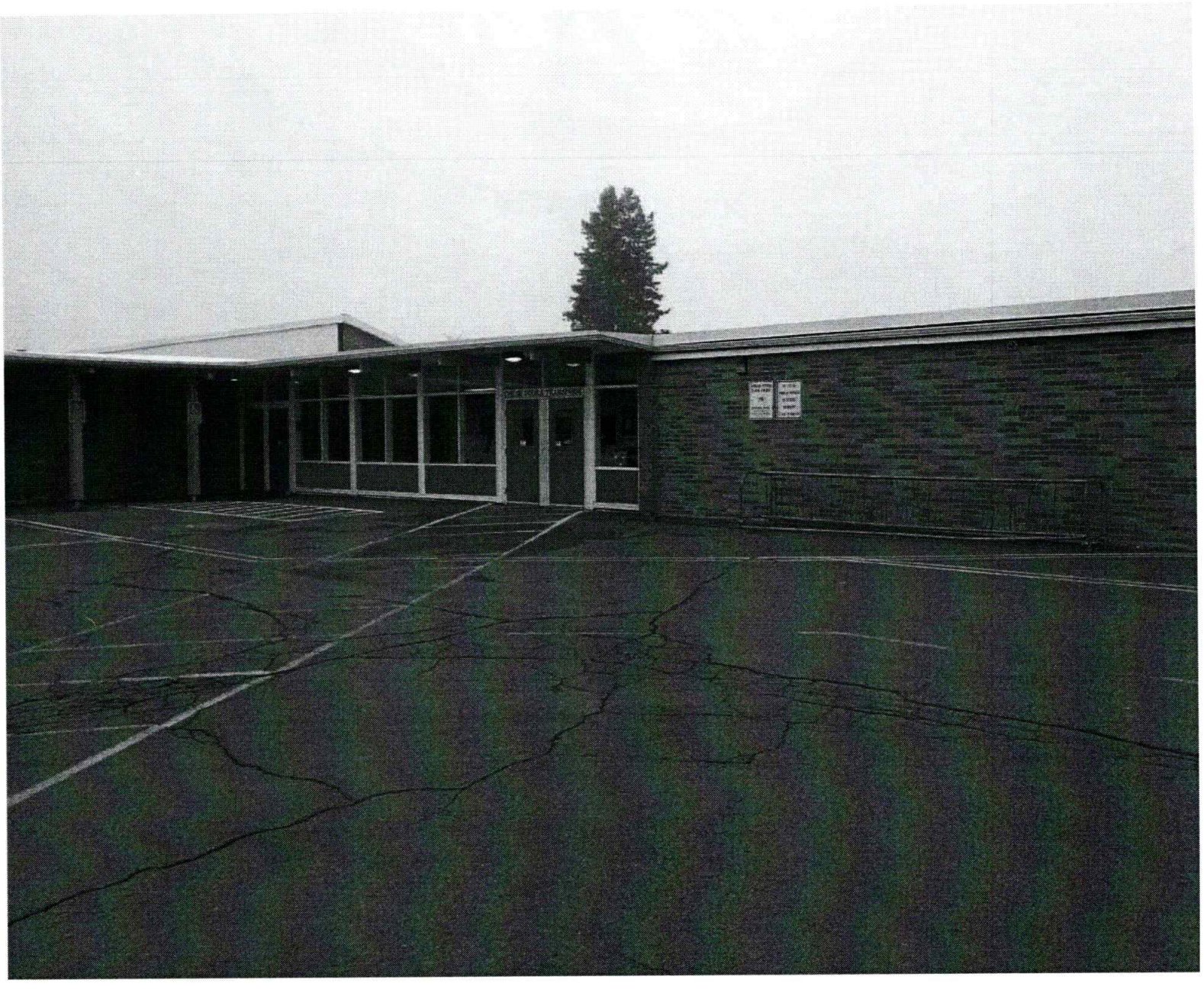

Seismic Evaluation Report For:

CHILOQUIN ELEMENTARY SCHOOL

548 S 2nd Avenue, Chiloquin, OR 97624
Klamath County School District

Prepared By:
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STRUCTURAL
REGISTERED PROFESSIONAL
ENGINEER
OREGON
JULY 08, 2014
MATTHEW R. SMITH

EXPIRES: 06-30-24

ZCS
ENGINEERING
ARCHITECTURE

Project Summary Information						
Building Part	Building Part Name	Included in Retrofit	Year Built	Building Type***	Nonstructural Retrofits Included in Scope Y/N***	Previous Seismic Retrofit Y/N*** (Year if Yes)
A	Original North/South Classroom	No	1955	W2	No	No
B	Original East/West Classroom	Yes	1955	C2 & URM	Yes	No
C	Original Multi-Purpose Room	Yes	1955	URM	Yes	No
D	OCDC	No	1980 est.	W2	No	No

*** Entries required **ONLY** for building parts included in proposed seismic retrofit. If building part was previously or is currently being retrofit, please list the building part's Risk Category and retrofit design Performance Objective, if known.

Nonstructural deficiencies posing life safety risk **MUST** be included in the scope of work and budget.

Seismic fragility inputs for existing buildings with **previous seismic retrofits MUST** be adjusted to reflect previous seismic retrofit measures completed for a building part.

Total Retrofit Cost			$2,499,640
Retrofit Square Feet			23,700
Retrofit Cost per Square Foot			$105.47

Is the campus within a tsunami, FEMA flood zone, landslide/slope instability, liquefaction potential or other high hazard area? **If so, provide documentation (e.g. the Oregon Statewide Hazards Viewer by DOGAMI). ** Projects within the code defined Tsunami Design Zone require consultation with DOGAMI prior to application submittal. Applicant shall include such documentation with the application.**	No

Engineering Report Checklist		
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1.0 Project Introduction

Klamath County School District is located in Klamath Falls, Oregon in Klamath County. The District operates 22 schools located within the community including the property of interest, Chiloquin Elementary School. The District has retained ZCS Engineering and Architecture (ZCS) to perform a seismic evaluation of Chiloquin Elementary School that provides the District with an objective, comprehensive analysis of the condition of the building's seismic resisting systems. The purpose of the evaluation is to determine the seismic lateral resisting system deficiencies when compared to buildings designed using modern building codes. This evaluation was performed in accordance with the American Society of Civil Engineers "Seismic Rehabilitation of Existing Buildings ASCE/SEI 41-17".

SEISMIC EVALUATION SNAPSHOT	
Street Address	548 S 2nd Ave, Chiloquin, OR 97624
Evaluation Standard	ASCE 41-17 (Tier 1 Analysis)
Building's Risk Category	IV
Target Building Performance Level	Immediate Occupancy for BSE-1E and Life Safety for BSE-2E
Target Non-Structural Performance Level	Position Retention for BSE-1E and Hazards Reduced for BSE-2E
ASCE 41 Building Type	C2 and URM
FEMA P-154 Seismicity Region (Table 2-2)	Moderately High
ASCE 41-17 Level of Seismicity (Table 2-4)	High
Cost Estimate	$2,499,640
Cost/Square Foot	$105.47

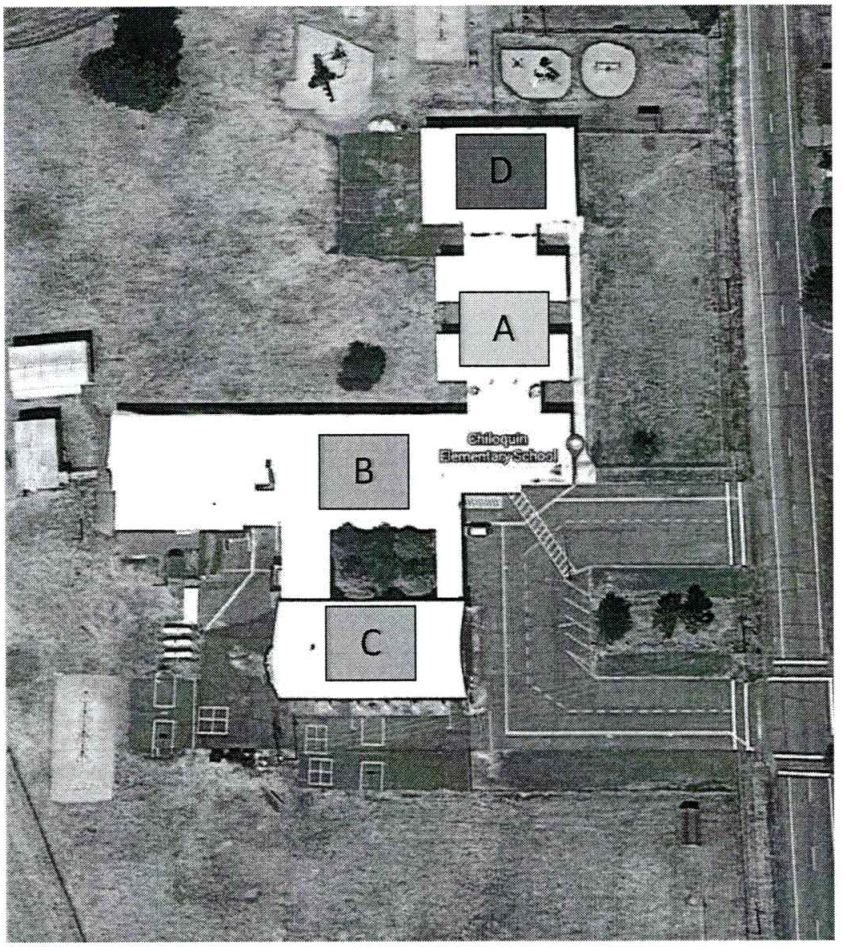
2.0 Building Description

The buildings being considered in this report include the Original East/ West Classroom Wing and the Original Multi-Purpose Room. ZCS has reviewed the buildings and their construction to classify their lateral systems as identified in ASCE 41-17. These lateral systems will be used throughout this evaluation. The common lateral systems present within the facilities is C2 and URM. These determinations were made after observing the subject facilities and reviewing the available existing drawings. A description of these structures type is listed below that specifically identifies the lateral load resisting system. In addition to the lateral systems present, ZCS has summarized the gravity load carrying systems of the subject facilities including later in this section.

Concrete Shear Walls C2 – These buildings have floor and roof framing that consists of cast-in-place concrete slabs, concrete beams, one-way joists, two-way waffle joists, or flat slabs. Buildings may also have steel beams, columns, and concrete slabs for the gravity framing. Floors are supported on concrete columns or bearing walls. Seismic forces are resisted by cast-in-place concrete shear walls. In older construction, shear walls are lightly reinforced but often extend throughout the building. In more recent construction, shear walls occur in isolated locations, are more heavily reinforced, and have concrete slabs that are stiff relative to the walls. The foundation system may consist of a variety of elements.

Unreinforced Masonry Bearing Walls URM – This building was initially reviewed as an RM1 construction type due to the presence of some reinforcing present in the wall construction. Through the RM1 Tier 1 evaluation it was determined that the walls are under reinforced. Accordingly, this building is classified as a URM. These buildings have a perimeter bearing walls that consist of unreinforced clay brick, stone, or concrete masonry. Interior bearing walls, where present, also consist of unreinforced clay brick, stone, or concrete masonry. In older construction, floor and roof framing consists of straight or diagonal lumber sheathing supported by wood joists, which, in turn, are supported on posts and timbers. In more recent construction, floors consist of structural panel or plywood sheathing rather than lumber sheathing. The diaphragms are flexible relative to the walls. Where they exist, ties between the walls and the diaphragms consist of anchors or bent steel plates embedded in the mortar joints and attached to framing. The foundation system may consist of a variety of elements.

Below is a figure identifying the building parts on campus and listing applicable information. See below for descriptions of building parts included in the evaluation and applicable building types as noted above.



BUILDING PARTS	
A	Construction Year: 1955 Building Name: Original North/South Classroom ASCE 41-17 Building Type: W2 In Scope?: No
B	Construction Year: 1955 Building Name: Original East/West Classroom ASCE 41-17 Building Type: C2 & URM In Scope?:Yes
C	Construction Year: 1955 Building Name: Original Multi-Purpose Room ASCE 41-17 Building Type: URM In Scope?:Yes
D	Construction Year: 1980 est. Building Name: OCDC ASCE 41-17 Building Type: W2 In Scope?:No

Figure 1
Chiloquin Elementary School Key Plan
**Photographs of the building parts included in this report are located in Appendix A.

Building Part B Construction:

- ASCE 41-17 Building Type(s):
  - C2 & URM
- Roof Structure:
  - Straight sheathed roof diaphragm supported by heavy timber glulam beams
- Walls:
  - Unreinforced masonry walls and large window walls infilled with wood stud wall framing sheathed with gypsum wall board are not properly anchored.
- Floor Structure and Foundation:
  - Slab-on-grade foundation with cast-in-place footings.
- Boiler Room:
  - Reinforced cast-in-place concrete boiler room walls.
  - Reinforced concrete roof.
- Notable Structural Features/Concerns:
  - Tall URM Chimney
  - URM Walls
  - Clear story windows which creates a roof step along the north corridor wall.

Building Part C Construction:

- ASCE 41-17 Building Type(s):
  - URM
- Roof Structure:
  - Straight sheathed roof diaphragm supported by light timber purlins and arched glulam beams. The diaphragm has been sheathed with structural panels in 2014.
- Walls:
  - Dimensional studs with diagonal sheathing
- Mezzanine/ Stage:
  - Diagonally sheathed diaphragm supported by dimensional floor joists bearing on exterior walls and interior post and beam lines
- Floor Structure and Foundation:
  - Diagonally sheathed floor supported by 2x joists on regularly spaced pony walls, all supported on a slab-on-grade foundation
- Notable Structural Features/Concern:
  - Tall URM Shear walls on the east and west end of the structure
  - Under designed glue-laminated beams

3.0 Seismic Evaluation Methodology

The subject structure was evaluated using information gathered from site observations, available historic construction documents, and interviews with District staff. This information was then utilized to perform a structural evaluation as outlined in the American Society of Civil Engineer's "Seismic Evaluation and Retrofit of Existing Buildings – ASCE 41-17" (ASCE 41-17). ASCE 41-17 is referenced as the standard for seismic evaluations of existing buildings by the International Existing Building Code (IEBC) which is referenced by the Oregon Structural Specialty Code (OSSC). Further, ASCE 41-17 is the evaluation tool required by the Seismic Rehabilitation Grant Program for grant applications.

ASCE 41-17 provides several levels of evaluation (Tiers 1-3) depending on the level of evaluation and/or retrofit being performed. The Tier 1 evaluation is a quick checklist selected based on the type of construction and the performance objective of the building and is the baseline tool for preliminary seismic evaluations. In the case of this evaluation, a Tier 1 was performed to identify the likely structural deficiencies requiring retrofit to meet the performance objective stated below.

The OSSC classifies buildings into risk categories based on the type of building and occupancy type. The building's risk category informs the required performance objective post retrofit. Risk categories I and II cover low risk structures. Risk category III includes school buildings that are not required to be used as emergency shelters and are relatively low occupancy. Risk category IV includes emergency service buildings and school buildings that are required to be designed as emergency shelters (high occupancy spaces). Figure 2, below, identifies the performance objective for each risk category.

The primary objective of the adjusting performance objectives relative to risk category is to ensure that the subject building is capable of performing in the necessary manner following a seismic event. In the case of a risk category III building, the intention is to ensure that the building is adequately stable following an earthquake to provide egress for occupants out of the building. Prior to reoccupation, the building would need evaluated and significant structural damage preventing reoccupation may be present. For risk category IV structures, the intent is that the building can be inspected then immediately reoccupied following a seismic event to function in its intended role as an emergency service building or as a high occupancy space capable of acting as an emergency structure.

In accordance with the table below, these sections B and C of this building are categorized as risk category IV structures and were evaluated to meet the Life Safety structural performance and Hazards Reduced nonstructural performance level for BSE-2E loading and the Immediate Occupancy structural performance and Position Retention nonstructural performance level for BSE-1E loading.

Table 2-2. Scope of Assessment Required for Tier 1 and Tier 2 with the Basic Performance Objective for Existing Buildings (BPOE)

Risk Category	Tier 1 and 2[a]	
	BSE-1E	BSE-2E
I and II	Not evaluated	Collapse Prevention Structural Performance
	Life Safety Nonstructural Performance (3-C)	Hazards Reduced Nonstructural Performance[b] (5-D)
III	Not evaluated	Limited Safety Structural Performance[c]
	Position Retention Nonstructural Performance (2-B)	Hazards Reduced Nonstructural Performance[b] (4-D)
IV	Immediate Occupancy Structural Performance	Life Safety Structural Performance[d]
	Position Retention Nonstructural Performance (1-B)	Hazards Reduced Nonstructural Performance[b] (3-D)

[a] For Tier 1 and 2 assessments of Risk Categories I–III, Structural Performance for the BSE-1E is not explicitly evaluated.
[b] Compliance with ASCE 7 provisions for new construction is deemed to comply.
[c] For Risk Category III, the Tier 1 screening checklists shall be based on the Collapse Prevention Performance Level (S-5), except that checklist statements using the Quick Check procedures of Section 4.4.3 shall be based on M_s factors taken as the average of the values for Life Safety and Collapse Prevention.
[d] For Risk Category IV, the Tier 1 screening checklists shall be based on the Collapse Prevention Performance Level (S-5), except that checklist statements using the Quick Check procedures of Section 4.4.3 shall be based on M_s factors for Life Safety.

Figure 2
Building Performance Objectives

Source: Table 2-2, ASCE 41-17: American Society of Civil Engineers – Seismic Evaluation and Retrofit of Existing Buildings

4.0 Seismicity

Seismic design is based on site specific parameters that relate to the location of the building relative to faults and the soil that supports the building. The United States Geologic Survey has developed seismic design data that is utilized to perform the calculations specified in ASCE 41-17. The table below summarizes the factors appropriate for computing the seismic lateral loads for the design earthquake specified in ASCE 41-17.

SITE SPECIFIC SEISMICITY	
ASCE 7-16 Site Soil Classification	D
FEMA P-154 Seismicity Region (Table 2-2)	Moderately High
ASCE 41-17 Level of Seismicity (Table 2-4)	High
BSE-1E:	
S_{xs}	0.293
S_{x1}	0.185
Soil Condition Amplification Factors (F_a, F_v)	F_v = 2.4 | F_a = 1.6
BSE-2E:	
S_{xs}	0.72
S_{x1}	0.481
Soil Condition Amplification Factors (f_a, f_v)	F_v = 2.153 | F_a = 1.384

Source: SEAOC and OSHPD Seismic Design Maps, https://seismicmaps.org/

5.0 Site Specific Hazards

Site specific hazards were assessed as part of our engineering evaluation. The hazards evaluated in our analysis included liquefaction, slope failure/landslide, surface fault rupture, and tsunami potential. These potential hazards were evaluated using ASCE 41-17 guidelines, as well as information provided by the online Oregon HazVu: Statewide Geohazards Viewer, maintained by the Department of Geology and Mineral Industries (DOGAMI). Tsunami risk was evaluated using the ASCE Tsunami Hazard Tool. Results from the HazVu analysis are included in Appendix D. Unless noted below, the hazards listed above are not present at the site.

6.0 Deficiencies and Repairs

The table below summarizes both the structural and nonstructural deficiencies noted in the Tier 1 evaluation and states both the proposed retrofit methodology and the plan key note that corresponds to the scope items in the preliminary plans and the cost estimate. See Appendix B for complete Tier 1 check sheets. Drawings illustrating the proposed retrofit measures are attached in Appendix C.

Tier 1 Deficiency Description	Deficiency Statement	Repair Statement	Plan Key Note
	IO BASIC CHECKLIST		
LOAD PATH	The structure does not 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.	Provide new in-plane attachments to all wood shear walls.	S1
ADJACENT BUILDINGS	The clear distance between the building being evaluated and any adjacent building is less than 0.5% of the height of the shorter building in low seismicity, 1.0% in moderate seismicity, and 3.0% in high seismicity.	A. Provide seismic isolation joint to avoid pounding of the taller structure into the lower structure. B. Provide new moment frame at seismic isolation joint	S2
MEZZANINES	Interior mezzanine levels are not braced independently from the main structure or are not anchored to the seismic-force-resisting elements of the main structure.	Anchor the mezzanine/stage to the seismic-force-resisting elements of the main structure.	S3
VERTICAL IRREGULARITIES	Vertical elements in the seismic-force-resisting system are not continuous to the foundation.	Provide additional shear walls as required to transfer lateral loads to foundation elements at clear story windows.	S4
	URM: IO CHECKLIST		
REDUNDANCY	The number of lines of shear walls in each principal direction is less than 2.	Install new shear walls to ensure a minimum of 2 shear lines in each principal direction.	S5

SHEAR STRESS CHECK	The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is greater than 30lb/in.^{2} for clay units and 70lb/in.^{2} for concrete units.	Install new plywood shear walls to ensure adequate shear capacity.	S6
WALL ANCHORAGE	Exterior concrete or masonry walls that are dependent on the diaphragm for lateral support are not anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections do not have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	Install new out-of-plane anchorage.	S7
TRANSFER TO SHEAR WALLS	Diaphragms are not connected for transfer of seismic forces to the shear walls, or the connections are not able to develop the shear strength of the walls or diaphragms.	Install new hardware for transfer of seismic forces from diaphragm to shear walls.	S8
PROPORTIONS	The height-to-thickness ratio of the shear walls at each story is greater than the following: Top story of multi-story building 9 First story of multi-story building 15 All other conditions 13	A. Install new steel strongback columns to resist out-of-plane forces. B. Install new wood wall adjacent to URM wall to resist out-of-plane forces	S9
PLAN IRREGULARITIES	There is not tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	Provide new drag elements.	S10
CROSS TIES	There are not continuous cross ties between diaphragm chords.	Provide new continuous cross ties between diaphragm chords.	S11
STRAIGHT SHEATHING	Not all straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	Install new plywood diaphragm sheathing.	S12
SPANS	Not all wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing.	A. Install new plywood diaphragm sheathing and install new shear walls to reduce diaphragm spans. B. Install new drag elements to reduce diaphragm spans.	S13

BEAM, GIRDER, AND TRUSS SUPPORTS	Beams, girders, and trusses supported by unreinforced masonry walls or pilasters do not have independent secondary columns for support of vertical loads.	Install new secondary support for vertical load carrying framing elements.	S14
	GRAVITY DEFICIENCIES		
GLULAMS	Existing glue laminated beams built prior to 1970 were under designed based on inadequate material stress information available at the time. This results in beams that cannot be relied upon to support code prescribed gravity loading.	Retrofit and strengthen beams to support code required gravity loading.	S15
	NONSTRUCTURAL CHECKLIST		
EMERGENCY POWER	Equipment used to power or control Life Safety systems is not anchored or braced.	Anchor and brace equipment used to power or control Life Safety system.	N1
EMERGENCY LIGHTING	Emergency and egress lighting equipment is not anchored or braced.	Anchor and brace emergency and egress lighting equipment.	N2
INTEGRATED CEILINGS	Integrated suspended ceilings with continuous areas greater than 144 ft2 and ceilings of smaller areas that are not surrounded by restraining partitions are not laterally restrained at a spacing less than 12ft with members attached to the structure above. Each restraint location does not have a minimum of four diagonal wires and compression struts, nor diagonal members capable of resisting compression.	Install seismic bracing for integrated suspended ceilings.	N3
EDGE CLEARANCE	The free edges of integrated suspended ceilings with continuous areas greater than 144ft.2 does not have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in.; in High Seismicity, 3/4 in.	Install free edge clearance for integrated suspended ceilings.	N4
EDGE SUPPORT	The free edges of integrated suspended ceilings with continuous areas greater than 144ft.2 are not supported by closure angles or channels not less than 2 in. wide.	Install free edge support for integrated suspended ceilings.	N5
LENS COVERS	Lens covers on light fixtures are not attached with safety devices.	Install safety devices for light fixture lens covers.	N6

CANOPIES	Canopies at building exits are not anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft; for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft.	Seismically anchor existing canopies to the structure.	N7
URM CHIMNEYS	Unreinforced masonry chimneys extend above the roof surface more than the following: for Life Safety in Low or Moderate Seismicity, 3 times the least dimension of the chimney; for Life Safety in High Seismicity and for Position Retention in any seismicity, 2 times the least dimension of the chimney.	Demolish existing unreinforced masonry chimneys down to 4 ft max above the roof level. Provide new sheet metal flue if required.	N8
ANCHORAGE	Masonry chimneys are not anchored at each floor level, at the topmost ceiling level, and at the roof.	Provide anchorage of chimneys at each level.	N9
TALL NARROW CONTENTS	Contents more than 6 ft high with a height-to-depth or height-to-width ratio greater than 3-to-1 are not anchored to the structure or to each other.	Anchor contents to the structure.	N10

In addition to the structural and nonstructural deficiencies noted above, the gravity load resisting system was reviewed to identify obvious insufficient gravity components. Insufficient gravity elements can cause failure during seismic events. These gravity deficiencies are based on visual observations of the existing structural elements. No formal structural analysis was performed during this evaluation of the gravity resisting element.

The buildings contain hazardous materials. These materials will need to be dealt with on a case-by-case basis as they are encountered during the project.

7.0 Preliminary Construction Cost Estimate

The attached engineer's opinion of probable cost has been developed by ZCS. ZCS has a successful record of completing seismic rehabilitation projects within the State of Oregon. The prices provided in the attached cost estimate have been developed using the extensive list of past projects as a baseline for this project. These prices are based on Oregon BOLI wage rates. The cost estimate is broken down into multiple line items associated with each major task (general conditions, foundation, structural steel, MEP, etc) associated with the rehabilitation. Additional line items are included for design associated permit costs, and owner construction management. A complete breakdown of the cost estimate can be found in Appendix E.

DIRECT COST	
Construction	$1,868,900
Engineering	$275,400
Construction Management	$59,700
Relocation	$26,900
Construction Contingency	$268,740
TOTALS AND SUMMARY	
Total Cost Estimate	**$2,499,640**
Match Funds	**$0**
Total Amount Requested from SRGP	**$2,499,640**
Total Area	**23,700**
Cost/Square Foot	**$105.47**

8.0 Conclusion and Certification Statement

The findings described in this report have been limited to the lateral force-resisting structural system and general assessment of the gravity force-resisting elements. Based on our visual observations, we find the structure to be in relatively good condition and generally safe for occupancy. No significant damage to the existing structural system was discovered.

Given the current condition of the structure, the current code section on existing buildings does not mandate that upgrades are required unless the building is scheduled for repairs, alterations, additions, or change in occupancy. To clarify, upgrades outlined in this report are strictly at the discretion of the District.

Please contact our office if you would like to discuss our findings. Please review the attached schematic drawings that can be used to refine a scope and budget.

Certification Statement

ZCS Engineering & Architecture's professional staff has reviewed the subject building and the deficiencies noted in the Tier 1 evaluation, developed seismic retrofit solutions to rectify the deficiencies, and developed the engineering cost estimate. The project cost estimate was developed by ZCS based on unit costs from our extensive list of past seismic retrofit projects as a baseline. We certify to the best of our knowledge, based on known and readily identifiable existing conditions, that all the seismic deficiencies present in the building are included in the retrofit scope of work and that all the retrofit's scope of work elements are included in the cost estimate.

Matthew R. Smith, PE, SE

Appendix A: Figures

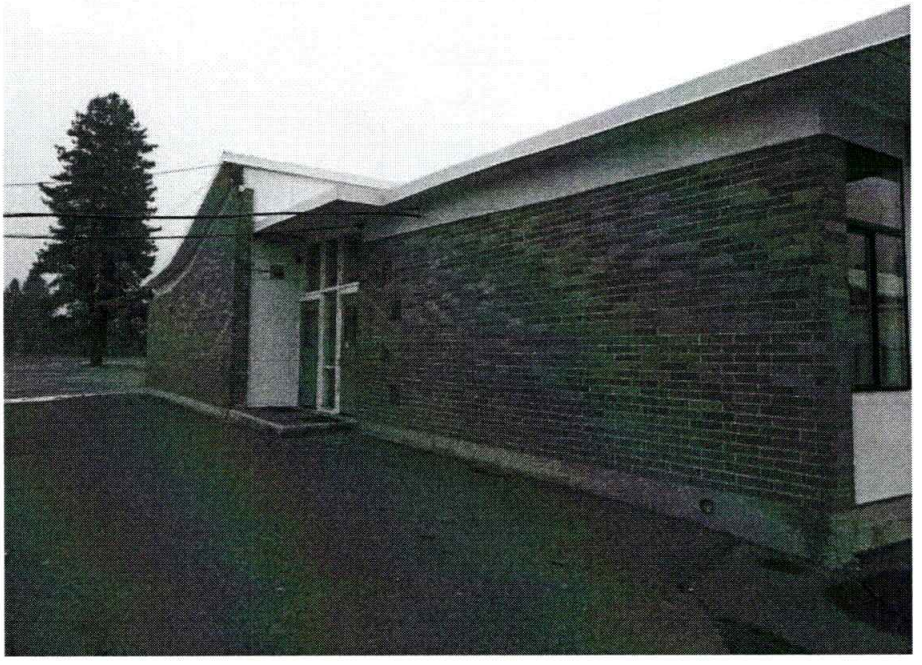


Figure 1: West Elevation of Building Area B

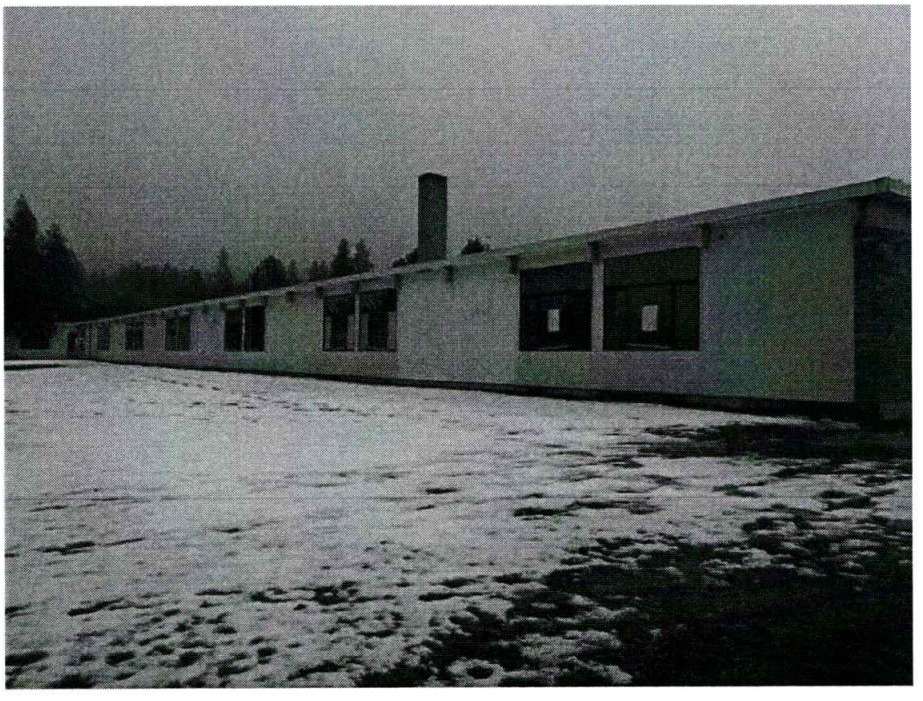


Figure 2: North Elevation of Building Area B

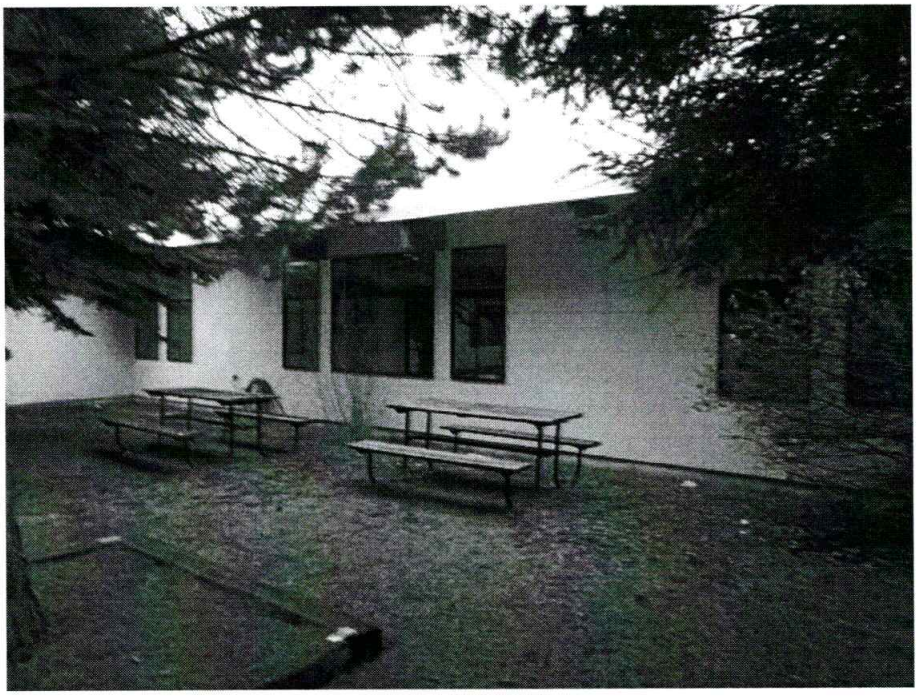


Figure 3: Courtyard

Figure 4: South Elevation of Area C

Figure 5: Interior Masonry Shear Wall

Figure 6: Interior Masonry Veneer

Appendix B:
Tier 1 Check Sheets

17.1.2IO Basic Configuration Checklist

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Very Low Seismicity							
Building System—General							
C	NC	N/A	U	LOAD PATH: The structure contains 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.	5.4.1.1	A.2.1.1	Wood Walls do not have adequate in-plane connections.
☐	☒	☐	☐				
C	NC	N/A	U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.5% of the height of the shorter building in low seismicity, 1.0% in moderate seismicity, and 3.0% in high seismicity.	5.4.1.2	A.2.1.2	Building areas A and B are built directly adjacent to each other with no spacing between the buildings.
☐	☒	☐	☐				
C	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.	5.4.1.3	A.2.1.3	The stage is in area C is not anchored to its surrounding shear walls.
☐	☒	☐	☐				
Building System—Building Configuration							
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.	5.4.2.1	A.2.2.2	
☐	☐	☒	☐				
C	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.	5.4.2.2	A.2.2.3	
☐	☐	☒	☐				
C	NC	N/A	U	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	5.4.2.3	A.2.2.4	There is a roof step along the north wall of the corridor with clear story windows. There is not an adequate amount of shear wall below the roof step.
☐	☒	☐	☐				

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

C	NC	N/A	U			
☐	☐	☒	☐	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	5.4.2.4	A.2.2.5
C	NC	N/A	U			
☐	☐	☒	☐	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	5.4.2.5	A.2.2.6
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.	5.4.2.6	A.2.2.7

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Low Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)							
Geologic Site Hazards							
C	NC	N/A	U				
☒	☐	☐	☐	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	5.4.3.1	A.6.1.1	
C	NC	N/A	U				
☒	☐	☐	☐	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	5.4.3.1	A.6.1.2	
C	NC	N/A	U				
☒	☐	☐	☐	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3	

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

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Moderate and High Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)							
Foundation Configuration							
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 $0.6S_a$.	5.4.3.3	A.6.2.1	
C ☐	**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.	5.4.3.4	A.6.2.2	

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

Project Name Chiloquin Elementary Sc
Project Number K-6307-22

17.12IO Structural Checklist for Building Types C2: Concrete Shear Walls with Stiff Diaphragms and C2a: Concrete Shear Walls with Flexible Diaphragms

Table 17-25. Immediate Occupancy Structural Checklist for Building Types C2 and C2a

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Very Low Seismicity							
Seismic-Force-Resisting System							
C	NC	N/A	U	COMPLETE FRAMES: Steel or concrete frames classified as secondary components form a complete vertical-load-carrying system.	5.5.2.5.1	A.3.1.6.1	
☐	☐	☒	☐				
C	NC	N/A	U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1	
☒	☐	☐	☐				
C	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the concrete shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the greater of 100 lb/in.^{2} (0.69 MPa) or $2\sqrt{f'_c}$.	5.5.3.1.1	A.3.2.2.1	
☒	☐	☐	☐				
C	NC	N/A	U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. The spacing of reinforcing steel is equal to or less than 18 in. (457 mm).	5.5.3.1.3	A.3.2.2.2	
☒	☐	☐	☐				
Connections							
C	NC	N/A	U	WALL ANCHORAGE AT FLEXIBLE DIAPHRAGMS: Exterior concrete or masonry walls that are dependent on flexible diaphragms for lateral support are anchored for out-of-plane forces at each diaphragm level with steel anchors, reinforcing dowels, or straps that are developed into the diaphragm. Connections have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1	
☐	☐	☒	☐				
C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of loads to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1	
☒	☐	☐	☐				

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

C	NC	N/A	U			
☒	☐	☐	☐	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation, and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation.	5.7.3.4	A.5.3.5
Foundation System						
C	NC	N/A	U			
☐	☐	☒	☐	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.		A.6.2.3
C	NC	N/A	U			
☐	☐	☒	☐	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.		A.6.2.4

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Low, Moderate, and High Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)							
Seismic-Force-Resisting System							
C	NC	N/A	U				
☐	☐	☒	☐	DEFLECTION COMPATIBILITY: Secondary components have the shear capacity to develop the flexural strength of the components and are compliant with the following items in Table 17-23: COLUMN-BAR SPLICES, BEAM-BAR SPLICES, COLUMN-TIE SPACING, STIRRUP SPACING, and STIRRUP AND TIE HOOKS.	5.5.2.5.2	A.3.1.6.2	
C	NC	N/A	U				
☐	☐	☒	☐	FLAT SLABS: Flat slabs or plates not part of seismic-force-resisting system have continuous bottom steel through the column joints.	5.5.2.5.3	A.3.1.6.3	
C	NC	N/A	U				
☐	☐	☒	☐	COUPLING BEAMS: The ends of both walls to which the coupling beam is attached are supported at each end to resist vertical loads caused by overturning. Coupling beams have the capacity in shear to develop the uplift capacity of the adjacent wall.	5.5.3.2.1	A.3.2.2.3	
C	NC	N/A	U				
☒	☐	☐	☐	OVERTURNING: All shear walls have aspect ratios less than 4-to-1. Wall piers need not be considered.	5.5.3.1.4	A.3.2.2.4	

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

C	NC	N/A	U			
☐	☐	☒	☐	CONFINEMENT REINFORCING: For shear walls with aspect ratios greater than 2-to-1, the boundary elements are confined with spirals or ties with spacing less than $8d_b$.	5.5.3.2.2	A.3.2.2.5
☒	☐	☐	☐	WALL REINFORCING AT OPENINGS: There is added trim reinforcement around all wall openings with a dimension greater than three times the thickness of the wall.	5.5.3.1.5	A.3.2.2.6
☒	☐	☐	☐	WALL THICKNESS: Thicknesses of bearing walls are not less than 1/25 the unsupported height or length, whichever is shorter, nor less than 4 in. (101 mm).	5.5.3.1.2	A.3.2.2.7
Diaphragms (Stiff or Flexible)						
☒	☐	☐	☐	DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints.	5.6.1.1	A.4.1.1
☒	☐	☐	☐	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length.	5.6.1.3	A.4.1.4
☐	☐	☒	☐	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	5.6.1.4	A.4.1.7
☐	☐	☒	☐	DIAPHRAGM REINFORCEMENT AT OPENINGS: There is reinforcing around all diaphragm openings larger than 50% of the building width in either major plan dimension.	5.6.1.5	A.4.1.8
Flexible Diaphragms						
☐	☐	☒	☐	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
☐	☐	☒	☐	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	5.6.2	A.4.2.1
☐	☐	☒	☐	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2

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

C	NC	N/A	U			
☐	☐	☒	☐	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and aspect ratios less than or equal to 3-to-1.	5.6.2	A.4.2.3
C	NC	N/A	U			
☐	☐	☒	☐	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	5.6.3	A.4.3.1
C	NC	N/A	U			
☒	☐	☐	☐	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
Connections						
C	NC	N/A	U			
☐	☐	☒	☐	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps; the pile cap reinforcement and pile anchorage are able to develop the tensile capacity of the piles.	5.7.3.5	A.5.3.8

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

17.18IO Structural Checklist for Building Types URM: Unreinforced Masonry Bearing Walls with Flexible Diaphragms and URMa: Unreinforced Masonry Bearing Walls with Stiff Diaphragms

Table 17-37. Immediate Occupancy Structural Checklist for Building Types URM and URMa

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Very Low Seismicity							
Seismic-Force-Resisting System							
C	NC	N/A	U	REDUNDANCY: The number of lines of shear walls in each principal direction is greater than or equal to 2.	5.5.1.1	A.3.2.1.1	There are no shear walls along the north and south window walls. Gypsum wall infills are inadequate
☐	☒	☐	☐				
C	NC	N/A	U	SHEAR STRESS CHECK: The shear stress in the unreinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 30 lb/in.^{2} (0.21 MPa) for clay units and 70 lb/in.^{2} (0.48 MPa) for concrete units.	5.5.3.1.1	A.3.2.5.1	URM walls in Area B fail the basic shear check.
☐	☒	☐	☐				
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 have strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.1.1	A.5.1.1	The URM walls are not anchored to the diaphragm for out of plane anchorage.
☐	☒	☐	☐				
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.	5.7.1.3	A.5.1.2	
☐	☐	☒	☐				
C	NC	N/A	U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1	The URM walls are not connected to the diaphragms to develop in-plane forces.
☐	☒	☐	☐				
C	NC	N/A	U	GIRDER–COLUMN CONNECTION: There is a positive connection using plates, connection hardware, or straps between the girder and the column support.	5.7.4.1	A.5.4.1	
☒	☐	☐	☐				

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

Foundation System						
C	NC	N/A	U	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.		A.6.2.3
C	NC	N/A	U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story high.		A.6.2.4

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Low, Moderate, and High Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)							
Seismic-Force-Resisting System							
C	NC	N/A	U	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than the following: Top story of multi-story building 9 First story of multi-story building 15 All other conditions 13	5.5.3.1.2	A.3.2.5.2	The height to thickness ratio of the masonry shear wall is 22.5 and exceeds the allowable 13 in Area C. The height to thickness ratio of the masonry shear wall is 18 and exceeds the allowable 13 in Area B.
C	NC	N/A	U	MASONRY LAYUP: Filled collar joints of multi-wythe masonry walls have negligible voids.	5.5.3.4.1	A.3.2.5.3	
Diaphragms (Stiff or Flexible)							
C	NC	N/A	U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 15% of the wall length.	5.6.1.3	A.4.1.4	
C	NC	N/A	U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 4 ft (1.2 m) long.	5.6.1.3	A.4.1.6	
C	NC	N/A	U	PLAN IRREGULARITIES: There is tensile capacity to develop the strength of the diaphragm at reentrant corners or other locations of plan irregularities.	5.6.1.4	A.4.1.7	Re-entrant corners are not properly detailed.
C	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.	5.6.1.5	A.4.1.8	
Flexible Diaphragms							
C	NC	N/A	U	CROSS TIES: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2	No cross ties are present to develop out-of-plane forces.

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

C	NC	N/A	U				
☐	☒	☐	☐	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 1-to-1 in the direction being considered.	5.6.2	A.4.2.1	Straight sheathed diaphragms aspect ratios exceed 1:1
C	NC	N/A	U				
☐	☒	☐	☐	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2	Diaphragm spans exceed 12'-0" and are straight sheathed.
C	NC	N/A	U				
☐	☐	☒	☐	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft (9.2 m) and aspect ratios less than or equal to 3-to-1.	5.6.2	A.4.2.3	
C	NC	N/A	U				
☐	☐	☒	☐	NONCONCRETE FILLED DIAPHRAGMS: Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of less than 40 ft (12.2 m) and have aspect ratios less than 4-to-1.	5.6.3	A.4.3.1	
C	NC	N/A	U				
☒	☐	☐	☐	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1	
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. (3 mm) before engagement of the anchors.	5.7.1.2	A.5.1.4	
C	NC	N/A	U				
☐	☒	☐	☐	BEAM, GIRDER, AND TRUSS SUPPORTS: Beams, girders, and trusses supported by unreinforced masonry walls or pilasters have independent secondary columns for support of vertical loads.	5.7.4.4	A.5.4.5	URM walls in do not have a secondary gravity system.

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

Project Name Chiloquin Elementary
Project Number K-6307-22

17.19 Nonstructural Checklist

Table 17-38. Nonstructural Checklist

Status				Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference	Comments
Life Safety Systems							
C	NC	N/A	U	**HR—not required; LS—LMH; PR—LMH.** FIRE SUPPRESSION PIPING: Fire suppression piping is anchored and braced in accordance with NFPA-13.	13.7.4	A.7.13.1	
☐	☐	☒	☐				
C	NC	N/A	U	**HR—not required; LS—LMH; PR—LMH.** FLEXIBLE COUPLINGS: Fire suppression piping has flexible couplings in accordance with NFPA-13.	13.7.4	A.7.13.2	
☐	☐	☒	☐				
C	NC	N/A	U	**HR—not required; LS—LMH; PR—LMH.** EMERGENCY POWER: Equipment used to power or control Life Safety systems is anchored or braced.	13.7.7	A.7.12.1	Emergency power equipment is not braced to structure
☐	☒	☐	☐				
C	NC	N/A	U	**HR—not required; LS—LMH; PR—LMH.** STAIR AND SMOKE DUCTS: Stair pressurization and smoke control ducts are braced and have flexible connections at seismic joints.	13.7.6	A.7.14.1	
☐	☐	☒	☐				
C	NC	N/A	U	**HR—not required; LS—MH; PR—MH.** SPRINKLER CEILING CLEARANCE: Penetrations through panelized ceilings for fire suppression devices provide clearances in accordance with NFPA-13.	13.7.4	A.7.13.3	
☐	☐	☒	☐				
C	NC	N/A	U	**HR—not required; LS—not required; PR—LMH.** EMERGENCY LIGHTING: Emergency and egress lighting equipment is anchored or braced.	13.7.9	A.7.3.1	Emergency lighting is not adequately braced to structure
☐	☒	☐	☐				
Hazardous Materials							
C	NC	N/A	U	**HR—LMH; LS—LMH; PR—LMH.** HAZARDOUS MATERIAL EQUIPMENT: Equipment mounted on vibration isolators and containing hazardous material is equipped with restraints or snubbers.	13.7.1	A.7.12.2	
☐	☐	☒	☐				
C	NC	N/A	U	**HR—LMH; LS—LMH; PR—LMH.** HAZARDOUS MATERIAL STORAGE: Breakable containers that hold hazardous material, including gas cylinders, are restrained by latched doors, shelf lips, wires, or other methods.	13.8.3	A.7.15.1	
☐	☐	☒	☐				
C	NC	N/A	U	**HR—MH; LS—MH; PR—MH.** HAZARDOUS MATERIAL DISTRIBUTION: Piping or ductwork conveying hazardous materials is braced or otherwise protected from damage that would allow hazardous material release.	13.7.3 13.7.5	A.7.13.4	
☐	☐	☒	☐				
C	NC	N/A	U	**HR—MH; LS—MH; PR—MH.** SHUTOFF VALVES: Piping containing hazardous material, including natural gas, has shutoff valves or other devices to limit spills or leaks.	13.7.3 13.7.5	A.7.13.3	
☐	☐	☒	☐				
C	NC	N/A	U	**HR—LMH; LS—LMH; PR—LMH.** FLEXIBLE COUPLINGS: Hazardous material ductwork and piping, including natural gas piping, have flexible couplings.	13.7.3 13.7.5	A.7.15.4	
☐	☐	☒	☐				

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

C	NC	N/A	U			
☐	☐	☒	☐	**HR—MH; LS—MH; PR—MH**. PIPING OR DUCTS CROSSING SEISMIC JOINTS: Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5 13.7.6	A.7.13.6

Partitions

C	NC	N/A	U			
☐	☐	☒	☐	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft (3.0 m) in Low or Moderate Seismicity, or at most 6 ft (1.8 m) in High Seismicity.	13.6.2	A.7.1.1
☐	☐	☒	☐	**HR—LMH; LS—LMH; PR—LMH**. HEAVY PARTITIONS SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH**. DRIFT: Rigid cementitious partitions are detailed to accommodate the following drift ratios: in steel moment frame, concrete moment frame, and wood frame buildings, 0.02; in other buildings, 0.005.	13.6.2	A.7.1.2
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH**. LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH**. STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints.	13.6.2	A.7.1.3
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH**. TOPS: The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m).	13.6.2	A.7.1.4

Ceilings

C	NC	N/A	U			
☐	☐	☒	☐	**HR—H; LS—MH; PR—LMH**. SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3
☐	☐	☒	☐	**HR—not required; LS—MH; PR—LMH**. SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3

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

C	NC	N/A	U				
☐	☒	☐	☐	**HR—not required; LS—not required; PR—MH.** INTEGRATED CEILINGS: Integrated suspended ceilings with continuous areas greater than 144 ft² (13.4 m²) and ceilings of smaller areas that are not surrounded by restraining partitions are laterally restrained at a spacing no greater than 12 ft (3.6 m) with members attached to the structure above. Each restraint location has a minimum of four diagonal wires and compression struts, or diagonal members capable of resisting compression.	13.6.4	A.7.2.2	Suspended ceilings in Area B exceed 144 square feet and do not have compression struts.
C	NC	N/A	U				
☐	☒	☐	☐	**HR—not required; LS—not required; PR—MH.** EDGE CLEARANCE: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft² (13.4 m²) have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in. (13 mm); in High Seismicity, 3/4 in. (19 mm).	13.6.4	A.7.2.4	Suspended ceilings in Area B exceed 144 square feet and do not have proper edge clearances.
C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH.** CONTINUITY ACROSS STRUCTURE JOINTS: The ceiling system does not cross any seismic joint and is not attached to multiple independent structures.	13.6.4	A.7.2.5	
C	NC	N/A	U				
☐	☒	☐	☐	**HR—not required; LS—not required; PR—H.** EDGE SUPPORT: The free edges of integrated suspended ceilings with continuous areas greater than 144 ft² (13.4 m²) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	13.6.4	A.7.2.6	Suspended ceilings in Area B exceed 144 square feet and do not have proper edge supports.
C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** SEISMIC JOINTS: Acoustical tile or lay-in panel ceilings have seismic separation joints such that each continuous portion of the ceiling is no more than 2,500 ft² (232.3 m²) and has a ratio of long-to-short dimension no more than 4-to-1.	13.6.4	A.7.2.7	
Light Fixtures							
C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH.** INDEPENDENT SUPPORT: Light fixtures that weigh more per square foot than the ceiling they penetrate are supported independent of the grid ceiling suspension system by a minimum of two wires at diagonally opposite corners of each fixture.	13.6.4 13.7.9	A.7.3.2	

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

C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** PENDANT SUPPORTS: Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are free to allow a 360-degree range of motion at an angle not less than 45 degrees from horizontal without contacting adjacent components. Alternatively, if rigidly supported and/or braced, they are free to move with the structure to which they are attached without damaging adjoining components. Additionally, the connection to the structure is capable of accommodating the movement without failure.	13.7.9	A.7.3.3	
C	NC	N/A	U				
☐	☒	☐	☐	**HR—not required; LS—not required; PR—H.** LENS COVERS: Lens covers on light fixtures are attached with safety devices.	13.7.9	A.7.3.4	Light fixtures are not adequately braced.

Cladding and Glazing

C	NC	N/A	U				
☐	☐	☒	☐	**HR—MH; LS—MH; PR—MH.** CLADDING ANCHORS: Cladding components weighing more than 10 lb/ft^2 (0.48 kN/m^2) are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft (1.8 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft (1.2 m)	13.6.1	A.7.4.1	
C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH.** CLADDING ISOLATION: For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.3	
C	NC	N/A	U				
☐	☐	☒	☐	**HR—MH; LS—MH; PR—MH.** MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.4	

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

C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH.** THREADED RODS: Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity.	13.6.1	A.7.4.9
C	NC	N/A	U			
☐	☐	☒	☐	**HR—MH; LS—MH; PR—MH.** PANEL CONNECTIONS: Cladding panels are anchored out of plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections.	13.6.1.4	A.7.4.5
C	NC	N/A	U			
☐	☐	☒	☐	**HR—MH; LS—MH; PR—MH.** BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.	13.6.1.4	A.7.4.6
C	NC	N/A	U			
☐	☐	☒	☐	**HR—MH; LS—MH; PR—MH.** INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.	13.6.1.4	A.7.4.7
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH.** OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft^2 (1.5 m^2) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.	13.6.1.5	A.7.4.8
Masonry Veneer						
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—LMH; PR—LMH.** TIES: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft^2 (0.25 m^2), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm).	13.6.1.2	A.7.5.1
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—LMH; PR—LMH.** SHELF ANGLES: Masonry veneer is supported by shelf angles or other elements at each floor above the ground floor.	13.6.1.2	A.7.5.2
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—LMH; PR—LMH.** WEAKENED PLANES: Masonry veneer is anchored to the backup adjacent to weakened planes, such as at the locations of flashing.	13.6.1.2	A.7.5.3

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

C	NC	N/A	U				
☐	☐	☒	☐	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup.	13.6.1.1 13.6.1.2	A.7.7.2	
C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH**. STUD TRACKS: For veneer with cold-formed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center.	13.6.1.1 13.6.1.2	A.7.6.1	
C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH**. ANCHORAGE: For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	13.6.1.1 13.6.1.2	A.7.7.1	
C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH**. WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.	13.6.1.2	A.7.5.6	
C	NC	N/A	U				
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH**. OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	13.6.1.1 13.6.1.2	A.7.6.2	
Parapets, Cornices, Ornamentation, and Appendages							
C	NC	N/A	U				
☐	☐	☒	☐	**HR—LMH; LS—LMH; PR—LMH**. URM PARAPETS OR CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5.	13.6.5	A.7.8.1	
C	NC	N/A	U				
☐	☒	☐	☐	**HR—not required; LS—LMH; PR—LMH**. CANOPIES: Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m).	13.6.6	A.7.8.2	Canopies do not have independent lateral support at roof step.
C	NC	N/A	U				
☐	☐	☒	☐	**HR—H; LS—MH; PR—LMH**. CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.	13.6.5	A.7.8.3	
C	NC	N/A	U				
☐	☐	☒	☐	**HR—MH; LS—MH; PR—LMH**. APPENDAGES: Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements.	13.6.6	A.7.8.4	

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

C	NC	N/A	U				
Masonry Chimneys							
☐	☒	☐	☐	**HR—LMH; LS—LMH; PR—LMH**. URM CHIMNEYS: Unreinforced masonry chimneys extend above the roof surface no more than the following: for Life Safety in Low or Moderate Seismicity, 3 times the least dimension of the chimney; for Life Safety in High Seismicity and for Position Retention in any seismicity, 2 times the least dimension of the chimney.	13.6.7	A.7.9.1	URM chimneys exceeds the allowable height for position retention.
☐	☒	☐	☐	**HR—LMH; LS—LMH; PR—LMH**. ANCHORAGE: Masonry chimneys are anchored at each floor level, at the topmost ceiling level, and at the roof.	13.6.7	A.7.9.2	Masonry chimneys are not anchored at the roof.
Stairs							
☐	☐	☒	☐	**HR—not required; LS—LMH; PR—LMH**. STAIR ENCLOSURES: Hollow-clay tile or unreinforced masonry walls around stair enclosures are restrained out of plane and have height-to-thickness ratios not greater than the following: for Life Safety in Low or Moderate Seismicity, 15-to-1; for Life Safety in High Seismicity and for Position Retention in any seismicity, 12-to-1.	13.6.2 13.6.8	A.7.10.1	
☐	☐	☒	☐	**HR—not required; LS—LMH; PR—LMH**. STAIR DETAILS: The connection between the stairs and the structure does not rely on post-installed anchors in concrete or masonry, and the stair details are capable of accommodating the drift calculated using the Quick Check procedure of Section 4.4.3.1 for moment-frame structures or 0.5 in. for all other structures without including any lateral stiffness contribution from the stairs.	13.6.8	A.7.10.2	
Contents and Furnishings							
☐	☐	☒	☐	**HR—LMH; LS—MH; PR—MH**. INDUSTRIAL STORAGE RACKS: Industrial storage racks or pallet racks more than 12 ft high meet the requirements of ANSI/RMI MH 16.1 as modified by ASCE 7, Chapter 15.	13.8.1	A.7.11.1	
☐	☒	☐	☐	**HR—not required; LS—H; PR—MH**. TALL NARROW CONTENTS: Contents more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 are anchored to the structure or to each other.	13.8.2	A.7.11.2	Contents are not anchored to the structure.
☐	☐	☒	☐	**HR—not required; LS—H; PR—H**. FALL-PRONE CONTENTS: Equipment, stored items, or other contents weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level are braced or otherwise restrained.	13.8.2	A.7.11.3	

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

C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH.** ACCESS FLOORS: Access floors more than 9 in. (229 mm) high are braced.	13.6.10	A.7.11.4
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH.** EQUIPMENT ON ACCESS FLOORS: Equipment and other contents supported by access floor systems are anchored or braced to the structure independent of the access floor.	13.7.7 13.6.10	A.7.11.5
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** SUSPENDED CONTENTS: Items suspended without lateral bracing are free to swing from or move with the structure from which they are suspended without damaging themselves or adjoining components.	13.8.2	A.7.11.6
Mechanical and Electrical Equipment						
☐	☐	☒	☐	**HR—not required; LS—H; PR—H.** FALL-PRONE EQUIPMENT: Equipment weighing more than 20 lb (9.1 kg) whose center of mass is more than 4 ft (1.2 m) above the adjacent floor level, and which is not in-line equipment, is braced.	13.7.1 13.7.7	A.7.12.4
☐	☐	☒	☐	**HR—not required; LS—H; PR—H.** IN-LINE EQUIPMENT: Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb (34.0 kg), is supported and laterally braced independent of the duct or piping system.	13.7.1	A.7.12.5
☐	☐	☒	☐	**HR—not required; LS—H; PR—MH.** TALL NARROW EQUIPMENT: Equipment more than 6 ft (1.8 m) high with a height-to-depth or height-to-width ratio greater than 3-to-1 is anchored to the floor slab or adjacent structural walls.	13.7.1 13.7.7	A.7.12.6
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH.** MECHANICAL DOORS: Mechanically operated doors are detailed to operate at a story drift ratio of 0.01.	13.6.9	A.7.12.7
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** SUSPENDED EQUIPMENT: Equipment suspended without lateral bracing is free to swing from or move with the structure from which it is suspended without damaging itself or adjoining components.	13.7.1 13.7.7	A.7.12.8
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** VIBRATION ISOLATORS: Equipment mounted on vibration isolators is equipped with horizontal restraints or snubbers and with vertical restraints to resist overturning.	13.7.1	A.7.12.9
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** HEAVY EQUIPMENT: Floor-supported or platform-supported equipment weighing more than 400 lb (181.4 kg) is anchored to the structure.	13.7.1 13.7.7	A.7.12.10

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

C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** ELECTRICAL EQUIPMENT: Electrical equipment is laterally braced to the structure.	13.7.7	A.7.12.11
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** CONDUIT COUPLINGS: Conduit greater than 2.5 in. (64 mm) trade size that is attached to panels, cabinets, or other equipment and is subject to relative seismic displacement has flexible couplings or connections.	13.7.8	A.7.12.12
Piping						
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** FLEXIBLE COUPLINGS: Fluid and gas piping has flexible couplings.	13.7.3 13.7.5	A.7.13.2
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** FLUID AND GAS PIPING: Fluid and gas piping is anchored and braced to the structure to limit spills or leaks.	13.7.3 13.7.5	A.7.13.4
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** C-CLAMPS: One-sided C-clamps that support piping larger than 2.5 in. (64 mm) in diameter are restrained.	13.7.3 13.7.5	A.7.13.5
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** PIPING CROSSING SEISMIC JOINTS: Piping that crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5	A.7.13.6
Ducts						
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** DUCT BRACING: Rectangular ductwork larger than 6 ft^2 (0.56 m^2) in cross-sectional area and round ducts larger than 28 in. (711 mm) in diameter are braced. The maximum spacing of transverse bracing does not exceed 30 ft (9.2 m). The maximum spacing of longitudinal bracing does not exceed 60 ft (18.3 m).	13.7.6	A.7.14.2
C	NC	N/A	U			
☒	☐	☐	☐	**HR—not required; LS—not required; PR—H.** DUCT SUPPORT: Ducts are not supported by piping or electrical conduit.	13.7.6	A.7.14.3
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** DUCTS CROSSING SEISMIC JOINTS: Ducts that cross seismic joints or isolation planes or are connected to independent structures have couplings or other details to accommodate the relative seismic displacements.	13.7.6	A.7.14.4
Elevators						
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—H; PR—H.** RETAINER GUARDS: Sheaves and drums have cable retainer guards.	13.7.11	A.7.16.1
C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—H; PR—H.** RETAINER PLATE: A retainer plate is present at the top and bottom of both car and counterweight.	13.7.11	A.7.16.2

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

C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.	13.7.11	A.7.16.3
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** SEISMIC SWITCH: Elevators capable of operating at speeds of 150 ft/min (0.30 m/min) or faster are equipped with seismic switches that meet the requirements of ASME A17.1 or have trigger levels set to 20% of the acceleration of gravity at the base of the structure and 50% of the acceleration of gravity in other locations.	13.7.11	A.7.16.4
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** SHAFT WALLS: Elevator shaft walls are anchored and reinforced to prevent toppling into the shaft during strong shaking.	13.7.11	A.7.16.5
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** COUNTERWEIGHT RAILS: All counterweight rails and divider beams are sized in accordance with ASME A17.1.	13.7.11	A.7.16.6
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** BRACKETS: The brackets that tie the car rails and the counterweight rail to the structure are sized in accordance with ASME A17.1.	13.7.11	A.7.16.7
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** SPREADER BRACKET: Spreader brackets are not used to resist seismic forces.	13.7.11	A.7.16.8
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** GO-SLOW ELEVATORS: The building has a go-slow elevator system.	13.7.11	A.7.16.9

[a] Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.

[b] Level of Seismicity: L = Low, M = Moderate, and H = High.

Appendix C: Preliminary Seismic Retrofit Drawings

CHILOQUIN ELEMENTARY SCHOOL SEISMIC RETROFIT

PRELIMINARY DESIGN

KLAMATH COUNTY SCHOOL DISTRICT
548 S 2ND AVENUE
CHILOQUIN, OR 97624

REPAIR KEYNOTES

STRUCTURAL REPAIRS

S1. PROVIDE NEW IN-PLANE ATTACHMENTS TO ALL WOOD SHEAR WALLS
S2.
- a. PROVIDE SEISMIC ISOLATION JOINT TO AVOID POUNDING OF THE TALLER STRUCTURE IN TO THE LOWER STRUCTURE
- b. PROVIDE NEW MOMENT FRAME AT SEISMIC ISOLATION JOINT

S3. ANCHOR THE MEZZANINE/STAGE TO THE SEISMIC-FORCE-RESISTING ELEMENTS OF THE MAIN STRUCTURE
S4 PROVIDE ADDITIONAL SHEAR WALLS AS REQUIRED TO TRANSFER LATERAL LOADS TO FOUNDATION ELEMENTS AT CLEAR STORY WINDOWS
S5. INSTALL NEW SHEAR WALLS TO ENSURE A MINIMUM OF 2 SHEAR LINES IN EACH PRINCIPAL DIRECTION
S6. INSTALL NEW PLYWOOD SHEAR WALLS TO ENSURE ADEQUATE SHEAR CAPACITY
S7 INSTALL NEW OUT-OF-PLANE ANCHORAGE
S8. INSTALL NEW HARDWARE FOR TRANSFER OF SEISMIC FORCES FROM DIAPHRAGM TO SHEAR WALLS
S9
- a. INSTALL NEW STEEL STRONGBACK COLUMNS TO RESIST OUT-OF-PLANE FORCES
- b. INSTALL NEW WOOD WALL ADJACENT TO URM WALL TO RESIST OUT-OF-PLANE FORCES

S10. PROVIDE NEW DRAG ELEMENTS
S11. PROVIDE NEW CONTINUOUS CROSS TIES BETWEEN DIAPHRAGM CHORDS
S12 INSTALL NEW PLYWOOD DIAPHRAGM SHEATHING
S13
- a. INSTALL NEW PLYWOOD DIAPHRAGM SHEATHING AND INSTALL NEW SHEAR WALLS TO REDUCE DIAPHRAGM SPANS
- b. INSTALL NEW DRAG ELEMENTS TO REDUCE DIAPHRAGM SPANS

S14. INSTALL NEW SECONDARY SUPPORT FOR VERTICAL LOAD CARRYING FRAMING ELEMENTS

GRAVITY REPAIRS

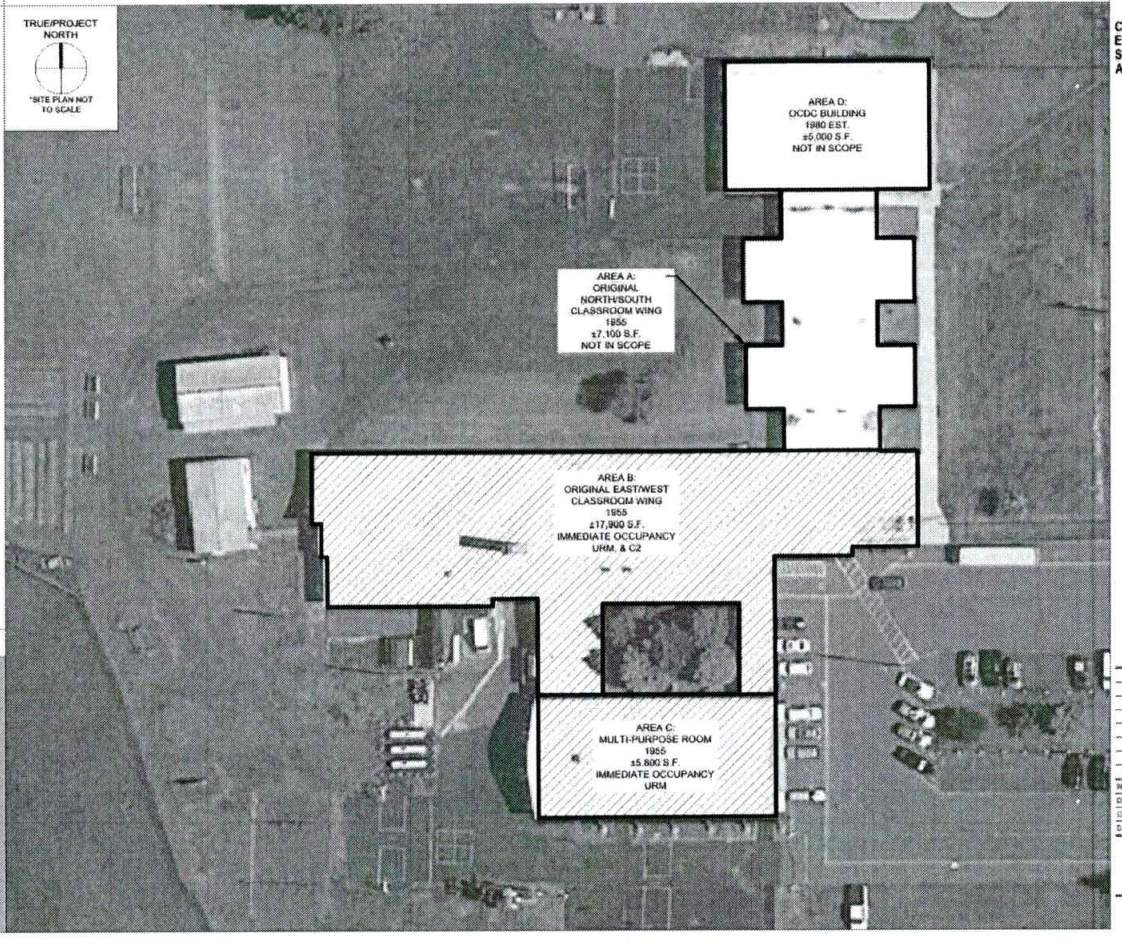
S15 RETROFIT AND STRENGTHEN BEAMS TO SUPPORT CODE REQUIRED GRAVITY LOADING

NON-STRUCTURAL REPAIRS

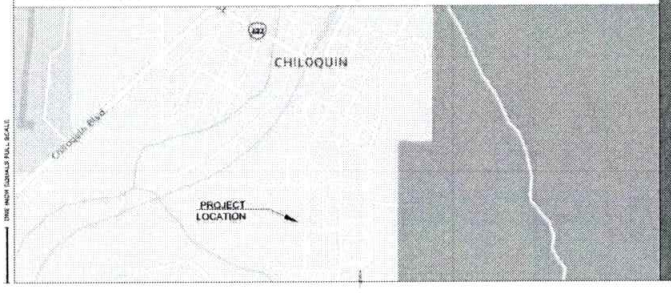
N1. ANCHOR AND BRACE EQUIPMENT USED TO POWER OR CONTROL LIFE SAFETY SYSTEM.
N2 ANCHOR AND BRACE EMERGENCY AND EGRESS LIGHTING EQUIPMENT
N3. INSTALL SEISMIC BRACING FOR INTEGRATED SUSPENDED CEILINGS
N4. INSTALL FREE EDGE CLEARANCE FOR INTEGRATED SUSPENDED CEILINGS
N5 INSTALL FREE EDGE SUPPORT FOR INTEGRATED SUSPENDED CEILINGS
N6 INSTALL SAFETY DEVICES FOR LIGHT FIXTURE LENS COVERS
N7. SEISMICALLY ANCHOR EXISTING CANOPIES TO THE STRUCTURE
N8. DEMOLISH EXISTING UNREINFORCED MASONRY CHIMNEYS DOWN TO 4 FT MAX ABOVE THE ROOF LEVEL. PROVIDE NEW SHEET METAL FLUE IF REQUIRED.
N9 PROVIDE ANCHORAGE OF CHIMNEYS AT EACH LEVEL
N10. ANCHOR CONTENTS TO THE STRUCTURE.

SHEET INDEX

BUILDING KEY PLAN



VICINITY MAP



ZCS ENGINEERING ARCHITECTURE

900 Klamath Avenue, Klamath Falls, Oregon 97601 | 541.884.2421

KLAMATH COUNTY SCHOOL DISTRICT

CHILOQUIN ELEMENTARY SCHOOL SRG APPLICATION

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID	DATE

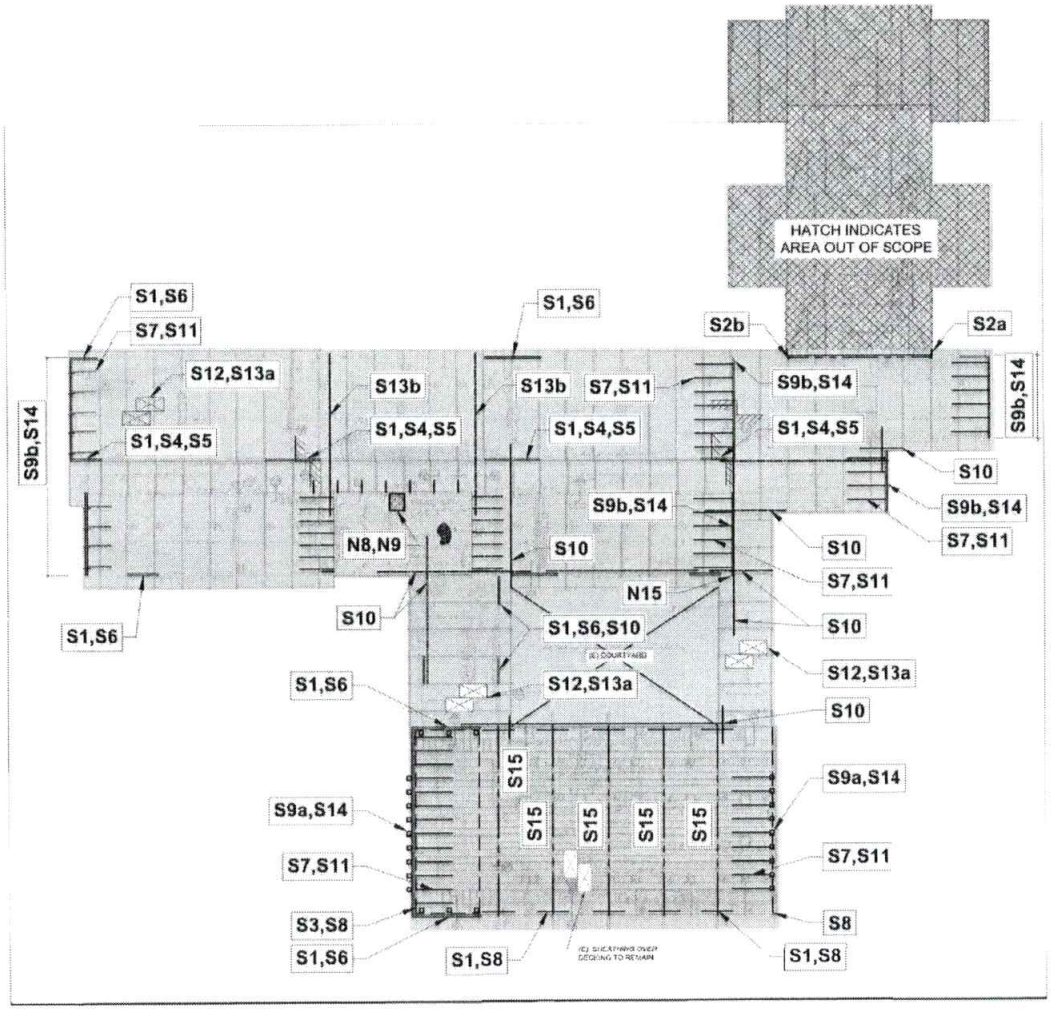
PROJECT NO.	K-6307-22
DRAWN	JRE
CHECKED	MRS
DATE	DECEMBER 2022

COVER SHEET

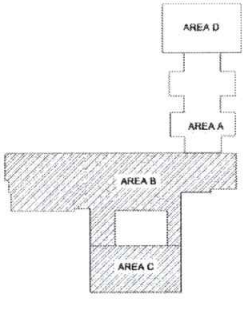
G0.0

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

ONE INCH SQUARES FULL SCALE



1 S1.1 **AREA B & C ROOF FRAMING PLAN** 1/16"=1'-0"



2 S1.1 **KEY PLAN** NTS

ZCS ENGINEERING ARCHITECTURE

400 Klamath Avenue, Klamath Falls, Oregon 97601 | 541-884-7421

KLAMATH COUNTY SCHOOL DISTRICT

CHILOQUIN ELEMENTARY SCHOOL SRG APPLICATION

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO	K4007-02
DRAWN	JRE
CHECKED	MRS
DATE	DECEMBER 2020

AREA B & C ROOF FRAMING PLAN

S1.1

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

ONE INCH EQUALS FULL SCALE

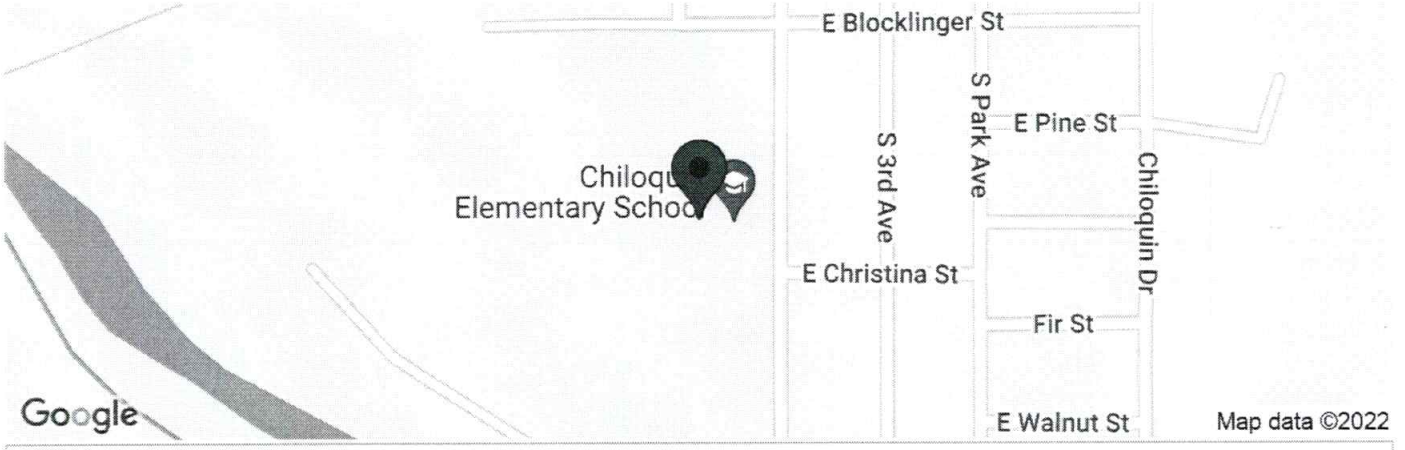
Appendix D:
Geotechnical Information

OSHPD

Chiloquin ES SRG Application

548 S 2nd Ave, Chiloquin, OR 97624, USA

Latitude, Longitude: 42.5703608, -121.8648577



Date	11/4/2022, 1:04:08 PM
Design Code Reference Document	ASCE41-17
Custom Probability	
Site Class	D - Default (See Section 11.4.3)

Type	Description	Value
Hazard Level		BSE-2N
S_S	spectral response (0.2 s)	0.767
S_1	spectral response (1.0 s)	0.323
S_{XS}	site-modified spectral response (0.2 s)	0.921
S_{X1}	site-modified spectral response (1.0 s)	0.639
F_a	site amplification factor (0.2 s)	1.2
F_v	site amplification factor (1.0 s)	1.977
ssuh	max direction uniform hazard (0.2 s)	0.865
crs	coefficient of risk (0.2 s)	0.887
ssrt	risk-targeted hazard (0.2 s)	0.767
ssd	deterministic hazard (0.2 s)	2.18
s1uh	max direction uniform hazard (1.0 s)	0.367
cr1	coefficient of risk (1.0 s)	0.881
s1rt	risk-targeted hazard (1.0 s)	0.323
s1d	deterministic hazard (1.0 s)	0.999

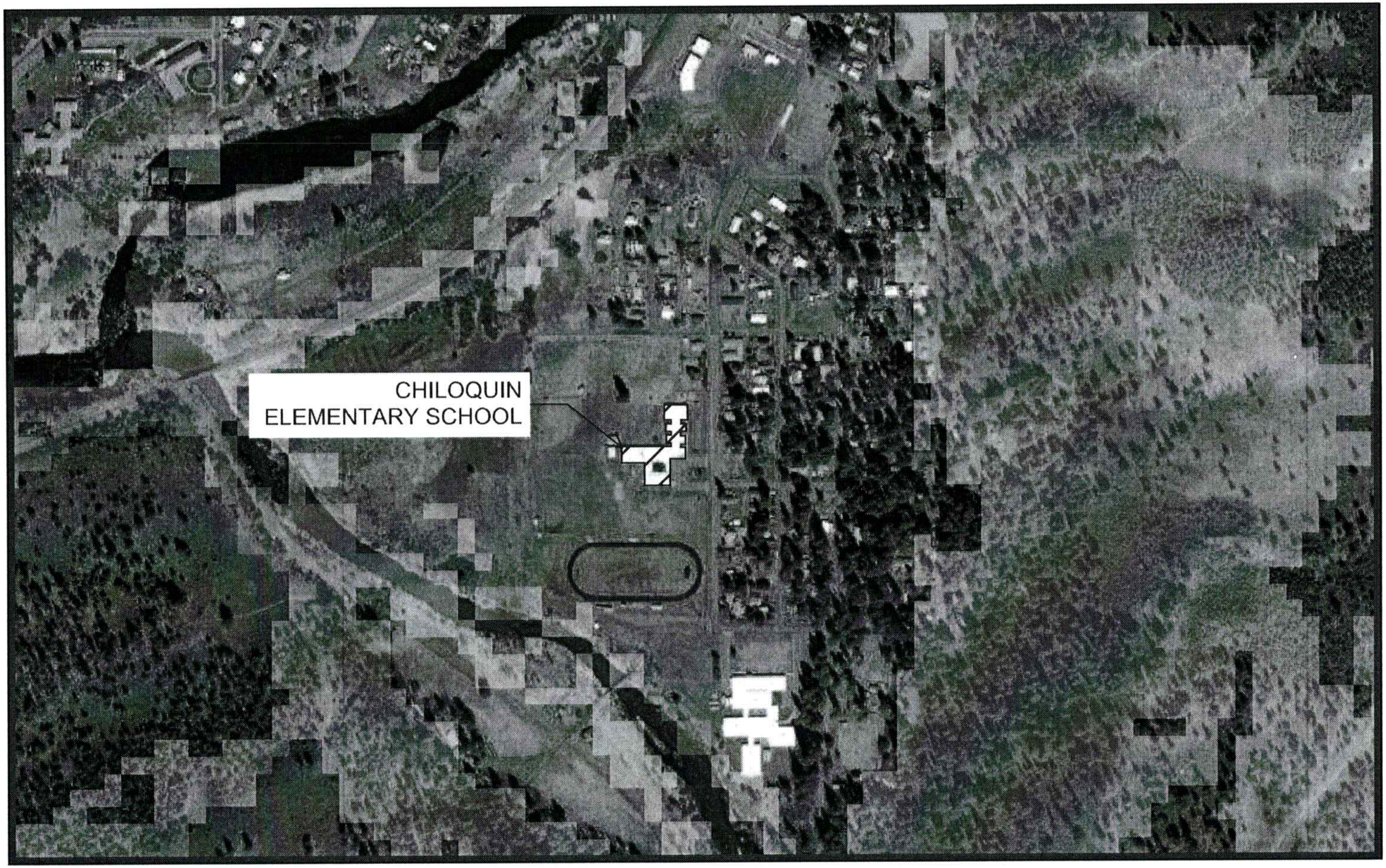
Type	Description	Value
Hazard Level		BSE-1N
S_{XS}	site-modified spectral response (0.2 s)	0.614
S_{X1}	site-modified spectral response (1.0 s)	0.426

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	0.521
S_1	spectral response (1.0 s)	0.224
S_{XS}	site-modified spectral response (0.2 s)	0.72
S_{X1}	site-modified spectral response (1.0 s)	0.481
f_a	site amplification factor (0.2 s)	1.384
f_v	site amplification factor (1.0 s)	2.153

Type	Description	Value
Hazard Level		BSE-1E
S_S	spectral response (0.2 s)	0.183
S_1	spectral response (1.0 s)	0.077
S_{XS}	site-modified spectral response (0.2 s)	0.293
S_{X1}	site-modified spectral response (1.0 s)	0.185
F_a	site amplification factor (0.2 s)	1.6
F_v	site amplification factor (1.0 s)	2.4

Type	Description	Value
Hazard Level		TL Data
T-Sub-L	Long-period transition period in seconds	16

&KLORTXLQ (OHPHQWDU\ 6FKRRO /DQGVOLG



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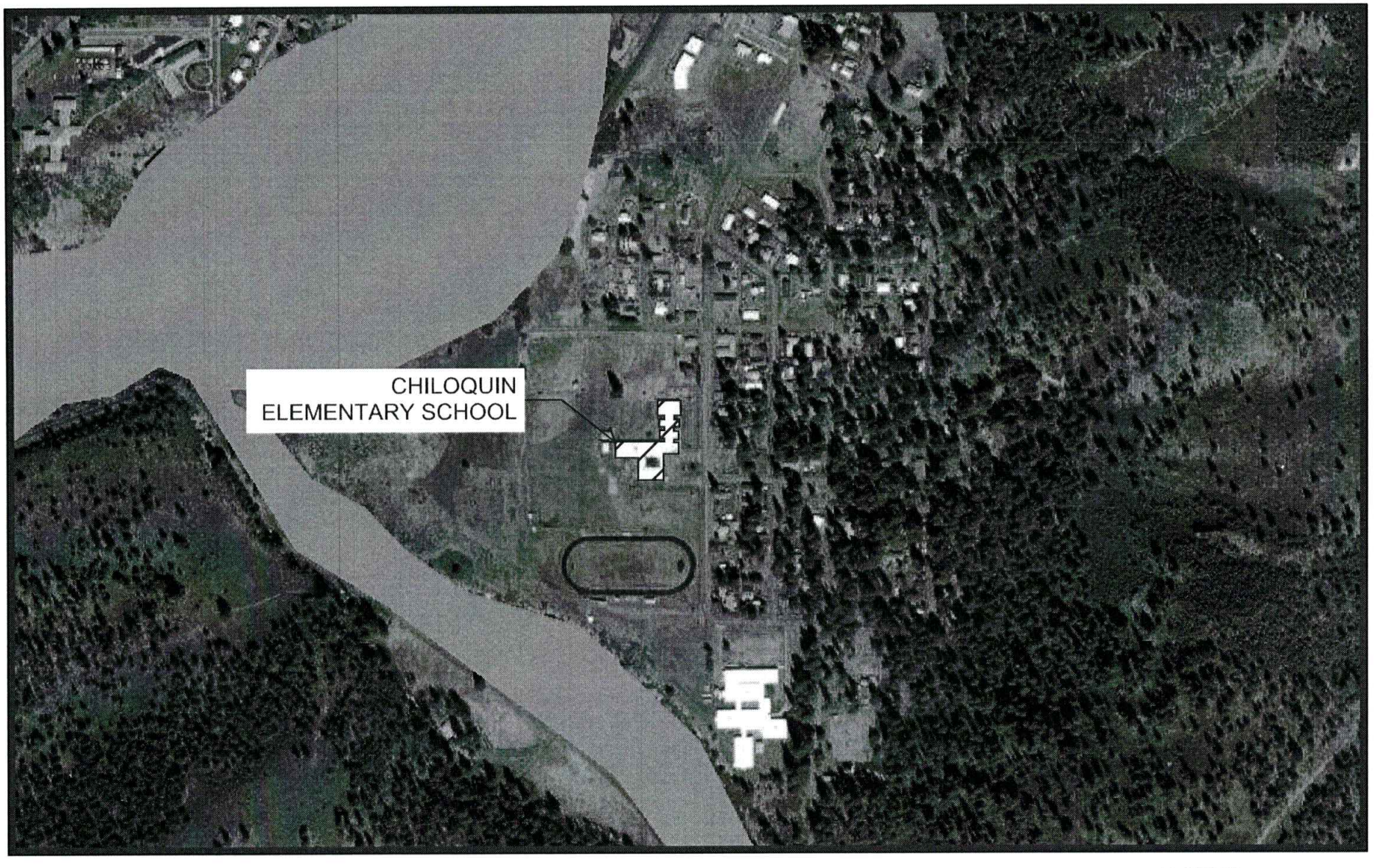

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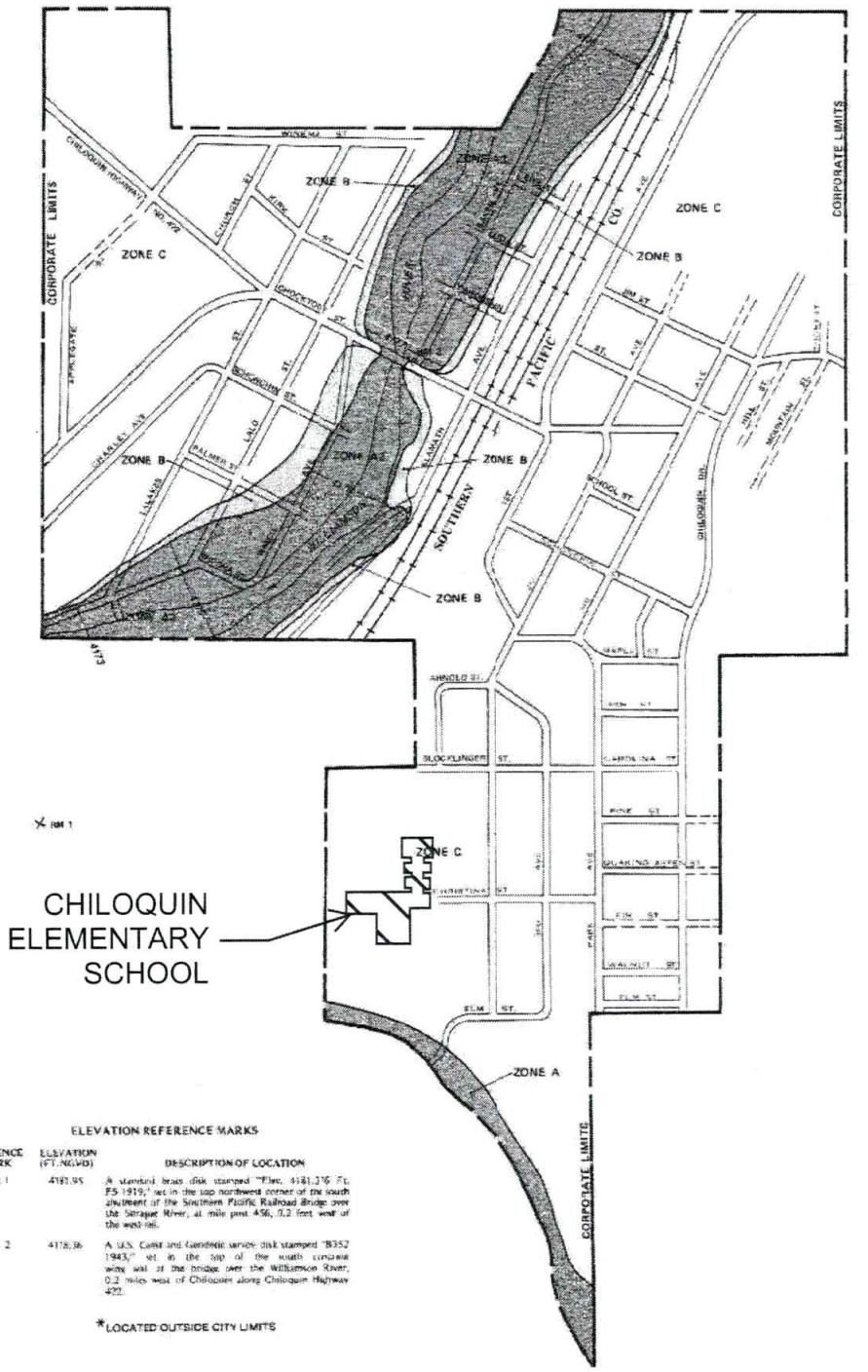


ELEVATION REFERENCE MARKS

REFERENCE MARK	ELEVATION (FT. NGVD)	DESCRIPTION OF LOCATION
*RM 1	4181.95	A standard brass disk stamped "Elev. 4181.316 Ft. PS 1919," set in the top northwest corner of the south abutment of the Southern Pacific Railroad Bridge over the Sprague River, at mile post 456, 0.2 feet west of the west rail.
RM 2	4178.36	A U.S. Coast and Geodetic survey disk stamped "B352 1943," set in the top of the south concrete wing wall at the bridge over the Williamson River, 0.2 miles west of Chiloquin along Chiloquin Highway 422.

*LOCATED OUTSIDE CITY LIMITS

KEY TO MAP

100-Year Flood Boundary
500-Year Flood Boundary
Zone Designations*
100-Year Flood Boundary
500-Year Flood Boundary
Base Flood Elevation Line With Elevation in Feet*
Base Flood Elevation in Feet Where Uniform Within Zone*
Elevation Reference Mark
Zone D Boundary
River Mile

**Referenced to the National Geodetic Vertical Datum

*EXPLANATION OF ZONE DESIGNA

ZONE	EXPLANATION
A	Areas of 100-year flood; base flood elev flood hazard factors not determined.
AO	Areas of 100-year shallow flooding wh are between one (1) and three (3) feet; ave of inundation are shown, but no flood haz are determined.
AH	Areas of 100-year shallow flooding wh and depths are (1) and three (3) feet; ponding areas are shown, but no flood haz are determined.
A1-A30	Areas of 100-year flood; base flood elev flood hazard factors determined.
AGE	Areas of 100-year flood to be inundated protection system under construction; elevations and flood hazards based on c
B	Areas between limits of the 100-year flood year flood, or certain areas subject to 100-ye ing with average depths less than one (1) fo the contributing drainage area is less than mile, or areas protected by levees from the (Medium shading)
C	Areas of minimal flooding. (No shading)
D	Areas of undetermined, but possible, floo
V	Areas of 100-year coastal flood with velo velocity) wave elevations and flood haz not determined.
V1-V30	Areas of 100-year coastal flood with velo velocity) wave elevations and flood haz determined.

NOTE TO USER

Certain areas not in the special flood hazard areas (zones may be protected by flood control structures.

This map is for flood insurance purposes only; it does not show all areas subject to flooding in the com all topographic features outside special flood hazard area

INITIAL IDENTIFICATION:
NOVEMBER 30, 1973
FLOOD HAZARD BOUNDARY MAP REVISIO
NOVEMBER 14, 1975
FLOOD INSURANCE RATE MAP EFFECTIV
AUGUST 15, 1984
FLOOD INSURANCE RATE MAP REVISION

Refer to the FLOOD INSURANCE RATE MAP (FIRM) shown on this map to determine when actuarial rate or purchase the zones where participation is limited

For detailed information concerning flood insurance in this co contact your insurance agent or call the National Flood Program, at (800) 638-6620.

APPROXIMATE SCALE

NATIONAL FLOOD INSURANCE

FIRM
FLOOD INSURANCE RA
CITY OF
CHILOQUIN, OREGO
KLAMATH COUNTY

ONLY PANEL PRINTED

COMMUNITY-PANEL
410
EFFECTIV
AUGUST

Federal Emergency Managem

Appendix E: Construction Cost Estimate Worksheets

ENGINEER'S OPINION OF PROBABLE COST - CHILOQUIN ELEMENTARTY SCHOOL SEISMIC REHABILITATION

SUMMARY

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 6.0)	Quantity	Units	Unit Price	Total Price for Construction Item
GENERAL CONDITIONS					
General Conditions		10%	%		$ 139,103.00
Preconstruction Services		2%	%		$ 27,820.60
Escalation		7%	%		$ 109,056.75
Bonding & Insurance		3%	%		$ 46,738.61
Contractor Profit & Overhead		5%	%		$ 77,897.68
				General Conditions Subtotal	$ 400,616.64
Non-Structural Elements					
Misc MEP	N1-N10	1	Lump Sum	$ 89,600.00	$ 89,600.00
Misc Non-Structural	N1-N10	1	Lump Sum	$ 35,900.00	$ 35,900.00
				Non-Structural Subtotal	$ 125,500.00
Construction Cost Per Building Part					
				Building Part 'B' Subtotal	$ 999,310.00
				Building Part 'C' Subtotal	$ 266,220.00
				Sub-Total Construction Cost	$ 1,791,600.00
				Contingency 15%	$ 268,740.00
				Total Construction Cost	$ 2,060,340.00
Cost Estimate Summary					
Engineering					$ 275,400.00
Architectural Consulting				$ 30,900.00	
Structural / Rehabilitation Engineering				$ 227,000.00	
Geotechnical Consulting				$ 10,300.00	
Materials Testing for Design				$ 7,200.00	
Construction Management					$ 59,700.00
Construction					$ 1,868,900.00
Sub-Total Construction Cost				$ 1,791,600.00	
Special Inspection Services for Construction				$ 15,500.00	
Permitting Fees				$ 61,800.00	
Relocation of FF&E					$ 26,900.00
Contingency					$ 268,740.00
				Total Project Funding Requirement	$ 2,499,640.00

ENGINEER'S OPINION OF PROBABLE COST - CHILOQUIN ELEMENTARTY SCHOOL SEISMIC REHABILITATION

BUILDING PART - 'B'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 6.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Abatement	S1-S15	1750	Square Foot	$ 5.00	$ 8,750.00
Pull Sheathing/Decking	S12,S13	2500	Square Foot	$ 4.00	$ 10,000.00
Chimney Demolition	N8,N9	1	EA	$ 15,000.00	$ 15,000.00
TPO / Comp / Metal Roof Demo	S12,S13	17890	Square Foot	$ 2.00	$ 35,780.00
Hard Demolition	S2	100	Square Foot	$ 18.00	$ 1,800.00
Soft Demolition	S1-S15	600	Square Foot	$ 2.00	$ 5,000.00
			Demolition & Asbestos Subtotal		$ 76,330.00
Foundation / Floor Strengthening Construction					
Bolting of Extg Walls to footings	S1,S4,S5,S6	160	Linear Foot	$ 30.00	$ 4,800.00
Holdowns	S1	36	Each	$ 1,000.00	$ 36,000.00
Shear Wall Footings - Wood Walls	S2,S14	120	Linear Foot	$ 300.00	$ 36,000.00
Spread Footings for Columns / Holdown	S2	2	Each	$ 3,000.00	$ 6,000.00
			Foundation Level Subtotal		$ 82,800.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S1,S4,S5,S6	1750	Square Foot	$ 5.00	$ 8,750.00
Painting	S1-S15	17890	Square Foot	$ 3.00	$ 53,670.00
Brick Veneer Ties	S14	1250	Square Foot	$ 30.00	$ 37,500.00
Moment Frame	S2	1	EA	$ 25,000.00	$ 25,000.00
New 2x Framed Shear Walls	S9,S14	2000	Square Foot	$ 10.00	$ 20,000.00
			Wall Strengthening Subtotal		$ 144,920.00
Roof Strengthening Construction					
New Roof Sheathing	S12,S13	17890	Square Foot	$ 4.00	$ 71,560.00
Diaphragm Attachments - In-Plane Shear	S1,S8	1000	Linear Foot	$ 20.00	$ 20,000.00
Diaphragm Attachments - Out-of-Plane	S7,S11	300	Linear Foot	$ 50.00	$ 15,000.00
New Single Ply Roof	S12,S13	17890	Square Foot	$ 15.00	$ 268,350.00
New 6" polyisociurinate rigid insulation	S12,S13	17890	Square Foot	$ 15.00	$ 268,350.00
Seismic Isolation from Adjacent Building	S2	45	Linear Foot	$ 400.00	$ 18,000.00
Ceiling Repair	S4,S5,S6	500	Square Foot	$ 3.00	$ 1,500.00
New Drag Beam	S8,S13	10	EA	$ 2,500.00	$ 25,000.00
Reinstall Decking	S1,S4,S5,S6	2500	Square Foot	$ 3.00	$ 7,500.00
			Roof Strengthening Subtotal		$ 695,260.00
			Building Part 'B' - Total Construction Cost		$ 999,310.00

ENGINEER'S OPINION OF PROBABLE COST - CHILOQUIN ELEMENTARTY SCHOOL SEISMIC REHABILITATION

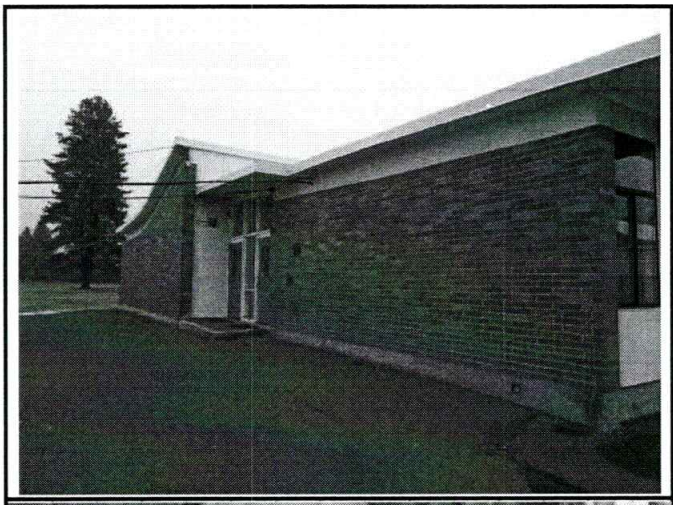
BUILDING PART - 'C'

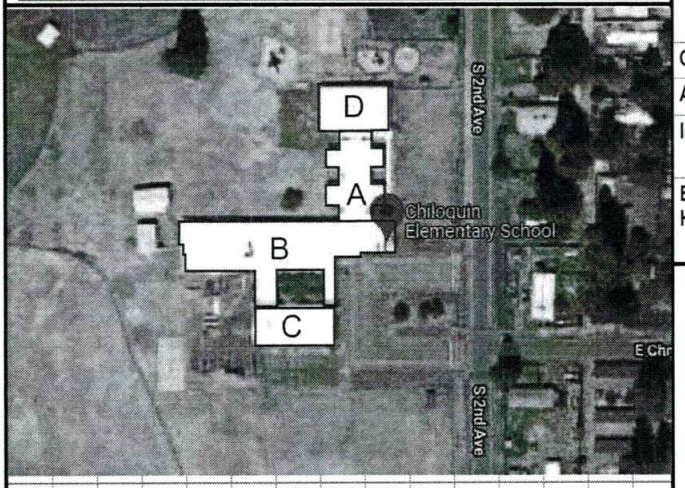
Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 6.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Abatement	S1-S15	1285	Square Foot	$ 5.00	$ 6,425.00
Hard Demolition	S9,S14	162	Square Foot	$ 20.00	$ 3,240.00
Soft Demolition	S5,S7	162	Square Foot	$ 2.00	$ 324.00
Ceiling Demolition	S9,S14	450	Square Foot	$ 2.00	$ 900.00
			Demolition & Asbestos Subtotal		$ 10,889.00
Foundation / Floor Strengthening Construction					
Bolting of Extg Walls to footings	S1	90	Linear Foot	$ 35.00	$ 3,150.00
Spread Footings for Columns / Holdown	S9,S14	24	Each	$ 3,000.00	$ 72,000.00
Flooring Protection	S1-S15	2900	Square Foot	$ 6.00	$ 17,400.00
Gym Floor Patch / Replacement	S1-S15	162	Square Foot	$ 13.00	$ 2,106.00
Diaphragm Attachments - In-Plane Shear	S3,S8	142	Linear Foot	$ 20.00	$ 5,000.00
			Foundation Level Subtotal		$ 99,656.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S1,S5,S6	1285	Square Foot	$ 5.00	$ 6,425.00
Light Steel Columns	S9,S14	24	EA	$ 1,400.00	$ 33,600.00
Painting	S1-S15	5800	Square Foot	$ 3.00	$ 17,400.00
			Wall Strengthening Subtotal		$ 57,425.00
Roof Strengthening Construction					
Diaphragm Attachments - In-Plane Shear	S1,S8	320	Linear Foot	$ 20.00	$ 6,400.00
Diaphragm Attachments - Out-of-Plane	S7,S11	110	Linear Foot	$ 50.00	$ 5,500.00
Ceiling Repair	S1,S8,S9,S14	450	Square Foot	$ 3.00	$ 1,350.00
Existing Beam Strengthening	S15	5	EA	$ 15,000.00	$ 75,000.00
New Drag Beam	S1,S10	4	EA	$ 2,500.00	$ 10,000.00
			Roof Strengthening Subtotal		$ 98,250.00
			Building Part 'C' - Total Construction Cost		**$ 266,220.00**

Appendix F:
Rapid Visual Screening

Rapid Visual Screening of Buildings for Potential Seismic Hazards — **Level 1**

FEMA P-154 Data Collection Form — **MODERATELY HIGH Seismicity**





SKETCH

Address: 548 S 2ND AVENUE
CHILOQUIN, OR **Zip:** 97624
Other Identifiers: Building Area B
Building Name: Chiloquin Elementary School
Use: Elementary School
Latitude: 42.57061 **Longitude:** -121.86469
S_S: 0.84 **S_1:** 0.29
Screener(s): JRE **Date/Time:** 10/19/2022

No. Stories: Above Grade: Yes Below Grade: No **Year Built:** 1955 ☐ EST
Total Floor Area (sq. ft.): 17890 **Code Year:**
Additions: ■ None ☐ Yes, Year(s) Built:

Occupancy: Assembly ☐ Commercial ☐ Emer. Services ☐ Historic ☐ Shelter
Industrial ☐ Office ■ School ☐ Government
Utility ☐ Warehouse ☐ Residential, # Units:

Soil Type: ☐A Hard Rock ☐B Avg Rock ☐C Dense Soil ■D Stiff Soil ☐E Soft Soil ☐F Poor Soil **DNK** *If DNK, assume Type D.*

Geologic Hazards: Liquefaction: Yes/No/DNK Landslide: Yes/No/DNK Surf. Rupt.: Yes/No/DNK

Adjacency: ■ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Vertical (type/severity)
■ Plan (type) Re-entrant corners

Exterior Falling Hazards: ■ Unbraced Chimneys ■ Heavy Cladding or Heavy Veneer
☐ Parapets ☐ Appendages
☐ Other:

COMMENTS:

☐ Additional sketches or comments on separate page

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}

FEMA BUILDING TYPE W2 (Do Not Know)	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score	**4.1**	**3.7**	**3.2**	**2.3**	**2.2**	**2.9**	**2.2**	**2.0**	**1.7**	**2.1**	**1.4**	**1.8**	**1.5**	**1.8**	**1.8**	**1.2**	**2.2**
Severe Vertical Irregularity, V_{L1}	-1.3	-1.3	-1.3	-1.1	-1.0	-1.2	-1.0	-0.9	-1.0	-1.1	-0.8	-1.0	-0.9	-1.0	-1.0	-0.8	NA
Moderate Vertical Irregularity, V_{L1}	-0.8	-0.8	-0.8	-0.7	-0.6	-0.8	-0.6	-0.6	-0.6	-0.6	-0.5	-0.6	-0.6	-0.6	-0.6	-0.5	NA
Plan Irregularity, P_{L1}	-1.3	-1.2	-1.1	-0.9	-0.8	-1.0	-0.8	-0.7	-0.7	-0.9	-0.6	-0.8	-0.7	-0.7	-0.7	-0.5	NA
Pre-Code	-0.8	-0.9	-0.9	-0.5	-0.5	-0.7	-0.6	-0.2	-0.4	-0.7	-0.1	-0.4	-0.3	-0.5	-0.5	-0.1	-0.3
Post-Benchmark	1.5	1.9	2.3	1.4	1.4	1.0	1.9	NA	1.9	2.1	NA	2.1	2.4	2.1	2.1	NA	1.2
Soil Type A or B	0.3	0.6	0.9	0.6	0.9	0.3	0.9	0.9	0.6	0.8	0.7	0.9	0.7	0.8	0.8	0.6	0.9
Soil Type E (1-3 stories)	0.0	-0.1	-0.3	-0.4	-0.5	0.0	-0.4	-0.5	-0.2	-0.2	-0.4	-0.5	-0.3	-0.4	-0.4	-0.3	-0.5
Soil Type E (> 3 stories)	-0.5	-0.8	-1.2	-0.7	-0.7	NA	-0.7	-0.6	-0.6	-0.8	-0.4	NA	-0.5	-0.6	-0.7	-0.3	NA
Minimum Score, S_{MIN}	*1.6*	*1.2*	*0.8*	*0.5*	*0.5*	*0.9*	*0.5*	*0.5*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.3*	*0.3*	*0.2*	*1.4*

FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$: 0.2 ~ High Collapse potential

EXTENT OF REVIEW

Exterior: ☐ Partial ■ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ■ Entered
Drawings Reviewed: ■ Yes ☐ No
Soil Type Source: Assumed
Geologic Hazards Source: Dogami
Contact Person:

LEVEL 2 SCREENING PERFORMED?

■ Yes, Final Level 2 Score, S_{L2} 0.3 ☐ No
Nonstructural hazards? ■ Yes ☐ No

OTHER HAZARDS

Are There Hazards That Trigger A Detailed Structural Evaluation?

☐ Pounding potential (unless S_{L2} > cut-off, if known)
☐ Falling hazards from taller adjacent building
☐ Geologic hazards or Soil Type F
☐ Significant damage/deterioration to the structural system

ACTION REQUIRED

Detailed Structural Evaluation Required?

☐ Yes, unknown FEMA building type or other building
■ Yes, score less than cut-off
☐ Yes, other hazards present
☐ No

Detailed Nonstructural Evaluation Recommended? *(check one)*

☐ Yes, nonstructural hazards identified that should be evaluated
☐ No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
☐ No, no nonstructural hazards identified ☐ DNK

Where information cannot be verified, screener shall note the following: EST = Estimated or unreliable data OR DNK = Do Not Know

Legend: MRF = Moment-resisting frame; BR = Braced frame; RC = Reinforced concrete; SW = Shear wall; URM INF = Unreinforced masonry infill; TU = Tilt up; MH = Manufactured Housing; LM = Light metal; FD = Flexible diaphragm; RD = Rigid diaphragm

Rapid Visual Screening of Buildings for Potential Seismic Hazards — **Level 2 (Optional)**

FEMA P-154 Data Collection Form — **MODERATELY HIGH Seismicity**

Optional Level 2 data collection to be performed by a civil or structural engineering professional, architect, or graduate student with background in seismic evaluation or design of buildings.

Bldg Name: Chiloquin Elementary School	**Final Level 1 Score:**	S_{L1} = 0.2	*(do not consider S_{MIN})*
Screener: JRE	**Level 1 Irregularity Modifiers:**	*Vertical Irregularity,* V_{L1} = -0.5	*Plan Irregularity,* P_{L1} = -0.5
Date/Time: October 2022	**ADJUSTED BASELINE SCORE:**	$S' = (S_{L1} - V_{L1} - P_{L1})$ = 1.2	

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic	Statement *(If statement is true, circle the "Yes" modifier; otherwise cross out the modifier.)*		Yes	Subtotals
Vertical Irregularity, V_{L2}	Sloping Site	W1 building: There is at least a full story grade change from one side of the building to the other.	-1.3	
		Non-W1 building: There is at least a full story grade change from one side of the building to the other.	-0.3	
	Weak and/or Soft Story *(circle one maximum)*	W1 building cripple wall: An unbraced cripple wall is visible in the crawl space.	-0.6	
		W1 house over garage: Underneath an occupied story, there is a garage opening without a steel moment frame, and there is less than 8' of wall on the same line (for multiple occupied floors above, use 16' of wall minimum).	-1.3	
		W1A building open front: There are openings at the ground story (such as for parking) over at least 50% of the length of the building.	-1.3	
		Non-W1 building: Length of lateral system at any story is less than 50% of that at story above or height of any story is more than 2.0 times the height of the story above.	-1.0	
		Non-W1 building: Length of lateral system at any story is between 50% and 75% of that at story above or height of any story is between 1.3 and 2.0 times the height of the story above.	-0.5	
	Setback	Vertical elements of the lateral system at an upper story are outboard of those at the story below causing the diaphragm to cantilever at the offset.	-1.0	
		Vertical elements of the lateral system at upper stories are inboard of those at lower stories.	-0.5	
		There is an in-plane offset of the lateral elements that is greater than the length of the elements.	-0.3	
	Short Column/ Pier	C1,C2,C3,PC1,PC2,RM1,RM2: At least 20% of columns (or piers) along a column line in the lateral system have height/depth ratios less than 50% of the nominal height/depth ratio at that level.	-0.5	
		C1,C2,C3,PC1,PC2,RM1,RM2: The column depth (or pier width) is less than one half of the depth of the spandrel, or there are infill walls or adjacent floors that shorten the column.	-0.5	
	Split Level	There is a split level at one of the floor levels or at the roof.	-0.5	
	Other Irregularity	There is another observable severe vertical irregularity that obviously affects the building's seismic performance.	-1.0	V_{L2} = -0.5
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	(-0.5)	*(Cap at -1.3)*
Plan Irregularity, P_{L2}	Torsional irregularity: Lateral system does not appear relatively well distributed in plan in either or both directions. *(Do not include the W1A open front irregularity listed above.)*		-0.8	
	Non-parallel system: There are one or more major vertical elements of the lateral system that are not orthogonal to each other.		-0.4	
	Reentrant corner: Both projections from an interior corner exceed 25% of the overall plan dimension in that direction.		(-0.4)	
	Diaphragm opening: There is an opening in the diaphragm with a width over 50% of the total diaphragm width at that level.		-0.3	
	C1, C2 building out-of-plane offset: The exterior beams do not align with the columns in plan.		-0.4	P_{L2} = -0.4
	Other irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.8	*(Cap at -1.3)*
Redundancy	The building has at least two bays of lateral elements on each side of the building in each direction.		+0.3	
Pounding	Building is separated from an adjacent structure by less than 0.5% of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1.0	
		One building is 2 or more stories taller than the other.	-1.0	
		The building is at the end of the block.	-0.5	
		(Cap total pounding modifiers at -1.3)		
S2 Building	"K" bracing geometry is visible.		-1.0	
C1 Building	Flat plate serves as the beam in the moment frame.		-0.5	
PC1/RM1 Bldg	There are roof-to-wall ties that are visible or known from drawings that do not rely on cross-grain bending. *(Do not combine with post-benchmark or retrofit modifier.)*		+0.3	
PC1/RM1 Bldg	The building has closely spaced, full height interior walls (rather than an interior space with few walls such as in a warehouse).		+0.3	
URM	Gable walls are present.		-0.4	
MH	There is a supplemental seismic bracing system provided between the carriage and the ground.		+1.2	
Retrofit	Comprehensive seismic retrofit is visible or known from drawings.		+1.4	M = 0

FINAL LEVEL 2 SCORE, $S_{L2} = (S' + V_{L2} + P_{L2} + M) \geq S_{MIN}$: 0.3 ~ Moderate Collapse Potential *(Transfer to Level 1 form)*

There is observable damage or deterioration or another condition that negatively affects the building's seismic performance: ☐ Yes ■ No

If yes, describe the condition in the comment box below and indicate on the Level 1 form that detailed evaluation is required independent of the building's score.

OBSERVABLE NONSTRUCTURAL HAZARDS

Location	Statement *(Check "Yes" or "No")*	Yes	No	Comment
Exterior	There is an unbraced unreinforced masonry parapet or unbraced unreinforced masonry chimney.	x		
	There is heavy cladding or heavy veneer.	x		
	There is a heavy canopy over exit doors or pedestrian walkways that appears inadequately supported.		x	
	There is an unreinforced masonry appendage over exit doors or pedestrian walkways.	x		
	There is a sign posted on the building that indicates hazardous materials are present.		x	
	There is a taller adjacent building with an unanchored URM wall or unbraced URM parapet or chimney.	x		
	Other observed exterior nonstructural falling hazard:		x	
Interior	There are hollow clay tile or brick partitions at any stair or exit corridor.			
	Other observed interior nonstructural falling hazard:			

Estimated Nonstructural Seismic Performance *(Check appropriate box and transfer to Level 1 form conclusions)*

☐ Potential nonstructural hazards with significant threat to occupant life safety → Detailed Nonstructural Evaluation recommended

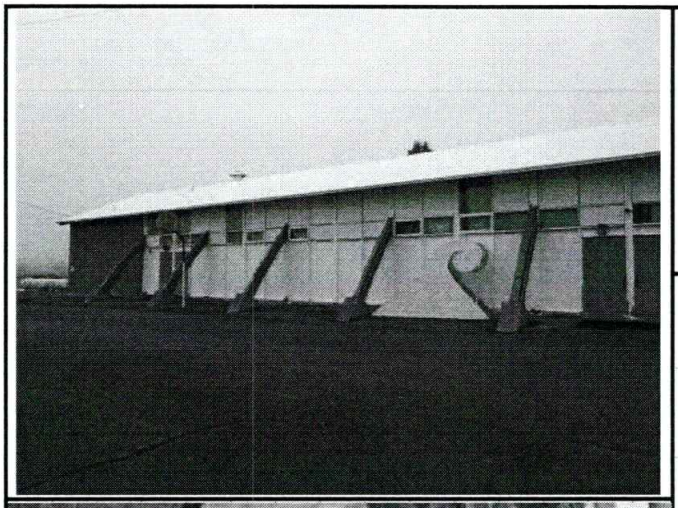
■ Nonstructural hazards identified with significant threat to occupant life safety → But no Detailed Nonstructural Evaluation required

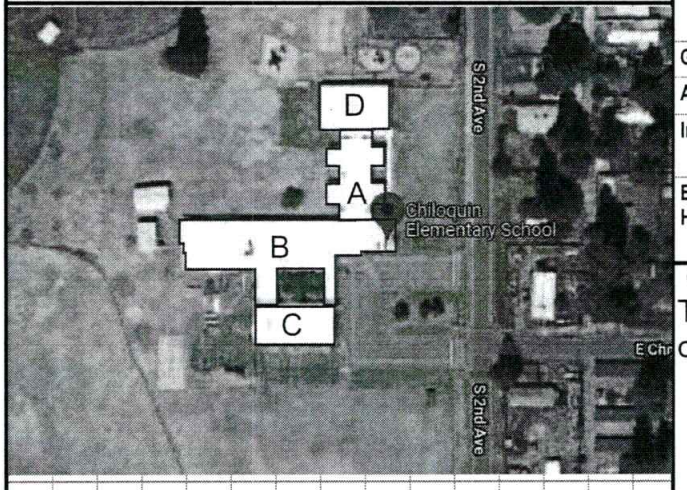
☐ Low or no nonstructural hazard threat to occupant life safety → No Detailed Nonstructural Evaluation required

Comments:

Rapid Visual Screening of Buildings for Potential Seismic Hazards — **Level 1**

FEMA P-154 Data Collection Form — **MODERATELY HIGH Seismicity**





SKETCH

Address: 548 S 2ND AVENUE
CHILOQUIN, OR **Zip:** 97624
Other Identifiers: Building Area C
Building Name: Chiloquin Elementary School
Use: Elementary School
Latitude: 42.57061 **Longitude:** -121.86469
S_S: 0.84 **S_1:** 0.29
Screener(s): JRE **Date/Time:** 10/19/2022

No. Stories: Above Grade: Yes Below Grade: No **Year Built:** 1955 ☐ EST
Total Floor Area (sq. ft.): 5800 **Code Year:**
Additions: ■ None ☐ Yes, Year(s) Built:

Occupancy: Assembly ☐ Commercial ☐ Emer. Services ☐ Historic ☐ Shelter
Industrial ☐ Office ■ School ☐ Government
Utility ☐ Warehouse Residential, # Units:

Soil Type: ☐A Hard Rock ☐B Avg Rock ☐C Dense Soil ■D Stiff Soil ☐E Soft Soil ☐F Poor Soil **DNK** *If DNK, assume Type D.*

Geologic Hazards: Liquefaction: Yes/No/DNK Landslide: Yes/No/DNK Surf. Rupt.: Yes/No/DNK

Adjacency: ■ Pounding ☐ Falling Hazards from Taller Adjacent Building

Irregularities: ☐ Vertical (type/severity)
■ Plan (type) Re-entrant corners

Exterior Falling Hazards: ☐ Unbraced Chimneys ■ Heavy Cladding or Heavy Veneer
☐ Parapets ☐ Appendages
☐ Other:

COMMENTS:

The Structure is primarily W2, however, the east end of the structure is braced with a URM shear wall.

☐ Additional sketches or comments on separate page

BASIC SCORE, MODIFIERS, AND FINAL LEVEL 1 SCORE, S_{L1}

FEMA BUILDING TYPE W2	Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score		**4.1**	**3.7**	**3.2**	**2.3**	**2.2**	**2.9**	**2.2**	**2.0**	**1.7**	**2.1**	**1.4**	**1.8**	**1.5**	**1.8**	**1.8**	**1.2**	**2.2**
Severe Vertical Irregularity, V_{L1}		-1.3	-1.3	-1.3	-1.1	-1.0	-1.2	-1.0	-0.9	-1.0	-1.1	-0.8	-1.0	-0.9	-1.0	-1.0	-0.8	NA
Moderate Vertical Irregularity, V_{L1}		-0.8	-0.8	-0.8	-0.7	-0.6	-0.8	-0.6	-0.6	-0.6	-0.6	-0.5	-0.6	-0.6	-0.6	-0.6	-0.5	NA
Plan Irregularity, P_{L1}		-1.3	-1.2	-1.1	-0.9	-0.8	-1.0	-0.8	-0.7	-0.7	-0.9	-0.6	-0.8	-0.7	-0.7	-0.7	-0.5	NA
Pre-Code		-0.8	-0.9	-0.9	-0.5	-0.5	-0.7	-0.6	-0.2	-0.4	-0.7	-0.1	-0.4	-0.3	-0.5	-0.5	-0.1	-0.3
Post-Benchmark		1.5	1.9	2.3	1.4	1.4	1.0	1.9	NA	1.9	2.1	NA	2.1	2.4	2.1	2.1	NA	1.2
Soil Type A or B		0.3	0.6	0.9	0.6	0.9	0.3	0.9	0.9	0.6	0.8	0.7	0.9	0.7	0.8	0.8	0.6	0.9
Soil Type E (1-3 stories)		0.0	-0.1	-0.3	-0.4	-0.5	0.0	-0.4	-0.5	-0.2	-0.2	-0.4	-0.5	-0.3	-0.4	-0.4	-0.3	-0.5
Soil Type E (> 3 stories)		-0.5	-0.8	-1.2	-0.7	-0.7	NA	-0.7	-0.6	-0.6	-0.8	-0.4	NA	-0.5	-0.6	-0.7	-0.3	NA
Minimum Score, S_{MIN}		*1.6*	*1.2*	*0.8*	*0.5*	*0.5*	*0.9*	*0.5*	*0.5*	*0.3*	*0.3*	*0.3*	*0.3*	*0.2*	*0.3*	*0.3*	*0.2*	*1.4*

FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$: 0.2 ~ High Collapse Potential

EXTENT OF REVIEW

Exterior: ☐ Partial ■ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ■ Entered
Drawings Reviewed: ■ Yes ☐ No
Soil Type Source: Assumed
Geologic Hazards Source: Dogami
Contact Person:

LEVEL 2 SCREENING PERFORMED?

■ Yes, Final Level 2 Score, S_{L2} 0.8 ☐ No
Nonstructural hazards? ■ Yes ☐ No

OTHER HAZARDS

Are There Hazards That Trigger A Detailed Structural Evaluation?

☐ Pounding potential (unless S_{L2} > cut-off, if known)
☐ Falling hazards from taller adjacent building
☐ Geologic hazards or Soil Type F
☐ Significant damage/deterioration to the structural system

ACTION REQUIRED

Detailed Structural Evaluation Required?

☐ Yes, unknown FEMA building type or other building
☐ Yes, score less than cut-off
☐ Yes, other hazards present
☐ No

Detailed Nonstructural Evaluation Recommended? *(check one)*

☐ Yes, nonstructural hazards identified that should be evaluated
☐ No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
☐ No, no nonstructural hazards identified ☐ DNK

Where information cannot be verified, screener shall note the following: EST = Estimated or unreliable data OR DNK = Do Not Know

Legend: MRF = Moment-resisting frame; BR = Braced frame; RC = Reinforced concrete; SW = Shear wall; URM INF = Unreinforced masonry infill; TU = Tilt up; MH = Manufactured Housing; LM = Light metal; FD = Flexible diaphragm; RD = Rigid diaphragm

Rapid Visual Screening of Buildings for Potential Seismic Hazards — **Level 2 (Optional)**

FEMA P-154 Data Collection Form — **MODERATELY HIGH Seismicity**

Optional Level 2 data collection to be performed by a civil or structural engineering professional, architect, or graduate student with background in seismic evaluation or design of buildings.

Bldg Name: Chiloquin Elementary School	**Final Level 1 Score:**	S_{L1} = 0.2	*(do not consider S_{MIN})*
Screener: JRE	**Level 1 Irregularity Modifiers:**	*Vertical Irregularity,* V_{L1} = -0.5	*Plan Irregularity,* P_{L1} = -0.5
Date/Time: October 2022	**ADJUSTED BASELINE SCORE:**	$S' = (S_{L1} - V_{L1} - P_{L1})$ = 1.2	

STRUCTURAL MODIFIERS TO ADD TO ADJUSTED BASELINE SCORE

Topic	Statement *(If statement is true, circle the "Yes" modifier; otherwise cross out the modifier.)*		Yes	Subtotals
Vertical Irregularity, V_{L2}	Sloping Site	W1 building: There is at least a full story grade change from one side of the building to the other.	-1.3	
		Non-W1 building: There is at least a full story grade change from one side of the building to the other.	-0.3	
	Weak and/or Soft Story *(circle one maximum)*	W1 building cripple wall: An unbraced cripple wall is visible in the crawl space.	-0.6	
		W1 house over garage: Underneath an occupied story, there is a garage opening without a steel moment frame, and there is less than 8' of wall on the same line (for multiple occupied floors above, use 16' of wall minimum).	-1.3	
		W1A building open front: There are openings at the ground story (such as for parking) over at least 50% of the length of the building.	-1.3	
		Non-W1 building: Length of lateral system at any story is less than 50% of that at story above or height of any story is more than 2.0 times the height of the story above.	-1.0	
		Non-W1 building: Length of lateral system at any story is between 50% and 75% of that at story above or height of any story is between 1.3 and 2.0 times the height of the story above.	-0.5	
	Setback	Vertical elements of the lateral system at an upper story are outboard of those at the story below causing the diaphragm to cantilever at the offset.	-1.0	
		Vertical elements of the lateral system at upper stories are inboard of those at lower stories.	-0.5	
		There is an in-plane offset of the lateral elements that is greater than the length of the elements.	-0.3	
	Short Column/ Pier	C1,C2,C3,PC1,PC2,RM1,RM2: At least 20% of columns (or piers) along a column line in the lateral system have height/depth ratios less than 50% of the nominal height/depth ratio at that level.	-0.5	
		C1,C2,C3,PC1,PC2,RM1,RM2: The column depth (or pier width) is less than one half of the depth of the spandrel, or there are infill walls or adjacent floors that shorten the column.	-0.5	
	Split Level	There is a split level at one of the floor levels or at the roof.	-0.5	
	Other Irregularity	There is another observable severe vertical irregularity that obviously affects the building's seismic performance.	-1.0	V_{L2} = _____
		There is another observable moderate vertical irregularity that may affect the building's seismic performance.	-0.5	*(Cap at -1.3)*
Plan Irregularity, P_{L2}	Torsional irregularity: Lateral system does not appear relatively well distributed in plan in either or both directions. *(Do not include the W1A open front irregularity listed above.)*		-0.8	
	Non-parallel system: There are one or more major vertical elements of the lateral system that are not orthogonal to each other.		-0.4	
	Reentrant corner: Both projections from an interior corner exceed 25% of the overall plan dimension in that direction.		-0.4	
	Diaphragm opening: There is an opening in the diaphragm with a width over 50% of the total diaphragm width at that level.		-0.3	
	C1, C2 building out-of-plane offset: The exterior beams do not align with the columns in plan.		-0.4	P_{L2} = -0.4
	Other irregularity: There is another observable plan irregularity that obviously affects the building's seismic performance.		-0.8	*(Cap at -1.3)*
Redundancy	The building has at least two bays of lateral elements on each side of the building in each direction.		+0.3	
Pounding	Building is separated from an adjacent structure by less than 0.5% of the height of the shorter of the building and adjacent structure and:	The floors do not align vertically within 2 feet.	-1.0	
		One building is 2 or more stories taller than the other.	-1.0	
		The building is at the end of the block.	-0.5	
		(Cap total pounding modifiers at -1.3)		
S2 Building	"K" bracing geometry is visible.		-1.0	
C1 Building	Flat plate serves as the beam in the moment frame.		-0.5	
PC1/RM1 Bldg	There are roof-to-wall ties that are visible or known from drawings that do not rely on cross-grain bending. *(Do not combine with post-benchmark or retrofit modifier.)*		+0.3	
PC1/RM1 Bldg	The building has closely spaced, full height interior walls (rather than an interior space with few walls such as in a warehouse).		+0.3	
URM	Gable walls are present.		-0.4	
MH	There is a supplemental seismic bracing system provided between the carriage and the ground.		+1.2	
Retrofit	Comprehensive seismic retrofit is visible or known from drawings.		+1.4	M = 0

FINAL LEVEL 2 SCORE, $S_{L2} = (S' + V_{L2} + P_{L2} + M) \geq S_{MIN}$: 0.8 = High Collapse Potential *(Transfer to Level 1 form)*

There is observable damage or deterioration or another condition that negatively affects the building's seismic performance: ☐ Yes ■ No

If yes, describe the condition in the comment box below and indicate on the Level 1 form that detailed evaluation is required independent of the building's score.

OBSERVABLE NONSTRUCTURAL HAZARDS

Location	Statement *(Check "Yes" or "No")*	Yes	No	Comment
Exterior	There is an unbraced unreinforced masonry parapet or unbraced unreinforced masonry chimney.	x		
	There is heavy cladding or heavy veneer.	x		
	There is a heavy canopy over exit doors or pedestrian walkways that appears inadequately supported.		x	
	There is an unreinforced masonry appendage over exit doors or pedestrian walkways.	x		
	There is a sign posted on the building that indicates hazardous materials are present.		x	
	There is a taller adjacent building with an unanchored URM wall or unbraced URM parapet or chimney.	x		
	Other observed exterior nonstructural falling hazard:		x	
Interior	There are hollow clay tile or brick partitions at any stair or exit corridor.			
	Other observed interior nonstructural falling hazard:			

Estimated Nonstructural Seismic Performance *(Check appropriate box and transfer to Level 1 form conclusions)*

- ☐ Potential nonstructural hazards with significant threat to occupant life safety → Detailed Nonstructural Evaluation recommended
- ■ Nonstructural hazards identified with significant threat to occupant life safety → But no Detailed Nonstructural Evaluation required
- ☐ Low or no nonstructural hazard threat to occupant life safety → No Detailed Nonstructural Evaluation required

Comments: