Seismic Evaluation Report For:

REEDSPORT COMMUNITY CHARTER SCHOOL

2260 Longwood Dr, Reedsport, OR 97467
Reedsport School District

Prepared By:
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EXPIRES: 06-30-22

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	Classrooms	Y	1948	URM	Y	N
B	Auditorium	N	1966			
C	Gymnasium	N	1966			
D	Shop & Art	N	1966			
E	Cafeteria & Music	N	1962			
F	Gymnasium	N	1948			
G	Locker Room	N	1948			
H	Weight Room	N	1962			
I	Academics	N	1966			
*** Entries required **ONLY** for building parts included in proposed seismic retrofit						
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	$2,497,880					
Retrofit Square Feet	29,500					
Retrofit Cost per Square Foot	$84.68					
Is the campus within a tsunami, FEMA flood zone, landslide/slope instability, liquefaction potential or other high hazard area? **If so, provide documentation.**						No

Engineering Report Checklist		
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1.0 Project Introduction

Reedsport School District is located in Reedsport, Oregon in Douglas County. The District operates two schools located within the community including the property of interest, Reedsport Community Charter School. The District has retained ZCS Engineering and Architecture (ZCS) to perform a seismic evaluation of Reedsport Community Charter 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	2260 Longwood Drive, Reedsport, OR 97467
Evaluation Standard	ASCE 41-17 (Tier 1 Analysis)
Target Building Performance Level	Life Safety – BSE-2E; Immediate Occupancy – BSE-1E
Target Non-Structural Performance Level	Hazards Reduced – BSE-2E; Position Retention – BSE-1E
ASCE 41 Building Type	URM
Site Soil Classification	D
Seismic Zone Hazard Level	Very High
Cost Estimate	$2,497,880

2.0 Building Description

Building A Classrooms was constructed in 1948 and is approximately 29,500 square feet. The classroom building is a one-story structure with straight sheathed roof diaphragm supported by rough sawn rafters and ceiling joists. The exterior envelope consists of unreinforced masonry walls, long window lines, and wood posts. The foundation consists of slab on grade with concrete strip footings under bearing walls. Photographs of the building parts included in this report are located in Appendix A.

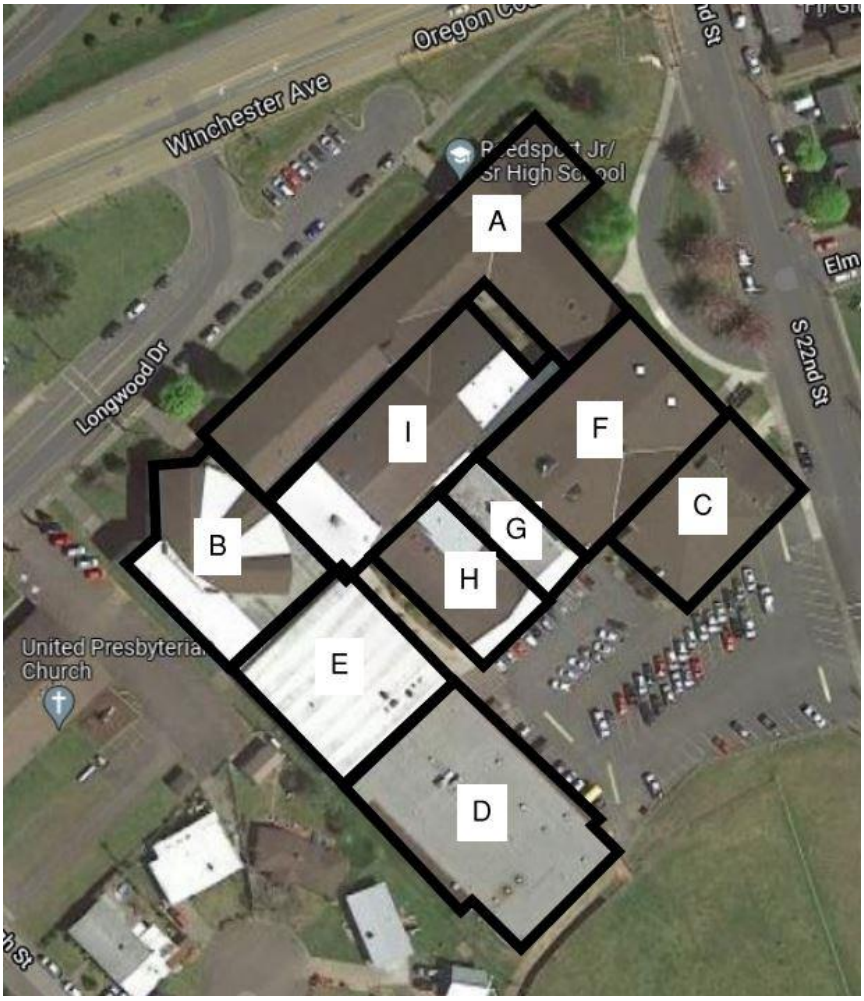


Figure 1
Key Plan

A	Construction Year: 1948 Building Name: CLASSROOMS Construction Type: URM
B	Construction Year: 1966 Building Name: AUDITORIUM Not in Scope
C	Construction Year: 1966 Building Name: GYMNASIUM Not in Scope
D	Construction Year: 1966 Building Name: SHOP & ART Not in Scope
E	Construction Year: 1962 Building Name: CAFETERIA & MUSIC Not in Scope
F	Construction Year: 1948 Building Name: GYMNASIUM Not in Scope
G	Construction Year: 1948 Building Name: LOCKER ROOM Not in Scope
H	Construction Year: 1962 Building Name: WEIGHT ROOM Not in Scope
I	Construction Year: 1966 Building Name: ACAMDEMICS Not in Scope

3.0 Definition of Building Types

After reviewing the facility and the existing drawings we have determined the lateral system is defined as URM. Per ASCE 41-17 the subject structure's lateral system is defined as:

Unreinforced Masonry Bearing Walls 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.

4.0 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, this section A is categorized as a risk category IV structure and was 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

5.0 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	
Soil Density	Stiff Soil
ASCE 7-16 Soil Classification	D
BSE-1E:	
S_{xs}	0.254
S_{x1}	0.172
BSE-2E:	
S_{xs}	1.142
S_{x1}	0.901
Soil Condition Amplification Factors (F_V, F_A)	F_v = 1.799 | F_a = 1.2
ASCE 41 Site Seismicity	Very High

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

6.0 Site Specific Hazards

Site specific hazards were assessed as part of our engineering evaluation. The hazards evaluated in our analysis included liquefaction, slope failure, 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.

7.0 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
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 a complete, well-defined load path by installing new elements and connections as needed to transfer inertial forces from all elements of the building to the foundation.	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.	Provide seismic isolation joint to avoid pounding of the taller structure into the lower structure. Provide all new gravity framing and lateral resisting elements as necessary to provide building separation. Provide double wall to create a separate gravity load bearing system and additional vertical seismic load resisting elements. Provide new beam connections and ledgers that can accommodate the required differential out-of-plane movement while transferring gravity and in-plane lateral forces as needed.	S2
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.	Provide new vertical lateral resisting elements.	S3

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.	S4
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.	S5
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	Install new wood strongback columns and walls to resist out-of-plane forces.	S6
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.	S7
CROSS TIES	There are not continuous cross ties between diaphragm chords.	Provide new continuous cross ties between diaphragm chords.	S8
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.	S9
SPANS	Not all wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing.	Install new plywood diaphragm sheathing.	S10
STIFFNESS OF WALL ANCHORS	Anchors of concrete or masonry walls to wood structural elements are not installed taut or are not 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.	Install new out-of-plane anchorage.	S11
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.	S12

FIRE SUPPRESSION PIPING	Fire suppression piping is not anchored or braced in accordance with NFPA-13.	Anchor and brace the fire suppression piping in accordance with NFPA-13.	N1
FLEXIBLE COUPLINGS	Fire suppression piping does not have flexible couplings in accordance with NFPA-13.	Install flexible couplings for fire suppression piping in accordance with NFPA-13.	N2
TIES	Masonry veneer is not connected to the backup with corrosion-resistant ties. There is not a minimum of one tie for every 2-2/3 ft.2, or the ties have spacing greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in.; for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in.	Secure existing masonry veneer with new stitch ties or remove and replace with new tied masonry veneer	N3
WEAKENED PLANES	Masonry veneer is not anchored to the backup adjacent to weakened planes, such as at the locations of flashing.	Remove existing masonry veneer and replace with new tied masonry veneer.	N4
ANCHORAGE	For veneer with concrete block or masonry backup, the backup is not positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	Install new out-of-plane anchorage.	N5
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.	N6
FALL-PRONE CONTENTS	Equipment, stored items, or other contents weighing more than 20lb whose center of mass is more than 4 ft above the adjacent floor level are not braced or otherwise restrained.	Brace equipment to structure.	N7
FALL-PRONE EQUIPMENT	Equipment weighing more than 20 lb whose center of mass is more than 4 ft above the adjacent floor level, and which is not in-line equipment, is not braced.	Brace and anchor equipment weighing more than 20 lb, whose center of mass is more than 4 ft above the adjacent floor level.	N8
IN-LINE EQUIPMENT	Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb, is not supported or laterally braced independent of the duct or piping system.	Independently support and laterally brace equipment with an operating weight more than 75 lb installed in line with a duct or piping system.	N9
TALL NARROW EQUIPMENT	Equipment more than 6ft high with a height-to-depth or height-to-width ratio greater than 3-to-1 is not anchored to the floor slab or adjacent structural walls.	Anchor equipment more than 6ft high with a height-to-depth or height-to-width ratio greater than 3-to-1 to the	N10

		floor slab or adjacent structural walls.	
FLEXIBLE COUPLINGS	Fluid and gas piping does not have flexible couplings.	Install flexible couplings for fluid and gas piping.	N11
FLUID AND GAS PIPING	Fluid and gas piping is not anchored or braced to the structure to limit spills or leaks.	Anchor and brace fluid and gas piping to the structure.	N12

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 gravity resisting system was found to be in good general condition based on the visual observations performed. No known gravity deficiencies were observed.

Based upon ZCS's previous experience and discussions with site personnel the building contains hazardous materials. These materials will need to be dealt with on a case-by-case basis as they are encountered during the project.

8.0 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.

Special Notes

- This building is an unreinforced masonry structure. Accordingly, it is acknowledged that a Tier 3 evaluation is required prior to the retrofit design. The consultant costs for the Tier 3 evaluation have been included in the cost estimate as a separate line item.

DIRECT COST	
Construction	$1,782,300
Engineering	$286,200
Construction Management	$61,600
Relocation	$25,700
Construction Contingency	$342,080
TOTALS AND SUMMARY	
Total Cost Estimate	**$2,497,880**
Match Funds	**$0**
Total Amount Requested from SRGP	**$2,497,880**
Total Area	**29,500**
Cost/Square Foot	**$84.68**

9.0 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: NORTHWEST ELEVATION

Figure 2: NORTHEAST ELEVATION

Figure 3: CLASSROOM

Figure 4: SOUTHEAST ELEVATION

Figure 5: INTERIOR ELEVATION

Figure 6: SCIENCE ROOM

Appendix B:
Tier 1 Check Sheets

ASCE 41-17 Tier 1 Checklists

FIRM:	ZCS Engineering & Architecture
PROJECT NAME:	Reedsport Community Charter School
SEISMICITY LEVEL:	Very High
PROJECT NUMBER:	G-1367-20
COMPLETED BY:	Matthew R. Smith
DATE COMPLETED:	FEB. 2022
REVIEWED BY:	Matthew R. Smith
REVIEW DATE:	FEB. 2022

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

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	Complete load path does not exist. In-plane connections do not exist. Out-of-plane connections to not exist.
☐	☒	☐	☐				
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	Clear distance between the building being evaluated and any adjacent building is greater than the allowable amount.
☐	☒	☐	☐				
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	
☐	☐	☒	☐				
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	
☒	☐	☐	☐				

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 _____
Project Number _____

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	
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	Shear stress exceeds allowable amount.
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	Wall anchors do not exist.
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	Diaphragms are not connected to shear walls for transfer of 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	Wall height-to-thickness ratio exceeds the allowable amount.
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 exist.
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	Continuous cross ties do not exist.

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	Diaphragm exceeds the allowable aspect ratio
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 exceeds the allowable span.
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	Top of masonry wall anchors do not exist.
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	Roof framing supported by unreinforced masonry walls do not have independent secondary support framing.

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

Project Name _____
Project Number _____

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	Fire suppression piping is not braced.
☐	☒	☐	☐				
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	Flexible couplings do not exist.
☐	☒	☐	☐				
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	
☐	☐	☒	☐				
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	
☒	☐	☐	☐				
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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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 ft^2 (13.4 m^2) 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
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 ft^2 (13.4 m^2) 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
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 ft^2 (13.4 m^2) are supported by closure angles or channels not less than 2 in. (51 mm) wide.	13.6.4	A.7.2.6
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 ft^2 (232.3 m^2) 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
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	Veneer ties do not exist.
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	Veneer is not anchored to the backup.

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	Veneer anchorage does not exist.
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	
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	
☐	☐	☒	☐	**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	
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	Tall narrow contents are not braced.
☐	☒	☐	☐	**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	Fall prone contents are not braced.

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	
C	**NC**	**N/A**	**U**				
☐	☐	☒	☐	**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	
C	**NC**	**N/A**	**U**				
☒	☐	☐	☐	**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							
C	**NC**	**N/A**	**U**				
☐	☒	☐	☐	**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	Fall-prone equipment is not braced.
C	**NC**	**N/A**	**U**				
☐	☒	☐	☐	**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	In-line equipment is not laterally braced.
C	**NC**	**N/A**	**U**				
☐	☒	☐	☐	**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	Tall-narrow equipment is not braced.
C	**NC**	**N/A**	**U**				
☐	☐	☒	☐	**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	
C	**NC**	**N/A**	**U**				
☒	☐	☐	☐	**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	
C	**NC**	**N/A**	**U**				
☐	☐	☒	☐	**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	
C	**NC**	**N/A**	**U**				
☐	☐	☒	☐	**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	Fluid and gas piping do not have flexible couplings.
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	Piping is not anchored to the structure.
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

REEDSPORT COMMUNITY CHARTER SCHOOL SEISMIC RETROFIT

PRELIMINARY DESIGN

REEDSPORT SCHOOL DISTRICT
2260 LONGWOOD DRIVE
REEDSPORT, OR 97467

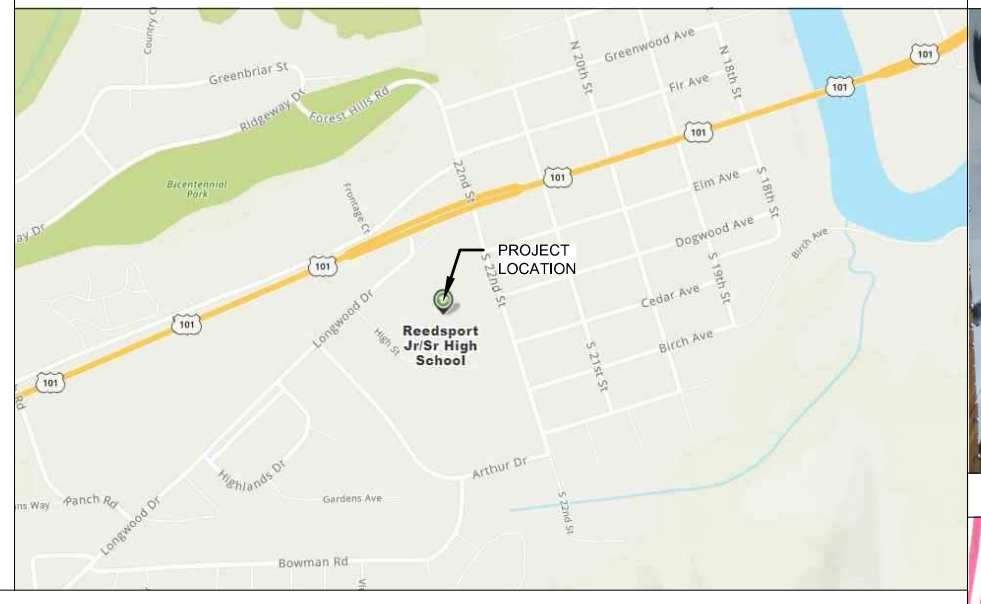
ABBREVIATIONS

ABBREVIATIONS			
(E)	EXISTING	L.P.	LOW POINT
(N)	NEW	M.C.	MEDICINE CABINET
(R)	REMOVE	M.D.F.	MEDIUM DENSITY FIBERBOARD
A.C.	ASPHALT CONCRETE	M.D.O.	MEDIUM DENSITY OVERLAY
A.C.B.	ACOUSTICAL BOARD	MEMB.	MEMBRANE
A.C.P.	ACOUSTICAL PANEL	MH.	MANHOLE
A.C.T.	ACOUSTICAL CEILING TILE	MIR.	MIRROR
A.D.	AREA DRAIN	M.O.	MASONRY OPENING
ADJ.	ADJUSTABLE	M.P.	MIDPOINT
A.F.	ACCESS FLOORING	M.S.	MACHINE SCREW
AGGR.	AGGREGATE	MTD.	MOUNTED
A.F.	ABOVE FINISHED FLOOR	MUL.	MULLION
BD.	BOARD	NOM.	NOMINAL
BITUM.	BITUMINOUS	N.T.S.	NOT TO SCALE
BKP.	BACKING PLATE	OBS.	OBSCURE
BM.	BEAM	O.C.	ON CENTER
BOT./B.O.	BOTTOM/BOTTOM OF	O.C.D.	OVERHEAD COILING DOOR
C.B.	CATCH BASIN	O.C.G	OVERHEAD COILING GRILLE
CEM.	CEMENT	O.D.	OUTSIDE DIAMETER
CER.	CERAMIC	O.F.C.I.	OWNER FURNISHED CONTRACTOR INSTALLED
C.G.	CORNER GUARD	O.F.D.	OVERFLOW DRAIN
C.I.	CAST IRON	O.F.O.I.	OWNER FURNISHED OWNER INSTALLED
C.J	CONTROL JOINT		
CLG.	CEILING	OH.	OPPOSITE HAND
CLKG.	CAULKING	PL.	PLATE
CLO.	CLOSET	P.LAM.	PLASTIC LAMINATE
CLR.	CLEAR	PLAS.	PLASTER
CMU	CONCRETE MASONRY UNIT	P.C.P.	PORTLAND CEMENT PLASTER
C.O.	CASED OPENING		
CONN	CONNECTION	PR.	PAIR
CORR.	CORRIDOR	PTN.	PARTITION
CPT.	CARPET	R.C.P.	REFLECTED CEILING PLAN
CTSK.	COUNTERSUNK	R.D.	ROOF DRAIN
C.T.	CERAMIC TILE	RL.	RELOCATE
CTR.	CENTER	R.O.	ROUGH OPENING
D.F.	DRINKING FOUNTAIN	RWD.	REDWOOD
DET.	DETAIL	R.W.L.	RAIN WALL LEADER
DISP.	DISPENSER	REV.	REVERSED
DR.	DOOR	S.C.	SOLID CORE
DWR.	DRAWER	S.C.D.	SEE CIVIL DRAWINGS
D.S.	DOWNSPOUT	SHR.	SHOWER
D.S.A.	DRY STANDPIPE	S.J.	SCORE JOINT
E.J.	EXPANSION JOINT	S.L.D.	SEE LANDSCAPING DRAWINGS
EL.	ELEVATION		
EXPO.	EXPOSED	S.M.	SHEET METAL
EXP.	EXPANSION	S.M.D	SEE MECHANICAL DRAWINGS
F.A.	FIRE ALARM		
FB.	FLAT BAR	S.O.G.	SLAB ON GRADE
F.D.	FLOOR DRAIN	S.S.D.	SEE STRUCTURAL DRAWINGS
FDN.	FOUNDATION		
FE	FIRE EXTINGUISHER	S.S.	STAINLESS STEEL
F.A.	FLAT HEAD	STR.	STRUCTURAL
F.O.C	FACE OF CONCRETE	S.T.S.	SELF TAPPING SCREW
F.O.F	FACE OF FINISH	SUSP.	SUSPENDED
F.O.S.	FACE OF STUDS	TRD.	TREAD
F.S.	FULL SIZE	T.B.	TOWEL BAR
FTG.	FOOTING	T.C.	TOP OF CURB
FUT.	FUTURE	T&G.	TONGUE AND GROOVE
G.A.	GAUGE	THK.	THICK
G.L.	GRID LINE	T.P.	TOP OF PAVEMENT
GLB.	GLULAM BEAM	T.W.	TOP OF WALL
G.B.	GRAB BAR	V.I.F.	VERIFY IN FIELD
GND.	GROUND	V.T.R.	VENT THROUGH ROOF
GYP.	GYPSUM	W.C.	WATER CLOSET
G.W.B.	GYPSUM WALL BOARD	W.O.	WINDOW OPENING
H.B.	HOSE BIBB		
H.C.	HOLLOW CORE		
H.M.	HOLLOW METAL		
J.B.	JUNCTION BOX		
J.O.H.	JAMB OPENING HEIGHT		
J.O.W.	JAMB WIDTH		
JT.	JOINT		
LAM.	LAMINATE		

SHEET INDEX

G0.0	COVER SHEET
A1.1	BUILDING KEY PLAN
S1.1	REPAIR KEY NOTES
S2.1	ROOF FRAMING PLAN

VICINITY MAP



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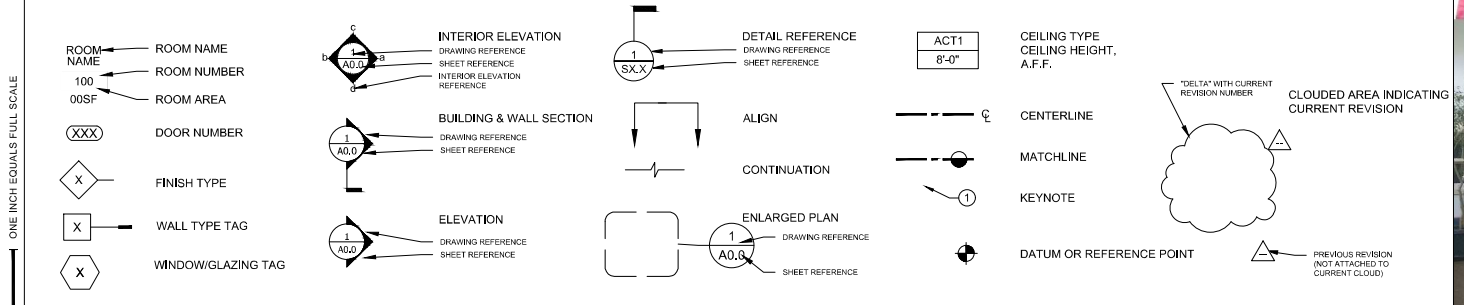


ONE INCH EQUALS FULL SCALE

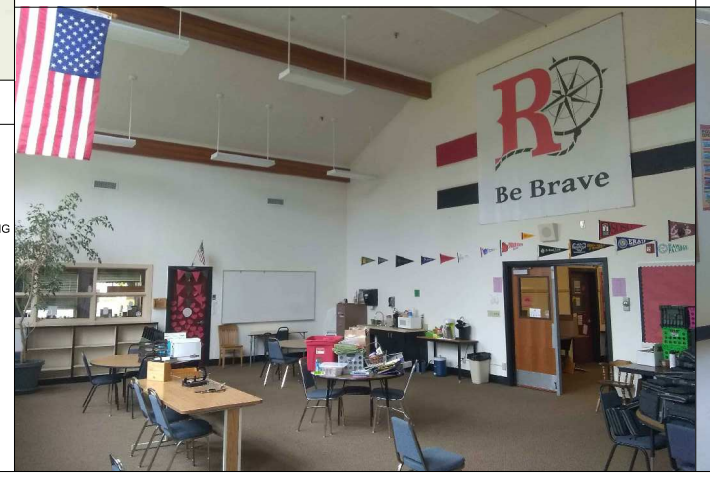
NORTHWEST ELEVATION:

NORTHEAST ELEVATION:

CLASSROOM:

SOUTHEAST ELEVATION:

INTERIOR ELEVATION:



SCIENCE ROOM:

ZCS ENGINEERING ARCHITECTURE
45 Hawthorne Street, Suite 5, Medford, Oregon 97504 | 541-500-8588

REEDSPORT SCHOOL DISTRICT
100 RANCH RD.
REEDSPORT, OR 97467

REEDSPORT COMMUNITY CHARTER SCHOOL SEISMIC RETROFIT

REEDSPORT SCHOOL DISTRICT 105

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER
OREGON
08, 2014
MATTHEW R. SMITH
EXPIRES: 06-30-22

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	M-0283-21
DRAWN:	KMH
CHECKED:	MRS
DATE:	FEB, 2022

COVER SHEET

G0.0

PRELIMINARY DESIGN

ONE INCH EQUALS FULL SCALE

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ARCHITECTURE
45 Hawthorne Street, Suite 5, Medford, Oregon 97504 | 541-500-8588

REEDSPORT SCHOOL DISTRICT
100 RANCH RD.
REEDSPORT, OR 97467

REEDSPORT COMMUNITY CHARTER SCHOOL SEISMIC RETROFIT

REEDSPORT SCHOOL DISTRICT 105

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER OREGON JUNE 08, 2014 DREW R. SMITH EXPIRES: 06-30-22
PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	M-0283-21
DRAWN:	KMH
CHECKED:	MRS
DATE:	FEB. 2022

BUILDING KEY PLAN

A1.1

PRELIMINARY DESIGN

STRUCTURAL REPAIRS:

S1. PROVIDE A COMPLETE, WELL-DEFINED LOAD PATH BY INSTALLING NEW ELEMENTS AND CONNECTIONS AS NEEDED TO TRANSFER INERTIAL FORCES FROM ALL ELEMENTS OF THE BUILDING TO THE FOUNDATION.
   A. DIAPHRAGM ATTACHMENTS - IN-PLANE SHEAR.
   B. DIAPHRAGM ATTACHMENTS - OUT-OF-PLANE.

S2. PROVIDE SEISMIC ISOLATION JOINT TO AVOID POUNDING OF THE TALLER STRUCTURE INTO THE LOWER STRUCTURE. PROVIDE ALL NEW GRAVITY FRAMING AND LATERAL RESISTING ELEMENTS AS NECESSARY TO PROVIDE BUILDING SEPARATION.
   A. PROVIDE DOUBLE WALL TO CREATE A SEPARATE GRAVITY LOAD BEARING SYSTEM AND ADDITIONAL VERTICAL SEISMIC LOAD RESISTING ELEMENTS.
   B. PROVIDE NEW BEAM CONNECTIONS AND LEDGERS THAT CAN ACCOMMODATE THE REQUIRED DIFFERENTIAL OUT-OF-PLANE MOVEMENT WHILE TRANSFERRING GRAVITY AND IN-PLANE LATERAL FORCES AS NEEDED.

S3. PROVIDE NEW VERTICAL LATERAL RESISTING ELEMENTS.
- NEW 2X FRAMED SHEAR WALLS.
- SHEAR WALL FOOTINGS - WOOD WALLS.

S4. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S5. INSTALL NEW HARDWARE FOR TRANSFER OF SEISMIC FORCES FROM DIAPHRAGM TO SHEAR WALLS.

S6. INSTALL NEW WOOD STRONGBACK COLUMNS AND WALLS TO RESIST OUT-OF-PLANE FORCES.

S7. PROVIDE NEW DRAG ELEMENTS.

S8. PROVIDE NEW CONTINUOUS CROSS TIES BETWEEN DIAPHRAGM CHORDS.

S9. INSTALL NEW PLYWOOD DIAPHRAGM SHEATHING.

S10. INSTALL NEW PLYWOOD DIAPHRAGM SHEATHING.

S11. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S12. INSTALL NEW SECONDARY SUPPORT FOR VERTICAL LOAD CARRYING FRAMING ELEMENTS.
- NEW WOOD BEAMS
- NEW WOOD COLUMNS
- NEW 2X FRAMED SHEAR WALLS
- SHEAR WALL FOOTINGS - WOOD WALLS

NON-STRUCTURAL REPAIRS:

N1. ANCHOR AND BRACE THE FIRE SUPPRESSION PIPING IN ACCORDANCE WITH NFPA-13.

N2. INSTALL FLEXIBLE COUPLINGS FOR FIRE SUPPRESSION PIPING IN ACCORDANCE WITH NFPA-13.

N3. SECURE EXISTING MASONRY VENEER WITH NEW STITCH TIES OR REMOVE AND REPLACE WITH NEW TIED MASONRY VENEER.

N4. REMOVE EXISTING MASONRY VENEER AND REPLACE WITH NEW TIED MASONRY VENEER.

N5. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

N6. ANCHOR CONTENTS TO THE STRUCTURE.

N7. BRACE EQUIPMENT TO STRUCTURE.

N8. BRACE AND ANCHOR EQUIPMENT WEIGHING MORE THAN 20 LB, WHOSE CENTER OF MASS IS MORE THAN 4 FT ABOVE THE ADJACENT FLOOR LEVEL.

N9. INDEPENDENTLY SUPPORT AND LATERALLY BRACE EQUIPMENT WITH AN OPERATING WEIGHT MORE THAN 75 LB INSTALLED IN LINE WITH A DUCT OR PIPING SYSTEM.

N10. ANCHOR EQUIPMENT MORE THAN 6FT HIGH WITH A HEIGHT-TO-DEPTH OR HEIGHT-TO-WIDTH RATIO GREATER THAN 3-TO-1 TO THE FLOOR SLAB OR ADJACENT STRUCTURAL WALLS.

N11. INSTALL FLEXIBLE COUPLINGS FOR FLUID AND GAS PIPING.

N12. ANCHOR AND BRACE FLUID AND GAS PIPING TO THE STRUCTURE.

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REEDSPORT SCHOOL DISTRICT
100 RANCH RD.
REEDSPORT, OR 97467

REEDSPORT COMMUNITY CHARTER SCHOOL SEISMIC RETROFIT

REEDSPORT SCHOOL DISTRICT 105

STRUCTURAL
REGISTERED PROFESSIONAL ENGINEER
OREGON
JUNE 08, 2014
MATTHEW R. SMITH
EXPIRES: 06-30-22

PRELIMINARY - NOT FOR CONSTRUCTION

△ REVISION ID:	DATE:

PROJECT NO:	M-0283-21
DRAWN:	KMH
CHECKED:	MRS
DATE:	FEB, 2022

REPAIR KEY NOTES

S1.1

PRELIMINARY DESIGN

ONE INCH EQUALS FULL SCALE

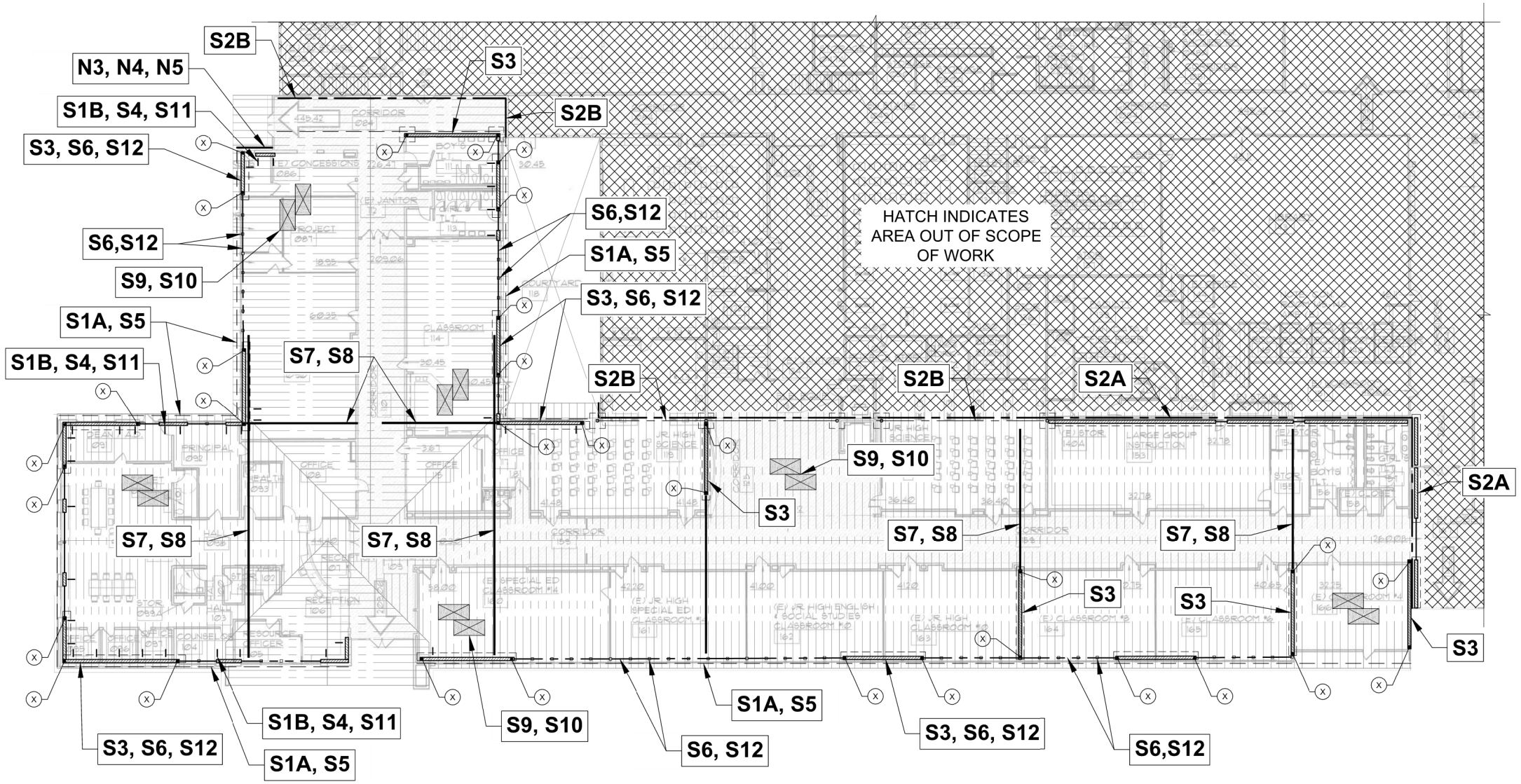
ZCS
ENGINEERING
ARCHITECTURE

45 Hawthorne Street, Suite 5, Medford,
Oregon 97504 | 541-500-8588

REEDSPORT SCHOOL
DISTRICT
100 RANCH RD.
REEDSPORT, OR 97467

REEDSPORT COMMUNITY CHARTER SCHOOL SEISMIC RETROFIT

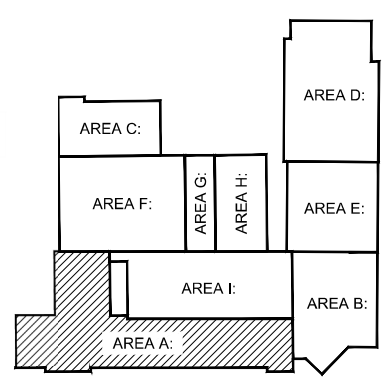
REEDSPORT
SCHOOL DISTRICT 105



1 / S2.1 **ROOF FRAMING PLAN**

1/16"= 1'-0"

ONE INCH EQUALS FULL SCALE



0 / S2.1 **CAMPUS KEY**

N.T.S.

STRUCTURAL
REGISTERED PROFESSIONAL ENGINEER
OREGON
OCTOBER 08, 2014
MATTHEW R. SMITH
EXPIRES: 06-30-22

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	M-0283-21
DRAWN:	KMH
CHECKED:	MRS
DATE:	FEB, 2022

ROOF FRAMING PLAN

S2.1

PRELIMINARY DESIGN

Appendix D:
Geotechnical Information

OSHPD

Latitude, Longitude: 43.6938, -124.1236

Date	7/24/2020, 4:07:38 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)	1.428
S_1	spectral response (1.0 s)	0.749
S_{XS}	site-modified spectral response (0.2 s)	1.714
S_{X1}	site-modified spectral response (1.0 s)	1.274
F_a	site amplification factor (0.2 s)	1.2
F_v	site amplification factor (1.0 s)	1.7
ssuh	max direction uniform hazard (0.2 s)	1.668
crs	coefficient of risk (0.2 s)	0.856
ssrt	risk-targeted hazard (0.2 s)	1.428
ssd	deterministic hazard (0.2 s)	2.005
s1uh	max direction uniform hazard (1.0 s)	0.878
cr1	coefficient of risk (1.0 s)	0.854
s1rt	risk-targeted hazard (1.0 s)	0.749
s1d	deterministic hazard (1.0 s)	1.027

Type	Description	Value
Hazard Level		BSE-1N
S_{XS}	site-modified spectral response (0.2 s)	1.142
S_{X1}	site-modified spectral response (1.0 s)	0.849

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	0.952
S_1	spectral response (1.0 s)	0.501
S_{XS}	site-modified spectral response (0.2 s)	1.142
S_{X1}	site-modified spectral response (1.0 s)	0.901
f_a	site amplification factor (0.2 s)	1.2
f_v	site amplification factor (1.0 s)	1.799

Type	Description	Value
Hazard Level		BSE-1E
S_S	spectral response (0.2 s)	0.159
S_1	spectral response (1.0 s)	0.072
S_{XS}	site-modified spectral response (0.2 s)	0.254
S_{X1}	site-modified spectral response (1.0 s)	0.172
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

Liquefaction & Faults

July 27, 2020

Active Faults

High

Moderate

Low

1:4,800

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,

Landslide

July 27, 2020

Landslide Hazard

Green: Band_2

Blue: Band_3

Red: Band_1

1:4,800

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Source: Esri, Maxar, GeoEye, Earthstar Geographics, CNES/Airbus DS,

Appendix E: Construction Cost Estimate Worksheets

ENGINEER'S OPINION OF PROBABLE COST - REEDSPORT COMMUNITY CHARTER SCHOOL SEISMIC REHABILITATION

SUMMARY

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 7.0)	Quantity	Units	Unit Price	Total Price for Construction Item
GENERAL CONDITIONS					
General Conditions		10%	%		$ 132,795.00
Preconstruction Services		2%	%		$ 26,559.00
Escalation		7%	%		$ 104,111.28
Bonding & Insurance		3%	%		$ 44,619.12
Contractor Profit & Overhead		5%	%		$ 74,365.20
				General Conditions Subtotal	$ 382,449.60
Non-Structural Elements					
Misc MEP	N1-N2, N9, N11-N12	1	Lump Sum	$ 85,600.00	$ 85,600.00
Misc Non-Structural	N6-N8, N10	1	Lump Sum	$ 34,300.00	$ 34,300.00
				Non-Structural Subtotal	$ 119,900.00
Construction Cost Per Building Part					
				Building Part 'A' Subtotal	$ 1,208,050.00
				Sub-Total Construction Cost	$ 1,710,400.00
				Contingency 20%	$ 342,080.00
				Total Construction Cost	$ 2,052,480.00
Cost Estimate Summary					
Engineering					$ 286,200.00
Architectural Consulting				$ 30,800.00	
Structural / Rehabilitation Engineering				$ 225,800.00	
URM Tier 3 Evaluation				$ 4,000.00	
Geotechnical Consulting				$ 10,300.00	
Materials Testing for Design				$ 10,300.00	
Seismic Feasibility Study Reimbursment				$ 5,000.00	
Construction Management					$ 61,600.00
Construction					$ 1,782,300.00
Sub-Total Construction Cost				$ 1,710,400.00	
Special Inspection Services for Construction				$ 10,300.00	
Permitting Fees				$ 61,600.00	
Relocation of FF&E					$ 25,700.00
Contingency					$ 342,080.00
				Total Project Funding Requirement	$ 2,497,880.00

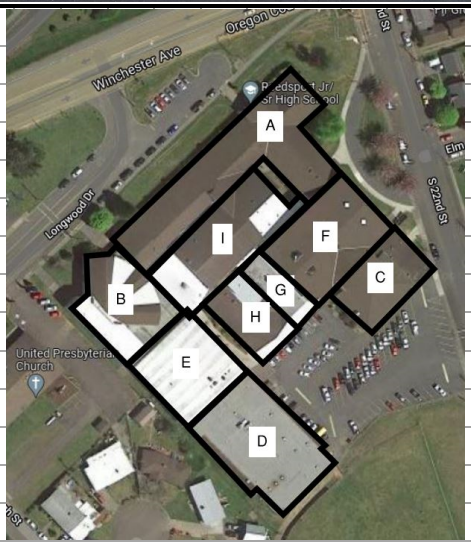
ENGINEER'S OPINION OF PROBABLE COST - REEDSPORT COMMUNITY CHARTER SCHOOL SEISMIC REHABILITATION

BUILDING PART - 'A'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 7.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
TPO / Comp / Metal Roof Demo	S9, S10	29500	Square Foot	$ 2.00	$ 59,000.00
Hard Demolition	S3, S6, S12	1000	Square Foot	$ 20.00	$ 20,000.00
Abatement	S1-S8, S11, S12	7100	Square Foot	$ 5.00	$ 35,500.00
			Demolition & Asbestos Subtotal		$ 114,500.00
Foundation / Floor Strengthening Construction					
Shear Wall Footings - Wood Walls	S3, S6, S12	500	Linear Foot	$ 300.00	$ 150,000.00
Spread Footings for Columns / Holdown	S2B, S3	7	Each	$ 4,000.00	$ 28,000.00
Bolting of Extg Walls to footings	S3	50	Linear Foot	$ 35.00	$ 1,750.00
Concrete Repair & Patching	S2B, S3, S6, S12	1000	Square Foot	$ 15.00	$ 15,000.00
Floor Finish Patch / Replacement	S2B, S3, S6, S12	1000	Square Foot	$ 7.00	$ 7,000.00
Holdown Hardware	S3	32	Each	$ 250.00	$ 8,000.00
			Foundation Level Subtotal		$ 209,750.00
Wall Strengthening Construction					
Heavy Steel Columns	S2B	5	EA	$ 10,000.00	$ 50,000.00
New 2x Framed Shear Walls	S3, S6, S12	3500	Square Foot	$ 10.00	$ 35,000.00
Sheathing of Existing Walls	S3	600	Square Foot	$ 5.00	$ 3,000.00
Painting	S1-S12	29500	Square Foot	$ 3.00	$ 88,500.00
Brick Veneer Ties	N3-N5	110	Square Foot	$ 30.00	$ 3,300.00
Interior Wall Finish Repair	S3, S6, S12	4100	Square Foot	$ 2.00	$ 8,200.00
New Wood Columns	S6, S12	44	EA	$ 350.00	$ 15,400.00
			Wall Strengthening Subtotal		$ 203,400.00
Roof Strengthening Construction					
New Composite Roof Shingles	S9, S10	29500	Square Foot	$ 10.00	$ 295,000.00
New Roof Sheathing	S9, S10	29500	Square Foot	$ 4.00	$ 118,000.00
Seismic Isolation from Adjacent Building	S2A, S2B	330	Linear Foot	$ 400.00	$ 132,000.00
New Drag Beam Attachments	S7, S8	7	EA	$ 2,500.00	$ 17,500.00
New Steel Beams	S2B	110	Linear Foot	$ 500.00	$ 55,000.00
New Batt Insulation in Attic	S1, S2, S6-S8, S12	3000	Square Foot	$ 5.00	$ 15,000.00
Diaphragm Attachments - Out-of-Plane	S1B, S4, S11	180	Linear Foot	$ 50.00	$ 9,000.00
Diaphragm Attachments - In-Plane Shear	S1A, S5	1000	Linear Foot	$ 20.00	$ 20,000.00
New Wood Beams	S12	330	Linear Foot	$ 30.00	$ 9,900.00
Ceiling Repair	S1, S2, S6-S8, S12	3000	Square Foot	$ 3.00	$ 9,000.00
			Roof Strengthening Subtotal		$ 680,400.00
			Building Part 'A' - Total Construction Cost		$ 1,208,050.00

Appendix F:
Rapid Visual Screening

Rapid Visual Screening of Buildings for Potential Seismic Hazards **Reedsport_CharterA Level 1**
FEMA P-154 Data Collection Form **VERY HIGH Seismicity**



SKETCH

Address: 2260 Longwood Drive
Reedsport, OR **Zip:** 97467
Other Identifiers:
Building Name: Classrooms
Use: Educational
Latitude: **Longitude:**
S_S: 0.952 **S_1:** 0.501
Screener(s): Matthew R. Smith **Date/Time:** FEB. 2022

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1948 ☐ EST
Total Floor Area (sq. ft.): 29,500 **Code Year:** Unkown
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) Roof-step / Moderate
☒ Plan (type) Re-entrant Corner

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 (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	**2.1**	**1.9**	**1.8**	**1.5**	**1.4**	**1.6**	**1.4**	**1.2**	**1.0**	**1.2**	**0.9**	**1.1**	**1.0**	**1.1**	**1.1**	**0.9**	**1.1**
Severe Vertical Irregularity, V_{L1}	-0.9	-0.9	-0.9	-0.8	-0.7	-0.8	-0.7	-0.7	-0.7	-0.8	-0.6	-0.7	-0.7	-0.7	-0.7	-0.6	NA
Moderate Vertical Irregularity, V_{L1}	-0.6	-0.5	-0.5	-0.4	-0.4	-0.5	-0.4	-0.3	-0.4	-0.4	-0.3	-0.4	-0.4	-0.4	-0.4	-0.3	NA
Plan Irregularity, P_{L1}	-0.7	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.4	-0.4	-0.5	-0.3	-0.5	-0.4	-0.4	-0.4	-0.3	NA
Pre-Code	-0.3	-0.3	-0.3	-0.3	-0.2	-0.3	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	0.0
Post-Benchmark	1.9	1.9	2.0	1.0	1.1	1.1	1.5	NA	1.4	1.7	NA	1.5	1.7	1.6	1.6	NA	0.5
Soil Type A or B	0.5	0.5	0.4	0.3	0.3	0.4	0.3	0.2	0.2	0.3	0.1	0.3	0.2	0.3	0.3	0.1	0.1
Soil Type E (1-3 stories)	0.0	-0.2	-0.4	-0.3	-0.2	-0.2	-0.2	-0.1	-0.1	-0.2	0.0	-0.2	-0.1	-0.2	-0.2	0.0	-0.1
Soil Type E (> 3 stories)	-0.4	-0.4	-0.4	-0.3	-0.3	NA	-0.3	-0.1	-0.1	-0.3	-0.1	NA	-0.1	-0.2	-0.2	0.0	NA
Minimum Score, S_{MIN}	*0.7*	*0.7*	*0.7*	*0.5*	*0.5*	*0.5*	*0.5*	*0.5*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.3*	*0.3*	*0.2*	*1.0*

FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$: 0.3

EXTENT OF REVIEW

Exterior: ☐ Partial ☒ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☒ Entered
Drawings Reviewed: ☒ Yes ☐ No
Soil Type Source: Assumed
Geologic Hazards Source: N.A.
Contact Person: Matthew R. Smith

LEVEL 2 SCREENING PERFORMED?

☐ Yes, Final Level 2 Score, S_{L2} _____ ☒ 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