING	10110		DESCRIPTION	COMMENTS
С	NC	N/A	U <b>x</b>	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.
С	NC	N/A	U X	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.

					Project Name 39_Meadow Park Mid 10021800125	
С	NC	N/A	U <b>x</b>	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.	ELEMENTARY SCHOOLS
High	Seisr	nicity	,			
Foun	datio	n Cor	nfigur	ration		ш S
RA	TING			DESCRIPTION	COMMENTS	디즈
<b>x</b>	NC	N/A	υ	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	Assumed to be in compliance.	MIDDLE
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The		HIGH SCHOOLS
	X			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)		+ SCF
						OPTION SCHOOLS
						SUPPORT FACILITIES

Project Name Project Number 10021800125

39\_Meadow Park Mid

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	39_Meadow Park Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

# 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

**Low Seismicity** 

Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	COMMENTS
				,	

**Moderate Seismicity** 

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS	ı
C *	NC	N/A	>	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)		
С	NC x	N/A	U	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in. <sup>2</sup> or 2√fc. (Commentary: Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)	Assumed to be non compliant with the narrow shear walls in the classroom wings.	

Project Name 39\_Meadow Park Midels Project Number 10021800125 REINFORCING STEEL: The ratio of reinforcing steel NC N/A U area to gross concrete area is not less than 0.0012 X in the vertical direction and 0.0020 in the horizontal direction. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3) WALL THICKNESS: Thicknesses of bearing walls NC U C N/A shall not be less than 1/40 the unsupported X height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2) Diaphragms RATING DESCRIPTION COMMENTS TOPPING SLAB: Precast concrete diaphragm C NC N/A U elements are interconnected by a continuous X reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4) Connections RATING DESCRIPTION COMMENTS WOOD LEDGERS: The connection between the C NC U N/A wall panels and the diaphragm does not induce X cross-grain bending or tension in the wood ledgers. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3)

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

					Project Name Project Number	10021800125	
С	NC x	N/A	U	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)			ELEMENTARY SCHOOLS
C	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)			MIDDLE
C <b>X</b>	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)			HIGH
Seisn		nicity prce-R		ing System  DESCRIPTION  DEFLECTION COMPATIBILITY FOR RIGID  DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	COMMENTS		OPTION SCHOOLS
gend	: C = 0	Comp	oliant,	NC = Noncompliant, N/A = Not Applicable, U = Unkno	own		SUPPORT FACILITIES

Project Name 39\_Meadow Park Mid Project Number 10021800125

С	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than	
x				75% of the length of any perimeter wall when the	
				wall piers have aspect ratios of less than 2-to-1.	
				(Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)	

Diap	Diaphragms					
RA	TING			DESCRIPTION	COMMENTS	
C **	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)		
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		
C **	NC	N/A	о <sub>—</sub>	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		

					Project Name Project Number	39_Meadow Park Mid 10021800125	
C <b>x</b>	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)			ELEMENTARY SCHOOLS
С	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)	Tectum in the gymnas	sium	MIDDLE SCHOOLS
Conn	nectio	) Ins	<u></u>				
	TING			DESCRIPTION	COMMENTS		
С	NC 🗶	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each precast wall panel into the diaphragm elements. (Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)	Walls are not connect	ed to the foundation	SCHOOFS HIGH
С	NC	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation. (Commentary: Sec. A.5.3.6. Tier 2: Sec. 5.7.3.4)			OPTION SCHOOLS
egend	d: C = <sup>7</sup>	Comp	bliant,	, NC = Noncompliant, N/A = Not Applicable, U = Unk	known		SUPPORT FACILITIES

Project Name 39\_Meadow Park Mid 10021800125

С	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile	
		X		caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec.	
				5.7.3.5)	
С	NC	N/A	U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts	
		X		unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)	

Project Name

40\_Mountain View Mi

Project Number 10021800125

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	40_Mountain View Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

Project Name Project Number 10021800125

40\_Mountain View Mi

#### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	
С	NC *	N/A	υ	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)	

### 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С <u></u>	NC X	N/A	υ	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)	
С	NC	N/A X	υ	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)	
С	NC	N/A *	υ	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)	

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

Project Name 40\_Mountain View Mirroject Number 10021800125

#### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of	
×				the seismic-force-resisting system in any story in each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec.	
				A2.2.2. Tier 2: Sec. 5.4.2.1)	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-	
X				resisting system in any story is not 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	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous	
X			П	to the foundation. (Commentary: Sec. A.2.2.4. Tier	
				2: Sec. 5.4.2.3)	
_	NC	N1 / A		GEOMETRY: There are no changes in the net	
C	NC	N/A	U	horizontal dimension of the seismic-force-	
X				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)	

					Project Name Project Number	40_Mountain View Mi 10021800125	
C <b>X</b>	NC	N/A	U	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)			ELEMENTARY SCHOOLS
C <b>X</b>	NC	N/A	U	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)			MIDDLE SCHOOLS
Mode	erate	Seisn	nicity	,			
Geolo			•				(0
RA	TING			DESCRIPTION	COMMENTS		H DL
С	NC	N/A	U <b>x</b>	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)	Assumed to be complinvestigation by a geoneed to be conducted	technical engineer will	SCHOOFS HIGH
							- S
С <u></u>	NC	N/A	U X	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)	Assumed to be complinvestigation by a geonetric need to be conducted	technical engineer will	OPTION SCHOOLS
							रT ES

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	Assumed to be compliant. Further
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	investigation by a geotechnical engineer will need to be conducted.
				5.4.3.1)	

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U X	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	Not explicitly checked, assumed to be in compliance as there are long shear walls relative to the height of the building.
С	NC 🗶	N/A	U	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)	The tilt up panels are not tied into the strip footings. There are no ties between the slab on grade and the surrounding strip footing.

Project Name

40\_Mountain View Mi

Project Number 10021800125

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	40_Mountain View Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

# 16.3LS Life Safety Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

**Low and Moderate Seismicity** 

Lateral Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls	
				in each principal direction is greater than or equal	
X				to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec.	
				5.5.1.1)	
C	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the	Assumed to be in compliance.
			X	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):	
				Structural panel sheathing 1,000 lb/ft	
				Diagonal sheathing 700 lb/ft	
				Straight sheathing 100 lb/ft All other conditions 100 lb/ft	
				All other conditions 100 lb/ft	
С	NC	N/A	U	STUCCO (EXTERIOR PLASTER) SHEAR WALLS:	
				Multi-story buildings do not rely on exterior	
Ш		X	Ш	stucco walls as the primary seismic-force-resisting	
				system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)	
				3.3.3.0.1)	
	NC	N1 / A		GYPSUM WALLBOARD OR PLASTER SHEAR	
C	NC	N/A	U	WALLS: Interior plaster or gypsum wallboard is	
X				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)	

					Project Name Project Number	10021800125	
C <b>X</b>	NC	N/A	U	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)			ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	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)			MIDDLE SCHOOLS
C x	NC	N/A	U	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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)			STOOHDS HBIH
C	NC	N/A	U	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)			OPTION SCHOOLS
							SUPPORT FACILITIES

3

Project Name Project Number

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)

#### Connections

	Connections					
RA	TING			DESCRIPTION	COMMENTS	
C	NC		)   	WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec.		
		X		A.5.3.3. Tier 2: Sec. 5.7.3.3)		
C **	NC	N/A	U	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)		
C	NC	N/A	υ	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)		

Project Name	40_Mountain View Mi		
Project Number			

#### **High Seismicity**

High Seismicity  Diaphragms  RATING DESCRIPTION COMMENTS							
C <b>X</b>	NC	N/A	U	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)		ELEMENTARY SCHOOLS	
C <b>X</b>	NC	N/A	U	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)		MIDDLE	
C <b>X</b>	NC	N/A	υ	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)		HIGH SCHOOLS	
С	NC	N/A X	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		OPTION SCHOOLS	

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

С	NC	N/A	>	SPANS: All wood diaphragms with spans greater than 24 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	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED	
				DIAPHRAGMS: All diagonally sheathed or	
X	Ш	Ш	Ш	unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect	
				ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
c	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm does not	Tectum at the gymnasium
				consist of a system other than wood, metal deck,	,
	X			concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)	

#### Connections

R/	RATING			DESCRIPTION	COMMENTS	
С	NC	N/A	U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or	Assumed to be compliant	
			X	less, with proper edge and end distance provided for wood and concrete. (Commentary: A.5.3.7. Tier 2: Sec. 5.7.3.3)		
				2. Sec. 5.7.5.5)		

Project Name

40\_Mountain View Mi

Project Number 10021800125

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	40_Mountain View Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

# 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

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#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	

#### **Moderate Seismicity**

Seismic-Force-Resisting System

00.011	ooisime-rored-hosisting dystom							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls				
				in each principal direction is greater than or equal				
X		Ш		to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)				
				3.3.1.1)				
C	NC	N/A	U	WALL SHEAR STRESS CHECK: The shear stress in	Assumed to be in compliance as there are a			
			X	the precast panels, calculated using the Quick Check procedure of Section 4.5.3.3, is less than	lot of shear walls.			
		Ш		the greater of 100 lb/in. <sup>2</sup> or $2\sqrt{f}$ c. (Commentary:				
				Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)				

					Project Number 40_Modifically view Mil-	<u> </u>
C X	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. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3)		ELEMENTARY SCHOOLS
С	NC X	N/A	U	WALL THICKNESS: Thicknesses of bearing walls shall not be less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2)	The concrete shear walls in the gym do not meet this criterion.	MIDDLE
Diaph	_	ns				
RAT				DESCRIPTION  TORRING SI ARI Proceed concrete displayage	COMMENTS	ω,
С	NC	N/A	υ	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)		HIGH
Conne RAT		ns		DESCRIPTION	COMMENTS	
	NC	N/A	U	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. 5.7.1.3)	CONMENTO	OPTION
gend:	C = (	Comp	liant,	NC = Noncompliant, N/A = Not Applicable, U = Unk	nown	SUPPORT

С	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the	
X				shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec.	
<u></u>	ш			5.7.2)	
				TOPPING CLAP TO WALLS OF FRAMES D.: (	
C	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the	
		X		precast concrete diaphragm elements are	
	ш	_ <del></del>		doweled for transfer of forces into the shear wall	
				or frame elements. (Commentary: Sec. A.5.2.3. Tier	
				2: Sec. 5.7.2)	
_				GIRDER–COLUMN CONNECTION: There is a	
C	NC	N/A	U	positive connection using plates, connection	
X	П			hardware, or straps between the girder and the	
			_	column support. (Commentary: Sec. A.5.4.1. Tier 2:	
				Sec. 5.7.4.1)	

#### **High Seismicity**

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	DEFLECTION COMPATIBILITY FOR RIGID	
		X		DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier	
				2: Sec. 5.5.2.5.2)	

					Project Name Project Number	40_Mountain View Mi 10021800125	
C <b>x</b>	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)			ELEMENTARY SCHOOLS
Dian	hragn	ms	<u> </u>				
-	TING			DESCRIPTION	COMMENTS		၂၂ တု
C <b>x</b>	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)			MIDDLE
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			HIGH SCHOOLS
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			OPTION SCHOOLS
egend		Comr		.NC = Noncompliant, N/A = Not Applicable, U = Unk	nown		SUPPORT FACILITIES

C **	NC	N/A	υ	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)	
С	NC x	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)	There is tectum in the gymnasium.

#### Connections

RΑ	TING			DESCRIPTION	COMMENTS
C	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each precast wall panel into the diaphragm elements. (Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)	COMMENTS
С	NC x	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation. (Commentary: Sec. A.5.3.6. Tier 2: Sec. 5.7.3.4)	There is no positive connection between the foundation and the tilt up panels.

					Project Name Project Number	40_Mountain View Mi
С	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	1 TOJECT NUMBER	10021800125
C <b>X</b>	NC	N/A	U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)	The quick check proce performed.	edure was not

Project Name Project Number 10021800125

40\_Mountain View Mi

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	40_Mountain View Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

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# 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Low and Moderate Seismicity
Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls	
X				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)	
С	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the	Assumed to be compliant as there are a lot of
			X	reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is	shear walls.
				less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1.	
				Tier 2: Sec. 5.5.3.1.1)	
С	NC	N/A	U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced	Horizontal reinforcement is not called out in
	X			masonry walls is greater than 0.002 of the wall	the plans. Vertical reinforcement meets the minimum ratio and spacing.
				with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less	. 5
				than 48 in., and all vertical bars extend to the top	
				of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)	
				Sec. 5.5.5.1.3)	

Project Name 40\_Mountain View Mirroject Number 10021800125

Stiff Diaphragms

RA	RATING			DESCRIPTION	COMMENTS
С	NC	N/A	J	TOPPING SLAB: Precast concrete diaphragm	
		×		elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	

#### Connections

COIIII	onnections							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for				
	X			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)				
				WOOD LEDGERS: The connection between the				
C	NC	N/A	U	wall panels and the diaphragm does not induce				
		X		cross-grain bending or tension in the wood				
				ledgers. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3)				
				3.7.1.3)				
С	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are	The diaphragm is not connected directly to			
			) [	connected for transfer of seismic forces to the	the CMU shear walls in some locations.			
	X	Ш	Ш	shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)				
				3.7.2)				

					Project Name Project Number	10021800125	
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)			ELEMENTARY SCHOOLS
C <b>X</b>	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)			MIDDLE SCHOOLS
C <b>x</b>	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)			STOOH2S HIGH
High	Seisr	nicity	1				
		ragm	ıs	DECOMPTION	COMMENTS		
C <b>x</b>	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	COMMENTS		OPTION SCHOOLS
egend	: C = 0	Comp	liant,	NC = Noncompliant, N/A = Not Applicable, U = Unkn	nown		SUPPORT FACILITIES

С	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:	
x				Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than	
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.	
				5.6.1.3)	

Flexible Diaphragms

Flexible Diaphragms							
RA	TING			DESCRIPTION	COMMENTS		
C X	NC	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)			
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls			
X				are less than 25% of the wall length.			
				(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)			
С	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to			
×				exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)			

					Project Name Project Number	10021800125	
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			ELEMENTARY SCHOOLS
С	NC	N/A	υ	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			MIDDLE
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)			STOOHDS HIGH
c	NC x	N/A	υ	OTHER DIAPHRAGMS: The diaphragm shall 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)	There is tectum in the	gymnasium.	OPTION SCHOOLS
							SUPPORT ACILITIES

#### Connections

RA	TING			DESCRIPTION	COMMENTS
C .	NC	N/A	U X	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)	Assumed to be in compliance.

42\_Stoller Middle Sch

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	42_Stoller Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

42\_Stoller Middle Sch

### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	No ties between foundation elements
С	NC	N/A	U X	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)	Assumed to be in compliance for the quick check procedure.

Project Name 42\_Stoller Middle Schrift 10021800125

### 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	No ties between foundation elements
C <b>X</b>	NC	N/A	U	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)	Assumed to be in compliance. The buildings are separated with a seismic joint.
С	NC	N/A *	U	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)	

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

Project Name 42\_Stoller Middle Schrift 10021800125

### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	J	WEAK STORY: The sum of the shear strengths of	
				the seismic-force-resisting system in any story in	
ш		X	Ш	each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	
				7.2.2.2. 1101 2. 300. 3. 1.2.17	
				SOFT STORY: The stiffness of the seismic-force-	
C	NC	N/A	U	resisting system in any story is not less than 70%	
		X		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)	
				7.112.131 (16) 2.1 366.1 37.112.12/	
				VEDTICAL IDDECLIL ADITIES: All continue de la consenta la	
C	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous	
ΙП	П	X		to the foundation. (Commentary: Sec. A.2.2.4. Tier	
				2: Sec. 5.4.2.3)	
С	NC	N/A	U	GEOMETRY: There are no changes in the net	
		x		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)	

					Project Name Project Number	42_Stoller Middle Sch	
С	NC	N/A	U	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)			ELEMENTARY SCHOOLS
C	NC	N/A	U	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)			MIDDLE
Geold RA	ogic S TING	Seisn	azard		COMMENTS		HIGH CHOOLS
C	NC	N/A	U		It is assumed to be in	compliance, however	I≅₽
			X	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)	further exploration sh geotechincal enginee	ould be conducted by a	IOOHDS HBIH
			X	jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary:			
c	NC	N/A	U	jeopardize the building's seismic performance shall not exist in the foundation soils at depths within 50 ft under the building. (Commentary:	geotechincal enginee	compliance, however	OPTION SCHOOLS

Project Name 42\_Stoller Middle Schrift
Project Number 10021800125

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	It is assumed to be in compliance, however
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	further exploration should be conducted by a geotechincal engineer.
				5.4.3.1)	

### **High Seismicity**

### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U X	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	Assumed to be in compliance.
С	NC x	N/A	υ	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)	2001 addition does not have ties between foundation elements.

42\_Stoller Middle Sch

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	42_Stoller Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

Project Name 42\_Stoller Middle Schrift 10021800125

## 16.3LS Life Safety Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

**Low and Moderate Seismicity** 

Lateral Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls	
	110	14//		in each principal direction is greater than or equal	
X				to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec.	
				5.5.1.1)	
С	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the	Assumed to be in sometimes
١	INC	IN/A	0	shear walls, calculated using the Quick Check	Assumed to be in compliance.
			X	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):	
				Structural panel sheathing 1,000 lb/ft	
				Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft	
				All other conditions 100 lb/ft	
				All other conditions	
С	NC	N/A	U	STUCCO (EXTERIOR PLASTER) SHEAR WALLS:	
				Multi-story buildings do not rely on exterior	
Ш	Ш	X	Ш	stucco walls as the primary seismic-force-resisting	
				system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)	
				3.3.3.0.1)	
C	NC	N/A	U	GYPSUM WALLBOARD OR PLASTER SHEAR	
X				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)	
			l		

					Project Name Project Number	42_Stoller Middle Sch	
C <b>x</b>	NC	N/A	U	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)			ELEMENTARY SCHOOLS
С	NC	N/A	U	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)			MIDDLE
С	NC	N/A	U	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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)	Not applicable for the	2001 addition.	HIGH SCHOOLS
С	NC	N/A	U	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)			OPTION SCHOOLS
							PORT LITIES

Project Name
Project Number

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10021800125

С	NC	N/A	U	OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural	
		X		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)	

### Connections

CUIIII	onnections						
RA	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U	WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec.			
		X		A.5.3.3. Tier 2: Sec. 5.7.3.3)			
С	NC	N/A	U	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec.			
X				5.7.3.3)			
С	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a			
X				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)			

Project Name	42_Stoller Middle Sch
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### **High Seismicity**

Diap	Seisr hragi TING NC	nicity ns N/A	U	DESCRIPTION  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)	COMMENTS	ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	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)		MIDDLE
С	NC	N/A	U	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)		HIGH SCHOOLS
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		OPTION SCHOOLS

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

Project Name 42\_Stoller Middle Sch Project Number 10021800125

С	NC	N/A *	υ	SPANS: All wood diaphragms with spans greater than 24 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)	
С	NC x	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	2001 roof diaphragm is not blocked but with further analysis, this potential deficiency may prove to be adequate.
<b>X</b>	NC	N/A	υ	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)	

### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or	
X				less, with proper edge and end distance provided for wood and concrete. (Commentary: A.5.3.7. Tier	
				2: Sec. 5.7.3.3)	

43\_Whitford Middle S

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	43_Whitford Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

43\_Whitford Middle S

### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	
С	NC *	N/A	о <sub>—</sub>	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)	

### 16.1.2LS Life Safety Basic Configuration Checklist

**Low Seismicity Building System** General

	Jeneral					
RA	TING			DESCRIPTION	COMMENTS	
C	NC	N/A	U	LOAD PATH: The structure shall contain a		
	X			complete, well-defined load path, including structural elements and connections, that serves		
	•	ш		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)		
С	NC	N/A	U	ADJACENT BUILDINGS: The clear distance		
<b> </b>				between the building being evaluated and any adjacent building is greater than 4% of the height		
	Ш	Ш		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	NC	N/A	U	MEZZANINES: Interior mezzanine levels are		
		X		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)		

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

Project Name 43\_Whitford Middle Scheme Project Number 10021800125

### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of	
×				the seismic-force-resisting system in any story in each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec.	
				A2.2.2. Tier 2: Sec. 5.4.2.1)	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-	
X				resisting system in any story is not 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	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous	
X			П	to the foundation. (Commentary: Sec. A.2.2.4. Tier	
				2: Sec. 5.4.2.3)	
_	NC	N1 / A		GEOMETRY: There are no changes in the net	
C	NC	N/A	U	horizontal dimension of the seismic-force-	
X				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)	

					Project Name Project Number	43_Whitford Middle S	
C X	NC	N/A	U	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)			ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	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)			MIDDLE
Mode	erate	Seisn	nicity				
	-	ite Ha	azard				တ
RA	TING	ı		DESCRIPTION	COMMENTS		모리
С	NC	N/A	U <b>X</b>	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)	It is assumed to be in a further exploration sh geotechincal enginee	ould be conducted by a	HIGH SCHOOLS
							S
С	NC	N/A	U X	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)	It is assumed to be in a further exploration sh geotechincal enginee	ould be conducted by a	OPTION SCHOOLS
							IRT IES

Project Name 43\_Whitford Middle State
Project Number 10021800125

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	It is assumed to be in compliance, however
			X	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	further exploration should be conducted by a geotechincal engineer.
				5.4.3.1)	

### **High Seismicity**

### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at	Assumed to be in compliance.
X				the foundation level to the building height (base/height) is greater than 0.6S <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic	
	X			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)	

43\_Whitford Middle S

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	43_Whitford Middle School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

Project Name 43\_Whitford Middle Scheme 10021800125

# 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

Low Seismicity
----------------

#### Connections

R/	TING			DESCRIPTION	COMMENTS
C	NC X	N/A	U	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)	

### **Moderate Seismicity**

Seismic-Force-Resisting System

00.011	seisime i oree nesisting dystem								
RA	TING			DESCRIPTION	COMMENTS				
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls					
X				in each principal direction is greater than or equal					
			Ш	to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)					
				3.3.1.1)					
C	NC	N/A	U	WALL SHEAR STRESS CHECK: The shear stress in	Assumed to be non compliant with the				
	X			the precast panels, calculated using the Quick Check procedure of Section 4.5.3.3, is less than	narrow shear walls in the classroom wings.				
			Ш	the greater of 100 lb/in. <sup>2</sup> or $2\sqrt{f}$ c. (Commentary:					
				Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)					

					Project Name Project Number	43_Whitford Middle S	
<b>K</b>	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. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3)			ELEMENTARY SCHOOLS
C **	NC	N/A	U	WALL THICKNESS: Thicknesses of bearing walls shall not be less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2)			MIDDLE SCHOOLS
<b>Diap</b> i	hragn	us ms	<u></u>				
-	TING			DESCRIPTION	COMMENTS		(0)
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)			SCHOOLS HIGH
Conn	ection	nc nc					<sub>00</sub>
	TING			DESCRIPTION	COMMENTS		N S
C <b>x</b>	NC	N/A	U	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. 5.7.1.3)			OPTION SCHOOLS
egend	i: C = (	Comp	bliant,	NC = Noncompliant, N/A = Not Applicable, U = Unk			SUPPORT FACILITIES

3

Project Name 43\_Whitford Middle Strongert Number 10021800125

C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the	
	X			shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec.	
				5.7.2)	
				3.7.27	
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced	
	IVC	ואירו		concrete topping slabs that interconnect the	
		X		precast concrete diaphragm elements are	
				doweled for transfer of forces into the shear wall	
				or frame elements. (Commentary: Sec. A.5.2.3. Tier	
				2: Sec. 5.7.2)	
				CIDDED COLLIAMS CONSIGNATION. The area in a	
C	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection	
x				hardware, or straps between the girder and the	
	Ш		ш	column support. (Commentary: Sec. A.5.4.1. Tier 2:	
				Sec. 5.7.4.1)	
				, , , , , , , , , , , , , , , , , , , ,	

### **High Seismicity**

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	DEFLECTION COMPATIBILITY FOR RIGID	
		X		DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier	
				2: Sec. 5.5.2.5.2)	

					Project Name Project Number	43_Whitford Middle S	
C <b>x</b>	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)			ELEMENTARY SCHOOLS
Dian	hragn	me					
-	TING			DESCRIPTION	COMMENTS		v
C <b>x</b>	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)			MIDDLE
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			HIGH SCHOOLS
C x	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			OPTION SCHOOLS
							SUPPORT FACILITIES

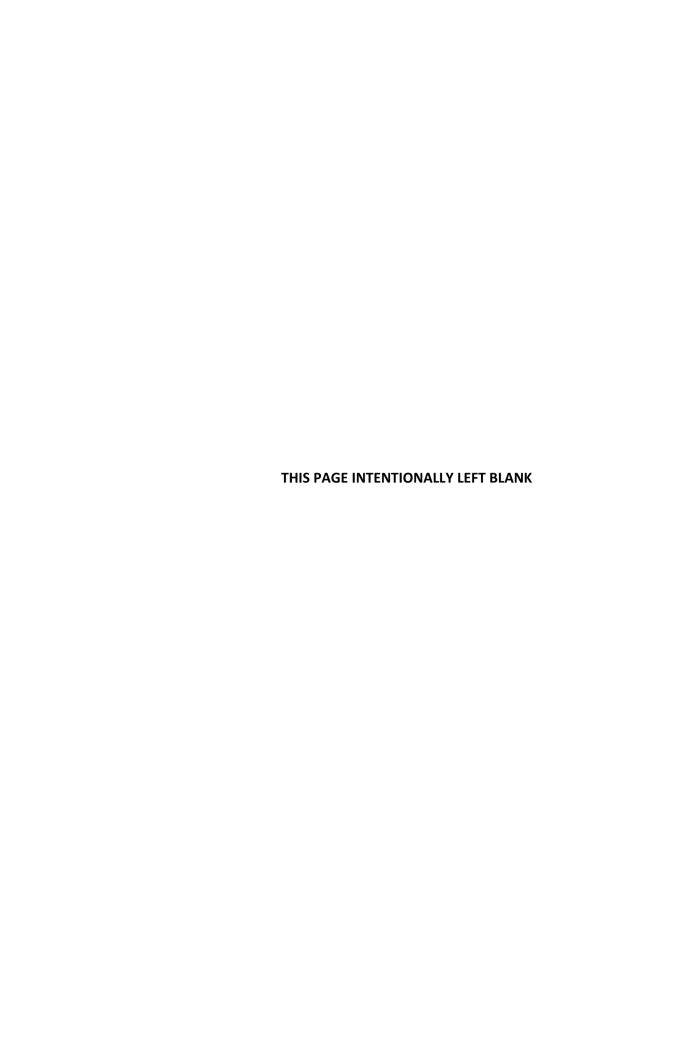
Project Name 43\_Whitford Middle Strongert Number 10021800125

C <b>x</b>	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)	
С	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)	Tectum in the gymnasium

### Connections

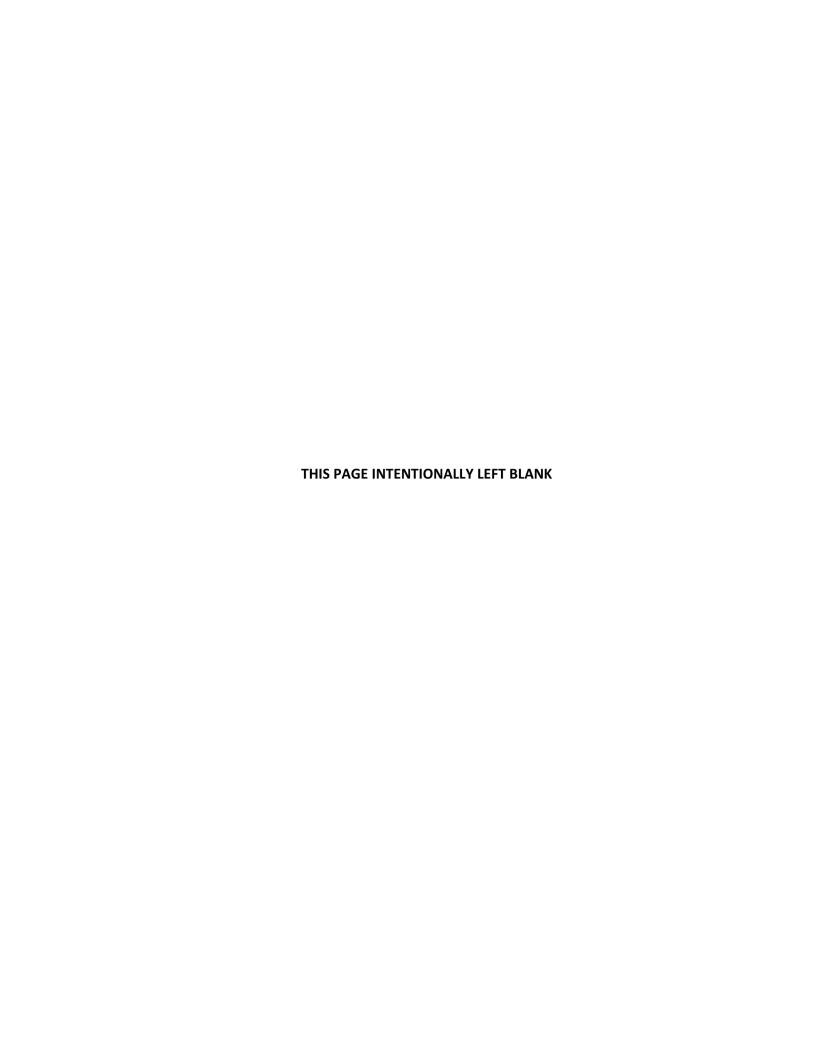
• • • • • • • • • • • • • • • • • • • •	· · · · · · · · · · · · · · · · · · ·							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each	Walls are not connected to the foundation			
	X			precast wall panel into the diaphragm elements.				
				(Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)				
С	NC	N/A	U	PRECAST WALL PANELS: Precast wall panels are				
	X			connected to the foundation. (Commentary: Sec. A.5.3.6. Tier 2: Sec. 5.7.3.4)				
		1						

c	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	Project Name Project Number	43_Whitford Middle S 10021800125	ELEMENTARY SCHOOLS
С	NC	N/A	U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)			MIDDLE
							iH OLS



## Appendix C

High Schools - ASCE 41-13 Checklists



## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Southridge High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	5/21/18
REVIEWED BY:	
REVIEW DATE:	

### 16.1 Basic Checklist

### **Very Low Seismicity**

Structural Components

RA	TING			DESCRIPTION	COMMENTS
C **	NC	N/A	U	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)	
С	NC	N/A	U X	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)	Wall anchorage is present however connection strength has not be checked against Quick Check procedure yet.

Project Name 47	:Southridge High School
Project Number	21800125

ELEMENTARY SCHOOLS

## 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	LOAD PATH: The structure shall contain a	
X		П		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)	
С	NC	N/A	U	ADJACENT BUILDINGS: The clear distance	
X				between the building being evaluated and any adjacent building is greater than 4% of the height	
		ш	Ш	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)	
				3.11.2)	
С	NC	N/A	U	MEZZANINES: Interior mezzanine levels are	
X				braced independently from the main structure or are anchored to the seismic-force-resisting	
	Ш		Ш	elements of the main structure. (Commentary:	
				Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)	

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

### **Building Configuration**

RA	TING		COMMENTS		
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of	
				the seismic-force-resisting system in any story in	
X	Ш	Ш	Ш	each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec.	
				A2.2.2. Tier 2: Sec. 5.4.2.1)	
				7 (2.12.1.1)	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-	
				resisting system in any story is not less than 70%	
X	Ш	Ш	Ш	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)	
С	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in	
				the seismic-force-resisting system are continuous	
X	Ш	Ш		to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)	
				2. 300. 3. 1.2.3)	
С	NC	N/A	U	GEOMETRY: There are no changes in the net	
x				horizontal dimension of the seismic-force- resisting system of more than 30% in a story	
	ш			relative to adjacent stories, excluding one-story	
				penthouses and mezzanines. (Commentary: Sec.	
				A.2.2.5. Tier 2: Sec. 5.4.2.4)	

					Project Name 47: Southridge High School Project Number 21800125	
C **	NC	N/A	U	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)		ELEMENTARY SCHOOLS
C x	NC	N/A	U	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)		MIDDLE SCHOOLS
	Moderate Seismicity  Geologic Site Hazards					
	NC	N/A	U X		COMMENTS	SCHOOLS HIGH
						LS N
С	NC	N/A	U <b>x</b>	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)		OPTION
egend	l: C = (	Comp	liant,	NC = Noncompliant, N/A = Not Applicable, U = Unkn	own	SUPPORT FACILITIES

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	
				5.4.3.1)	

### **High Seismicity**

### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal	
X				dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than 0.6Sa. (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic	
X				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)	

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Southridge High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	5/18/18
REVIEWED BY:	
REVIEW DATE:	

# 16.5LS Life Safety Structural Checklist for Building Types S2: Steel Braced Frames with Stiff Diaphragms and S2A: Steel Braced Frames with Flexible Diaphragms

	1 0						
Low Seismicity							
Seismic-Force-Resisting System							
RA	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	<b>V</b>	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than 0.10Fy. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)	Calculation not complete.		
С	NC	N/A	U	BRACE AXIAL STRESS CHECK: The axial stress in	Calculation not complete.		
			X	the diagonals, calculated using the Quick Check procedure of Section 4.5.3.4, is less than 0.50Fy. (Commentary: Sec. A.3.3.1.2. Tier 2: Sec. 5.5.4.1)			
Conn	ectio	ns					
RA	TING			DESCRIPTION	COMMENTS		
C <b>X</b>	NC	N/A	>	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)			

					Project Name 47: Southridge High School Project Number 21800125	
C <b>x</b>	NC	N/A	U	STEEL COLUMNS: The columns in seismic-forceresisting frames are anchored to the building foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec. 5.7.3.1)		ELEMENTARY SCHOOLS
Mode	erate	Seisr	nicity			
Seisn	nic-Fa		-	ing System	COMMENTS	LE SLS
C <b>x</b>	NC	N/A	U	REDUNDANCY: The number of lines of braced frames in each principal direction is greater than or equal to 2. The number of braced bays in each line is greater than 2. (Commentary: Sec. A.3.3.1.1. Tier 2: Sec. 5.5.1.1)	COMMENTS	MIDDLE
						H. OLS
С	NC	N/A	<b>x</b>	CONNECTION STRENGTH: All the brace connections develop the buckling capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)		HIGH
						_ v
C <b>X</b>	NC	N/A	U	COMPACT MEMBERS: All brace elements meet compact section requirements set forth by AISC 360, Table B4.1. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)		OPTION
						(0)
				NC = Noncompliant, $N/A = Not Applicable$ , $U = Unk$		SUPPORT

С	NC	N/A	U	K-BRACING: The bracing system does not include K-braced bays. (Commentary: Sec. A.3.3.2.1. Tier 2:	
X				Sec. 5.5.4.6)	

## **High Seismicity**

Seismic-Force-Resisting System

	eismic-Force-Resisting System								
	RA	TING			DESCRIPTION	COMMENTS			
	C	NC	N/A	U	COLUMN SPLICES: All column splice details located in braced frames develop 50% of the tensile strength of the column. (Commentary: Sec. A.3.3.1.3. Tier 2: Sec. 5.5.4.2)				
_	C <b>X</b>	NC	N/A	υ	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have Kl/r ratios less than 200. (Commentary: Sec. A.3.3.1.4. Tier 2: Sec. 5.5.4.3)				
	c	NC	N/A	U	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)				

					Project Name 47:Southridge High School Project Number 21800125	
С	NC x	N/A	U	COMPACT MEMBERS: All brace elements meet section requirements set forth by AISC 341, Table D1.1, for moderately ductile members. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)	7x7x5/16 do not met criteria	ELEMENTARY SCHOOLS
С	NC	N/A	U	CHEVRON BRACING: Beams in chevron, or V-braced, bays are capable of resisting the vertical load resulting from the simultaneous yielding and buckling of the brace pairs. (Commentary: Sec. A.3.3.2.3. Tier 2: Sec. 5.5.4.6)		MIDDLE SCHOOLS
С	NC	N/A X	U	CONCENTRICALLY BRACED FRAME JOINTS: All the diagonal braces shall frame into the beam–column joints concentrically. (Commentary: Sec. A.3.3.2.4. Tier 2: Sec. 5.5.4.8)		SCHOOLS HIGH
L Diap	L hragr	ns (Fl	exible	e or Stiff)		
	TING			DESCRIPTION	COMMENTS	
C <b>x</b>	NC	N/A	U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the braced frames extend less than 25% of the frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)		OPTION SCHOOLS
egend	l: C = 0	Comp	l liant,	NC = Noncompliant, $N/A = Not Applicable$ , $U = Unk$	known	SUPPORT FACILITIES

## Flexible Diaphragms

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	CROSS TIES: There are continuous cross ties	
_				between diaphragm chords. (Commentary: Sec.	
	X			A.4.1.2. Tier 2: Sec. 5.6.1.2)	
				STRAIGHT SHEATHING: All straight sheathed	
C	NC	N/A	U	diaphragms have aspect ratios less than 2-to-1 in	
П		X		the direction being considered. (Commentary:	
_				Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
_				SPANS: All wood diaphragms with spans greater	
C	NC	N/A	U	than 24 ft consist of wood structural panels or	
$ \Box $		X		diagonal sheathing. (Commentary: Sec. A.4.2.2.	
				Tier 2: Sec. 5.6.2)	
	NC	NI/A	U	DIAGONALLY SHEATHED AND UNBLOCKED	
C	NC	N/A	U	DIAPHRAGMS: All diagonally sheathed or	
		X		unblocked wood structural panel diaphragms	
				have horizontal spans less than 40 ft and aspect	
				ratios less than or equal to 4-to-1. (Commentary:	
				Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	

				Project Name 47	:Southridge High School
				Project Number	21800125
NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm does not		
			concrete, or horizontal bracing. (Commentary:		
			,		
	NC	NC N/A	NC N/A U	consist of a system other than wood, metal deck,	NC N/A U OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck, concrete, or horizontal bracing. (Commentary:

OTION HOOLS

ELEMENTARY SCHOOLS

MIDDLE SCHOOLS

> SUPPORT FACILITIES

FIRM:	KPFF
PROJECT NAME:	Southridge High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	5/21/17
REVIEWED BY:	
REVIEW DATE:	

16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

## **Low Seismicity**

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for	Quick check calc not complete.
			X	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)	

## **Moderate Seismicity**

#### Seismic-Force-Resisting System

	or or or or moderning of orom							
RA	TING			DESCRIPTION	COMMENTS	ı		
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls		I		
x				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)				
С	NC	N/A	U	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick	Calculation not complete.	I		
			X	Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in.² or 2√fc. (Commentary: Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)				

c	NC	N/A	U	REINFORCING STEEL: The ratio of reinforcing steel	
x				area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the	
	ш			horizontal direction. (Commentary: Sec. A.3.2.3.2.	
				Tier 2: Sec. 5.5.3.1.3)	
				·	
С	NC	N/A	U	WALL THICKNESS: Thicknesses of bearing walls	7" tilt up papal dags pat limit at south onto
	INC	IN/A	0	shall not be less than 1/40 the unsupported	7" tilt-up panel does not limit at south entry (29ft height requires 8.7"). 7" tilt-up panel
	X			height or length, whichever is shorter, nor less	does not limit at gym (25.5ft height requires
				than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec.	7.7")
				5.5.3.1.2)	
Diapl	_	ns			
RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm	
С	NC		υ	elements are interconnected by a continuous	
с П	NC	N/A	υ	elements are interconnected by a continuous reinforced concrete topping slab with a minimum	
С	NC		>	elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2:	
С	NC		>	elements are interconnected by a continuous reinforced concrete topping slab with a minimum	
С	NC		υ <u></u>	elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2:	
c	NC		>	elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2:	
С	NC		>	elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2:	
С	NC		>	elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2:	
		×	υ 🗆	elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2:	
Conn	ectio	×	U	elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	COMMENTS
Conn RA	ection	ns		elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	COMMENTS
Conn	ectio	×	U	elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)  DESCRIPTION  WOOD LEDGERS: The connection between the	COMMENTS
Conn RA	ection	ns		elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	COMMENTS
Conn RA	ection	ns N/A		elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)  DESCRIPTION  WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce	COMMENTS
Conn RA	ection	ns N/A		elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)  DESCRIPTION  WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood	COMMENTS
Conn RA	ection	ns N/A		elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)  DESCRIPTION  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.	COMMENTS
Conn RA	ection	ns N/A		elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)  DESCRIPTION  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.	COMMENTS
Conn RA	ection	ns N/A		elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)  DESCRIPTION  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.	COMMENTS
Conn RA	ection	ns N/A		elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)  DESCRIPTION  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.	COMMENTS

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

					Project Number 21800125	
C <b>X</b>	NC	N/A	U	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)		ELEMENTARY SCHOOLS
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)		MIDDLE SCHOOLS
C x	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)		HIGH SCHOOLS
•		nicity				
	n <i>ic-Fo</i> TING		lesist.	ing System DESCRIPTION	COMMENTS	(0
С	NC	N/A	U X	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	OUNTILITY	OPTION SCHOOLS
egend	: C = 0	Comp	oliant,	NC = Noncompliant, $N/A = Not Applicable$ , $U = Unknown$	own	SUPPORT FACILITIES

C <b>X</b>	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)	
Diap	hragi	ns			

Diap	Diaphragms				
R/	TING			DESCRIPTION	COMMENTS
c	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are	
				continuous cross ties between diaphragm chords.	
$  \sqcup$	X	Ш	Ш	(Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed	
_				diaphragms have aspect ratios less than 2-to-1 in	
		X		the direction being considered. (Commentary:	
				Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater	
_				than 24 ft consist of wood structural panels or	
$  \sqcup$	ΙШ	X	Ш	diagonal sheathing. (Commentary: Sec. A.4.2.2.	
				Tier 2: Sec. 5.6.2)	

					Project Name 47:Southridge High School Project Number 21800125	
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)		ELEMENTARY SCHOOLS
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)		MIDDLE SCHOOLS
Conn	ectio	ns				
RA	TING			DESCRIPTION	COMMENTS	(0
<b>X</b>	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each precast wall panel into the diaphragm elements. (Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)		SCHOOLS HIGH
C <b>X</b>	NC	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation. (Commentary: Sec. A.5.3.6. Tier 2: Sec. 5.7.3.4)		OPTION SCHOOLS
egend	: C = 0	Comp	liant,	NC = Noncompliant, N/A = Not Applicable, U = Unk	nown	SUPPORT FACILITIES

С	NC	N/A X	υ	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	
C **	NC	N/A	υ	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)	

FIRM:	KPFF
PROJECT NAME:	Southridge High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	5/21/18
REVIEWED BY:	
REVIEW DATE:	

# 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Low and	Moderate	Seismicity
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Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
<b>x</b>	NC	N/A	υ	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)	
С	NC	N/A	U <b>x</b>	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1)	Calculation not complete.
C **	NC	N/A	U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)	

Project Name 47:Southridge High School Project Number 21800125  Stiff Diaphragms RATING DESCRIPTION COMMENTS							
C	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	COMMENTS	ELEMENTAF SCHOOLS	
	ectio	ns		DESCRIPTION	COMMENTS	MIDDLE SCHOOLS	
c	NC	N/A	U X	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	Quick check calc not complete.	MII	
				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)  WOOD LEDGERS: The connection between the		HIGH SCHOOLS	
С	NC	N/A	υ	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. 5.7.1.3)		SCF	
C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are		TION	
X				connected for transfer of seismic forces to the shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)		O SCF	
						SUPPORT FACILITIES	

С	NC	N/A x	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)	
С	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is	
x				doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)	
С	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection	
x				hardware, or straps between the girder and the	
				column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	

## **High Seismicity**

## Stiff Diaphragms

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls	
X				are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	
				(Commentary, Sec. 71.4.11.4. Her 2, Sec. 5.0.1.5)	

					Project Name 47:Southridge High School Project Number 21800125	
С	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:		ELEMENTARY SCHOOLS
x				Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than		₽ď
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)		EMENT SCHOOL
				3.0.1.3)		
						"
Flexi	b <i>le Di</i> TING	iaphra	agms	DESCRIPTION	COMMENTS	(n
С	NC	N/A	U	CROSS TIES: There are continuous cross ties	No cross-ties at sector G	등
	X			between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	No cross ties at sector d	MIDDLE SCHOOLS
	•			7.4.1.2. Het 2. sec. 5.6.1.2)		SS
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm		H STC
X				openings immediately adjacent to the shear walls are less than 25% of the wall length.		HIGH SCHOOLS
				(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)		SCI
С	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to		TION
X				exterior masonry shear walls are not greater than		     
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)		OP1
						"
						RT IES
						UPPORT ACILITIES
						SUPF

С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
C <b>x</b>	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm shall 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)	

Project Name 47	:Southridge High Schoo
Proiect Number	21800125

## Connections

RA	TING			DESCRIPTION	COMMENTS
С	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)	

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

ELEMENTARY SCHOOLS

FIRM:	KPFF
PROJECT NAME:	Sunset High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	05/16/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 48	:Sunset High School
Project Number	21800125

ELEMENTARY SCHOOLS

Rev. 41-31.1

## 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
C **	NC	N/A	U	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)	
С	NC	N/A	U X	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)	Supplemental wall anchorage added in 2014. Quick Check calculation not complete.

2

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

Project Name 48	:Sunset High School
Project Number	21800125

## 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
C X	NC	N/A	U	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)	
С	NC X	N/A	U	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)	No seismic separation between main building (W2/PC1a) and attached auditorium structure (C2/C2a).
C <b>x</b>	NC	N/A	U	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)	

Project Name 48	Sunset High School
Project Number	21800125

В	uil	ldi	na	Co	nfic	aur	atio	n

Build	_	onfig	urati		00141451470	չ տ
C <b>X</b>	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	COMMENTS	ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	SOFT STORY: The stiffness of the seismic-forceresisting system in any story is not 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)		MIDDLE SCHOOLS
C X	NC	N/A	U	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)		STOOHOS HIGH
C x	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)		OPTION SCHOOLS

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

C **	NC	N/A	U	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)	
С	NC	N/A	U	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)	

## **Moderate Seismicity**

## Geologic Site Hazards

Ocon	ocologic site Hazards						
RA	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could			
			X	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	NC	N/A	U	SLOPE FAILURE: The building site is sufficiently			
		×		remote from potential earthquake-induced slope failures or rockfalls to be unaffected by such			
	Ш		ш	failures or is capable of accommodating any			
				predicted movements without failure.			
				(Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)			

					Project Name 48:Sunset High School Project Number 21800125	
С	NC	N/A	U <b>X</b>	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)	Trojectita moci Ziosoizs	ELEMENTARY
High	Seisr	nicity	,			4
-		-		ration		
RA	TING			DESCRIPTION	COMMENTS	
<b>x</b>	NC	N/A	U	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)		MIDDLE
						H STC
С	NC	N/A		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)	Site Class D assumed.	HOHOS
						] _ v
						OPTION

FIRM:	KPFF
PROJECT NAME:	Sunset High School
SEISMICITY LEVEL:	
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	05/16/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 48	Sunset High School
Project Number	21800125

## 16.3LS Life Safety Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

16.3				ety Structural Checklist for Building, Commercial and Industrial	g Type W2: Wood	TARY
				Seismicity e-Resisting System		ELEMENTARY
	TING			DESCRIPTION	COMMENTS	□□
c	NC X	N/A	U	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)	Long window lines create weak lines of lateral support.	
						MIDDLE
С	NC	N/A	U X	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	Not calculated.	
				following values (Commentary: Sec. A.3.2.7.1. Tier 2: Sec. 5.5.3.1.1): Structural panel sheathing 1,000 lb/ft Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft All other conditions 100 lb/ft		HIGH
С	NC	N/A	U	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)		OPTION
C <b>X</b>	NC	N/A	U	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)		
						PORT

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

С	NC X	N/A	υ 	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)  WALLS CONNECTED THROUGH FLOORS: Shear	Narrow shear walls present at east wall of 1962 shop addition.
C <b>x</b>	NC	N/A	U	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)	
С	NC	N/A	⊃ <u></u>	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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)	
С	NC	N/A	U	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)	

					Project Name 48:Sunset High School Project Number 21800125	
С	NC	N/A	U	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)		ELEMENTARY SCHOOLS
Conn	ectio	ns				
RA	TING			DESCRIPTION	COMMENTS	၂၂ တု
C <b>X</b>	NC	N/A	U	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)		MIDDLE
C <b>X</b>	NC	N/A	U	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)		HIGH
<b>x</b>	NC	N/A	υ	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)		OPTION
						SUPPORT FACILITIES

## **High Seismicity**

Diaphragms

RA	TING			DESCRIPTION	COMMENTS
с П	NC	N/A	U	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)	
С	NC X	N/A	U	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)	Pop-ups in diaphragm occur at study hall/library, student center
<b>x</b>	NC	N/A	U	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)	
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	

					Project Name 48:Sunset High School Project Number 21800125	
С	NC	N/A	U X	SPANS: All wood diaphragms with spans greater than 24 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)	2014 Re-roof plans indicate that Tectum roofs at gym were replaced with plywood in 1995, VIF	ELEMENTARY SCHOOLS
С	NC	N/A	U <b>x</b>	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	See note above.	MIDDLE SCHOOLS
C <b>x</b>	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)		STOOH2S HIGH
Conn			_			
C	NC	N/A	U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: A.5.3.7. Tier 2: Sec. 5.7.3.3)	COMMENTS	OPTION SCHOOLS
egend	· C = 0	Comp	liant	NC = Noncompliant, N/A = Not Applicable, U = Unk	nown	SUPPORT FACILITIES

FIRM:	KPFF
PROJECT NAME:	Sunset High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	05/16/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 48	:Sunset High School
Project Number	21800125

## 16.10LS Life Safety Structural Checklist for Building Types C2: Concrete Shear Walls with Stiff Diaphragms and C2A: Concrete Shear Walls with Flexible Diaphragms

Seis	smic-	Force-	Resis	tina	Sı	vstem	1
JUI.	)    C-	1 01 66-	116313	ung	J)	y Stoll	ı

16.	16.10LS Life Safety Structural Checklist for Building Types C2: Concrete Shear Walls with Stiff Diaphragms and C2A: Concrete Shear Walls with Flexible Diaphragms					ELEMENTARY SCHOOLS
Low	and N	/lode	rate S	Seismicity		SC EM
		orce-R	Resist	ing System		_  ⊞
RA	TING			DESCRIPTION	COMMENTS	Ц
<b>x</b>	NC	N/A	U	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)		
						MIDDLE
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls		
X				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)		
						SCHOOLS
c	NC	N/A	U	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	Calculation not complete.	
				the greater of 100 lb/in.² or 2√fc. (Commentary: Sec. A.3.2.2.1. Tier 2: Sec. 5.5.3.1.1)		OPTION
C <b>X</b>	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. (Commentary: Sec. A.3.2.2.2.		
				Tier 2: Sec. 5.5.3.1.3)		SUPPORT ACILITIES

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

## Connections

RA	TING			DESCRIPTION	COMMENTS
	NC	N/A	∪ <b>x</b>	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)	Out-of-plane anchors provided per 2014 re-roof drawings. Quick Check not complete.
C <b>x</b>	NC	N/A	υ	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)	
С П	NC	N/A	<b>V</b>	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation with vertical bars equal in size and spacing to the vertical wall reinforcing immediately above the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)	Concrete walls appears to be anchored to footing at pilasters only and not intermittently along wall.

## **High Seismicity**

Seismic-Force-Resisting System

RA	TING		DESCRIPTION	COMMENTS
С	NC	U X	DEFLECTION COMPATIBILITY: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	Calculation not complete.

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

					Project Name 48:Sunset High School Project Number 21800125	
С	NC	N/A	U	FLAT SLABS: Flat slabs or plates not part of the 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)		ELEMENTARY SCHOOLS
С	NC x	N/A	U	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. (Commentary: Sec. A.3.2.2.3. Tier 2: Sec. 5.5.3.2.1)		MIDDLE
Conn		ns				
	TING	I		DESCRIPTION	COMMENTS	ဟ
С	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)		SCHOOLS
	hragi TING	ns (Fi	exibl	e or Stiff) DESCRIPTION	COMMENTS	ON
С	NC	N/A	U	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)	COMMENTS	OPTION
						SUPPORT FACILITIES
gend	: C = (	Comp	oliant,	, NC = Noncompliant, N/A = Not Applicable, U = Unkr	nown	SUPP

С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls	Occurs at Auditorium south walls.
	X			are less than 25% of the wall length.	
				(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	

Flexible Diaphragms

Flexible Diaphragms						
R/	TING		COMMENTS			
С	NC 🗶	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	Out-of-plane wall ties provided per 2014 re-roof drawings but continuation from chord to chord not provided.	
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		
C **	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		

					Project Name 48:Sunset High School
					Project Number 21800125
С	NC x	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	Unblocked diaphragms greater than 40ft at cafeteria and commons.
С	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)	

### **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Sunset High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	05/16/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 48:Sunset High School					
Project Number	21800125				

ELEMENTARY

# 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

#### **Low Seismicity**

#### **Connections**

C NC N/A U 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)	RA	TING			DESCRIPTION	COMMENTS
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:	С	NC	N/A	U	· · · · · · · · · · · · · · · · · · ·	
	×				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:	

#### **Moderate Seismicity**

#### Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
C x	NC	N/A	U	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)	
С	NC	N/A	U x	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in.² or 2√fc. (Commentary: Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)	Calculation not completed.

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

C X	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. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3)	
С	NC x	N/A	U	WALL THICKNESS: Thicknesses of bearing walls shall not be less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2)	6" and 8" gym tilt-up at 37ft height (need 11" min). Verify that tilt-up is used in gym. Tilt-up or cast in place was an option per drawings.
Diapl	_	ns			
RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	
Conn		ns			
RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	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. 5.7.1.3)	

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

					Project Name 46-Sunset High School Project Number 21800125	
<b>K</b>	NC	N/A	U	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)		ELEMENTARY SCHOOLS
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)		MIDDLE SCHOOLS
C <b>X</b>	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)		HIGH SCHOOLS
Seisn		nicity prce-R		ing System  DESCRIPTION  DEFLECTION COMPATIBILITY FOR RIGID  DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	COMMENTS	OPTION SCHOOLS
egend	l: C = 1	Comp	oliant,	NC = Noncompliant, $N/A = Not Applicable$ , $U = Unkr$	nown	SUPPORT FACILITIES

С	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than	
X				75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)	

Diaphragms

	viapnragms					
RA	TING			DESCRIPTION	COMMENTS	
С	NC X	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	No continuous cross ties present per 2014 Re-roof drawings.	
С	NC	N/A	υ	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		
C	NC	N/A	υ	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		

					Project Name 48:Sunset High School Project Number 21800125	
С	NC x	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)		ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	υ	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)		MIDDLE SCHOOLS
Conn	ectio	ns				
RA	TING			DESCRIPTION	COMMENTS	(0
<b>X</b>	NC	N/A	υ <u></u>	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each precast wall panel into the diaphragm elements. (Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)		SCHOOFS HIGH
С	NC	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation. (Commentary: Sec. A.5.3.6. Tier 2: Sec. 5.7.3.4)	Tilt-up wall appears to be anchored to footing at pilasters only and not intermittently along wall.	OPTION SCHOOLS
egend	: C = (	Comp	liant,	NC = Noncompliant, $N/A = Not Applicable$ , $U = Unk$	nown	SUPPORT FACILITIES

С	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	
С	NC	N/A	U <b>x</b>	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)	Quick Check calc not complete.

MIDDLE CHOOLS

CHOOLS

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Westview High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	1800125
COMPLETED BY:	RP
DATE COMPLETED:	5/18/19
REVIEWED BY:	
REVIEW DATE:	

#### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
C **	NC	N/A	U	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)	
С	NC	N/A	U X	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)	Anchors present but calculation not complete.

Project Name 49:	Westview High School
Project Number	1800125

#### 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

	oche ai							
RA	TING			DESCRIPTION	COMMENTS			
<b>x</b>	NC	N/A	υ	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)				
С	NC	N/A *	υ	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)				
С	NC	N/A *	U	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)				

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

#### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
<b>x</b>	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	
<b>x</b>	NC	N/A	U	SOFT STORY: The stiffness of the seismic-forceresisting system in any story is not 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	NC	N/A	U	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)	
<b>x</b>	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)	

					Project Name 49:Westview High School Project Number 1800125	
C <b>X</b>	NC	N/A	U	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)		ELEMENTARY SCHOOLS
С	NC	N/A	U	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)	Shear wall and braced frame locations are not evenly distributed at west class wings.	MIDDLE SCHOOLS
Mode	erate	Seisn	—— nicity	<u> </u>		
Geol	ogic S	Site Ha	-	ds		တု
C	TING NC	N/A	U	DESCRIPTION LIQUEFACTION: Liquefaction-susceptible,	COMMENTS	HIGH
			<b>x</b>	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)		HIGH SCHOOL
				CLOSE FAILURE The head discussion of the inner this inner the		NO NCS
с П	NC	N/A	<b>x</b>	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)		OPTION SCHOOLS
						SUPPORT FACILITIES
						S /

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture	
			X	and surface displacement at the building site are not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	
				5.4.3.1)	

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at	
X				the foundation level to the building height (base/height) is greater than 0.6S <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic	
X				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)	

## MIDDLE CHOOLS

SCHOOLS

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Westview High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	1800125
COMPLETED BY:	RP
DATE COMPLETED:	05/18/18
REVIEWED BY:	
REVIEW DATE:	

# 16.5LS Life Safety Structural Checklist for Building Types S2: Steel Braced Frames with Stiff Diaphragms and S2A: Steel Braced Frames with Flexible Diaphragms

	Low Seismicity Seismic-Force-Resisting System							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	U <b>x</b>	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than 0.10Fy.  Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)	Calculation not complete.			
С	NC	N/A	U X	BRACE AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check procedure of Section 4.5.3.4, is less than 0.50Fy. (Commentary: Sec. A.3.3.1.2. Tier 2: Sec. 5.5.4.1)	Calculation not complete.			
Conn								
RA	TING			DESCRIPTION	COMMENTS			
<b>x</b>	NC	N/A	U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)				

					Project Name 49:Westview High School	
				STEEL COLUMNS: The columns in seismic-force-	Project Number 1800125	<b> </b> >
C	NC	N/A	U	resisting frames are anchored to the building		ELEMENTARY SCHOOLS
X				foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec.		
				5.7.3.1)		L필운
						山 、
Mode	erate	Seisn	nicity			
		orce-R	esist	ing System	OOMMENTO.	MIDDLE
	TING	I		DESCRIPTION CONTRACTOR OF THE PROPERTY OF T	COMMENTS	I₽ĕ
C	NC	N/A	U	REDUNDANCY: The number of lines of braced frames in each principal direction is greater than		I불풍
X				or equal to 2. The number of braced bays in each		_ 0
				line is greater than 2. (Commentary: Sec. A.3.3.1.1.		
				Tier 2: Sec. 5.5.1.1)		
						တ
				CONNECTION STRENGTH: All the brace		SCHOOLS
C	NC	N/A	U	connections develop the buckling capacity of the	Calculation not complete.	HGH
			X	diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec.		30
				5.5.4.4)		0,
				COMPACT MEMBERS: All brace elements meet		OPTION
C	NC	N/A	U	compact section requirements set forth by AISC	EBF braces meet compaction limits. However,	<b>1</b> ≌8
X				360, Table B4.1. (Commentary: Sec. A.3.3.1.7. Tier	tension rod systems may not be an approved LFRS.	l 등 공
				2: Sec. 5.5.4)		l o
						FS
						몽
						<b> </b>
						SUPPORT
	_	_				<b> </b> " "
~~~~	/	· ~ ~~	liant.	N(C - N) and comparison the $N/N - N$ at $N$ and is a $N = N$ and $N = N$	(D.O.) (D.O.)	•

С	NC	N/A	U	K-BRACING: The bracing system does not include K-braced bays. (Commentary: Sec. A.3.3.2.1. Tier 2:	
x				Sec. 5.5.4.6)	

#### **High Seismicity**

Seismic-Force-Resisting System

RATING DESCRIPTION COMMENTS							
С	NC	N/A	U	COLUMN SPLICES: All column splice details located in braced frames develop 50% of the tensile strength of the column. (Commentary: Sec. A.3.3.1.3. Tier 2: Sec. 5.5.4.2)			
C **	NC	N/A	υ	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have Kl/r ratios less than 200. (Commentary: Sec. A.3.3.1.4. Tier 2: Sec. 5.5.4.3)	EBF braces meet compaction limits. However, tension rod systems may not be an approved LFRS.		
С	NC	N/A	U <b>x</b>	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)	Calculation not complete, although connections seem robust.		

					Project Name 49:Westview High School Project Number 1800125	
С	NC x	N/A	U	COMPACT MEMBERS: All brace elements meet section requirements set forth by AISC 341, Table D1.1, for moderately ductile members. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)		ELEMENTARY SCHOOLS
С	NC	N/A	U	CHEVRON BRACING: Beams in chevron, or V-braced, bays are capable of resisting the vertical load resulting from the simultaneous yielding and buckling of the brace pairs. (Commentary: Sec. A.3.3.2.3. Tier 2: Sec. 5.5.4.6)	Calculation not complete.	MIDDLE SCHOOLS
C <b>x</b>	NC	N/A	U	CONCENTRICALLY BRACED FRAME JOINTS: All the diagonal braces shall frame into the beam–column joints concentrically. (Commentary: Sec. A.3.3.2.4. Tier 2: Sec. 5.5.4.8)		SCHOOLS SCHOOLS
	hragn TING		exibl	le or Stiff)	COMMENTS	
C <b>x</b>	NC	N/A	U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the braced frames extend less than 25% of the frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)	COMMENTS	OPTION SCHOOLS
				NC - Nancompliant N/A - Nat Applicable II - Upl		SUPPORT FACILITIES

#### Flexible Diaphragms

RA	TING			DESCRIPTION	COMMENTS
U	NC X	N/A	∪ □	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	Continuity of ties (beams) interrupted throughout.
U	NC	N/A X	>	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
С	NC	N/A X	о П	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
С	NC	N/A x	>	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	

					Project Name 49	:Westview High School
					Project Number	1800125
С	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck,		
X				concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)		
				3cc. 7t. 117.11. Her 2. 3cc. 3.0.3)		

MIDDLE SCHOOLS

### **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Westview High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	1800125
COMPLETED BY:	RP
DATE COMPLETED:	05/18/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 49	:Westview High School
Project Number	1800125

#### 16.10LS Life Safety Structural Checklist for Building Types C2: Concrete Shear Walls with Stiff Diaphragms and C2A: Concrete Shear Walls with Flexible Diaphragms

	· ···· - · · · · · · · · · · · · · · ·
Low and Moderate Seismicity	

16.1	IOL:	Sh	ear	afety Structural Checklist for Build Walls with Stiff Diaphragms and C lexible Diaphragms		I ELEMENTARY
Low	and N	/loder	ate S	Seismicity		-EM
Seisn	nic-Fa	orce-R	esist	ing System		=
RA	TING			DESCRIPTION	COMMENTS	
<b>x</b>	NC	N/A	υ	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)		MIDDLE
C <b>X</b>	NC	N/A	U	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)		HIGH
С	NC	N/A	U <b>X</b>	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√f'c. (Commentary: Sec. A.3.2.2.1. Tier 2: Sec. 5.5.3.1.1)	Calculation not complete.	OPTION
C <b>X</b>	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. (Commentary: Sec. A.3.2.2.2. Tier 2: Sec. 5.5.3.1.3)		
						SUPPORT

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

#### Connections

RATING DESCRIPTION COMMENTS							
С	NC	N/A	U <b>x</b>	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)	Deck anchored to wall with shear connections. Unclear anchors are adequate for out-of-plane forces. Quick Check calc not complete.		
C **	NC	N/A	о <sub>П</sub>	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 <b>x</b>	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation with vertical bars equal in size and spacing to the vertical wall reinforcing immediately above the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)			

#### **High Seismicity**

Seismic-Force-Resisting System

RA	TING		DESCRIPTION	COMMENTS
С	NC	U X	DEFLECTION COMPATIBILITY: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	Compatibility of steel gravity columns throughout and conc columns in student center are unknown.

					Project Name 49. Westview High School Project Number 1800125	
С	NC	N/A	U	FLAT SLABS: Flat slabs or plates not part of the 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)		ELEMENTARY SCHOOLS
С	NC	N/A	U	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. (Commentary: Sec. A.3.2.2.3. Tier 2: Sec. 5.5.3.2.1)		MIDDLE SCHOOLS
Conn	ectio	ns				
RA	ΓING			DESCRIPTION	COMMENTS	(0)
С	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)		SCHOOLS SCHOOLS
Diapl	hragi	ns (Fl	exibl	e or Stiff)		]_ v
C	NC	N/A	U	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)	COMMENTS	OPTION SCHOOLS
egend	: C = 0	Comp	oliant,	NC = Noncompliant, N/A = Not Applicable, U = Unkr	nown	SUPPORT FACILITIES

С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls	
		X		are less than 25% of the wall length.	
				(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	

Flexible Diaphragms

	riexibie Diapili agilis								
RA	RATING DESCRIPTION COMMENTS								
C	NC x	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	Continuity of ties (beams) interrupted throughout in E-W direction.				
C	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)					
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)					

					Project Name 49 Project Number	:Westview High School 1800125
С	NC	N/A x	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		
C <b>x</b>	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)		

### **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Westview High School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	1800125
COMPLETED BY:	RP
DATE COMPLETED:	05/18/18
REVIEWED BY:	
REVIEW DATE:	

# MDDLE HOOLS

SCHOOLS

CHOOLS

SUPPORI

# 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Low and Moderate Seismicity
Seismic-Force-Resisting System

	RATING DESCRIPTION COMMENTS					
				REDUNDANCY: The number of lines of shear walls	O O MINIEW 10	
C	NC	N/A	U			
X				in each principal direction is greater than or equal		
🔼	Ш	Ш	Ш	to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec.		
				5.5.1.1)		
				SHEAR STRESS CHECK: The shear stress in the		
C	NC	N/A	U	reinforced masonry shear walls, calculated using	Calculation not complete.	
			X	the Quick Check procedure of Section 4.5.3.3, is		
	ш	ш		less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1.		
				Tier 2: Sec. 5.5.3.1.1)		
				Tiel 2. 3ee. 3.3.3.1.1)		
	NG	N 1 / A	U	REINFORCING STEEL: The total vertical and	(2)   -1	
C	NC	N/A	U	horizontal reinforcing steel ratio in reinforced	(2) #5 horiz at 48" oc in 12" CMU = 0.00107.	
	X			masonry walls is greater than 0.002 of the wall	Wall is likely in adequate for shear loads.	
				with the minimum of 0.0007 in either of the two		
				directions; the spacing of reinforcing steel is less		
				than 48 in., and all vertical bars extend to the top		
				of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2:		
				Sec. 5.5.3.1.3)		

#### Stiff Diaphragms

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous	
		X		reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	

#### Connections

	Somections						
RA	RATING DESCRIPTION COMMENTS						
С	NC	N/A	U X	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)	Deck anchored to wall with shear connections. Unclear anchors are adequate for out-of-plane forces. Quick Check calc not complete.		
С	NC	N/A	U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce			
		X		cross-grain bending or tension in the wood ledgers. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3)			
<b>x</b>	NC	N/A	U	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)			

					Project Name 49:Westview High School Project Number 1800125	
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)		ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)		MIDDLE SCHOOLS
C <b>X</b>	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)		HIGH
Stiff		l nicity nragn		DESCRIPTION	COMMENTS	S N
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)		OPTION SCHOOLS
Legend	l: C = 1	Comp	oliant,	NC = Noncompliant, N/A = Not Applicable, U = Unki	nown	SUPPORT FACILITIES

_	NIC	NI/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:	
C	NC	N/A	U		
				Diaphragm openings immediately adjacent to	
X				exterior masonry shear walls are not greater than	
النا					
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.	
				5.6.1.3)	
				3.0.1.37	

Flexible Diaphragms

	Flexible Diaphragms					
RA	TING			DESCRIPTION	COMMENTS	
С	NC X	N/A	υ	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	Unknown if joists to wall connections can handle out-of-plane loads in E-W direction at auditorium and gym roofs. No ties provided in N-S direction.	
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)		
				(Commentary, Sec. A.4.1.4. Her 2. Sec. 5.6.1.5)		
C **	NC	N/A	>	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)		

					Project Number 1800125	
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		ELEMENTARY SCHOOLS
C	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		MIDDLE SCHOOLS
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		HIGH
C x	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm shall 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)		OPTION SCHOOLS
						SUPPORT FACILITIES

Project Name 49	:Westview High School
Project Number	1800125

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural	
X				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)	

# Appendix D

Option Schools - ASCE 41-13 Checklists



# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff	EMEI SCHO
PROJECT NAME:	51_Capital Center	ELE S
SEISMICITY LEVEL:	High	
PROJECT NUMBER:	10021800125	
COMPLETED BY:	NMS	
DATE COMPLETED:	8/1/18	
REVIEWED BY:		ES E
REVIEW DATE:		100 00
		MIDDI

## 16.1 Basic Checklist

### **Very Low Seismicity**

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	
С	NC x	N/A	⊃ □	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)	There is a vague load path which is assumed to be non compliant.  The connection of the 1977 addition is vague and is assumed to not work.

# 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC X	N/A	υ <u></u>	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)	The load path is not complete and well defined. The roof diaphragm does not attach to the wall and the walls do not connect to the foundations.
C <b>x</b>	NC	N/A	o □	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)	There are no close adjacent buildings.
С	NC	N/A *	o □	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)	

## **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
	NC	N/A	υ	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force- resisting system in any story is not less than 70%	
		X		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	NC	N/A	U [	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous	
		X		to the foundation. (Commentary: Sec. A.2.2.4. Tier 2: Sec. 5.4.2.3)	
С	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-	
X				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)	
				/ N.Z.Z.J. TICI Z. JCC. J.T.Z.T)	

					Project Name 51_Capital Center Project Number 10021800125	
C <b>X</b>	NC	N/A	U	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)		ELEMENTARY SCHOOLS
C <b>X</b>	NC	N/A	U	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)		MIDDLE
		Seisn	-			
	ting	ite Ha	ızaı u	DESCRIPTION	COMMENTS	S
C	NC	N/A	U	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)	Likely not an issue. Assumed to be in compliance. Should be confirmed by a geotechnical engineer	H9IH
c	NC	N/A	U	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)	Likely not an issue. Assumed to be in compliance. Should be confirmed by a geotechnical engineer	OPTION

с П	NC	N/A	U	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)	Likely not an issue. Assumed to be in compliance. Should be confirmed by a geotechnical engineer

#### **High Seismicity**

## Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U <b>x</b>	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	The building is very large in plan and is only 1 story tall. This criterion is assumed to be compliant.
С	NC x	N/A	U	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)	There are no ties in the original 1970 building anchoring the shear walls to the foundation.

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff	EMEI SCHO
PROJECT NAME:	51_Capital Center	ELE S
SEISMICITY LEVEL:	High	
PROJECT NUMBER:	10021800125	
COMPLETED BY:	NMS	
DATE COMPLETED:	8/1/18	
REVIEWED BY:		ES E
REVIEW DATE:		100 00
		MIDDI

# 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

#### **Low Seismicity**

#### Connections

R/	TING			DESCRIPTION	COMMENTS
C	NC X	N/A	U	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,	The load path is vague and it is assumed that the connection is not structurally acceptable.
				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)	The connection of the 1977 addition is vague and it is assumed to not work.

#### **Moderate Seismicity**

Seismic-Force-Resisting System

00.0	ousime i or co-nesisting system							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls				
				in each principal direction is greater than or equal				
X		ш	Ш	to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec. 5.5.1.1)				
				3.3.1.1)				
С	NC	N/A	U	WALL SHEAR STRESS CHECK: The shear stress in	The wall stress check was not checked, but is			
			-	the precast panels, calculated using the Quick	assumed to be compliant.			
		Ш	X	Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in. <sup>2</sup> or $2\sqrt{f}$ c. (Commentary:				
				Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)				
				, , , , , , , , , , , , , , , , , , , ,				

					Project Name 51_Capital Center Project Number 10021800125	-
C <b>x</b>	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. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3)	Wall reinforcing is in compliance per this criterion.	ELEMENTARY SCHOOLS
С	NC x	N/A	U	WALL THICKNESS: Thicknesses of bearing walls shall not be less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2)	The wall thickness to unsupported height ratio is greater than 1/40 in the original building.  The wall thickness to unsupported height is non compliant in the 1977 addition.	MIDDLE
Diap	hragı	ns				
RA	TING			DESCRIPTION	COMMENTS	(0)
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)		SCHOOLS
Conn	ıectio	ns				S
	TING			DESCRIPTION	COMMENTS	
С	NC X	N/A	U	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. 5.7.1.3)	Cross grain bending in 1977 separate building	OPTION
egend	l: C = 0	Comp	liant,	NC = Noncompliant, N/A = Not Applicable, U = Unk	nown	SUPPORT FACILITIES

С	NC x	N/A	U	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)	Compliant in the 1977 separate building.
c   □	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are	
				doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)	
С	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection	
X				hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	

### **High Seismicity**

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the	Flexible diaphragm.
		x		shear capacity to develop the flexural strength of	
				the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	

					Project Name Project Number	51_Capital Center	
<b>x</b>	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1. (Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)			ELEMENTARY SCHOOLS
Diapi R A	nragi TING	ns		DESCRIPTION	COMMENTS		(n
С	NC	N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are	33MMENT3		ا ا ا
	INC.	IN/A	0	continuous cross ties between diaphragm chords.			[음호
X				(Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)			MIDDLE
							၂
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	plywood diaphragm.		SCHOOLS HIGH
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater			(0
X				than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			OPTION
							ORT TIES

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

C <b>x</b>	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)	Diaphragm is blocked and has a span larger than 40ft.
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)	

#### Connections

RΑ	TING			DESCRIPTION	COMMENTS
C	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each precast wall panel into the diaphragm elements. (Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)	
С	NC x	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation. (Commentary: Sec. A.5.3.6. Tier 2: Sec. 5.7.3.4)	Precast wall panels are not connected to the foundation.

ELEMENTARY SCHOOLS

С	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile	There are no piles or pile caps in the building.
		x		caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec.	
				5.7.3.5)	
С	NC	N/A	U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts	Assumed to be compliant
			X	unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)	

Project Name Project Number 10021800125

52\_International School

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	kpff
PROJECT NAME:	52_International School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 52\_International School

Project Number 10021800125

## 16.3LS Life Safety Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

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		JIIIIC-	1 0100	e-nesisting system	O O NABA ENTO
RA	TING			DESCRIPTION	COMMENTS
C <b>X</b>	NC	N/A	U	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)	
U	NC	N/A	U <b>X</b>	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): Structural panel sheathing 1,000 lb/ft Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft All other conditions 100 lb/ft	Assumed to be in compliance
<b>x</b>	NC	N/A	υ	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)	
<b>x</b>	NC	N/A	⊃	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

SUPPORT FACILITIES

C	NC	N/A	U	NARROW WOOD SHEAR WALLS: Narrow wood	
	X			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)	
				(Commentary, Sec. 71.5.2.7. 1. 11cl 2. Sec. 5.5.5.6.1)	
	NC	N/A	U	WALLS CONNECTED THROUGH FLOORS: Shear	
C	NC	IN/A	U	walls have an interconnection between stories to	
X				transfer overturning and shear forces through the	
				floor. (Commentary: Sec. A.3.2.7.5. Tier 2:	
				Sec.5.5.3.6.2)	
				LULI CIDE CITE E	
				HILLSIDE SITE: For structures that are taller on at	
C	NC	N/A	U		
C	NC			least one side by more than one-half story	
с П	NC	N/A			
С				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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec.	
С				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-	
С				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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec.	
С				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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec.	
C				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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec.	
С				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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)	
С	NC		U	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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)  CRIPPLE WALLS: Cripple walls below first-floor-	
		N/A		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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)  CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation	
		x		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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)  CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec.	
		N/A		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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)  CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation	
		N/A		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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)  CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec.	
		N/A		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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)  CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec.	
		N/A		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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)  CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec.	
		N/A		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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)  CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels. (Commentary: Sec.	

					Project Name 52_International School 10021800125	ol —
					Project Number 10021800125	- <b> </b>
C	NC	N/A	U	OPENINGS: Walls with openings greater than 80%		ELEMENTARY SCHOOLS
		x		of the length are braced with wood structural panel shear walls with aspect ratios of not more		¥3
			Ш	than 1.5-to-1 or are supported by adjacent		
				construction through positive ties capable of		EMENT
				transferring the seismic forces. (Commentary: Sec.		ll ii S
				A.3.2.7.8. Tier 2: Sec. 5.5.3.6.5)		∥"
Conn		ns				_l
RA	TING	I		DESCRIPTION	COMMENTS	MIDDLE
C	NC	N/A	U	WOOD POSTS: There is a positive connection of wood posts to the foundation. (Commentary: Sec.	Wood posts in the 1988 Modular are	III I S
	X			A.5.3.3. Tier 2: Sec. 5.7.3.3)	non-compliant.	비윤꽃
				7.13.3.3.1 (16) 21.3 (21.3.1, 13.3.)		≥S
						- $ $ $ $
C	NC	N/A	U	WOOD SILLS: All wood sills are bolted to the	The connection of the wood shear wall to the	HIGH
			X	foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)	foundation is not shown in the construction	∥ତ୍ର
					drawings. It is assumed that it is not connected and is non-compliant.	ll ェ 우
						S
C	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a		> 0
X				positive connection using plates, connection hardware, or straps between the girder and the		
				column support. (Commentary: Sec. A.5.4.1. Tier 2:		I 둔 오
				Sec. 5.7.4.1)		OPT SCH(
						Lω
						UPPORT
						ISI E
						SUPF
						ນ 4

## **High Seismicity**

## Diaphragms

RA	TING			DESCRIPTION	COMMENTS
υ <u></u>	NC x	N/A	U	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)	The diaphragms are non continuous where the classroom sections of the main building meet the cafeteria and the gymnasium sections of the main building.
C	NC X	N/A	U	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)	The roof elevation varies depending on the building addition construction year. this elevation change makes the roof chords discontinuous.
С	NC	N/A X	U	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)	
о <u></u>	NC	N/A	U X	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	It is unknown what the roof diaphragm material is constructed of. It is assumed that it is non-compliant.

					Project Name	52_International School 10021800125	
C **	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 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)	Project Number	10021800125	ELEMENTARY SCHOOLS
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)			MIDDLE SCHOOLS
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)			HIGH SCHOOLS
Conn	l ectio	ns					
RA	TING				COMMENTS		
<b>x</b>	NC	N/A	υ	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: A.5.3.7. Tier 2: Sec. 5.7.3.3)			OPTION
							SUPPORT FACILITIES

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

Project Name Project Number 10021800125

52\_International School

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	52_International School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 52\_International School

Project Number 10021800125

# 16.5LS Life Safety Structural Checklist for Building Types S2: Steel Braced Frames with Stiff Diaphragms and S2A: Steel Braced Frames with

16.	5LS	Fra	mes	fety Structural Checklist for Buildir s with Stiff Diaphragms and S2A: S e Diaphragms		ELEMENTARY SCHOOLS
Low	Seisn	nicity				SC EM
Seisi	nic-F	orce-F	Resist	ing System		= 1
RA	TING			DESCRIPTION	COMMENTS	
С	NC	N/A	<b>X</b>	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than 0.10Fy. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)	Assumed to be ok	MIDDLE
С	NC	N/A	U	BRACE AXIAL STRESS CHECK: The axial stress in	Assumed to be ok	
			X	the diagonals, calculated using the Quick Check procedure of Section 4.5.3.4, is less than 0.50Fy. (Commentary: Sec. A.3.3.1.2. Tier 2: Sec. 5.5.4.1)		HIGH
	nectio			DECORIDATION	COMMENTS	_
C	NC	N/A	U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)	COMMENTS	OPTION

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

С	NC	N/A	U	STEEL COLUMNS: The columns in seismic-force- resisting frames are anchored to the building	
X				foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec.	
				5.7.3.1)	
	l	1			

#### **Moderate Seismicity**

#### Seismic-Force-Resisting System

	RATING DESCRIPTION COMMENTS						
C	NC	N/A	U	REDUNDANCY: The number of lines of braced frames in each principal direction is greater than or equal to 2. The number of braced bays in each line is greater than 2. (Commentary: Sec. A.3.3.1.1. Tier 2: Sec. 5.5.1.1)	There are also CMU shear walls in the building addition.		
С	NC	N/A	U <b>x</b>	CONNECTION STRENGTH: All the brace connections develop the buckling capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)	Assumed to be ok		
С	NC	N/A	U	COMPACT MEMBERS: All brace elements meet compact section requirements set forth by AISC 360, Table B4.1. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)	Assumed to be ok		

					Project Name	52_International School	
C <b>X</b>	NC	N/A	U	K-BRACING: The bracing system does not include K-braced bays. (Commentary: Sec. A.3.3.2.1. Tier 2: Sec. 5.5.4.6)	Project Number	10021800125	ELEMENTARY SCHOOLS
Seisn				ing System  DESCRIPTION	COMMENTS		LE OLS
С	NC	N/A	U	COLUMN SPLICES: All column splice details located in braced frames develop 50% of the tensile strength of the column. (Commentary: Sec. A.3.3.1.3. Tier 2: Sec. 5.5.4.2)	COMMENTS		MIDDLE
С	NC	N/A	U	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have Kl/r ratios less than 200. (Commentary: Sec. A.3.3.1.4. Tier 2: Sec. 5.5.4.3)	Assumed to be ok.		HIGH SCHOOLS
С	NC	N/A	U	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)	Assumed to be ok.		OPTION SCHOOLS
							SUPPORT FACILITIES

С	NC	N/A	U X	COMPACT MEMBERS: All brace elements meet section requirements set forth by AISC 341, Table D1.1, for moderately ductile members. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)	Assumed to be ok.
C	NC	N/A	U	CHEVRON BRACING: Beams in chevron, or V-braced, bays are capable of resisting the vertical	Assumed to be ok.
			X	load resulting from the simultaneous yielding and buckling of the brace pairs. (Commentary: Sec. A.3.3.2.3. Tier 2: Sec. 5.5.4.6)	
<b>X</b>	NC	N/A	U	CONCENTRICALLY BRACED FRAME JOINTS: All the diagonal braces shall frame into the beam–column joints concentrically. (Commentary: Sec. A.3.3.2.4. Tier 2: Sec. 5.5.4.8)	

### Diaphragms (Flexible or Stiff)

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the braced frames	Assumed to be ok.
			X	extend less than 25% of the frame length.	
				(Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)	

Flexible Diaphragms

		артт	ayıns		0.01411170	<u>ا</u>
RA	TING			DESCRIPTION	COMMENTS	[ ≤
c	NC	N/A	U	CROSS TIES: There are continuous cross ties		CACAT
`		, , .		between diaphragm chords. (Commentary: Sec.		Ē
X				A.4.1.2. Tier 2: Sec. 5.6.1.2)		2
				·		"
						ū
						۱.,
c	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed		╽╙
_		,	_	diaphragms have aspect ratios less than 2-to-1 in		
		X		the direction being considered. (Commentary:		
				Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		2
						Г
				CDANC All III I III		
C	NC	N/A	U	SPANS: All wood diaphragms with spans greater		
_				than 24 ft consist of wood structural panels or		]
ш	Ш	X	Ш	diagonal sheathing. (Commentary: Sec. A.4.2.2.		
				Tier 2: Sec. 5.6.2)		-
	NG	N1/6		DIAGONALLY SHEATHED AND UNBLOCKED		
C	NC	N/A	U	DIAPHRAGMS: All diagonally sheathed or		
		X		unblocked wood structural panel diaphragms		2
		🗀		have horizontal spans less than 40 ft and aspect		
						Tac
				ratios less than or equal to 4-to-1. (Commentary:		
				Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		
						Г
						ı

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)

Project Name 52\_International School

Project Number 10021800125

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	52_International School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

## 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

L	ow	and	Mo	derate	Seism	icity

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
<b>x</b>	NC	N/A	U	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)	
С	NC	N/A	U X	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1)	Assumed to be in compliance.
С	NC x	N/A	U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)	Non compliant in the 1988 modular.

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Project Number	10021800125		

Stiff Diaphragm	
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Stiff Diaphragms						
RATING		DESCRIPTION	COMMENTS	TÆ SÌ		
C NC N	N/A U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)		ELEMENT		
				S		

#### Connections

Connections						
RA	TING	1		DESCRIPTION	COMMENTS	드
С	NC	N/A	U <b>x</b>	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	Assumed to be ok.	NIDDI SCHOC
				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)		HIGH SCHOOLS
С	NC	N/A	υ	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. 5.7.1.3)		SCH
	NG	<b>N</b> 1/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are		OPTION SCHOOLS
<b>X</b>	NC	N/A		connected for transfer of seismic forces to the shear walls. (Commentary: Sec. A.5.2.1. Tier 2: Sec. 5.7.2)		OPT SCH(
						SUPPORT FACILITIES

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

C	NC	N/A	υ	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)	
C	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is	
X				doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)	
c	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a	
		<b>—</b>		positive connection using plates, connection	
		X		hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	

## **High Seismicity**

#### Stiff Diaphragms

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm	
		X		openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	

					Project Name	52_International School	
		1			Project Number	10021600125	I.
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:			ELEMENTARY SCHOOLS
-				Diaphragm openings immediately adjacent to			lĕ≒
		X	Ш	exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.			Izo
				5.6.1.3)			男芸
				3.0.1.3)			
							□
	ble Di TING	iaphra	agms	DESCRIPTION	COMMENTS		<u></u>
				CROSS TIES: There are continuous cross ties	COMMENTS		MIDDLE SCHOOLS
C	NC	N/A	U	between diaphragm chords. (Commentary: Sec.			Į₫8
П	X	$  \Box  $		A.4.1.2. Tier 2: Sec. 5.6.1.2)			I₽ĭ
							≥8
_				OPENINGS AT SHEAR WALLS: Diaphragm			ဟု
С	NC	N/A	U	openings immediately adjacent to the shear walls	Assumed to be in con	npliance.	HIGH
			X	are less than 25% of the wall length.			Ⅰ≌우
				(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)			ㅗ ວૂ
							ဟ
С	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:			_
			) [	Diaphragm openings immediately adjacent to			IZΞ
	Ш	X	Ш	exterior masonry shear walls are not greater than			l≅ŏ
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.			l 등 뜻
				5.6.1.3)			9 5
							   _ ഗ

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

С	NC	N/A	U [	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in	
$   \Box  $		X		the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
_	NC	NI/A	U	SPANS: All wood diaphragms with spans greater	
C	NC	N/A	υ Π	than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2.	
				Tier 2: Sec. 5.6.2)	
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED	
	X			DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms	
				have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary:	
				Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
С	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm shall not consist of a system other than wood, metal deck,	
x				concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)	
				500.7.4.7.1. Het 2. 560. 5.0.5/	

#### Connections

C NC N/A U STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural	R/
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)	C

Project Name Project Number 10021800125

52\_International School

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	52_International School
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

Project Name	52_International Schoo		
Project Number	10021800125		

ELEMENTARY SCHOOLS

Rev. 41-31.1

## 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	LOAD PATH: The structure shall contain a complete, well-defined load path, including	
	X			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)	
				WALL ANGLIODAGE, Exterior concrete or massage.	
C	NC	N/A	U	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for	
		X		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)	

2

# 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC X	N/A	U	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 **	NC	N/A	υ	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)	
С	NC	N/A	U	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)	

Project Name 52\_International School Project Number 10021800125

#### Ruilding Configuration

Build	Building Configuration  PATING DESCRIPTION COMMENTS									
RATING DESCRIPTION COMMENTS  C NC N/A II WEAK STORY: The sum of the shear strengths of										
C <b>X</b>	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)		ELEMENTARY SCHOOLS				
C <b>X</b>	NC	N/A	U	SOFT STORY: The stiffness of the seismic-forceresisting system in any story is not 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)		MIDDLE				
C <b>x</b>	NC	N/A	U	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)		HIGH SCHOOLS				
С	NC	N/A	U X	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)	Assumed to be in compliance.	OPTION				
						1				

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

Project Name 52\_International School Project Number 10021800125

C <b>x</b>	NC	N/A	U	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 <b>X</b>	NC	N/A	U	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)	

#### **Moderate Seismicity**

#### Geologic Site Hazards

RATING DESCRIPTION COMMENTS						
С	NC	N/A	U <b>X</b>	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.	
С	NC	Z/A	U <b>x</b>	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.	

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	It is assumed to be in compliance, however
			X	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)	further exploration should be conducted by a geotechincal engineer.

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U X	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	Assumed to be in compliance as there are lot of shear walls in the building
С	NC	N/A	U X	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)	Assumed to be in compliance.

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	53_Merlo Station
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

#### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	υ 🗆	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)	There are no foundation ties connecting the strip footing and the concrete shear walls together.
C	NC	N/A	υ	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)	The strength requirement for this item is assumed to be compliant.

#### 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC X	N/A	U	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 **	NC	N/A	υ	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)	
С	NC	N/A	U	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)	

Build	<i>ling C</i> TING		urati	on DESCRIPTION	COMMENTS	S S
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	CONTINUENTS	ELEMENTARY SCHOOLS
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-forceresisting system in any story is not 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)		MIDDLE SCHOOLS
C <b>x</b>	NC	N/A	U	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)		SCHOOLS HIGH
С	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)		OPTION

С	NC	N/A *	U	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 <b>x</b>	NC	N/A	U	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)	This building is rectangular in plan and is constructed of tilt up concrete walls all around the perimeter.

#### **Moderate Seismicity**

#### Geologic Site Hazards

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U X	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.
С	NC	N/A	U X	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)	It is assumed to be in compliance, however further exploration should be conducted by a geotechincal engineer.

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С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	It is assumed to be in compliance, however	
			X	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2: 5.4.3.1)	further exploration should be conducted by a geotechincal engineer.	
						ľ

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U <b>x</b>	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	The concrete tilt up shear walls are very long in plan and have a very high base/height ratio. This criterion was assumed to be in compliance.
С	NC x	N/A	υ	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)	Ties are not shown in the drawings. Assumed to be non-compliant.

#### **ASCE 41-13 Tier 1 Checklists**

FIRM:	kpff
PROJECT NAME:	53_Merlo Station
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY

## 16.12LS Life Safety Structural Checklist for Building Types PC1: Precast or Tilt-Up Concrete Shear Walls with Flexible Diaphragms and PC1A: Precast or Tilt-Up Concrete Shear Walls with Stiff Diaphragms

**Low Seismicity** 

Connections

IVALI	ING			DESCRIPTION	COMMENTS
		N/A	U X	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)	The wall is supported for out of plane loading. It is assumed that this criterion is in compliance.

**Moderate Seismicity** 

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls	
X				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)	
С	NC	N/A	U <b>x</b>	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in.² or 2√fc. (Commentary: Sec. A.3.2.3.1. Tier 2: Sec. 5.5.3.1.1)	Assumed to be compliant since the concrete tilt up walls are around the entire perimeter of the building and are very long.

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

Project Name 53 Merlo Station Project Number 10021800125 REINFORCING STEEL: The ratio of reinforcing steel NC N/A U area to gross concrete area is not less than 0.0012 X in the vertical direction and 0.0020 in the horizontal direction. (Commentary: Sec. A.3.2.3.2. Tier 2: Sec. 5.5.3.1.3) WALL THICKNESS: Thicknesses of bearing walls NC U C N/A shall not be less than 1/40 the unsupported X height or length, whichever is shorter, nor less than 4 in. (Commentary: Sec. A.3.2.3.5. Tier 2: Sec. 5.5.3.1.2) Diaphragms RATING DESCRIPTION COMMENTS TOPPING SLAB: Precast concrete diaphragm C NC N/A U elements are interconnected by a continuous X reinforced concrete topping slab with a minimum thickness of 2 in. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4) Connections RATING DESCRIPTION COMMENTS WOOD LEDGERS: The connection between the C NC U N/A Connections are through a wood plate on top wall panels and the diaphragm does not induce of the wall. X cross-grain bending or tension in the wood ledgers. (Commentary: Sec. A.5.1.2. Tier 2: Sec. 5.7.1.3)

						53_Merlo Station 10021800125	
С	NC	N/A	U X	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)	Nailing called out in th cover page. Assumed t		ELEMENTARY SCHOOLS
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)			MIDDLE SCHOOLS
C <b>X</b>	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)			STOOH2S HIGH
Seisn		nicity orce-R N/A		ing System DESCRIPTION  DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	COMMENTS  The diaphragm is flexib	ole.	OPTION SCHOOLS
gend	: C = 0	Comp	liant,	NC = Noncompliant, $N/A = Not Applicable$ , $U = Unk$	nown		SUPPORT FACILITIES

С	NC	N/A	U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than	Assumed to be compliant.
			X	75% of the length of any perimeter wall when the	
				wall piers have aspect ratios of less than 2-to-1.	
				(Commentary: Sec. A.3.2.3.3. Tier 2: Sec. 5.5.3.3.1)	

Diaphragms

Dia	Diaphragms						
RATING DESCRIPTION COMMENTS							
C		N/A	U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	Glulam beams serve as the continuous cross ties in the EW direction and OWJ are the cross ties in the NS direction.		
					ties in the NS direction.		
C	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			
<b>X</b>		N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			

					Project Name Project Number	53_Merlo Station 10021800125	
С	NC x	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec.5.6.2)	The unblocked diaphr	agm is longer than 40ft.	ELEMENTARY SCHOOLS
C <b>X</b>	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)			MIDDLE SCHOOLS
Conn	ectio	ns					
RA	TING			DESCRIPTION	COMMENTS		
C <b>x</b>	NC	N/A	U	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each precast wall panel into the diaphragm elements. (Commentary: Sec. A.5.1.3. Tier 2: Sec. 5.7.1.4)			SCHOOFS HIGH
			ı				
С	NC x	N/A	U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation. (Commentary: Sec. A.5.3.6. Tier 2: Sec. 5.7.3.4)	The existing drawings connection of the she foundation.		OPTION
			Ī				
gend: C = Compliant, NC = Noncompliant, N/A = Not Applicable, U = Unknown						SUPPORT FACILITIES	

	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	There are no pile caps or piles in this building.
<b>x</b>	NC	N/A	U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with adequate strength to resist the connection force calculated in the Quick Check procedure of Section 4.5.3.7. (Commentary: Sec. A.5.4.2. Tier 2: Sec. 5.7.4.2)	

54\_Terra Nova School Project Name Project Number 10021800125

# ELEMENTARY SCHOOLS

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	54_Terra Nova School of Science & Sustainability
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 54\_Terra Nova School 1 10021800125

#### 16.1 Basic Checklist

#### **Very Low Seismicity**

#### Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC *	N/A	U	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)	Foundation elements are not tied together.
C	NC	N/A	υ	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)	Assumed to be ok for the quick check.

#### 16.1.2LS Life Safety Basic Configuration Checklist

**Low Seismicity Building System** General

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	
С	NC	N/A	U	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 <b>x</b>	NC	N/A	U	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)	

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

Project Name 54\_Terra Nova School 10021800125

#### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of	
П		X	П	the seismic-force-resisting system in any story in each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec.	
				A2.2.2. Tier 2: Sec. 5.4.2.1)	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-	
				resisting system in any story is not less than 70%	
		X	Ш	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)	
	NC	NI/A		VERTICAL IRREGULARITIES: All vertical elements in	
C	NC	N/A	U	the seismic-force-resisting system are continuous	
		X		to the foundation. (Commentary: Sec. A.2.2.4. Tier	
				2: Sec. 5.4.2.3)	
				CEOMETRY: There are no changes in the not	
С	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-	
		X		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)	
				·	

					Project Name 54_Terra Nova School 10021800125	
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C	NC	N/A	U   	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		TAR)
				considered. (Commentary: Sec. A.2.2.6. Tier 2: Sec. 5.4.2.5)		ELEMENTARY
				TORSION: The estimated distance between the		1
С	NC	N/A	U	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.	Assumed to be ok	
				Tier 2: Sec. 5.4.2.6)		MIDDLE
Mode			-			
Geolo	•	ite Ha	azard			, o
RA	TING			DESCRIPTION	COMMENTS	<u>+</u> 7
C	NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could	It is assumed to be in compliance, however further exploration should be conducted by a	HBH
			X	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)	geotechincal engineer.	
						C)
С	NC	N/A	U	SLOPE FAILURE: The building site is sufficiently	It is assumed to be in compliance, however	NO S

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)

X

further exploration should be conducted by a

geotechincal engineer.

Project Name 54\_Terra Nova School 10021800125

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	It is assumed to be in compliance, however
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	further exploration should be conducted by a geotechincal engineer.
				5.4.3.1)	

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at	Assumed to be ok.
			X	the foundation level to the building height (base/height) is greater than 0.6S <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC x	N/A	U	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)	The foundation elements are not tied together in the original, 1955 and 1958 addition.

54\_Terra Nova School Project Name Project Number 10021800125

# ELEMENTARY SCHOOLS

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	54_Terra Nova School of Science & Sustainability
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 54\_Terra Nova School 1
Project Number 10021800125

## 16.3LS Life Safety Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

**Low and Moderate Seismicity** 

Lateral Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls	
	110	14//		in each principal direction is greater than or equal	
X				to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec.	
				5.5.1.1)	
С	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the	Assume added her als
١	INC	IN/A	0	shear walls, calculated using the Quick Check	Assumed to be ok
			X	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):	
				Structural panel sheathing 1,000 lb/ft Diagonal sheathing 700 lb/ft	
				Straight sheathing 700 lb/ft 100 lb/ft	
				All other conditions 100 lb/ft	
С	NC	N/A	U	STUCCO (EXTERIOR PLASTER) SHEAR WALLS:	
				Multi-story buildings do not rely on exterior	
Ш	Ш	X	Ш	stucco walls as the primary seismic-force-resisting	
				system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)	
				3.3.3.0.1)	
				CVDCHAAMALL DOADD OD DI ACTED CHEAD	
C	NC	N/A	U	GYPSUM WALLBOARD OR PLASTER SHEAR	
X				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)	
		i l	1	1	

					Project Name Project Number	54_Terra Nova School 10021800125	
C <b>X</b>	NC	N/A	U	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)			ELEMENTARY SCHOOLS
С	NC	N/A X	U	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)			MIDDLE SCHOOLS
С	NC	N/A	U X	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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)	It is assumed to be in further exploration sh geotechincal enginee	ould be conducted by a	SCHOOLS HIGH
С	NC	N/A	U	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)			OPTION SCHOOLS

#### Connections

	Connections				
RA	TING			DESCRIPTION	COMMENTS
C	NC	N/A	υ	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)	
<b>X</b>	NC	N/A	U	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec. 5.7.3.3)	
С	NC	N/A X	υ	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)	

Project Name	54_Terra Nova School		
Project Number	10021800125		

Project Name

#### **High Seismicity**

High Seismicity  Diaphragms					
	NG NC N/A	U 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)	COMMENTS  The diaphragm at the roof level are not continuous between building additions.	ELEMENTARY SCHOOLS	
	NC N/A	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)		MIDDLE	
C N	NC N/A	U 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)		HIGH	
C N	NC N/A	U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		OPTION	
	NC N/A	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)  U STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary:			

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

Project Name 54\_Terra Nova School 10021800125

					, <u> </u>
C **	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 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)	
С	NC *	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	Gym diaphragm is not blocked.
С	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm does not	
X				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)	
Conn	ectio	ns			
RA	TING			DESCRIPTION	COMMENTS
<b>X</b>	NC	N/A	U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less, with proper edge and end distance provided for wood and concrete. (Commentary: A.5.3.7. Tier 2: Sec. 5.7.3.3)	

54\_Terra Nova School Project Name Project Number 10021800125

# ELEMENTARY SCHOOLS

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	Kpff
PROJECT NAME:	54_Terra Nova School of Science & Sustainability
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	NMS
DATE COMPLETED:	8/1/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 54\_Terra Nova School 10021800125

## 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

**Low and Moderate Seismicity** 

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
<b>x</b>	NC	N/A	υ 	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)	
С	NC	N/A	U <b>x</b>	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1)	Assumed to be in compliance.
о <u></u>	NC x	N/A	υ	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)	The reinforcement is less than 0.002 overall and the 0.0007 ratio for the horizontal direction.

Project Name	54_Terra Nova School
Project Number	10021800125

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Stiff Diaphragms ————————————————————————————————————										
RA	TING			DESCRIPTION	COMMENTS	ll ⊱ S				
С	NC	N/A	υ	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)		ELEMENT				
						ဟ				

#### Connections

RA	RATING DESCRIPTION COMMENTS									
С	NC	N/A	U <b>X</b>	WALL ANCHORAGE: Exterior concrete or masonry walls that are dependent on the diaphragm for check procedure						
				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)		HIGH SCHOOLS				
C **	NC	N/A	U	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. 5.7.1.3)		HISCH				
						ON OLS				
<b>x</b>	NC	N/A	U	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)		OPTION				
						SUPPORT FACILITIES				

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

Project Name 54\_Terra Nova School 10021800125

С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)	
C	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is	
X				doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)	
c	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a	
				positive connection using plates, connection	
X				hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	

#### **High Seismicity**

#### Stiff Diaphragms

Jui	our biapin agins									
R	ATING			DESCRIPTION	COMMENTS					
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls						
		X		are less than 25% of the wall length.						
				(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)						

	1	1			Project Name Project Number	54_Terra Nova School 10021800125	
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)			ELEMENTARY SCHOOLS
							)S ELEI
	ible D TING	-	agms	DESCRIPTION	COMMENTS		တ
С	NC x	N/A	υ <u></u>	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	Non compliant for ov	erall building.	MIDDLE
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)			SCHOOLS SCHOOLS
С	NC		U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to			STC
		<b>X</b>		exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)			OPTI( SCHO(
							F.S.
							SUPPORT FACILITIES
							S Y

Project Name 54\_Terra Nova School 10021800125

с П	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary:	
				Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
c	NC	N/A	U	SPANS: All wood diaphragms with spans greater	
X				than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
С <u></u>	NC x	N/A	υ	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	plywood decking in the gymnasium is unblocked and spans more than 40'
<b>x</b>	NC	N/A	υ <u></u>	OTHER DIAPHRAGMS: The diaphragm shall 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)	

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural	Assumed to be in compliance.
			X	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)	



# Appendix E

Support Facilities - ASCE 41-13 Checklists



FIRM:	KPFF
PROJECT NAME:	Administration Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	8-26-18
REVIEWED BY:	
REVIEW DATE:	

#### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RATING		DESCRIPTION		COMMENTS	
C *	NC	N/A	U	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)	
С	NC	N/A	U	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)	Quick check not performed.

Project Name 55	:Administration Building
Project Number	21800125

#### 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	J	LOAD PATH: The structure shall contain a	
X			П	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)	
С	NC	N/A	U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any	
X				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)	
С	NC	NI/A	U	MEZZANINES: Interior mezzanine levels are	
	]	N/A	0 [	braced independently from the main structure or	
		X		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)	

#### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-forceresisting system in any story is not 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)	
С	NC	N/A	U	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)	
С	NC	N/A	υ	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)	

					Project Name 55:Administration Building Project Number 21800125	
С	NC	N/A	U	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)		ELEMENTARY SCHOOLS
С	NC	N/A	U	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)		MIDDLE
Mode	erate	Seisr	nicity			
	-	Site Ha	azaro			ဟ
RA	TING	ı		DESCRIPTION	COMMENTS	ĮΞď
с П	NC	N/A	U X	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)		SCHOOLS
						N. S. J.
c	NC	N/A	U X	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)		OPTION
•						TA E

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	
				5.4.3.1)	

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at	
X				the foundation level to the building height (base/height) is greater than 0.6S <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic	
X				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)	

FIRM:	KPFF
PROJECT NAME:	Administration Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	8-26-18
REVIEWED BY:	
REVIEW DATE:	

# 16.3LS Life Safety Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

**Low and Moderate Seismicity** 

Lateral Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls	
				in each principal direction is greater than or equal	
X				to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec.	
				5.5.1.1)	
С	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the	Cala is at in automorph
١	INC	IN/A	0	shear walls, calculated using the Quick Check	Calc not performed
			X	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):	
				Structural panel sheathing 1,000 lb/ft	
				Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft	
				All other conditions 100 lb/ft	
				All other conditions	
С	NC	N/A	U	STUCCO (EXTERIOR PLASTER) SHEAR WALLS:	
				Multi-story buildings do not rely on exterior	
Ш	Ш	X	Ш	stucco walls as the primary seismic-force-resisting	
				system. (Commentary: Sec. A.3.2.7.2. Tier 2: Sec. 5.5.3.6.1)	
				3.3.3.0.1)	
С	NC	N/A	U	GYPSUM WALLBOARD OR PLASTER SHEAR	
		X		WALLS: Interior plaster or gypsum wallboard is not used as shear walls on buildings more than	
ш	ш	^	Ш	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)	
				,	
			l		

					Project Name 55:Administration Building Project Number 21800125	
С	NC	N/A x	U	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)		ELEMENTARY SCHOOLS
С	NC	N/A	U	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)		MIDDLE
С	NC	N/A	U	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-1. (Commentary: Sec. A.3.2.7.6. Tier 2: Sec. 5.5.3.6.3)		SCHOOLS HIGH
С	NC	N/A	υ	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)		OPTION SCHOOLS

С	NC	N/A	U	OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural	
		x		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)	

#### Connections

	Connections				
RA	TING			DESCRIPTION	COMMENTS
С	NC X	N/A	U	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)	interior posts not positively connected to footing
C	NC	N/A	U	WOOD SILLS: All wood sills are bolted to the foundation. (Commentary: Sec. A.5.3.4. Tier 2: Sec.	
X				5.7.3.3)	
C	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a positive connection using plates, connection	
		X		hardware, or straps between the girder and the column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	

Project Name 55	:Administration Building
Project Number	21800125

#### **High Seismicity**

Diaphragms

	TING			DESCRIPTION	COMMENTS
С	NC X	N/A	U	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)	Pop-up roof at addition
С	NC	N/A	U	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	NC x	N/A	υ <u></u>	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)	
С	NC	N/A	υ	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	

<b>x</b>	_ 	N/A	] c	SPANS: All wood diaphragms with spans greater than 24 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)	
				(Commentary: Sec. A.4.2.2. Her 2: Sec. 5.6.2)	
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or	
		X		unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect	
				ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
_	NC	N1/A	U	OTHER DIAPHRAGMS: The diaphragm does not	
C <b>X</b>	NC	N/A		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)	
Conn	ectio	ns			
RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft or less, with proper edge and end distance provided	
x				for wood and concrete. (Commentary: A.5.3.7. Tier	
				2: Sec. 5.7.3.3)	

FIRM:	KPFF
PROJECT NAME:	Administration Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	08-26-18
REVIEWED BY:	
REVIEW DATE:	

# 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Low and	Moderate	Seismicity
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Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
<b>x</b>	NC	N/A	υ	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)	
С	NC	N/A	U <b>x</b>	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1)	Calc not performed
C **	NC	N/A	U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)	

	55.41.4.4.4.0.0.11	
	Project Name 55:Administration Building Project Number 21800125	
Stiff Diaphragms		·   >
RATING DESCRIPTION	COMMENTS	■ AR S
C NC N/A U TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)		ELEMENTARY SCHOOLS
Connections		MIDDLE
RATING DESCRIPTION	COMMENTS	■I 음 후
C NC N/A U WALL ANCHORAGE: Exterior concrete or masonr walls that are dependent on the diaphragm for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchor reinforcing dowels, or straps that are developed	's,	W W
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)		HIGH
C NC N/A U 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. 5.7.1.3)	Cross grain at ledger of addition's cmu	HICK
		OLS
C NC N/A U 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.	OPTION
		ORT

С	NC	N/A x	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)	
С	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is	
x				doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)	
C	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection	
x				hardware, or straps between the girder and the	
				column support. (Commentary: Sec. A.5.4.1. Tier 2: Sec. 5.7.4.1)	

#### **High Seismicity**

#### Stiff Diaphragms

RA	RATING		DESCRIPTION	COMMENTS	
С	NC	N/A	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls		
X			are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)		
			(Commentary, Sec. A.4.1.4. Her 2, Sec. 5.6.1.5)		

						Project Name 55: Administration Building Project Number 21800125	
						21000123	,   ,
	<b>x</b>	NC	N/A	υ	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)		ELEMENTARY SCHOOLS
			aphra	agms		COMMITME	
1		TING			DESCRIPTION  CROSS TIES: There are continuous cross ties	COMMENTS	<u> </u>   щ 2
	С	NC X	N/A	υ	between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)		MIDDLE
	C <b>X</b>	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)		HIGH
	C <b>X</b>	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)		OPTION
			1	1	1		

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

С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
C <b>x</b>	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
С	NC	N/A X	υ	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
C <b>x</b>	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm shall 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)	

Project Name 55	:Administration Building
Project Number	21800125

#### Connections

R/	ATING			DESCRIPTION	COMMENTS
С	NC	N/A	U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural	See ledger note above
	X			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)	

ELEMENTARY SCHOOLS

Rev. 41-31.1

FIRM:	KPFF
PROJECT NAME:	Maintenance Building Carpentry Shop
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	Rich Poirier
DATE COMPLETED:	11/29/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 56	:Maintenance Building
Project Number	10021800125

ELEMENTARY SCHOOLS

Rev. 41-31.1

#### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RATING DESCRIPTION COMMENTS					COMMENTS
C **	NC	N/A	U	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)	
С	NC	N/A x	υ	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)	

2

#### 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
C **	NC	N/A	U	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)	
С	NC	N/A	U	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)	
С	NC	N/A *	о <sub>П</sub>	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)	

#### **Building Configuration**

RA C	ing C	N/A	U U	DESCRIPTION  WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	COMMENTS	ELEMENTARY SCHOOLS
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not 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)		MIDDLE SCHOOLS
С	NC	N/A	U	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)		HIGH SCHOOLS
С	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)		OPTION SCHOOLS

Project Name 56: Maintenance Building Froject Number 10021800125

С	NC	N/A	υ <u></u>	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)	
С	NC	N/A	U	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)	

#### **Moderate Seismicity**

#### Geologic Site Hazards

TING			DESCRIPTION	COMMENTS
NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible,	
		X	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)	
NC	N/A	U	SLOPE FAILURE: The building site is sufficiently	
		X	failures or rockfalls to be unaffected by such	
			predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)	
		NC N/A	NC N/A U  RC N/A U  NC N/A U	NC N/A U 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)  NC N/A U 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.

					Project Name 56: Maintenance Building 10021800125	
С	NC	N/A	U <b>x</b>	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)	Project Number 10021800125	ELEMENTARY SCHOOLS
-		nicity		ration		
	TING			DESCRIPTION	COMMENTS	II무호
C <b>X</b>	NC	N/A	U	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)		MIDDLE
						H.
С	NC	N/A	U	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)		SCHOOLS
						OPTION
						OP SCH

FIRM:	KPFF
PROJECT NAME:	Maintenance Building Carpentry Shop
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	Rich Poirier
DATE COMPLETED:	11/29/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

## 16.4LS Life Safety Structural Checklist for Building Types S1: Steel Moment Frames with Stiff Diaphragms and S1A: Steel Moment Frames with

Flexible Diaphragms **Low Seismicity** 

Sei	Seismic-Force-Resisting System					
R	ATING			DESCRIPTION	COMMENTS	
	NC	N/A	V	DRIFT CHECK: The drift ratio of the steel moment frames, calculated using the Quick Check procedure of Section 4.5.3.1, is less than 0.025. (Commentary: Sec. A.3.1.3.1. Tier 2: Sec. 5.5.2.1.2)	Quick check not performed.	
C	NC	N/A	U	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to	Quick check not performed.	
			X	overturning forces is less than 0.10Fy. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)		
C	NC	N/A	U X	FLEXURAL STRESS CHECK: The average flexural stress in the moment frame columns and beams, calculated using the Quick Check procedure of Section 4.5.3.9, is less than F <sub>y</sub> . Columns need not be checked if the strong column–weak beam checklist item is compliant. (Commentary: Sec. A.3.1.3.3. Tier 2: Sec. 5.5.2.1.2)	Quick check not performed.	

#### Connections

RA	TING			DESCRIPTION	COMMENTS
C <b>x</b>	NC	N/A	U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)	
C <b>x</b>	NC	N/A	U	STEEL COLUMNS: The columns in seismic-forceresisting frames are anchored to the building foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec. 5.7.3.1)	

#### **Moderate Seismicity**

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of moment	
X				frames in each principal direction is greater than or equal to 2. The number of bays of moment frames in each line is greater than or equal to 2. (Commentary: Sec. A.3.1.1.1. Tier 2: Sec. 5.5.1.1)	
C **	NC	N/A	υ	INTERFERING WALLS: All concrete and masonry infill walls placed in moment frames are isolated from structural elements. (Commentary: Sec. A.3.1.2.1. Tier 2: Sec. 5.5.2.1.1)	

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

Project Name 56:Maintenance Buildings Project Number 10021800125  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members based on the specified minimum yield stress of steel. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1). Note: more restrictive requirements for High Seismicity.  Seismic-Force-Resisting System  RATING  DESCRIPTION  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yields tress of the steel per AlSC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)  C NC N/A U COLUMN SPLICES: All column splice details located in moment-resisting frames include connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)							
C							
High Seismic:ty  Seismic-Force-Resisting System  RATING  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)						10021800125	_
High Seismic:ty  Seismic-Force-Resisting System  RATING  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)	c	NC	N/A	U			<b>∥</b> ≿"
High Seismic:ty  Seismic-Force-Resisting System  RATING  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)	_						
High Seismic:ty  Seismic-Force-Resisting System  RATING  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)	$  \sqcup  $			X			1155
High Seismic:ty  Seismic-Force-Resisting System  RATING  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							비밀물
High Seismic:ty  Seismic-Force-Resisting System  RATING  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)					· · · · · · · · · · · · · · · · · · ·		
High Seismic:ty  Seismic-Force-Resisting System  RATING  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)					restrictive requirements for High Seismicity.		∥୷୰
Seismic-Force-Resisting System  RATING  DESCRIPTION  COMMENTS  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							11 -
Seismic-Force-Resisting System  RATING  DESCRIPTION  COMMENTS  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							
Seismic-Force-Resisting System  RATING  DESCRIPTION  COMMENTS  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							
Seismic-Force-Resisting System  RATING  DESCRIPTION  COMMENTS  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							
Seismic-Force-Resisting System  RATING  DESCRIPTION  COMMENTS  C NC N/A U MOMENT-RESISTING CONNECTIONS: All moment connections are able to develop the strength of the adjoining members or panel zones based on 110% of the expected yield stress of the steel per AISC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)	High	Seisr	nicity				1
C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the stear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)	·		•		ina System		v.
C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the stear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)				03/30		COMMENTS	ᆲᇦᅙ
C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the stear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)						331111121113	비남우
C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the stear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)	'	NC	N/A	U			≥ ċ
To the spected yield stress of the steel per AlSC 341, Section A3.2. (Commentary: Sec. A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)				X			
A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)  C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							
C NC N/A U PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to develop 0.8 times the sum of the flexural strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							
strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)					A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)		
strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							
strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							
strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							
strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)							<u>(</u>
strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)					PANEL ZONES: All panel zones have the shear		┨ਸ਼⋝
strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)		NC	N/A	U			IJ≓£
strengths of the girders framing in at the face of the column. (Commentary: Sec. A.3.1.3.5. Tier 2: Sec. 5.5.2.2.2)	$ \Box $			X			- 0
Sec. 5.5.2.2.2)					l ·		J
C NC N/A U COLUMN SPLICES: All column splice details located in moment-resisting frames include connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)					Sec. 5.5.2.2.2)		
C NC N/A U COLUMN SPLICES: All column splice details located in moment-resisting frames include connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)							
C NC N/A U COLUMN SPLICES: All column splice details located in moment-resisting frames include connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)							
C NC N/A U COLUMN SPLICES: All column splice details located in moment-resisting frames include connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)							
C NC N/A U COLUMN SPLICES: All column splice details located in moment-resisting frames include connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)							(
located in moment-resisting frames include connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)		NIC	N1/A		COLUMN SPLICES: All column splice details		
Connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)	'	NC	N/A	U	i ·		∥≓č
(Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)			X				비슷포
							ZT EST

c	NC	N/A	U	STRONG COLUMN-WEAK BEAM: The percentage	
_				of strong column–weak beam joints in each story	
Ш	Ш	Ш	X	of each line of moment frames is greater than	
				50%. (Commentary: Sec. A.3.1.3.7. Tier 2: Sec.	
				5.5.2.1.5)	
	NC	N/A	U	COMPACT MEMBERS: All frame elements meet	
C	NC	IN/A	"	section requirements set forth by AISC 341Table	
			X	D1.1, for moderately ductile members.	
				(Commentary: Sec. A.3.1.3.8. Tier 2: Sec. 5.5.2.2.4)	
Dian	hranı	ne (Fl	avihl	e or Stiff)	
	TING		CAIDI	DESCRIPTION	COMMENTS
	IIII			DESSIII TISH	0011111110
				OPENINGS AT ERAMES: Diaphragm openings	
С	NC	N/A	U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the moment frames	
	NC	N/A	U	immediately adjacent to the moment frames	
C <b>x</b>	NC	N/A	U	immediately adjacent to the moment frames extend less than 25% of the total frame length.	
	NC	N/A	U	immediately adjacent to the moment frames	
	NC	N/A	U	immediately adjacent to the moment frames extend less than 25% of the total frame length.	
	NC	N/A	U	immediately adjacent to the moment frames extend less than 25% of the total frame length.	
	NC	N/A	U	immediately adjacent to the moment frames extend less than 25% of the total frame length.	
	NC	N/A	U	immediately adjacent to the moment frames extend less than 25% of the total frame length.	
	NC	N/A	υ	immediately adjacent to the moment frames extend less than 25% of the total frame length.	
	NC	N/A	U	immediately adjacent to the moment frames extend less than 25% of the total frame length.	
Flexil	□ ble Di	iaphr.		immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)	
Flexil		iaphr.		immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION	COMMENTS
Flexil	ble Di	iaphr.		immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties	COMMENTS
Flexil RA	ble Di	iaphr	agms	immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec.	COMMENTS
Flexil RA	ble Di	iaphr	agms	immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties	COMMENTS
Flexil RA	ble Di	iaphr	agms	immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec.	COMMENTS
Flexil RA	ble Di	iaphr	agms	immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec.	COMMENTS
Flexil RA	ble Di	iaphr	agms	immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec.	COMMENTS
Flexil RA	ble Di	iaphr	agms	immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec.	COMMENTS
Flexil RA	ble Di	iaphr	agms	immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec.	COMMENTS
Flexil RA	ble Di	iaphr	agms	immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)  DESCRIPTION  CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec.	COMMENTS

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

					Project Number 10021800125	
C	NC	N/A x	υ	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		ELEMENTARY SCHOOLS
С	NC	N/A	υ	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		MIDDLE
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		SCHOOLS HIGH
C X	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)		STOOHOS

FIRM:	KPFF
PROJECT NAME:	Maintenance Building Carpentry Shop
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	Rich Poirier
DATE COMPLETED:	11/29/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

## DDLE HOOLS

HIGH SCHOOLS

CHOOLS

-ACILITIES

# 16.5LS Life Safety Structural Checklist for Building Types S2: Steel Braced Frames with Stiff Diaphragms and S2A: Steel Braced Frames with Flexible Diaphragms

	kible Diaphragms	jiiio ana ozni otooi braooa rramoo with				
Low Seismicity						
Seismic-Force-Resisting System						
RATING	DESCRIPTION	COMMENTS				

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U X	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than 0.10Fy.  Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)	Quick check not performed.
С	NC	N/A	U X	BRACE AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check procedure of Section 4.5.3.4, is less than 0.50Fy. (Commentary: Sec. A.3.3.1.2. Tier 2: Sec. 5.5.4.1)	Quick check not performed.

#### Connections

RA	TING			DESCRIPTION	COMMENTS
C	NC	N/A	U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)	COMMENTS

Project Name 56: Maintenance Building Froject Number 10021800125

С	NC	N/A	U	STEEL COLUMNS: The columns in seismic-forceresisting frames are anchored to the building	
X				foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec.	
				5.7.3.1)	

#### **Moderate Seismicity**

Seismic-Force-Resisting System

	Seismic-Force-Resisting System						
RA	TING			DESCRIPTION	COMMENTS		
C **	NC	N/A	U	REDUNDANCY: The number of lines of braced frames in each principal direction is greater than or equal to 2. The number of braced bays in each line is greater than 2. (Commentary: Sec. A.3.3.1.1. Tier 2: Sec. 5.5.1.1)			
С	NC	N/A	U x	CONNECTION STRENGTH: All the brace connections develop the buckling capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)			
С	NC x	N/A	U	COMPACT MEMBERS: All brace elements meet compact section requirements set forth by AISC 360, Table B4.1. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)			

С	NC	N/A	U	K-BRACING: The bracing system does not include K-braced bays. (Commentary: Sec. A.3.3.2.1. Tier 2: Sec. 5.5.4.6)	Project Name 56:Maintenance Building 10021800125	ELEMENTARY SCHOOLS
Seisn		micity orce-R		ing System  DESCRIPTION  COLUMN SPLICES: All column splice details located in braced frames develop 50% of the tensile strength of the column. (Commentary: Sec. A.3.3.1.3. Tier 2: Sec. 5.5.4.2)	COMMENTS	MIDDLE
С	NC x	N/A	U	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have Kl/r ratios less than 200. (Commentary: Sec. A.3.3.1.4. Tier 2: Sec. 5.5.4.3)		HBIH
С	NC	N/A	U X	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)		NOLLON
						_ ∪

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

С	NC	N/A	U	COMPACT MEMBERS: All brace elements meet	
	X		П	section requirements set forth by AISC 341, Table D1.1, for moderately ductile members.	
				(Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)	
С	NC	N/A	U	CHEVRON BRACING: Beams in chevron, or V-	
		x		braced, bays are capable of resisting the vertical	
	ш			load resulting from the simultaneous yielding and buckling of the brace pairs. (Commentary: Sec.	
				A.3.3.2.3. Tier 2: Sec. 5.5.4.6)	
С	NC	N/A	U	CONCENTRICALLY BRACED FRAME JOINTS: All the	
				diagonal braces shall frame into the beam-	
	X			column joints concentrically. (Commentary: Sec. A.3.3.2.4. Tier 2: Sec. 5.5.4.8)	
				71.3.2.1. 1101 2. 300. 3.3. 1.0)	
Dian	h w o ev v	ma /FI	ovibl	o or Ctiff)	
•	TING	115 (F1	exibio	e or Stiff) DESCRIPTION	COMMENTS
С	NC	N/A	U	OPENINGS AT FRAMES: Diaphragm openings	
x				immediately adjacent to the braced frames extend less than 25% of the frame length.	
	Ш			(Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)	
				,	
		1		1	1

Project Name 56	:Maintenance Building
Project Number	10021800125

Flexible Diaphragms

RA	TING			DESCRIPTION	COMMENTS	
С	NC	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)		TI EMENIT
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		A IOOIM
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		HUIH
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		NOITOO

С	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm does not	
X				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)	

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Maintenance Building Print Shop
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	Rich Poirier
DATE COMPLETED:	11/29/18
REVIEWED BY:	
REVIEW DATE:	

## 16.1 Basic Checklist

### **Very Low Seismicity**

## Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	No braces in short direction of building.
С	NC	N/A X	U	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)	

Project Name 56	:Maintenance Building
Project Number	10021800125

## 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	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)	No braces in short direction of building.
С	NC	N/A	U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any	
		X		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)	
С	NC	N/A	U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or	
	X			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)	

## **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-forceresisting system in any story is not 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)	
С	NC	N/A	U	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)	
С	NC	N/A	υ	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)	

					Project Name 56:Maintenance Building Project Number 10021800125	
С	NC	N/A	U	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)		ELEMENTARY SCHOOLS
С	NC	N/A	U	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)		MIDDLE
Mode	erate	Seisr	nicity			
	-	ite Ha	azaro			ဟ
RA	TING	Ī		DESCRIPTION	COMMENTS	lΫĝ
С П	NC	N/A	U <b>x</b>	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)		SCHOOLS
						l N N
c	NC	N/A	U <b>x</b>	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)		OPTION
	•	•		-		ORT TES

Project Name 56: Maintenance Building Project Number 10021800125

С	NC	N/A	U	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)	

## **High Seismicity**

### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at	
X				the foundation level to the building height (base/height) is greater than 0.6S <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic	
X				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)	

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Maintenance Building Print Shop
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	Rich Poirier
DATE COMPLETED:	11/29/18
REVIEWED BY:	
REVIEW DATE:	

# 16.5LS Life Safety Structural Checklist for Building Types S2: Steel Braced Frames with Stiff Diaphragms and S2A: Steel Braced Frames with Flexible Diaphragms

Low Seismicity								
	Seismic-Force-Resisting System							
RA	TING			DESCRIPTION	COMMENTS			
С	NC	N/A	<b>X</b>	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than 0.10Fy.  Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)	Quick check not performed.			
С	NC	N/A	U X	BRACE AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check procedure of Section 4.5.3.4, is less than 0.50Fy. (Commentary: Sec. A.3.3.1.2. Tier 2: Sec. 5.5.4.1)	Quick check not performed.			
	ectio	ns						
RA	TING			DESCRIPTION	COMMENTS			
С	NC x	N/A	U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)				

					Ducks at Names EQAMPLATA AND DESCRIPTION	
					Project Name 56: Maintenance Building Project Number 10021800125	
					110Ject Number 10021000125	L
C	NC	N/A	U	STEEL COLUMNS: The columns in seismic-force-		ELEMENTARY
				resisting frames are anchored to the building		≥ا
X	Ш		Ш	foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec.		I5⊱
				5.7.3.1)		ᅵᆔ
						۱ ۱ ۳ ۰
						"
Mode	rate	Seisn	nicity			
			-	ing System		v.
	TING		CSISE	DESCRIPTION	COMMENTS	MIDDLE
				REDUNDANCY: The number of lines of braced		吕우
C	NC	N/A	U	frames in each principal direction is greater than	No braced frames in short direction.	کت∑ا
$ \Box $	X			or equal to 2. The number of braced bays in each		U.
				line is greater than 2. (Commentary: Sec. A.3.3.1.1.		
				Tier 2: Sec. 5.5.1.1)		
						U.
				CONNECTION STRENGTH: All the brace		HIGH
C	NC	N/A	U	connections develop the buckling capacity of the		ן ≒ ד
$ \Box $			X	diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec.		ر ا
				5.5.4.4)		"
						_
						_ v
				COMPACT MEMBERS: All brace elements meet		OPTION
C	NC	N/A	U	compact section requirements set forth by AISC		l≓č
$ \Box $	X			360, Table B4.1. (Commentary: Sec. A.3.3.1.7. Tier		ᆫ
				2: Sec. 5.5.4)		0 6
						T S

Project Name 56: Maintenance Building Project Number 10021800125

С	NC	N/A	K-BRACING: The bracing system does not include K-braced bays. (Commentary: Sec. A.3.3.2.1. Tier 2:	
		x	Sec. 5.5.4.6)	.z. i. Hei z.

#### **High Seismicity**

Seismic-Force-Resisting System

Solstine-1 Orde-neststing System							
RA	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U	COLUMN SPLICES: All column splice details located in braced frames develop 50% of the			
		X		tensile strength of the column. (Commentary: Sec. A.3.3.1.3. Tier 2: Sec. 5.5.4.2)			
С	NC x	N/A	U	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have Kl/r ratios less than 200. (Commentary: Sec. A.3.3.1.4. Tier 2: Sec. 5.5.4.3)			
С	NC	N/A	U X	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)			

					Project Name 56: Maintenance Building 10021800125	
С	NC	N/A	U	COMPACT MEMBERS: All brace elements meet section requirements set forth by AISC 341, Table D1.1, for moderately ductile members. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)		ELEMENTARY SCHOOLS
С	NC	N/A	υ	CHEVRON BRACING: Beams in chevron, or V-braced, bays are capable of resisting the vertical load resulting from the simultaneous yielding and buckling of the brace pairs. (Commentary: Sec. A.3.3.2.3. Tier 2: Sec. 5.5.4.6)		MIDDLE
С	NC x	N/A	U	CONCENTRICALLY BRACED FRAME JOINTS: All the diagonal braces shall frame into the beam–column joints concentrically. (Commentary: Sec. A.3.3.2.4. Tier 2: Sec. 5.5.4.8)		SCHOOLS HIGH
		ns (Fl	exible	e or Stiff)	01414	
C	TING NC	N/A	U	DESCRIPTION C OPENINGS AT FRAMES: Diaphragm openings	OMMENTS	(n
		<b>X</b>		immediately adjacent to the braced frames extend less than 25% of the frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)		OPTION

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

## Flexible Diaphragms

RA	RATING DESCRIPTION				COMMENTS
С	NC	N/A	U	CROSS TIES: There are continuous cross ties	
	110			between diaphragm chords. (Commentary: Sec.	
		X		A.4.1.2. Tier 2: Sec. 5.6.1.2)	
_				STRAIGHT SHEATHING: All straight sheathed	
C	NC	N/A	U	diaphragms have aspect ratios less than 2-to-1 in	
П		X		the direction being considered. (Commentary:	
				Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
				·	
_				SPANS: All wood diaphragms with spans greater	
C	NC	N/A	U	than 24 ft consist of wood structural panels or	
$ \Box $		X		diagonal sheathing. (Commentary: Sec. A.4.2.2.	
				Tier 2: Sec. 5.6.2)	
	NC	NI/A		DIAGONALLY SHEATHED AND UNBLOCKED	
C	NC	N/A	U	DIAPHRAGMS: All diagonally sheathed or	
		X		unblocked wood structural panel diaphragms	
				have horizontal spans less than 40 ft and aspect	
				ratios less than or equal to 4-to-1. (Commentary:	
				Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
		Ī	1	1	

					Project Name 56	S:Maintenance Building 🖺
					Project Number	10021800125
C	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck,		
X				concrete, or horizontal bracing. (Commentary: Sec. A.4.7.1. Tier 2: Sec. 5.6.5)		

HIGH SCHOOLS

ELEMENTARY SCHOOLS

MIDDLE SCHOOLS

CHOOLS

SUPPOR I

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Maintenance Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	Rich Poirier
DATE COMPLETED:	11/29/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 56	:Maintenance Building
Project Number	10021800125

ELEMENTARY SCHOOLS

Rev. 41-31.1

## 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
C <b>x</b>	NC	N/A	U	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)	
С	NC	N/A	υ	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)	

2

## 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	RATING DESCRIPTION COMMENTS						
C <b>X</b>	NC	N/A	U	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)			
С	NC	N/A	U	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 <b>X</b>	NC	N/A	о <sub>П</sub>	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)			

Project Name 56	:Maintenance Building
Proiect Number	10021800125

#### **Building Configuration**

	bunung conniguration								
RA	TING			DESCRIPTION	COMMENTS	<u>۵</u>			
c	NC	N/A	U	WEAK STORY: The sum of the shear strengths of		LINDENIT			
	110	13//	J	the seismic-force-resisting system in any story in		ĮΨ			
		X		each direction is not less than 80% of the strength		≥			
				in the adjacent story above. (Commentary: Sec.		l <u>"</u>			
				A2.2.2. Tier 2: Sec. 5.4.2.1)		ū			
				A2.2.2. Hel 2. Sec. 5.4.2.1)					
						┝			
	NC	N1/A		SOFT STORY: The stiffness of the seismic-force-		ш			
C	NC	N/A	U	resisting system in any story is not less than 70%		ح ا			
		X		of the seismic-force-resisting system stiffness in					
ш			ш			ΙĘ			
				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)					
						┡			
				VERTICAL IRREGULARITIES: All vertical elements in					
C	NC	N/A	U			I٦			
				the seismic-force-resisting system are continuous					
ш	ш	X	Ш	to the foundation. (Commentary: Sec. A.2.2.4. Tier					
				2: Sec. 5.4.2.3)		-			
						┝			
				GEOMETRY: There are no changes in the net					
C	NC	N/A	U	horizontal dimension of the seismic-force-		I			
						Į			
Ш	Ш	X		resisting system of more than 30% in a story		OTTO			
				relative to adjacent stories, excluding one-story		I۲			
				penthouses and mezzanines. (Commentary: Sec.		١ŏ			
				A.2.2.5. Tier 2: Sec. 5.4.2.4)		`			

С	NC	N/A	U	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)	
С	NC	N/A	U	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)	

### **Moderate Seismicity**

## Geologic Site Hazards

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible,	
			x	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)	
С	NC	N/A	U	SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope	
			X	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)	

					Project Name 56:Maintenance Building	
С	NC	N/A	U <b>x</b>	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)	Project Number 10021800125	ELEMENTARY SCHOOLS
Foun	datio			ration		ы — S
RA	TING			DESCRIPTION	COMMENTS	[달
C <b>X</b>	NC	N/A	U	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)		MIDDLE
C	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The		GH S IOO
				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)		HOHOS
						OPTION

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Maintenance Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	Rich Poirier
DATE COMPLETED:	11/29/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY SCHOOLS

MIDDLE CHOOLS

CHOOLS

CHOOLS

SUPPORT

# 16.4LS Life Safety Structural Checklist for Building Types S1: Steel Moment Frames with Stiff Diaphragms and S1A: Steel Moment Frames with Flexible Diaphragms

	exible Diaphragms
Low Seismic	ity

Seisn	Seismic-Force-Resisting System						
RA	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U <b>X</b>	DRIFT CHECK: The drift ratio of the steel moment frames, calculated using the Quick Check procedure of Section 4.5.3.1, is less than 0.025. (Commentary: Sec. A.3.1.3.1. Tier 2: Sec. 5.5.2.1.2)	Quick check not performed.		
С	NC	N/A	U	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to	Quick check not performed.		
			X	overturning forces is less than 0.10Fy. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)			
C	NC	N/A	U	FLEXURAL STRESS CHECK: The average flexural stress in the moment frame columns and beams,	Quick check not performed.		
				calculated using the Quick Check procedure of Section 4.5.3.9, is less than Fy. Columns need not be checked if the strong column–weak beam checklist item is compliant. (Commentary: Sec. A.3.1.3.3. Tier 2: Sec. 5.5.2.1.2)			

#### Connections

RA	TING			DESCRIPTION	COMMENTS
C <b>x</b>	NC	N/A	U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)	
C <b>x</b>	NC	N/A	U	STEEL COLUMNS: The columns in seismic-forceresisting frames are anchored to the building foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec. 5.7.3.1)	

### **Moderate Seismicity**

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
C <b>x</b>	NC	N/A	U	REDUNDANCY: The number of lines of moment frames in each principal direction is greater than or equal to 2. The number of bays of moment frames in each line is greater than or equal to 2. (Commentary: Sec. A.3.1.1.1 Tier 2: Sec. 5.5.1.1)	
C <b>X</b>	NC	N/A	U	INTERFERING WALLS: All concrete and masonry infill walls placed in moment frames are isolated from structural elements. (Commentary: Sec. A.3.1.2.1. Tier 2: Sec. 5.5.2.1.1)	

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

					Project Name 56:Maintenance Building	
					Project Number 10021800125	١.
c	NC	N/A	U	MOMENT-RESISTING CONNECTIONS: All moment		ELEMENTARY SCHOOLS
				connections are able to develop the strength of		<b> </b> ₹ 5
Ш	Ш	Ш	X	the adjoining members based on the specified		155
				minimum yield stress of steel. (Commentary: Sec.		님
				A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1). Note: more		
				restrictive requirements for High Seismicity.		<b>I</b>
						Ι"
High	Saicr	nicity	,			
_		-		ing System		v.
	TING		COISE	DESCRIPTION	COMMENTS	MIDDLE
				MOMENT-RESISTING CONNECTIONS: All moment	OOMMENTO	
C	NC	N/A	U	connections are able to develop the strength of		خ∃ا
			X	the adjoining members or panel zones based on		_ v.
				110% of the expected yield stress of the steel per		
				AISC 341, Section A3.2. (Commentary: Sec.		
				A.3.1.3.4. Tier 2: Sec. 5.5.2.2.1)		
						U.
				DANIEL ZONEC, All manual romas have the sheet		HIGH
C	NC	N/A	U	PANEL ZONES: All panel zones have the shear capacity to resist the shear demand required to		₩
			X	develop 0.8 times the sum of the flexural		+ 5
			••	strengths of the girders framing in at the face of		J 0.
				the column. (Commentary: Sec. A.3.1.3.5. Tier 2:		
				Sec. 5.5.2.2.2)		
						$z^{\alpha}$
C	NC	N/A	U	COLUMN SPLICES: All column splice details		OPTION
				located in moment-resisting frames include		IE
		X		connection of both flanges and the web. (Commentary: Sec. A.3.1.3.6. Tier 2: Sec. 5.5.2.2.3)		Ιōç
				(Commentary, Sec. A.S. 1.S.o. Her 2. Sec. S.S.2.2.S)		I "
						_ u
						~ 교

С	NC	N/A	U	STRONG COLUMN-WEAK BEAM: The percentage of strong column–weak beam joints in each story of each line of moment frames is greater than 50%. (Commentary: Sec. A.3.1.3.7. Tier 2: Sec. 5.5.2.1.5)				
С	NC	N/A	U <b>x</b>	COMPACT MEMBERS: All frame elements meet section requirements set forth by AISC 341Table D1.1, for moderately ductile members. (Commentary: Sec. A.3.1.3.8. Tier 2: Sec. 5.5.2.2.4)				
		ns (Fl	exible	e or Stiff)				
RA	TING			DESCRIPTION	COMMENTS			
C **	NC	N/A	U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the moment frames extend less than 25% of the total frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)				
Flexible Diaphragms								
RA				DESCRIPTION	COMMENTS			
	TING			CROSS TIES: There are continuous cross ties				

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

					Project Number 10021800125	
C	NC	N/A x	υ	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		ELEMENTARY SCHOOLS
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		MIDDLE
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		SCHOOLS HIGH
C X	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)		STOOHOS

## **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Maintenance Building
SEISMICITY LEVEL:	High
PROJECT NUMBER:	10021800125
COMPLETED BY:	Rich Poirier
DATE COMPLETED:	11/29/18
REVIEWED BY:	
REVIEW DATE:	

.S S

# 16.5LS Life Safety Structural Checklist for Building Types S2: Steel Braced

				s with Stiff Diaphragms and SZA: S e Diaphragms	teel Braced Frames With	ENTA JOOL
	Seisn nic-Fo	-	Resist	ing System		ELEMENTA SCHOOL
	TING			DESCRIPTION	COMMENTS	
С	NC	N/A	U <b>x</b>	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than 0.10Fy. Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)	Quick check not performed.	MIDDLE
С	NC	N/A	U	BRACE AXIAL STRESS CHECK: The axial stress in	Quick check not performed.	
			X	the diagonals, calculated using the Quick Check procedure of Section 4.5.3.4, is less than 0.50Fy. (Commentary: Sec. A.3.3.1.2. Tier 2: Sec. 5.5.4.1)		HIGH
	ectio			D FAADURTION	001414	_
	TING	1		TRANSFER TO STEEL FRAMES: Diaphragms are	COMMENTS	┩┣━━
C **	NC	N/A	U	connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)		OPTION
				1	1	— I

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

С	NC	N/A	U	STEEL COLUMNS: The columns in seismic-force- resisting frames are anchored to the building	
X				foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec.	
				5.7.3.1)	

#### **Moderate Seismicity**

Seismic-Force-Resisting System

	Seismic-Force-Resisting System								
RA	TING			DESCRIPTION	COMMENTS				
C	NC	N/A	U	REDUNDANCY: The number of lines of braced frames in each principal direction is greater than or equal to 2. The number of braced bays in each line is greater than 2. (Commentary: Sec. A.3.3.1.1. Tier 2: Sec. 5.5.1.1)					
С	NC	N/A	U X	CONNECTION STRENGTH: All the brace connections develop the buckling capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)					
С	NC x	N/A	U	COMPACT MEMBERS: All brace elements meet compact section requirements set forth by AISC 360, Table B4.1. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)					

С	NC	N/A	U	K-BRACING: The bracing system does not include K-braced bays. (Commentary: Sec. A.3.3.2.1. Tier 2: Sec. 5.5.4.6)	Project Name 56:Maintenance Building Project Number 10021800125	ELEMENTARY SCHOOLS
Seisr		I		ing System  DESCRIPTION  COLUMN SPLICES: All column splice details located in braced frames develop 50% of the tensile strength of the column. (Commentary: Sec. A.3.3.1.3. Tier 2: Sec. 5.5.4.2)	COMMENTS	MIDDLE
С	NC x	N/A	U	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have Kl/r ratios less than 200. (Commentary: Sec. A.3.3.1.4. Tier 2: Sec. 5.5.4.3)		NIGH NIGH
С	NC	N/A	U	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)		NOIT40
						⊢ <sup>0</sup>

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

С	NC x	N/A	U	COMPACT MEMBERS: All brace elements meet section requirements set forth by AISC 341, Table D1.1, for moderately ductile members. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)	
C	NC	N/A	U	CHEVRON BRACING: Beams in chevron, or V-	
_	]		] 0	braced, bays are capable of resisting the vertical	
Ш		X	Ш	load resulting from the simultaneous yielding and buckling of the brace pairs. (Commentary: Sec.	
				A.3.3.2.3. Tier 2: Sec. 5.5.4.6)	
	NC	N/A	U	CONCENTRICALLY BRACED FRAME JOINTS: All the	
				diagonal braces shall frame into the beam-	
Ш	X		Ш	column joints concentrically. (Commentary: Sec. A.3.3.2.4. Tier 2: Sec. 5.5.4.8)	
				7.13.3.2.1. 1101 2. 300. 3.3. 1.0)	
Diapl	hragn	ns (Fl	exible	e or Stiff)	
-	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OPENINGS AT FRAMES: Diaphragm openings	
x				immediately adjacent to the braced frames extend less than 25% of the frame length.	
				(Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)	

Project Name 56	:Maintenance Building
Project Number	10021800125

F	lex	ibl	e D	ia	ph.	rag	ms

	TING		-9	DESCRIPTION	COMMENTS	<u></u>
С	NC	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)		
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		1 100 IN
С	NC	N/A	υ	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		HIGH
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		NOITEO

С	NC	N/A	U	OTHER DIAPHRAGMS: The diaphragm does not consist of a system other than wood, metal deck,	
X				concrete, or horizontal bracing. (Commentary:	
				Sec. A.4.7.1. Tier 2: Sec. 5.6.5)	

# ELEMENTARY SCHOOLS

MIDDLE CHOOLS

CHOOLS

FIRM:	KPFF
PROJECT NAME:	Transportation Main
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	8/26/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 57	:Transportation Main
Project Number	21800125

## 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
C *	NC	N/A	U	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)	
С	NC	N/A	U X	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)	Quick check calcs not performed

Project Name 57	:Transportation Main
Project Number	21800125

# 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
C <b>x</b>	NC	N/A	U	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)	
С	NC	N/A	U	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 <b>X</b>	NC	N/A	U	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)	

### **Building Configuration**

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of	
		x	П	the seismic-force-resisting system in any story in each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec.	
				A2.2.2. Tier 2: Sec. 5.4.2.1)	
С	NC	N/A	U	SOFT STORY: The stiffness of the seismic-force-	
				resisting system in any story is not less than 70%	
		X	Ш	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)	
	NC	NI/A		VERTICAL IRREGULARITIES: All vertical elements in	
С	NC	N/A	U	the seismic-force-resisting system are continuous	
		X		to the foundation. (Commentary: Sec. A.2.2.4. Tier	
				2: Sec. 5.4.2.3)	
				CEOMETRY: There are no changes in the not	
С	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-	
		X		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)	
				·	

C	NC	N/A	U	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)	Project Name 57:Transportation Main Project Number 21800125	ELEMENTARY SCHOOLS
C <b>x</b>	NC	N/A	U	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)		MIDDLE
Geol		Seisr Site Ha	-		COMMENTS	HIGH
c	NC	N/A	U	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)		OPTION
						ORT TIES

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	
				5.4.3.1)	

#### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at	
X				the foundation level to the building height (base/height) is greater than 0.6S <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic	
X				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)	

# ELEMENTARY SCHOOLS

MIDDLE CHOOLS

CHOOLS

FIRM:	KPFF
PROJECT NAME:	Transportation Main
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	8/26/18
REVIEWED BY:	
REVIEW DATE:	

# 16.5LS Life Safety Structural Checklist for Building Types S2: Steel Braced Frames with Stiff Diaphragms and S2A: Steel Braced Frames with Flexible Diaphragms

				o Biapin agino			
	Low Seismicity Seismic-Force-Resisting System						
	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U <b>x</b>	COLUMN AXIAL STRESS CHECK: The axial stress caused by gravity loads in columns subjected to overturning forces is less than 0.10Fy.  Alternatively, the axial stress caused by overturning forces alone, calculated using the Quick Check procedure of Section 4.5.3.6, is less than 0.30Fy. (Commentary: Sec. A.3.1.3.2. Tier 2: Sec. 5.5.2.1.3)	Calc not performed.		
С	NC	N/A	U X	BRACE AXIAL STRESS CHECK: The axial stress in the diagonals, calculated using the Quick Check procedure of Section 4.5.3.4, is less than 0.50Fy. (Commentary: Sec. A.3.3.1.2. Tier 2: Sec. 5.5.4.1)			
	ectio	ns					
RA	TING			DESCRIPTION	COMMENTS		
C <b>x</b>	NC	N/A	U	TRANSFER TO STEEL FRAMES: Diaphragms are connected for transfer of seismic forces to the steel frames. (Commentary: Sec. A.5.2.2. Tier 2: Sec. 5.7.2)			

					D : .N 57.T M :	_
					Project Name 57:Transportation Main Project Number 21800125	
				,		I.
C	NC	N/A	U	STEEL COLUMNS: The columns in seismic-force-		ELEMENTARY SCHOOLS
				resisting frames are anchored to the building		I ≧ ≝
X		Ш		foundation. (Commentary: Sec. A.5.3.1. Tier 2: Sec.		<del> </del>
				5.7.3.1)		世 5
						┨╝ <sup>╸</sup>
Mode	erate	Seisn	nicity	1		
Seisn	nic-Fa	orce-R	esist	ing System		MIDDLE
RA	TING			DESCRIPTION	COMMENTS	l 리
c	NC	N/A	U	REDUNDANCY: The number of lines of braced		₽ ∺
				frames in each principal direction is greater than		≥ C
X		Ш	Ш	or equal to 2. The number of braced bays in each		
				line is greater than 2. (Commentary: Sec. A.3.3.1.1.) Tier 2: Sec. 5.5.1.1)		
				Her 2: 3ec. 5.5.1.1)		
						U.
						ا⊤≂
c	NC	N/A	U	CONNECTION STRENGTH: All the brace		HBH
				connections develop the buckling capacity of the		╽┰╶╴
		Ш	X	diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec.		Ŭ.
				5.5.4.4)		
						- °
c	NC	N/A	U	COMPACT MEMBERS: All brace elements meet		OPTION
				compact section requirements set forth by AISC		<del> </del>
$  \sqcup  $	Ш	Ш	X	360, Table B4.1. (Commentary: Sec. A.3.3.1.7. Tier		٥
				2: Sec. 5.5.4)		0
						_ ( <i>(</i>

С	NC	N/A	U	K-BRACING: The bracing system does not include K-braced bays. (Commentary: Sec. A.3.3.2.1. Tier 2:	
x				Sec. 5.5.4.6)	

#### **High Seismicity**

Seismic-Force-Resisting System

Sei	Seismic-Force-Resisting System								
R	ATING			DESCRIPTION	COMMENTS				
	NC	N/A	U	COLUMN SPLICES: All column splice details located in braced frames develop 50% of the tensile strength of the column. (Commentary: Sec. A.3.3.1.3. Tier 2: Sec. 5.5.4.2)					
C	NC	N/A	U <b>x</b>	SLENDERNESS OF DIAGONALS: All diagonal elements required to carry compression have Kl/r ratios less than 200. (Commentary: Sec. A.3.3.1.4. Tier 2: Sec. 5.5.4.3)					
	NC	N/A	U X	CONNECTION STRENGTH: All the brace connections develop the yield capacity of the diagonals. (Commentary: Sec. A.3.3.1.5. Tier 2: Sec. 5.5.4.4)					

					Project Name 57:Transportation Main Project Number 21800125	
С	NC	N/A	U X	COMPACT MEMBERS: All brace elements meet section requirements set forth by AISC 341, Table D1.1, for moderately ductile members. (Commentary: Sec. A.3.3.1.7. Tier 2: Sec. 5.5.4)		ELEMENTARY SCHOOLS
С	NC	N/A	U	CHEVRON BRACING: Beams in chevron, or V-braced, bays are capable of resisting the vertical load resulting from the simultaneous yielding and buckling of the brace pairs. (Commentary: Sec. A.3.3.2.3. Tier 2: Sec. 5.5.4.6)		MIDDLE
C <b>X</b>	NC	N/A	U	CONCENTRICALLY BRACED FRAME JOINTS: All the diagonal braces shall frame into the beam–column joints concentrically. (Commentary: Sec. A.3.3.2.4. Tier 2: Sec. 5.5.4.8)		SCHOOLS SCHOOLS
			exibl	e or Stiff)	COMMENTS	
С	NC	N/A	U	OPENINGS AT FRAMES: Diaphragm openings immediately adjacent to the braced frames extend less than 25% of the frame length. (Commentary: Sec. A.4.1.5. Tier 2: Sec. 5.6.1.3)	COMMENTS	OPTION

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

### Flexible Diaphragms

RA	TING			DESCRIPTION	COMMENTS
c	NC	N/A	υ	CROSS TIES: There are continuous cross ties	
			l	between diaphragm chords. (Commentary: Sec.	
ш	Ш	X		A.4.1.2. Tier 2: Sec. 5.6.1.2)	
С	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed	
				diaphragms have aspect ratios less than 2-to-1 in	
Ш		X		the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
				Sec. A.4.2.1. Hel 2. Sec. 5.0.2)	
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater	
X				than 24 ft consist of wood structural panels or	
				diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
				116. 21 500. 516.27	
С	NC	N/A	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or	
x				unblocked wood structural panel diaphragms	
				have horizontal spans less than 40 ft and aspect	
				ratios less than or equal to 4-to-1. (Commentary:	
				Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
		1			

FIRM:	KPFF
PROJECT NAME:	Transportation Main
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	8/26/18
REVIEWED BY:	
REVIEW DATE:	

-EMENTARY

LE SLS

CHOOLS

CHOOLS

# 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Low and Moderate Seismicity
Seismic-Force-Resisting System

	RATING DESCRIPTION COMMENTS							
KA	HING			DESCRIPTION	COMMENTS			
l c l	NC	N/A	U	REDUNDANCY: The number of lines of shear walls				
		,		in each principal direction is greater than or equal				
X				to 2. (Commentary: Sec. A.3.2.1.1. Tier 2: Sec.				
				5.5.1.1)				
	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the				
C	NC	IN/A	U	reinforced masonry shear walls, calculated using	Calc not performed			
		П	X	the Quick Check procedure of Section 4.5.3.3, is				
				less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1.				
				Tier 2: Sec. 5.5.3.1.1)				
				1161 2. 366. 3.3.3.111)				
				REINFORCING STEEL: The total vertical and				
C	NC	N/A	U	horizontal reinforcing steel ratio in reinforced	No reinf schedule found			
			X	masonry walls is greater than 0.002 of the wall				
ш	Ш	ш	_	with the minimum of 0.0007 in either of the two				
				directions; the spacing of reinforcing steel is less				
				than 48 in., and all vertical bars extend to the top				
				•				
				of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2:				
				Sec. 5.5.3.1.3)				

### Stiff Diaphragms

RA	RATING			DESCRIPTION	COMMENTS
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm	
×				elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	

#### Connections

RA	RATING DESCRIPTION COMMENTS							
С	NC	N/A	U X	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)	Calc not performed			
С	NC	N/A X	U	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. 5.7.1.3)				
C **	NC	N/A	U	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)				

					Project Name 57:Transportation Main Project Number 21800125	
С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)		ELEMENTARY
C **	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)		MIDDLE
C x	NC	N/A	υ	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)		HIGH
_		⊔ micity <i>nragn</i>				
	TING		ið		COMMENTS	
C **	NC	N/A	υ	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)		NOILION
						ORT

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

С	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to	
x				exterior masonry shear walls are not greater than	
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.	
				5.6.1.3)	

Flexible Diaphragms

FIEXI	Flexible Diaphragms								
RA	TING			DESCRIPTION	COMMENTS				
C	NC	N/A	U	CROSS TIES: There are continuous cross ties					
				between diaphragm chords. (Commentary: Sec.					
X		Ш	Ш	A.4.1.2. Tier 2: Sec. 5.6.1.2)					
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm					
<b>X</b>				openings immediately adjacent to the shear walls are less than 25% of the wall length.					
				(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)					
				(commentary, seer, will mer 2. seer sionns,					
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:					
X				Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than					
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.					
				5.6.1.3)					

					Project Name 57:Transportation Main Project Number 21800125	
C	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)		ELEMENTARY SCHOOLS
С	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)		MIDDLE
c	NC	N/A	υ	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)		HIGH
<b>x</b>	NC	N/A	υ	OTHER DIAPHRAGMS: The diaphragm shall 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)		OPTION SCHOOLS

Project Name 57	:Transportation Main
Project Number	21800125

#### Connections

RA	TING			DESCRIPTION	COMMENTS
С	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)	

# ELEMENTARY SCHOOLS

# MIDDLE CHOOLS

# CHOOLS

FIRM:	KPFF
PROJECT NAME:	Transportation Allen
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	08/26/18
REVIEWED BY:	
REVIEW DATE:	

## 16.1 Basic Checklist

#### **Very Low Seismicity**

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U X	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)	Incomplete original drawings
С	NC	N/A	U X	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)	Incomplete original drawings

Project Name 58	:Transportation Allen
Project Number	21800125

# 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	RATING DESCRIPTION COMMENTS					
С	NC	N/A	∪ <b>x</b>	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)	Incomplete original drawings	
с П	NC	N/A	U	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	NC	N/A	U	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting	Incomplete original drawings	
				elements of the main structure. (Commentary: Sec. A.2.1.3. Tier 2: Sec. 5.4.1.3)		

### **Building Configuration**

RA	RATING DESCRIPTION		DESCRIPTION	COMMENTS	
С	NC	N/A	J	WEAK STORY: The sum of the shear strengths of	
				the seismic-force-resisting system in any story in	
ш		X	Ш	each direction is not less than 80% of the strength	
				in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	
				7.2.2.2. 1101 2. 300. 3. 1.2.17	
				SOFT STORY: The stiffness of the seismic-force-	
C	NC	N/A	U	resisting system in any story is not less than 70%	
		X		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)	
				7.112.131 (16) 2.1 366.1 37.112.12/	
				VEDTICAL IDDECLIL ADITIES: All continue de la consenta la	
C	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous	
ΙП	П	X		to the foundation. (Commentary: Sec. A.2.2.4. Tier	
				2: Sec. 5.4.2.3)	
С	NC	N/A	U	GEOMETRY: There are no changes in the net	
		x		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)	

С	NC	N/A	U	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)	Project Name 58:Transportation Allen Project Number 21800125	ELEMENTARY SCHOOLS
c	NC	N/A	U	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)		MIDDLE
Geol		Seisr Site Ha	-	DESCRIPTION  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:	COMMENTS	HIGH
c	NC	N/A	U	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)		OPTION
				(Commentary, Sec. 760, 1,2, 1101 2, 3,7,3,1)		ORT TIES

С	NC	N/A	U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are	
			x	not anticipated. (Commentary: Sec. A.6.1.3. Tier 2:	
				5.4.3.1)	

### **High Seismicity**

#### Foundation Configuration

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at	
X				the foundation level to the building height (base/height) is greater than 0.6S <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)	
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic	Incomplete original drawings
			X	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)	

# ELEMENTARY SCHOOLS

# MIDDLE CHOOLS

# CHOOLS

FIRM:	KPFF
PROJECT NAME:	Transportation Allen
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	08/26/18
REVIEWED BY:	
REVIEW DATE:	

# 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

**Low and Moderate Seismicity** 

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
О <u></u>	NC x	N/A	>	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)	No Shear wall line on east side due to bay openings
υ <u></u>	NC	N/A	U X	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.5.3.3, is less than 70 lb/in. <sup>2</sup> . (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1)	
С	NC X	N/A	υ	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)	

					Project Name 58: Transportation Allen Project Number 21800125	
Stiff I	Dianh	nraan	าร			<b>&gt;</b>
	TING			DESCRIPTION	COMMENTS	AR LS
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)		ELEMENTARY SCHOOLS
Conn	ectio	ns				MIDDLE SCHOOLS
RA	TING			DESCRIPTION	COMMENTS	I블운
С	NC	N/A	U <b>X</b>	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	Calc not performed	SOS
				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)		HIGH
С	NC X	N/A	υ	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. 5.7.1.3)		E SCH
						ON OLS
С	NC	N/A	V X	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)		OPTION
						JRT TIES

С	NC	N/A *	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)	
С	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is	
		П	X	doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)	
С	NC	N/A	U	GIRDER-COLUMN CONNECTION: There is a	
x				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)	

### **High Seismicity**

#### Stiff Diaphragms

RA	TING			DESCRIPTION	COMMENTS
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	No shear wall line on east elevation
				(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	

						Drainet Name FOrTransportation Allen	
						Project Name 58:Transportation Allen Project Number 21800125	
Г							
	C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:		ELEMENTARY SCHOOLS
					Diaphragm openings immediately adjacent to		lĕä
	Ш	ш	X	Ш	exterior masonry shear walls are not greater than		158
					8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.		ᅵ빚모
					5.6.1.3)		
							ᆸᆔᇬ
							۱"
1	Flexil	ble Di	iaphra	agms			
I		TING			DESCRIPTION	COMMENTS	v
ſ	С	NC	N/A	U	CROSS TIES: There are continuous cross ties		MIDDLE
			14// (		between diaphragm chords. (Commentary: Sec.		l 님 오
		X			A.4.1.2. Tier 2: Sec. 5.6.1.2)		l≣ბ
							_ 0
ŀ		NC	N1 / A		OPENINGS AT SHEAR WALLS: Diaphragm		S
	C	NC	N/A	U	openings immediately adjacent to the shear walls		ヿ゙ヹ゙゙゙゙゙゙゙゙゙゙゙゙
	П	X			are less than 25% of the wall length.		L일우
					(Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)		HIGH
							S
ŀ					OPENINGS AT EVTERIOR MASONING SUFAR WALLS		
	C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:		~ w
			x		Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than		
	Ш				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.		
					5.6.1.3)		OPT SCHO
					3.5.1.5/		ا ۾ ي

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

С	NC	N/A x	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
С	NC	N/A x	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	
С	NC	N/A X	U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)	
С	NC	N/A *	U	OTHER DIAPHRAGMS: The diaphragm shall 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)	

Project Name 58	:Transportation Allen
Project Number	21800125

#### Connections

RA	TING			DESCRIPTION	COMMENTS
C	NC	N/A	U X	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)	

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Rev. 41-31.1

FIRM:	KPFF
PROJECT NAME:	Transportation 5th St North
SEISMICITY LEVEL:	High
PROJECT NUMBER:	12800125
COMPLETED BY:	RP
DATE COMPLETED:	8/27/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 59:	:Transportation 5th St 🕌
Project Number	12800125

ELEMENTARY SCHOOLS

Rev. 41-31.1

## 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U X	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)	No as-built drawings of original building found.
С	NC	N/A	U X	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)	Calc not performed.

2

# 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U X	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)	
С	NC	N/A X	U	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)	
С	NC	N/A	U X	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)	

**Building Configuration** 

	RATING DESCRIPTION COMMENTS						
RA	TING			DESCRIPTION	COMMENTS	l :	
c	NC	N/A	U	WEAK STORY: The sum of the shear strengths of		LINDENIT	
	110	13//	J	the seismic-force-resisting system in any story in		ĮΨ	
		X		each direction is not less than 80% of the strength		≥	
				in the adjacent story above. (Commentary: Sec.		l <u>"</u>	
				A2.2.2. Tier 2: Sec. 5.4.2.1)		ū	
				A2.2.2. Hel 2. Sec. 5.4.2.1)			
						┝	
	NC	N1/A		SOFT STORY: The stiffness of the seismic-force-		ш	
C	NC	N/A	U	resisting system in any story is not less than 70%		ح ا	
		X		of the seismic-force-resisting system stiffness in			
ш			ш			ΙĘ	
				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)			
						┡	
				VERTICAL IRREGULARITIES: All vertical elements in			
C	NC	N/A	U			I٦	
				the seismic-force-resisting system are continuous			
ш	ш	X	Ш	to the foundation. (Commentary: Sec. A.2.2.4. Tier			
				2: Sec. 5.4.2.3)		-	
						┝	
				GEOMETRY: There are no changes in the net			
C	NC	N/A	U	horizontal dimension of the seismic-force-			
						Į	
Ш	Ш	X		resisting system of more than 30% in a story		OTTO	
				relative to adjacent stories, excluding one-story		I۲	
				penthouses and mezzanines. (Commentary: Sec.		١ŏ	
				A.2.2.5. Tier 2: Sec. 5.4.2.4)		`	

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С	NC	N/A	U	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)	
С	NC	N/A	U	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)	

#### **Moderate Seismicity**

#### Geologic Site Hazards

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could	
			X	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)	
С	NC	N/A	U	SLOPE FAILURE: The building site is sufficiently remote from potential earthquake-induced slope	
			X	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)	
				(Commentary, Sec. A.O.1.2. Her 2. 3.4.3.1)	

c	NC	N/A	U	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)	Project Name 59:Transportation 5th St Project Number 12800125	ELEMENTARY SCHOOLS
						ELEN
-		nicity		ration		o
	uatio TING	ii Coi	myui	DESCRIPTION	COMMENTS	┖
C <b>X</b>	NC	N/A	U	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)		MIDDLE
	NG			TIES BETWEEN FOUNDATION ELEMENTS: The		SH SOLS
<b>X</b>	NC	N/A	υ	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)		HIGH SCHOOLS
						OPTION SCHOOLS

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Transportation 5th St North
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	8/27/18
REVIEWED BY:	
REVIEW DATE:	

Project Name 59	:Transportation 5th St 🕌
Project Number	21800125

# 16.10LS Life Safety Structural Checklist for Building Types C2: Concrete Shear Walls with Stiff Diaphragms and C2A: Concrete Shear Walls

with Flexible Diaphragms	
Low and Moderate Seismicity	

16.10LS Life Safety Structural Checklist for Building Types C2: Concrete Shear Walls with Stiff Diaphragms and C2A: Concrete Shear Walls with Flexible Diaphragms						ELEMENTARY SCHOOLS	
Low and Moderate Seismicity							
	Seismic-Force-Resisting System						
RA	TING			DESCRIPTION	COMMENTS		
С	NC	N/A	U	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)		MIDDLE	
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls			
<b>x</b>	□ NC	N/A	U	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)  SHEAR STRESS CHECK: The shear stress in the	Cale not naviormed	HIGH	
				concrete shear walls, calculated using the Quick	Calc not performed		
			X	Check procedure of Section 4.5.3.3, is less than the greater of 100 lb/in.² or 2√fc. (Commentary: Sec. A.3.2.2.1. Tier 2: Sec. 5.5.3.1.1)		OPTION	
С	NC	N/A	U <b>x</b>	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. (Commentary: Sec. A.3.2.2.2. Tier 2: Sec. 5.5.3.1.3)			
						SUPPORT	

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

#### Connections

RA	TING			DESCRIPTION	COMMENTS
	NC X	N/A	⊃	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)	Cross grain bending risk at wood ledgers.
С	NC	N/A	U	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)	
С	NC	N/A	U <b>x</b>	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation with vertical bars equal in size and spacing to the vertical wall reinforcing immediately above the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)	

#### **High Seismicity**

Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	DEFLECTION COMPATIBILITY: Secondary components have the shear capacity to develop	
		X		the flexural strength of the components. (Commentary: Sec. A.3.1.6.2. Tier 2: Sec. 5.5.2.5.2)	

					Project Name 59:Transportation 5th St Froject Number 21800125	
С	NC	N/A x	U	FLAT SLABS: Flat slabs or plates not part of the 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)		ELEMENTARY SCHOOLS
С	NC	N/A	υ	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. (Commentary: Sec. A.3.2.2.3. Tier 2: Sec. 5.5.3.2.1)		MIDDLE
Conn	ectio	ns		DESCRIPTION	COMMENTS	
С	NC	N/A	U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps. (Commentary: Sec. A.5.3.8. Tier 2: Sec. 5.7.3.5)	COMMINICIALS	HOHOS
	<i>hragı</i> TING	ns (Fl	exibl	e or Stiff)  DESCRIPTION	COMMENTS	NO C
C <b>X</b>	NC	N/A	U	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)		NOILOO
						ORT

<b>x</b>	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)	
Flexil		aphra	agms		
RA	TING			DESCRIPTION	COMMENTS
С	NC x	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords. (Commentary: Sec. A.4.1.2. Tier 2: Sec. 5.6.1.2)	
С	NC	N/A *	∪ □	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)	
C <b>X</b>	NC	N/A	U	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)	

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Transportation 5th St South
SEISMICITY LEVEL:	High
PROJECT NUMBER:	12800125
COMPLETED BY:	RP
DATE COMPLETED:	8/27/18
REVIEWED BY:	
REVIEW DATE:	

Project Name	Transportation 5t
Project Number	12800125

#### 16.1 Basic Checklist

**Very Low Seismicity** 

Structural Components

RA	TING			DESCRIPTION	COMMENTS
C **	NC	N/A	U	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)	
С	NC	N/A	U X	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)	Calc not performed

Project Name Transportation 5th St 12800125

## 16.1.2LS Life Safety Basic Configuration Checklist

Low Seismicity

Building System

General

RA	TING			DESCRIPTION	COMMENTS
C **	NC	N/A	U	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)	
С	NC	N/A	U	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 **	NC	N/A	υ	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)	

Project Name Project Number 12800125

Transportation 5th St

#### Building Configuration

Building Configuration  RATING DESCRIPTION COMMENTS  COMMENTS								
С	NC	N/A	U	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above. (Commentary: Sec. A2.2.2. Tier 2: Sec. 5.4.2.1)	CONNINENTS	ELEMENTARY SCHOOLS		
С	NC	N/A X	U	SOFT STORY: The stiffness of the seismic-forceresisting system in any story is not 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)		MIDDLE SCHOOLS		
C	NC	N/A	U	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)		SCHOOLS SCHOOLS		
С	NC	N/A	U	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-forceresisting 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)		OPTION SCHOOLS		

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

Project Name Project Number 12800125

С	NC	N/A	υ	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)	
С	NC	N/A	U	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)	

#### **Moderate Seismicity**

#### Geologic Site Hazards

TING			DESCRIPTION	COMMENTS
NC	N/A	U	LIQUEFACTION: Liquefaction-susceptible,	
		X	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)	
NC	N/A	U	SLOPE FAILURE: The building site is sufficiently	
		X	failures or rockfalls to be unaffected by such	
			predicted movements without failure. (Commentary: Sec. A.6.1.2. Tier 2: 5.4.3.1)	
		NC N/A	NC N/A U  RC N/A U  NC N/A U	NC N/A U 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)  NC N/A U 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.

					Project Name Project Number	Transportation 5th St 12800125	
С	NC	N/A	U X	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)	- Toject Namioci		ELEMENTARY SCHOOLS
_		nicity		ration			o
	uatio TING	II COI	nıyuı	DESCRIPTION	COMMENTS		[
C <b>X</b>	NC	N/A	U	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 <sub>a</sub> . (Commentary: Sec. A.6.2.1. Tier 2: Sec. 5.4.3.3)			MIDDLE
С	NC	N/A	U	TIES BETWEEN FOUNDATION ELEMENTS: The			HIGH SCHOOLS
X				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)			SC
							OPTION CHOOLS

Project Name Transporta
Project Number 21800125

Transportation 5th St

# **ASCE 41-13 Tier 1 Checklists**

FIRM:	KPFF
PROJECT NAME:	Transportation 5th St South
SEISMICITY LEVEL:	High
PROJECT NUMBER:	21800125
COMPLETED BY:	RP
DATE COMPLETED:	08/27/18
REVIEWED BY:	
REVIEW DATE:	

ELEMENTARY

### 16.15LS Life Safety Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

**Low and Moderate Seismicity** Seismic-Force-Resisting System

RA	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	REDUNDANCY: The number of lines of shear walls	
X			П	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)	
С	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using	Calc not performed
			X	the Quick Check procedure of Section 4.5.3.3, is	
				less than 70 lb/in.². (Commentary: Sec. A.3.2.4.1. Tier 2: Sec. 5.5.3.1.1)	
С	NC	N/A	U	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced	
	x			masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less	
				than 48 in., and all vertical bars extend to the top of the walls. (Commentary: Sec. A.3.2.4.2. Tier 2: Sec. 5.5.3.1.3)	

Project Name Project Number 21800125

#### Stiff Diaphragms

R.A	TING			DESCRIPTION	COMMENTS
С	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous	
		X		reinforced concrete topping slab. (Commentary: Sec. A.4.5.1. Tier 2: Sec. 5.6.4)	

#### Connections

	Connections						
RA	TING			DESCRIPTION	COMMENTS		
С	NC x	N/A	⊃	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)	no apparent conn at parallel deck. Calc not performed		
С	NC	N/A *	U	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. 5.7.1.3)			
C x	NC	N/A	υ	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)			

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С	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements. (Commentary: Sec. A.5.2.3. Tier 2: Sec. 5.7.2)			ELEMENTARY SCHOOLS
C x	NC	N/A	U	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation. (Commentary: Sec. A.5.3.5. Tier 2: Sec. 5.7.3.4)			MIDDLE
C <b>x</b>	NC	N/A	υ	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)			SCHOOLS HIGH
High Seismicity Stiff Diaphragms							
	TING		is	DESCRIPTION	COMMENTS		_ v
C x	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)			OPTION SCHOOLS
							ORT TIES

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

C NC N/A U Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)

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OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec. 5.6.1.3)

Flexible Diaphragms

Flexible Diaphragms						
RA	TING		COMMENTS			
c	NC	N/A	U	CROSS TIES: There are continuous cross ties		
				between diaphragm chords. (Commentary: Sec.		
X				A.4.1.2. Tier 2: Sec. 5.6.1.2)		
С	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm		
				openings immediately adjacent to the shear walls		
X	Ш	Ш	Ш	are less than 25% of the wall length. (Commentary: Sec. A.4.1.4. Tier 2: Sec. 5.6.1.3)		
				(commentary, seer, with their 2, seer sisting,		
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS:		
<b>x</b>				Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than		
				8 ft long. (Commentary: Sec. A.4.1.6. Tier 2: Sec.		
				5.6.1.3)		

					Project Name Project Number	Transportation 5th St 21800125	
c	NC	N/A	U	STRAIGHT SHEATHING: All straight sheathed diaphragms have aspect ratios less than 2-to-1 in the direction being considered. (Commentary: Sec. A.4.2.1. Tier 2: Sec. 5.6.2)			ELEMENTARY SCHOOLS
c	NC	N/A	υ	SPANS: All wood diaphragms with spans greater than 24 ft consist of wood structural panels or diagonal sheathing. (Commentary: Sec. A.4.2.2. Tier 2: Sec. 5.6.2)			MIDDLE
С <u></u>	NC	N/A X	>	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft and aspect ratios less than or equal to 4-to-1. (Commentary: Sec. A.4.2.3. Tier 2: Sec. 5.6.2)			HIGH SCHOOLS
С	NC	N/A	о <sub>П</sub>	OTHER DIAPHRAGMS: The diaphragm shall 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)			OPTION SCHOOLS

Project Name
Project Number
21800125

#### Connections

RA	TING			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)	