This addendum forms a part of the Contract Documents and modifies the original Documents dated **August 23, 2023** as noted below. Acknowledge receipt of this addendum in the space provided on the Official Bid Form. Failure to do so may subject the Bidder to disqualification.

Enclosed Seismic Rehabilitation Reports
Enclosed Seismic Rehabilitation Reports **– Seismic Rehabilitation Reports**

QUESTIONS AND CLARIFICATIONS

Question: Will interviews be held in person?

Answer: **Yes.**

Question: Are there people required for the Interview?

Answer: **Per Section IV. F. "Those members invited to the interview are Project or Corporate Executive dedicated to the Project, the Project Manager, the Project Superintendent, and Project Estimator as well as the key individual responsible for preconstruction services shall be in attendance." If one of these members is scheduled off, then a request for another person or absence will be considered by HMK at their sole discretion**

PRE-BID MEETING SIGN IN SHEET

Please review the attached sign in sheet; if corrections are required please send them to Stephen McKay at stephen.mckay@hmkco.org.

END OF ADDENDUM 1

REDMOND SCHOOL DISTRICT
SEISMIC PROJECT
PRE-PROPOSAL CONFERENCE
SIGN-IN SHEET AUGUST 31, 2023

Company: CB Const, Inc. Contact: Derek Howard

Address: 1202 Adams Ave, La Grande, OR 97850

Email: dhoward@cbconst.com

Phone: 541 786-5315 Cell: _____

Company: Griffin Construction Contact: Clayton Wood

Address: 1411 NW Murphy Ct, Prinville, OR 97754

Email: claytonw@griffinconstructionllc.com

Phone: 541 447-7237 Cell: _____

Company: Lorentz Bruun Construction Contact: Brandon Gammic

Address: 364 SE 20th Ave Suite 300, Portland, OR 97202

Email: brandon@lbruun.com

Phone: 503 232-7106 Cell: _____

Company: Sunwest Builders Contact: Crystal H

Address: 2642 SW 4th St, Redmond, OR 97756

Email: crystalh@sunwestbuilders.com

Phone: 541 548-7341 Cell: _____

The District will only accept Proposals from those firms who signed in at the Mandatory Pre-Proposal Conference. The District will not accept responses where an attendee subrogates their attendance to a firm not in attendance.

Seismic Evaluation Report For:

JOHN TUCK ELEMENTARY SCHOOL

209 NW 10th St, Redmond, OR 97756
Redmond School District

Prepared By:
ZCS Engineering & Architecture
Matthew R. Smith, PE, SE, Principal
524 Main Street, Suite 2, Oregon City, OR 97045
T: 503.659.2205 | E: MattS@zcsea.com

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	Classroom	N	1947			
B	Gym/Classroom	Y	1947	URM		
C	Classroom	N	1953			
D	Classroom	N	1964			
E	Library	N	1990s			
*** 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	$2,499,440					
Retrofit Square Feet	13,500					
Retrofit Cost per Square Foot	**$185.14 / SF**					
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		
☒	Engineering Report Cover Page	
☒	Project Summary Page	Page 1
☒	Building Parts Identification	Page 4
☒	Statement of the Performance Objective	Page 6
	Summary of Deficiencies	
☒	Structural Seismic Deficiencies	Page 10
☒	Nonstructural Seismic Deficiencies	Page 11
	Summary of Mitigation/Retrofit	
☒	Structural Mitigation/Retrofit	Page 10
☒	Nonstructural Mitigation/Retrofit	Page 11
	Summary Construction Cost Estimate	
☒	Direct Cost	Page 14
☒	Indirect Soft Cost	Page 14
☒	Certification Statement by Engineer	Page 15
	ASCE 41-17 Tier 1 Checklist	
☒	Basic Configuration Checklist	Appendix B
☒	Building System Structural Checklist	Appendix B
☒	Nonstructural Checklist	Appendix B
☒	**Retrofit Drawings & Sketches**	Appendix C
☒	**DOGAMI or Geotechnical Report**	Appendix D
☒	**Itemized Construction Cost Estimate**	Appendix E
☒	**Rapid Visual Screening**	Appendix F

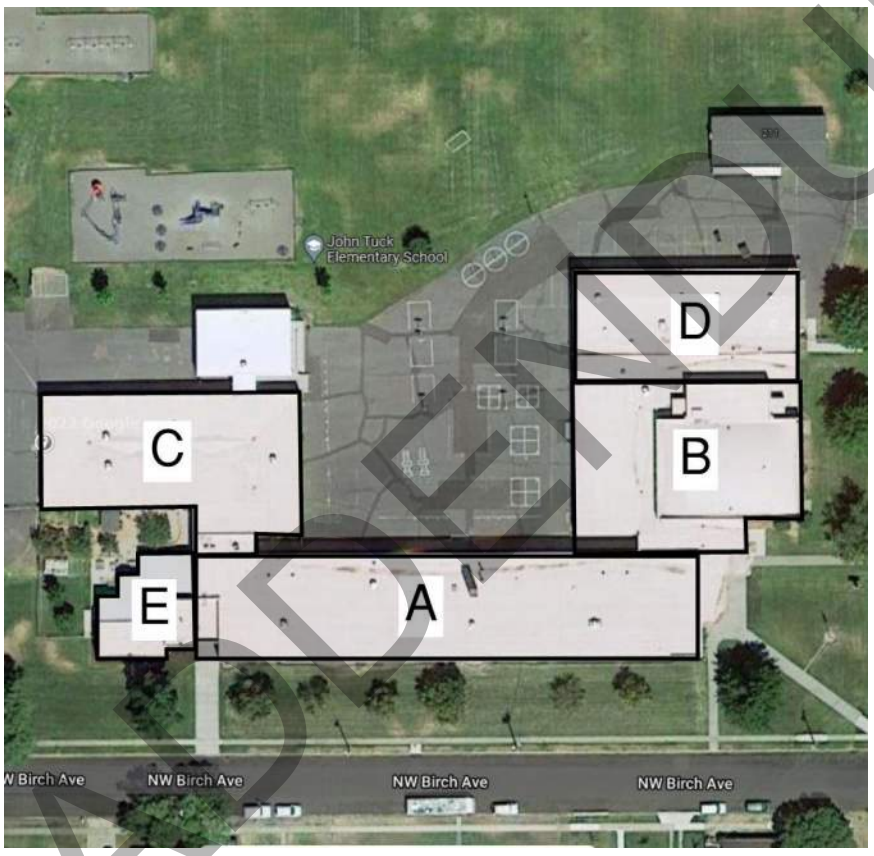
1.0 Project Introduction

Redmond School District is located in Redmond, Oregon in Deschutes County. The District operates ten schools located within the community including the property of interest, John Tuck Elementary School. The District has retained ZCS Engineering and Architecture (ZCS) to perform a seismic evaluation of John Tuck 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	209 NW Palmer Street, Redmond, OR 97756
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	Hazard Reduced – BSE-2E; Position Retention – BSE-1E
ASCE 41 Building Type	URM
Site Soil Classification	D
Seismic Zone Hazard Level	High
Cost Estimate	$2,451,125

2.0 Building Description

The John Tuck Elementary School gymnasium was constructed in 1947 including and consists of CMU bearing walls with exterior brick veneer. The roof structure consists of straight sheathing over wood joists supported by heavy timber bowstring trusses. The walls consist of under-reinforced CMU walls bearing over continuous reinforced concrete footings and slab-on-grade foundation. The gymnasium has an approximate floor area of 13,500-square-feet. Photographs of the building parts included in this report are located in Appendix A.



A
Construction Year: 1947
Building Name: Classroom
Construction Type: URM
In Scope?: No

B
Construction Year: 1947
Building Name: Gym
Construction Type: URM
In Scope?: Yes

C
Construction Year: 1953
Building Name: Classroom
Construction Type: URM
In Scope?: No

D
Construction Year: 1964
Building Name: Classroom
Construction Type: URM
In Scope?: No

E
Construction Year: 1990s
Building Name: Library
Construction Type: RM1
In Scope?: No

Figure 1
John Tuck Elementary Key Plan

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:

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.

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, section B this building is categorized as a risk category IV structure(s) 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	Tier 1 and 2[a] 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
ASCE 7-16 Soil Classification	D
BSE-1E:	
S_{xs}	0.159
S_{x1}	0.110
BSE-2E:	
S_{xs}	0.40
S_{x1}	0.303
Soil Condition Amplification Factors (F_V, F_A)	F_v = 2.4 - F_a = 1.6
ASCE 41 Site Seismicity	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.	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
WOOD LEDGERS	The connection between the wall panels and the diaphragm induces cross-grain bending or tension in the wood ledgers.	Install new out-of-plane anchorage.	S5

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.	S6
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 framed shear walls with stitch ties to support existing masonry walls for out of plane forces	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
HAZARDOUS MATERIAL DISTRIBUTION	Piping or ductwork conveying hazardous materials is not braced or otherwise protected from damage that would allow hazardous material release.	Brace piping or ductwork conveying hazardous materials.	N1
FLEXIBLE COUPLINGS	Hazardous material ductwork and piping, including natural gas piping, do not have flexible couplings.	Install flexible couplings for ductwork and piping containing hazardous material, including natural gas piping.	N2
UNREINFORCED MASONRY	Unreinforced masonry or hollow-clay tile partitions are not braced at a spacing of at most 10 ft in Low or Moderate Seismicity, or at most 6 ft in High Seismicity.	Brace unreinforced masonry or hollow-clay tile partitions.	N3

HEAVY PARTITIONS SUPPORTED BY CEILINGS	The tops of masonry or hollow-clay tile partitions are laterally supported by an integrated ceiling system.	Independently brace the tops of masonry or hollow-clay tile partitions.	N4
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 or other cladding system.	N5
WEAKENED PLANES	Masonry veneer is not anchored to the backup adjacent to weakened planes, such as at the locations of flashing.	Install wood framed walls with stitch ties to support existing masonry walls for out-of-plane forces.	N6
UNREINFORCED MASONRY BACKUP	Masonry backup is unreinforced.	Brace existing backup wall with new adjacent wall framing.	N7
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 wood framed walls with stitch ties to support existing masonry walls for out-of-plane forces.	N8
URM PARAPETS OR CORNICES	Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios 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.	Provide bracing of parapets or cornices.	N9
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 not reinforced or anchored to the structural system at a spacing equal to or less than 6ft.	Provide anchorage of appendages to the structure.	N10
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.	N11
FLEXIBLE COUPLINGS	Fluid and gas piping does not have flexible couplings.	Install flexible couplings for fluid and gas piping.	N12
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.	N13

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.

Bowstring trusses are markedly under-designed, exhibiting on-going symptoms of structural distress and can no longer be relied upon to support code prescribed gravity loading. The trusses will be retrofit and strengthened to support code required gravity loading. This is deficiency/repair/plan note S13.

Based upon ZCS's previous experience and discussions with site personnel 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.

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

- It should be noted that the cost per square-foot of the this retrofit may seem abnormally high. The higher-than-average costs are a result of the following:
    - The building is an unreinforced masonry wall structure. The walls exceed prescribed limitations and an entirely new lateral system to support seismic loading needs to be installed.

DIRECT COST	
Construction	$1,940,400
Engineering	$282,500
Construction Management	$61,700
Relocation	$28,000
Construction Contingency	$186,840
TOTALS AND SUMMARY	
Total Cost Estimate	**$2,499,440**
Match Funds	**$0**
Total Amount Requested from SRGP	**$2,499,440**
Total Area	**13,500**
Cost/Square Foot	**$185.14**

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: EXTERIOR VIEW

Figure 2: ENTRANCE

Figure 3: GYM ENTRANCE

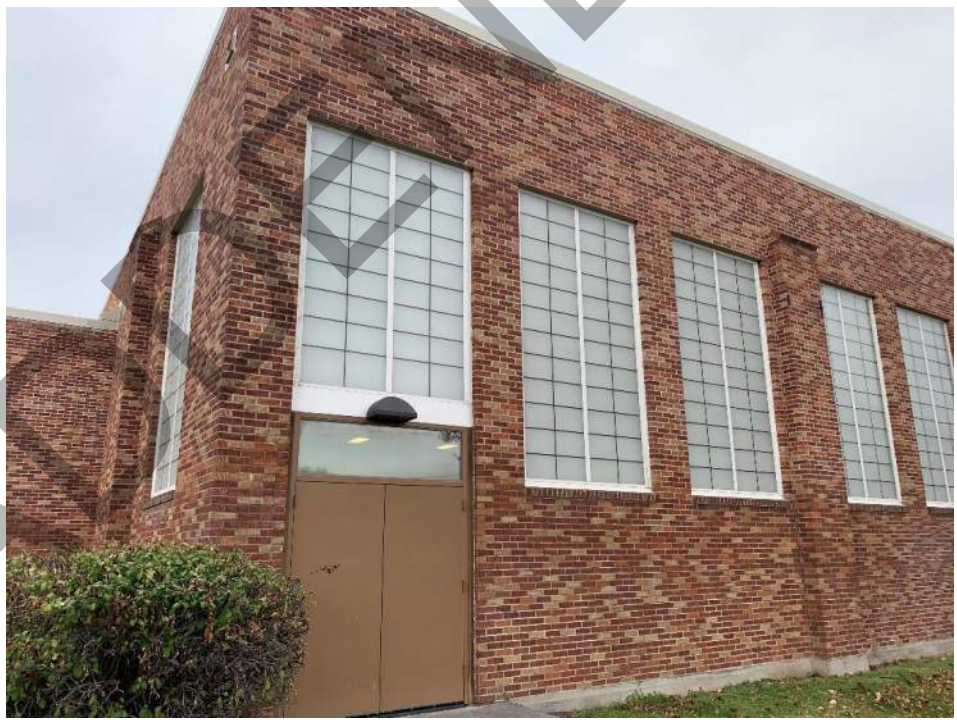


Figure 4: GYM EXTERIOR

Figure 5: CLASSROOM EXTERIOR

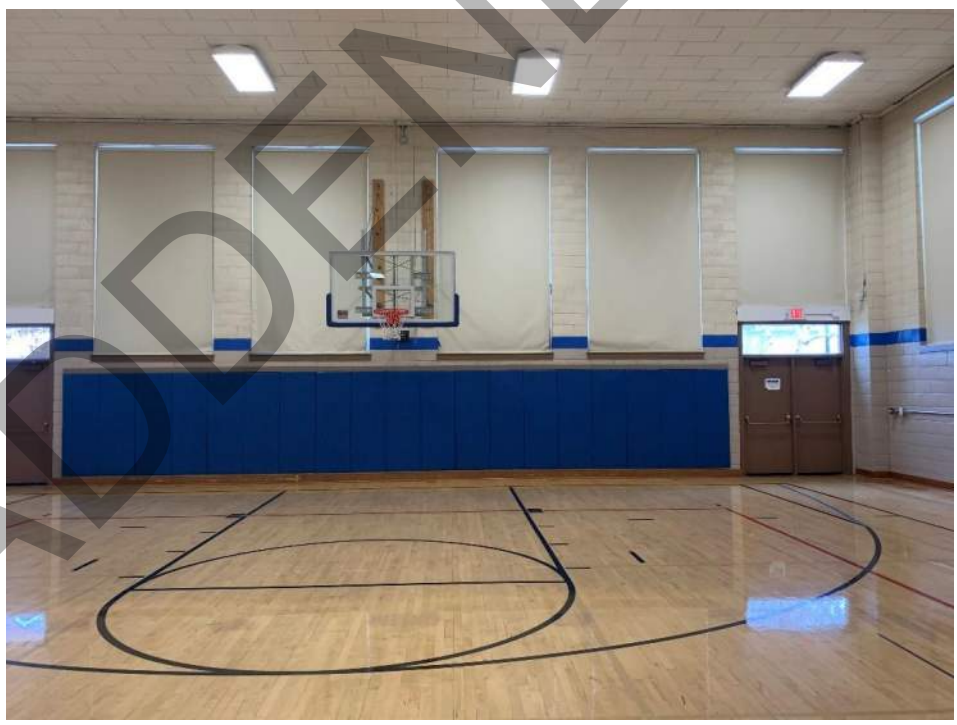


Figure 6: GYM INTERIOR

Appendix B:
Tier 1 Check Sheets

ASCE 41-17 Tier 1 Checklists

FIRM:	ZCS ENGINEERING & ARCHITECTURE
PROJECT NAME:	JOHN TUCK ES
SEISMICITY LEVEL:	HIGH
PROJECT NUMBER:	P-2706-21
COMPLETED BY:	JAG
DATE COMPLETED:	2/23/22
REVIEWED BY:	MRS
REVIEW DATE:	FEBRUARY 2022

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

Project Name _____
Project Number _____

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	DIAPHRAGM NOT ADEQUATELY CONENCTED TO SHEAR WALLS BELOW
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	ADJACENT BUILDING AT DIFFERENT ELEVATION, POUNDING MAY OCCUR
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

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
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	
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

Project Name _____
Project Number _____

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 _____
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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	UNDER REINFORCED CMU WALLS DO NOT HAVE ADEQUATE SHEAR CAPCITY
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	OUT OF PLANE HARDWARE NOT PRESENT
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	WOOD LEDGERS PRESENT WITHOUT OUT OF PLANE HARDWARE TO MITIGATE CROSS GRAIN BENDING
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 NOT ADEQUATELY CONNECTED TO SHEAR WALLS
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

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Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
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	
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	CMU WALLS ARE TALL AND NARROW
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	
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	CONTIUNOUS CROSS TIES NOT PRESENT IN ROOF FRAMING

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

Project Name _____
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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 DIAPHRAGM DOES NOT MEET 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	STRAIGHT SHEATHED DIAPHRAGMS EXCEED SPAN LIMITS
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	OUT OF PLANE HARDWARE NOT PRESENT
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	BOWSTRING TRUSSES DO NOT HAVE SECONDARY SUPPORTING ELEMENTS

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	
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	
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
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
☐	☐	☐	☐	**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
☐	☐	☐	☐	**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
☐	☐	☐	☐	**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
☐	☐	☐	☐	**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						
☐	☐	☐	☐	**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
☐	☐	☐	☐	**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
☐	☐	☐	☐	**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
☐	☐	☐	☐	**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

Project Name _____

Project Number _____

Masonry Chimneys						
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	**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
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	**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						
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	**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
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	**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						
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	**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
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	**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
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	**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
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
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
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
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
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.

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

Appendix C: Schematic Seismic Retrofit Drawings

JOHN TUCK ELEMENTARY SCHOOL SEISMIC RETROFIT

PRELIMINARY DESIGN

REDMOND SCHOOL DISTRICT
209 NW 10TH ST.
REDMOND, OR 97756

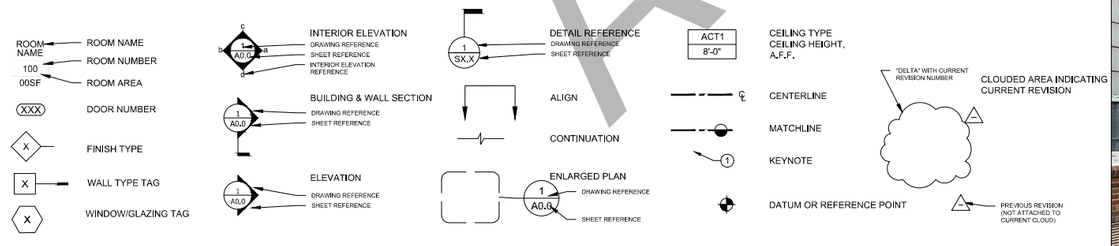
ABBREVIATIONS

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
C.M.U.	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:

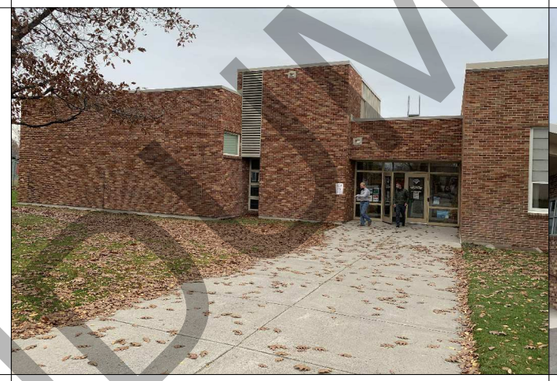
VICINITY MAP

SYMBOLS



ONE INCH EQUALS FULL SCALE

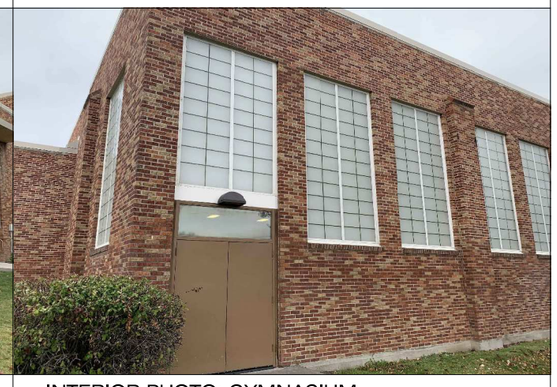
EXTERIOR PHOTO: SOUTH ENTRANCE



EXTERIOR PHOTO: EAST ELEVATION

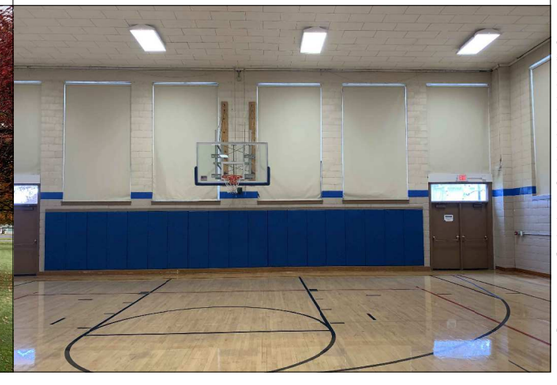
EXTERIOR PHOTO: EAST ENTRANCE

EXTERIOR PHOTO: EAST ELEVATION



EXTERIOR PHOTO: SOUTH ELEVATION

INTERIOR PHOTO: GYMNASIUM



ZCS ENGINEERING ARCHITECTURE
524 Main Street, Suite 2, Oregon City, Oregon 97045 | 503-659-2205

REDMOND SCHOOL DISTRICT
145 SE SALMON DRIVE
REDMOND, OR 97756

JOHN TUCK ELEMENTARY SCHOOL SEISMIC RETROFIT

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

REVISION ID:	DATE:

PROJECT NO:	P-2706-21
DRAWN:	MEG
CHECKED:	MRS
DATE:	FEB. 2022

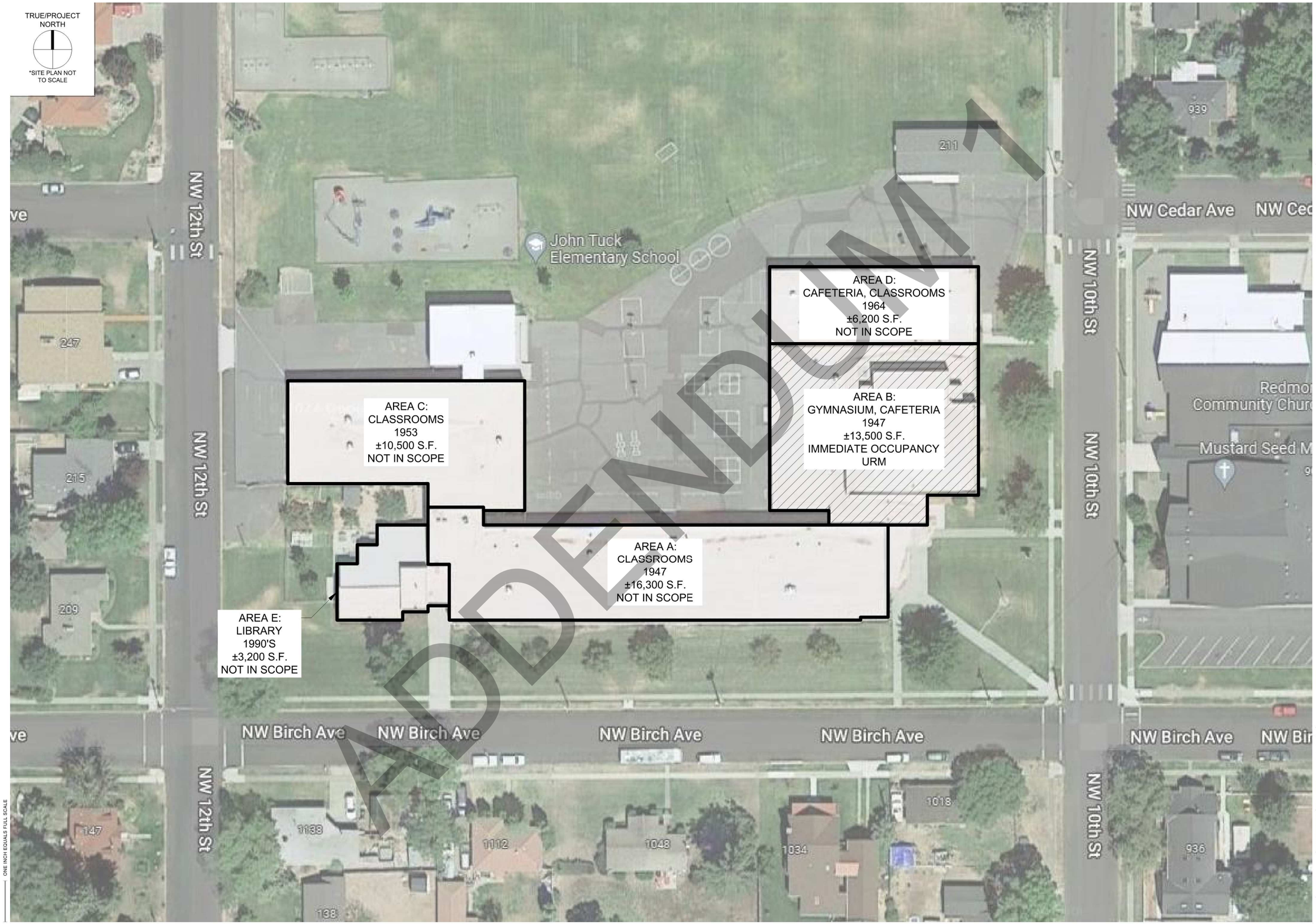
COVER SHEET

G0.0

PRELIMINARY DESIGN

TRUE/PROJECT NORTH

*SITE PLAN NOT TO SCALE



ADDENDUM 1

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE

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REDMOND SCHOOL DISTRICT
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JOHN TUCK ELEMENTARY SCHOOL SEISMIC RETROFIT

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

PRELIMINARY- NOT FOR CONSTRUCTION

REVISION ID:	DATE:

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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.

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.

- PROVIDE 2x FRAMED SHEAR WALL

S3. PROVIDE NEW VERTICAL LATERAL RESISTING ELEMENTS.

S4. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S5. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S6. INSTALL NEW HARDWARE FOR TRANSFER OF SEISMIC FORCES FROM DIAPHRAGM TO SHEAR WALLS.

S7. INSTALL NEW WOOD FRAMED SHEAR WALLS WITH STITCH TIES TO SUPPORT EXISTING MANSORY WALLS FOR OUT OF PLANE FORCES

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.

S13. STRENGTHEN EXISTING BOWSTRING TRUSSES FOR PRESCRIBED SEISMIC LOADS

NON-STRUCTURAL REPAIRS:

N1. BRACE PIPING OR DUCTWORK CONVEYING HAZARDOUS MATERIALS.

N2. INSTALL FLEXIBLE COUPLINGS FOR DUCTWORK AND PIPING CONTAINING HAZARDOUS MATERIAL, INCLUDING NATURAL GAS PIPING.

N3. BRACE UNREINFORCED MASONRY OR HOLLOW-CLAY TILE PARTITIONS.

N4. INDEPENDENTLY BRACE THE TOPS OF MASONRY OR HOLLOW-CLAY TILE PARTITIONS.

N5. SECURE EXISTING MASONRY VENEER WITH NEW STITCH TIES.

N6. INSTALL WOOD FRAMED WALLS WITH STITCH TIES TO SUPPORT EXISTING MASONRY WALLS FOR OUT-OF-PLANE FORCES.

N7. BRACE EXISTING BACKUP WALL WITH NEW ADJACENT WALL FRAMING.

N8. INSTALL WOOD FRAMED WALLS WITH STITCH TIES TO SUPPORT EXISTING MASONRY WALLS FOR OUT-OF-PLANE FORCES.

N9. PROVIDE BRACING OF PARAPETS OR CORNICES.

N10. PROVIDE ANCHORAGE OF APPENDAGES TO THE STRUCTURE.

N11. ANCHOR CONTENTS TO THE STRUCTURE.

N12. INSTALL FLEXIBLE COUPLINGS FOR FLUID AND GAS PIPING.

N13. ANCHOR AND BRACE FLUID AND GAS PIPING TO THE STRUCTURE.

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ONE INCH EQUALS FULL SCALE

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

PRELIMINARY- NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	P-2706-21
DRAWN:	MEG
CHECKED:	MRS
DATE:	FEB. 2022

REPAIR KEY NOTES

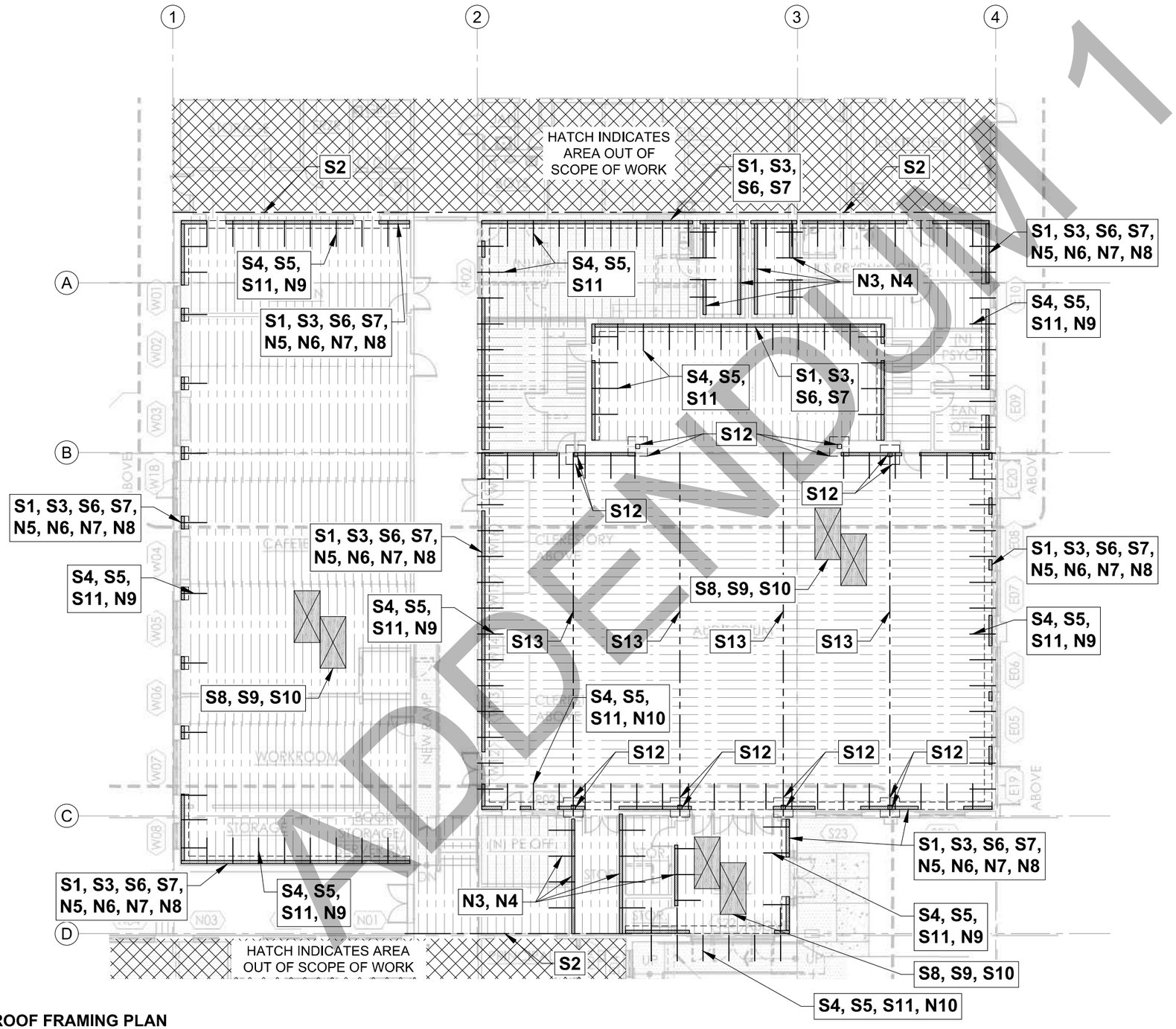
S1.1

PRELIMINARY DESIGN

ZCS
ENGINEERING
ARCHITECTURE
524 Main Street, Suite 2, Oregon City, Oregon 97045 | 503-859-2205

REDMOND SCHOOL DISTRICT
145 SE SALMON DRIVE
REDMOND, OR 97756

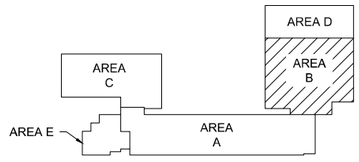
JOHN TUCK ELEMENTARY SCHOOL SEISMIC RETROFIT



1 S2.1 **AREA 'B' ROOF FRAMING PLAN**

N.T.S.

ONE INCH EQUALS FULL SCALE



0 S2.1 **CAMPUS KEY** NTS

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER
PRELIMINARY- NOT FOR CONSTRUCTION
EXPIRES: 06-30-22

REVISION ID:	DATE:

PROJECT NO:	P-2706-21
DRAWN:	MEG
CHECKED:	MRS
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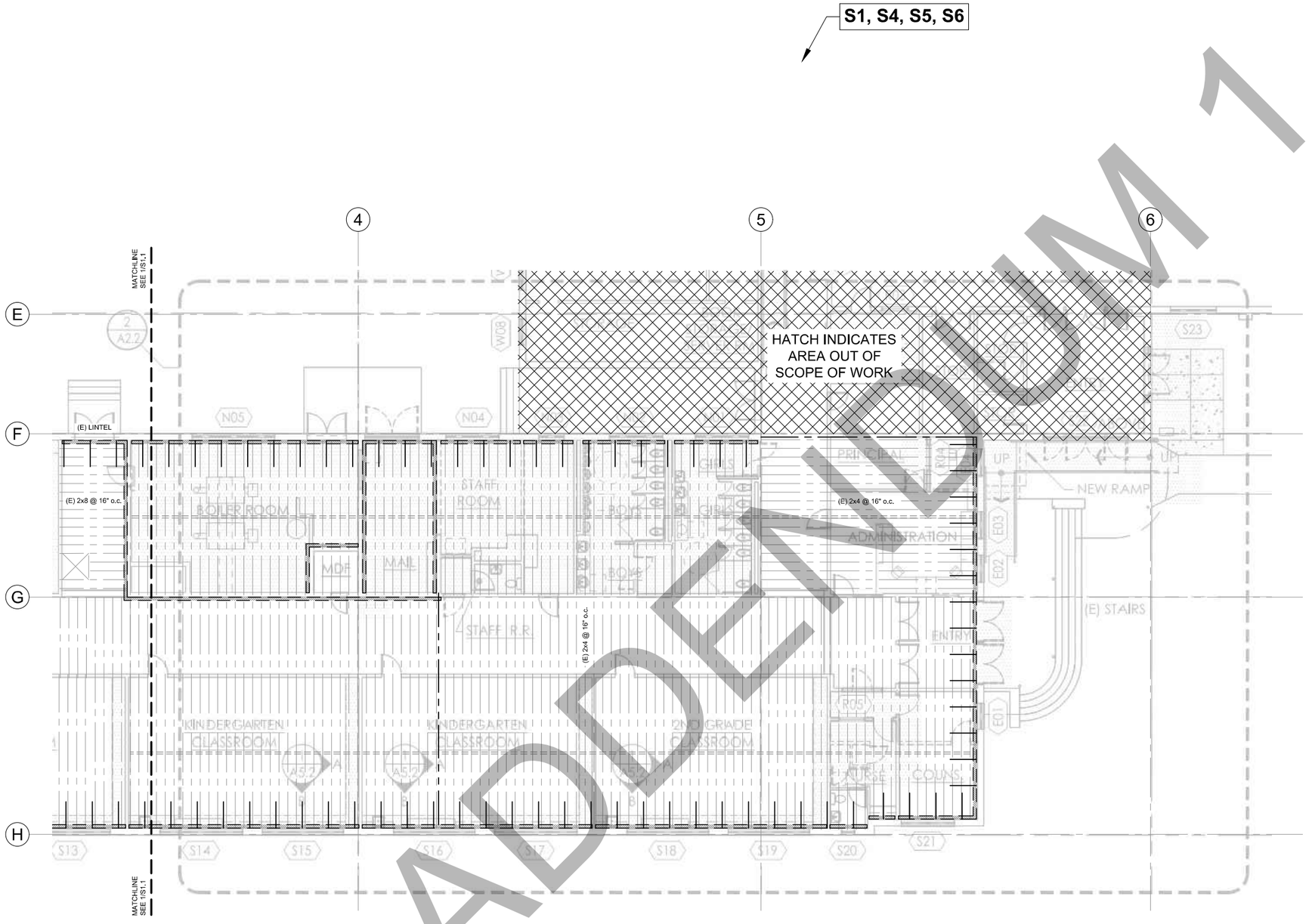
AREA 'B' ROOF FRAMING PLAN

S2.1

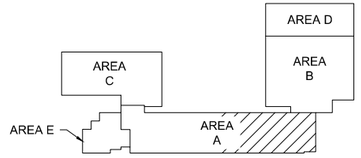
PRELIMINARY DESIGN



1 S1.2 **AREA 'A' ROOF FRAMING PLAN - EAST WING**

1/16"=1'-0"

ONE INCH EQUALS FULL SCALE



0 S1.2 **CAMPUS KEY**

NTS

ZCS
ENGINEERING
ARCHITECTURE
524 Main Street, Suite 2, Oregon City,
Oregon 97045 | 503-659-2205

REDMOND SCHOOL
DISTRICT
145 SE SALMON DRIVE
REDMOND, OR 97756

**JOHN TUCK
ELEMENTARY
SCHOOL SEISMIC
RETROFIT**

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

PRELIMINARY-
NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	P-2706-21
DRAWN:	MEG
CHECKED:	MRS
DATE:	FEB. 2022

AREA 'A' ROOF
FRAMING PLAN

S1.2

PRELIMINARY DESIGN

Appendix D: Geotechnical Information

OSHPD

Latitude, Longitude: 44.27793421408763, -121.17956523856027

Date	11/3/2021, 1:49:42 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)	0.361
S_1	spectral response (1.0 s)	0.187
S_{XS}	site-modified spectral response (0.2 s)	0.545
S_{X1}	site-modified spectral response (1.0 s)	0.416
F_a	site amplification factor (0.2 s)	1.511
F_v	site amplification factor (1.0 s)	2.227
ssuh	max direction uniform hazard (0.2 s)	0.4
crs	coefficient of risk (0.2 s)	0.903
ssrt	risk-targeted hazard (0.2 s)	0.361
ssd	deterministic hazard (0.2 s)	1.5
s1uh	max direction uniform hazard (1.0 s)	0.212
cr1	coefficient of risk (1.0 s)	0.88
s1rt	risk-targeted hazard (1.0 s)	0.187
s1d	deterministic hazard (1.0 s)	0.6

Type	Description	Value
Hazard Level		BSE-1N
S_{XS}	site-modified spectral response (0.2 s)	0.364
S_{X1}	site-modified spectral response (1.0 s)	0.277

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	0.25
S_1	spectral response (1.0 s)	0.129
S_{XS}	site-modified spectral response (0.2 s)	0.4
S_{X1}	site-modified spectral response (1.0 s)	0.303
f_a	site amplification factor (0.2 s)	1.6
f_v	site amplification factor (1.0 s)	2.342

Type	Description	Value
Hazard Level		BSE-1E
S_S	spectral response (0.2 s)	0.099
S_1	spectral response (1.0 s)	0.046
S_{XS}	site-modified spectral response (0.2 s)	0.159
S_{X1}	site-modified spectral response (1.0 s)	0.11
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

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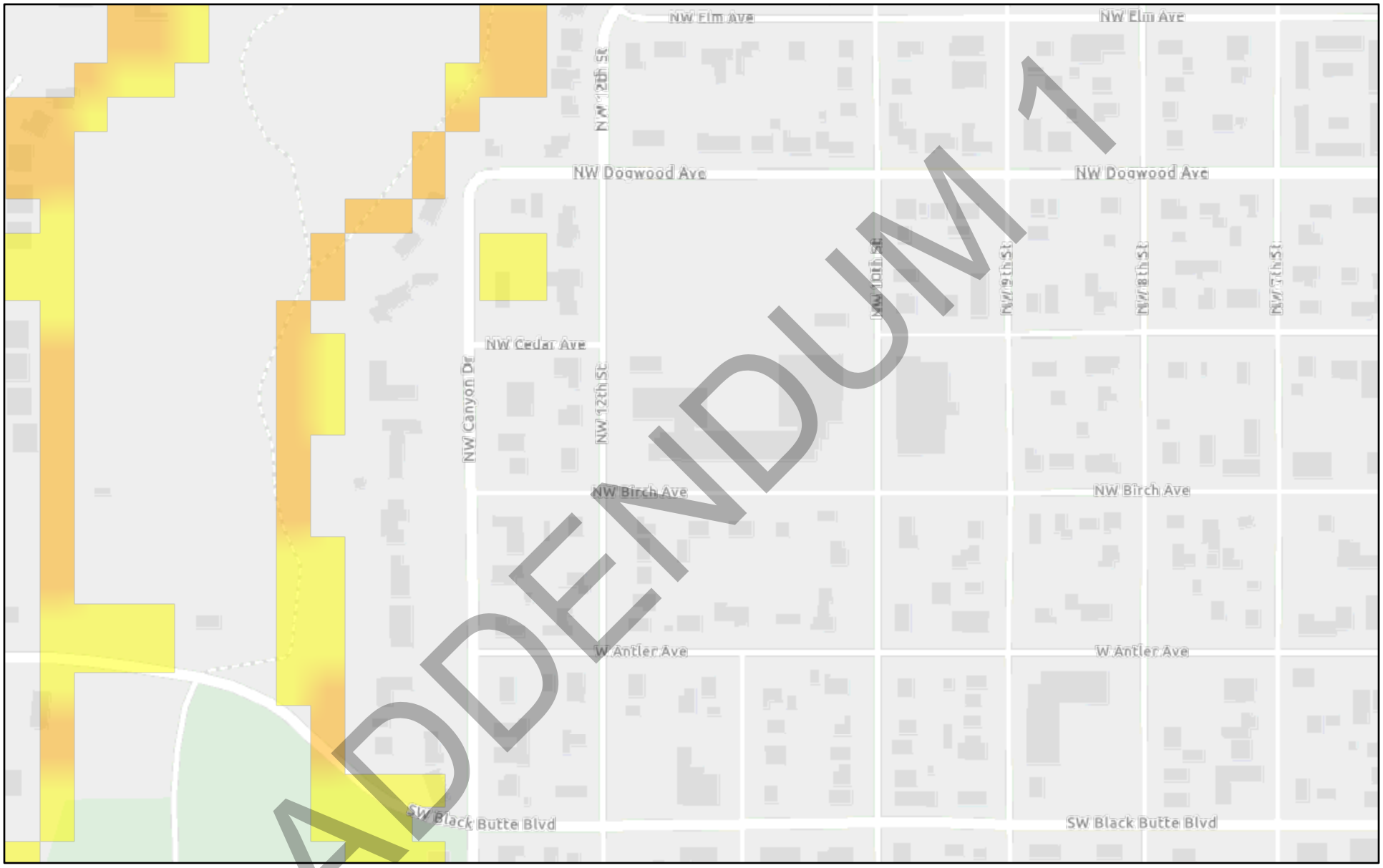
John Tuck ES DOGAMI Landslide



November 3, 2021

Landslide Hazard

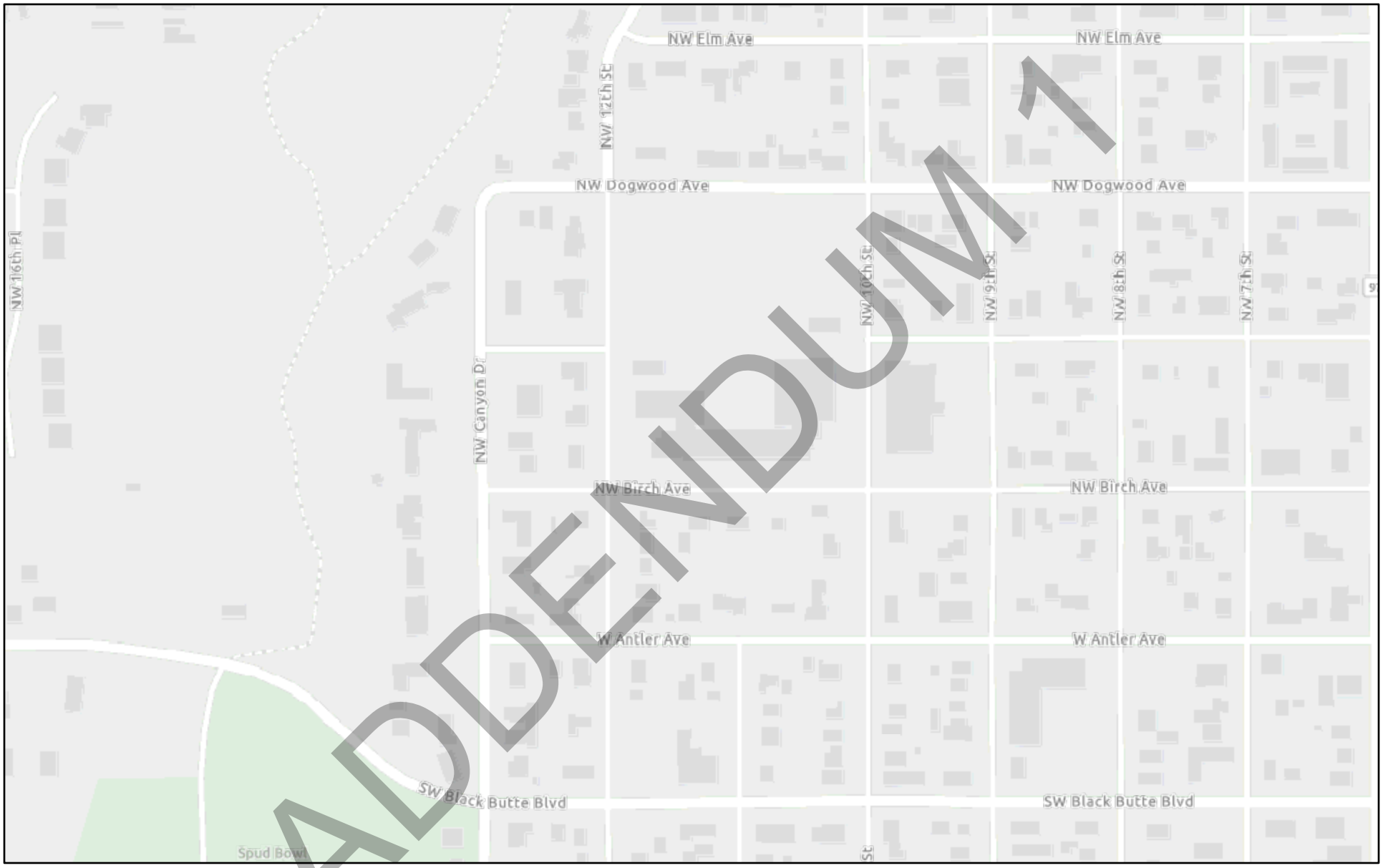
- Low - Landsliding Unlikely
- Moderate - Landsliding Possible
- High - Landsliding Likely
- Very High - Existing Landslide

1:4,800

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Redmond DOGAMI Liquefaction



November 3, 2021

Active Faults

High

Moderate

Low

1:9,028

0 0.05 0.1 0.2 mi

0 0.07 0.15 0.3 km

Appendix E: Construction Cost Estimate Worksheets

ENGINEER'S OPINION OF PROBABLE COST - JOHN TUCK ELEMENTARY 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%	%		$ 145,060.00
Preconstruction Services		2%	%		$ 29,012.00
Escalation		7%	%		$ 113,727.04
Bonding & Insurance		3%	%		$ 48,740.16
Contractor Profit & Overhead		5%	%		$ 81,233.60
			General Conditions Subtotal		$ 417,772.80
Non-Structural Elements					
Misc MEP	N1, N2, N12, N13	1	Lump Sum	$ 93,600.00	$ 93,600.00
Misc Non-Structural	N11	1	Lump Sum	$ 37,500.00	$ 37,500.00
New Restroom	N3, N4	1	EA	$ 20,000.00	$ 20,000.00
			Non-Structural Subtotal		$ 151,100.00
Construction Cost Per Building Part					
			Building Part 'A' Subtotal		$ -
			Building Part 'B' Subtotal		$ 1,299,500.00
			Building Part 'C' Subtotal		$ -
			Building Part 'D' Subtotal		
			Sub-Total Construction Cost		**$ 1,868,400.00**
			Contingency	**10%**	**$ 186,840.00**
			Total Construction Cost		**$ 2,055,240.00**
Cost Estimate Summary					
Engineering					$ 282,500.00
Architectural Consulting				$ 30,800.00	
Structural / Rehabilitation Engineering				$ 226,100.00	
Geotechnical Consulting				$ 10,300.00	
Materials Testing for Design				$ 10,300.00	
URM Tier 3 Analysis				$ 5,000.00	
Construction Management					$ 61,700.00
Construction					$ 1,940,400.00
Sub-Total Construction Cost				$ 1,868,400.00	
Special Inspection Services for Construction				$ 10,300.00	
Permitting Fees				$ 61,700.00	
Relocation of FF&E					$ 28,000.00
Contingency					$ 186,840.00
			Total Project Funding Requirement		**$ 2,499,440.00**

ENGINEER'S OPINION OF PROBABLE COST - JOHN TUCK ELEMENTARY SCHOOL SEISMIC REHABILITATION

BUILDING PART - 'B'

Description	Deficiencies Seismic Evaluation (Ref. Report Sec. 7.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Soft Demolition	S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11	13500	Square Foot	$ 2.00	$ 27,000.00
Abatement	S1, S2, S3, S4, S5, S6, S7, S8, S9, S10, S11	13500	Square Foot	$ 5.00	$ 67,500.00
Hard Demolition	S3, S7, S12	1900	Square Foot	$ 20.00	$ 38,000.00
			Demolition & Asbestos Subtotal		$ 132,500.00
Foundation / Floor Strengthening Construction					
Gym Floor Patch / Replacement	S3, S7, S12	5400	Square Foot	$ 13.00	$ 70,200.00
Spread Footings for Columns / Holdown	S12	8	Each	$ 4,000.00	$ 32,000.00
Shear Wall Footings - Wood Walls	S3, S7	625	Linear Foot	$ 300.00	$ 187,500.00
Floor Finish Patch / Replacement	S3, S7, S12	4400	Square Foot	$ 7.00	$ 30,800.00
			Foundation Level Subtotal		$ 320,500.00
Wall Strengthening Construction					
New 2x Framed Shear Walls	S3, S7	10900	Square Foot	$ 10.00	$ 109,000.00
Interior Wall Finish Repair	S3, S7	10900	Square Foot	$ 2.00	$ 21,800.00
Painting	S3, S7	10900	Square Foot	$ 3.00	$ 32,700.00
Masonry Ties	S3, S7, N3, N4, N5, N6, N7, N8	10900	Square Foot	$ 20.00	$ 218,000.00
Heavy Steel Columns	S12	8	EA	$ 7,500.00	$ 60,000.00
			Wall Strengthening Subtotal		$ 441,500.00
Roof Strengthening Construction					
Existing Truss Strengthening	S13	4	EA	$ 30,000.00	$ 120,000.00
Diaphragm Attachments - Out-of-Plane	S4, S5, S11	770	Linear Foot	$ 50.00	$ 38,500.00
Diaphragm Attachments - In-Plane Shear	S1, S6	650	Linear Foot	$ 20.00	$ 13,000.00
Seismic Isolation from Adjacent Building	S2	164	Linear Foot	$ 400.00	$ 65,600.00
Parapet Bracing	N9	200	Linear Foot	$ 65.00	$ 13,000.00
Fold Back Existing Roofing for Diaphragm	S2, N9	800	Square Foot	$ 8.00	$ 6,400.00
New Ceiling Sheathing	S8, S9, S10	13500	Square Foot	$ 5.00	$ 67,500.00
Ceiling Repair	S1, S2, S4, S5, S7, S8, S9, S10, S11	13500	Square Foot	$ 3.00	$ 40,500.00
Painting	S1, S2, S4, S5, S7, S8, S9, S10, S11	13500	Square Foot	$ 3.00	$ 40,500.00
			Roof Strengthening Subtotal		$ 405,000.00
			Building Part 'B' - Total Construction Cost		**$ 1,299,500.00**

Appendix F:
Rapid Visual Screening

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

SKETCH

Address: 209 NW 10th Street
Redmond, OR **Zip:** 97756
Other Identifiers:
Building Name: Desc_sch08A
Use: School
Latitude: 44.27788 **Longitude:** -121.17988
S_S: **S_1:**
Screener(s): SLC / JAG **Date/Time:** November 2021

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1947 ☐ EST
Total Floor Area (sq. ft.): 16,300 **Code Year:** 1946 UBC
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) REENTRANT CORNERS, L-SHAPE

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	**3.6**	**3.2**	**2.9**	**2.1**	**2.0**	**2.6**	**2.0**	**1.7**	**1.5**	**2.0**	**1.2**	**1.6**	**1.4**	**1.7**	**1.7**	**1.0**	**1.5**
Severe Vertical Irregularity, V_{L1}	-1.2	-1.2	-1.2	-1.0	-1.0	-1.1	-1.0	-0.8	-0.9	-1.0	-0.7	-1.0	-0.9	-0.9	-0.9	-0.7	NA
Moderate Vertical Irregularity, V_{L1}	-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.4	NA
Plan Irregularity, P_{L1}	-1.1	-1.0	-1.0	-0.8	-0.7	-0.9	-0.7	-0.6	-0.6	-0.8	-0.5	-0.7	-0.6	-0.7	-0.7	-0.4	NA
Pre-Code	-1.1	-1.0	-0.9	-0.6	-0.6	-0.8	-0.6	-0.2	-0.4	-0.7	-0.1	-0.5	-0.3	-0.5	-0.5	0.0	-0.1
Post-Benchmark	1.6	1.9	2.2	1.4	1.4	1.1	1.9	NA	1.9	2.1	NA	2.0	2.4	2.1	2.1	NA	1.2
Soil Type A or B	0.1	0.3	0.5	0.4	0.6	0.1	0.6	0.5	0.4	0.5	0.3	0.6	0.4	0.5	0.5	0.3	0.3
Soil Type E (1-3 stories)	0.2	0.2	0.1	-0.2	-0.4	0.2	-0.1	-0.4	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.4
Soil Type E (> 3 stories)	-0.3	-0.6	-0.9	-0.6	-0.6	NA	-0.6	-0.4	-0.5	-0.7	-0.3	NA	-0.4	-0.5	-0.6	-0.2	NA
Minimum Score, S_{MIN}	*1.1*	*0.9*	*0.7*	*0.5*	*0.5*	*0.6*	*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, $S_{L1} \geq S_{MIN}$: 0.6; THEREFORE FEMA 154 COLLAPSE POTENTIAL IS ~HIGH (>10%)

EXTENT OF REVIEW

Exterior: ☐ Partial ☒ All Sides ☒ Aerial
Interior: ☐ None ☒ Visible ☒ Entered
Drawings Reviewed: ☒ Yes ☐ No
Soil Type Source: NONE
Geologic Hazards Source: DOGAMI
Contact Person: JOSEPH GIPNER

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

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

SKETCH

Address: 209 NW 10th Street
Redmond, OR **Zip:** 97756
Other Identifiers:
Building Name: Desc_sch08B
Use: School
Latitude: 44.27788 **Longitude:** -121.17988
S_S: **S_1:**
Screener(s): SLC / JAG **Date/Time:** November 2021

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1947 ☐ EST
Total Floor Area (sq. ft.): 13,500 **Code Year:** 1946 UBC
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) STEPS IN ELEVATION (MODERATE)
☐ Plan (type)

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	**3.6**	**3.2**	**2.9**	**2.1**	**2.0**	**2.6**	**2.0**	**1.7**	**1.5**	**2.0**	**1.2**	**1.6**	**1.4**	**1.7**	**1.7**	**1.0**	**1.5**
Severe Vertical Irregularity, V_{L1}	-1.2	-1.2	-1.2	-1.0	-1.0	-1.1	-1.0	-0.8	-0.9	-1.0	-0.7	-1.0	-0.9	-0.9	-0.9	-0.7	NA
Moderate Vertical Irregularity, V_{L1}	-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.4	NA
Plan Irregularity, P_{L1}	-1.1	-1.0	-1.0	-0.8	-0.7	-0.9	-0.7	-0.6	-0.6	-0.8	-0.5	-0.7	-0.6	-0.7	-0.7	-0.4	NA
Pre-Code	-1.1	-1.0	-0.9	-0.6	-0.6	-0.8	-0.6	-0.2	-0.4	-0.7	-0.1	-0.5	-0.3	-0.5	-0.5	0.0	-0.1
Post-Benchmark	1.6	1.9	2.2	1.4	1.4	1.1	1.9	NA	1.9	2.1	NA	2.0	2.4	2.1	2.1	NA	1.2
Soil Type A or B	0.1	0.3	0.5	0.4	0.6	0.1	0.6	0.5	0.4	0.5	0.3	0.6	0.4	0.5	0.5	0.3	0.3
Soil Type E (1-3 stories)	0.2	0.2	0.1	-0.2	-0.4	0.2	-0.1	-0.4	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.4
Soil Type E (> 3 stories)	-0.3	-0.6	-0.9	-0.6	-0.6	NA	-0.6	-0.4	-0.5	-0.7	-0.3	NA	-0.4	-0.5	-0.6	-0.2	NA
Minimum Score, S_{MIN}	*1.1*	*0.9*	*0.7*	*0.5*	*0.5*	*0.6*	*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, $S_{L1} \geq S_{MIN}$: 0.6; THEREFORE FEMA 154 COLLAPSE POTENTIAL IS ~HIGH (>10%)

EXTENT OF REVIEW

Exterior: ☐ Partial ☒ All Sides ☒ Aerial
Interior: ☐ None ☒ Visible ☒ Entered
Drawings Reviewed: ☒ Yes ☐ No
Soil Type Source: NONE
Geologic Hazards Source: DOGAMI
Contact Person: JOSEPH GIPNER

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

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

SKETCH

Address: 209 NW 10th Street
Redmond, OR **Zip:** 97756
Other Identifiers:
Building Name: Desc_sch08C
Use: School
Latitude: 44.27788 **Longitude:** -121.17988
S_S: **S_1:**
Screener(s): SLC / JAG **Date/Time:** November 2021

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1953 ☐ EST
Total Floor Area (sq. ft.): 10,460 **Code Year:** 1952 UBC
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) REENTRANT CORNERS, L-SHAPE

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	**3.6**	**3.2**	**2.9**	**2.1**	**2.0**	**2.6**	**2.0**	**1.7**	**1.5**	**2.0**	**1.2**	**1.6**	**1.4**	**1.7**	**1.7**	**1.0**	**1.5**
Severe Vertical Irregularity, V_{L1}	-1.2	-1.2	-1.2	-1.0	-1.0	-1.1	-1.0	-0.8	-0.9	-1.0	-0.7	-1.0	-0.9	-0.9	-0.9	-0.7	NA
Moderate Vertical Irregularity, V_{L1}	-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.4	NA
Plan Irregularity, P_{L1}	-1.1	-1.0	-1.0	-0.8	-0.7	-0.9	-0.7	-0.6	-0.6	-0.8	-0.5	-0.7	-0.6	-0.7	-0.7	-0.4	NA
Pre-Code	-1.1	-1.0	-0.9	-0.6	-0.6	-0.8	-0.6	-0.2	-0.4	-0.7	-0.1	-0.5	-0.3	-0.5	-0.5	0.0	-0.1
Post-Benchmark	1.6	1.9	2.2	1.4	1.4	1.1	1.9	NA	1.9	2.1	NA	2.0	2.4	2.1	2.1	NA	1.2
Soil Type A or B	0.1	0.3	0.5	0.4	0.6	0.1	0.6	0.5	0.4	0.5	0.3	0.6	0.4	0.5	0.5	0.3	0.3
Soil Type E (1-3 stories)	0.2	0.2	0.1	-0.2	-0.4	0.2	-0.1	-0.4	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.4
Soil Type E (> 3 stories)	-0.3	-0.6	-0.9	-0.6	-0.6	NA	-0.6	-0.4	-0.5	-0.7	-0.3	NA	-0.4	-0.5	-0.6	-0.2	NA
Minimum Score, S_{MIN}	*1.1*	*0.9*	*0.7*	*0.5*	*0.5*	*0.6*	*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, $S_{L1} \geq S_{MIN}$: 0.6; THEREFORE FEMA 154 COLLAPSE POTENTIAL IS ~HIGH (>10%)

EXTENT OF REVIEW

Exterior: ☐ Partial ☒ All Sides ☒ Aerial
Interior: ☐ None ☒ Visible ☒ Entered
Drawings Reviewed: ☒ Yes ☐ No
Soil Type Source: NONE
Geologic Hazards Source: DOGAMI
Contact Person: JOSEPH GIPNER

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

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

SKETCH

Address: 209 NW 10th Street
Redmond, OR **Zip:** 97756
Other Identifiers:
Building Name: Desc_sch08D
Use: School
Latitude: 44.27788 **Longitude:** -121.17988
S_S: **S_1:**
Screener(s): SLC / JAG **Date/Time:** November 2021

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1964 ☐ EST
Total Floor Area (sq. ft.): 6,150 **Code Year:** 1961 UBC
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)

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	**3.6**	**3.2**	**2.9**	**2.1**	**2.0**	**2.6**	**2.0**	**1.7**	**1.5**	**2.0**	**1.2**	**1.6**	**1.4**	**1.7**	**1.7**	**1.0**	**1.5**
Severe Vertical Irregularity, V_{L1}	-1.2	-1.2	-1.2	-1.0	-1.0	-1.1	-1.0	-0.8	-0.9	-1.0	-0.7	-1.0	-0.9	-0.9	-0.9	-0.7	NA
Moderate Vertical Irregularity, V_{L1}	-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.4	NA
Plan Irregularity, P_{L1}	-1.1	-1.0	-1.0	-0.8	-0.7	-0.9	-0.7	-0.6	-0.6	-0.8	-0.5	-0.7	-0.6	-0.7	-0.7	-0.4	NA
Pre-Code	-1.1	-1.0	-0.9	-0.6	-0.6	-0.8	-0.6	-0.2	-0.4	-0.7	-0.1	-0.5	-0.3	-0.5	-0.5	0.0	-0.1
Post-Benchmark	1.6	1.9	2.2	1.4	1.4	1.1	1.9	NA	1.9	2.1	NA	2.0	2.4	2.1	2.1	NA	1.2
Soil Type A or B	0.1	0.3	0.5	0.4	0.6	0.1	0.6	0.5	0.4	0.5	0.3	0.6	0.4	0.5	0.5	0.3	0.3
Soil Type E (1-3 stories)	0.2	0.2	0.1	-0.2	-0.4	0.2	-0.1	-0.4	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.4
Soil Type E (> 3 stories)	-0.3	-0.6	-0.9	-0.6	-0.6	NA	-0.6	-0.4	-0.5	-0.7	-0.3	NA	-0.4	-0.5	-0.6	-0.2	NA
Minimum Score, S_{MIN}	*1.1*	*0.9*	*0.7*	*0.5*	*0.5*	*0.6*	*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, $S_{L1} \geq S_{MIN}$: 1.0; THEREFORE FEMA 154 COLLAPSE POTENTIAL IS ~HIGH (10%)

EXTENT OF REVIEW

Exterior: ☐ Partial ☒ All Sides ☒ Aerial
Interior: ☐ None ☒ Visible ☒ Entered
Drawings Reviewed: ☒ Yes ☐ No
Soil Type Source: NONE
Geologic Hazards Source: DOGAMI
Contact Person: JOSEPH GIPNER

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

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

SKETCH

Address: 209 NW 10th Street
Redmond, OR **Zip:** 97756
Other Identifiers:
Building Name: Desc_sch08E
Use: School
Latitude: 44.27788 **Longitude:** -121.17988
S_S: **S_1:**
Screener(s): SLC / JAG **Date/Time:** November 2021

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1990 ☒ EST
Total Floor Area (sq. ft.): 3,200 **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) REENTRANT CORNES, L-SHAPE

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	**3.6**	**3.2**	**2.9**	**2.1**	**2.0**	**2.6**	**2.0**	**1.7**	**1.5**	**2.0**	**1.2**	**1.6**	**1.4**	**1.7**	**1.7**	**1.0**	**1.5**
Severe Vertical Irregularity, V_{L1}	-1.2	-1.2	-1.2	-1.0	-1.0	-1.1	-1.0	-0.8	-0.9	-1.0	-0.7	-1.0	-0.9	-0.9	-0.9	-0.7	NA
Moderate Vertical Irregularity, V_{L1}	-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.4	NA
Plan Irregularity, P_{L1}	-1.1	-1.0	-1.0	-0.8	-0.7	-0.9	-0.7	-0.6	-0.6	-0.8	-0.5	-0.7	-0.6	-0.7	-0.7	-0.4	NA
Pre-Code	-1.1	-1.0	-0.9	-0.6	-0.6	-0.8	-0.6	-0.2	-0.4	-0.7	-0.1	-0.5	-0.3	-0.5	-0.5	0.0	-0.1
Post-Benchmark	1.6	1.9	2.2	1.4	1.4	1.1	1.9	NA	1.9	2.1	NA	2.0	2.4	2.1	2.1	NA	1.2
Soil Type A or B	0.1	0.3	0.5	0.4	0.6	0.1	0.6	0.5	0.4	0.5	0.3	0.6	0.4	0.5	0.5	0.3	0.3
Soil Type E (1-3 stories)	0.2	0.2	0.1	-0.2	-0.4	0.2	-0.1	-0.4	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.4
Soil Type E (> 3 stories)	-0.3	-0.6	-0.9	-0.6	-0.6	NA	-0.6	-0.4	-0.5	-0.7	-0.3	NA	-0.4	-0.5	-0.6	-0.2	NA
Minimum Score, S_{MIN}	*1.1*	*0.9*	*0.7*	*0.5*	*0.5*	*0.6*	*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, $S_{L1} \geq S_{MIN}$: 1.0; THEREFORE FEMA 154 COLLAPSE POTENTIAL IS ~HIGH (10%)

EXTENT OF REVIEW

Exterior: ☐ Partial ☒ All Sides ☒ Aerial
Interior: ☐ None ☒ Visible ☒ Entered
Drawings Reviewed: ☐ Yes ☒ No
Soil Type Source: NONE
Geologic Hazards Source: DOGAMI
Contact Person: JOSEPH GIPNER

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

Seismic Evaluation Report For:

TUMALO ELEMENTARY SCHOOL

19835 2nd St, Tumalo, OR 97703
Redmond School District

Prepared By:
ZCS Engineering & Architecture
Matthew R. Smith, PE, SE, Principal
524 Main Street, Suite 2, Oregon City, OR 97045
T: 503.659.2205 | E: MattS@zcsea.com

STRUCTURAL
REGISTERED PROFESSIONAL
ENGINEER
70
JULY 08, 2014
MATTHEW R. SMITH
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	Classroom	N	1918			
B	Classroom	N	1930			
C	Classroom	N	1958			
D	Classroom	Y	1950	URM	Y	N
E	Gymnasium	Y	1958	URM	Y	N
F	Classroom	N	1970			
G	Classroom	N	1994			
H	Classroom	Y	1986	URM	Y	N
*** 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	$2,481,875					
Retrofit Square Feet	15,600					
Retrofit Cost per Square Foot	$159.09					
Is the campus within a tsunami, FEMA flood zone, landslide/slope instability, liquefaction potential or other high hazard area? **If so, provide documentation.**						Yes, per DOGAMI hazvu, but ruled out per Geotechnical Report, in Appendix D

Engineering Report Checklist		
☒	Engineering Report Cover Page	
☒	Project Summary Page	Page 1
☒	Building Parts Identification	Page 5
☒	Statement of the Performance Objective	Page 7
	Summary of Deficiencies	
☒	Structural Seismic Deficiencies	Page 11
☒	Nonstructural Seismic Deficiencies	Page 12
	Summary of Mitigation/Retrofit	
☒	Structural Mitigation/Retrofit	Page 11
☒	Nonstructural Mitigation/Retrofit	Page 12
	Summary Construction Cost Estimate	
☒	Direct Cost	Page 15
☒	Indirect Soft Cost	Page 15
☒	Certification Statement by Engineer	Page 16
	ASCE 41-17 Tier 1 Checklist	
☒	Basic Configuration Checklist	Appendix B
☒	Building System Structural Checklist	Appendix B
☒	Nonstructural Checklist	Appendix B
☒	**Retrofit Drawings & Sketches**	Appendix C
☒	**DOGAMI or Geotechnical Report**	Appendix D
☒	**Itemized Construction Cost Estimate**	Appendix E
☒	**Rapid Visual Screening**	Appendix F

1.0 Project Introduction

Redmond School District is located in Redmond, Oregon in Deschutes County. The District operates ten schools located within the community including the property of interest, Tumalo Elementary School. The District has retained ZCS Engineering and Architecture (ZCS) to perform a seismic evaluation of Tumalo 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	19835 2nd Street, Tumalo, OR 97703
Evaluation Standard	ASCE 41-17 (Tier 1 Analysis)
Target Building Performance Level	Immediate Occupancy – BSE-1E; Life Safety – BSE-2E
Target Non-Structural Performance Level	Position Retention – BSE-1E; Hazard Reduced – BSE-2E
ASCE 41 Building Type	URM
Site Soil Classification	D
Seismic Zone Hazard Level	Moderately High
Cost Estimate	$2,481,875

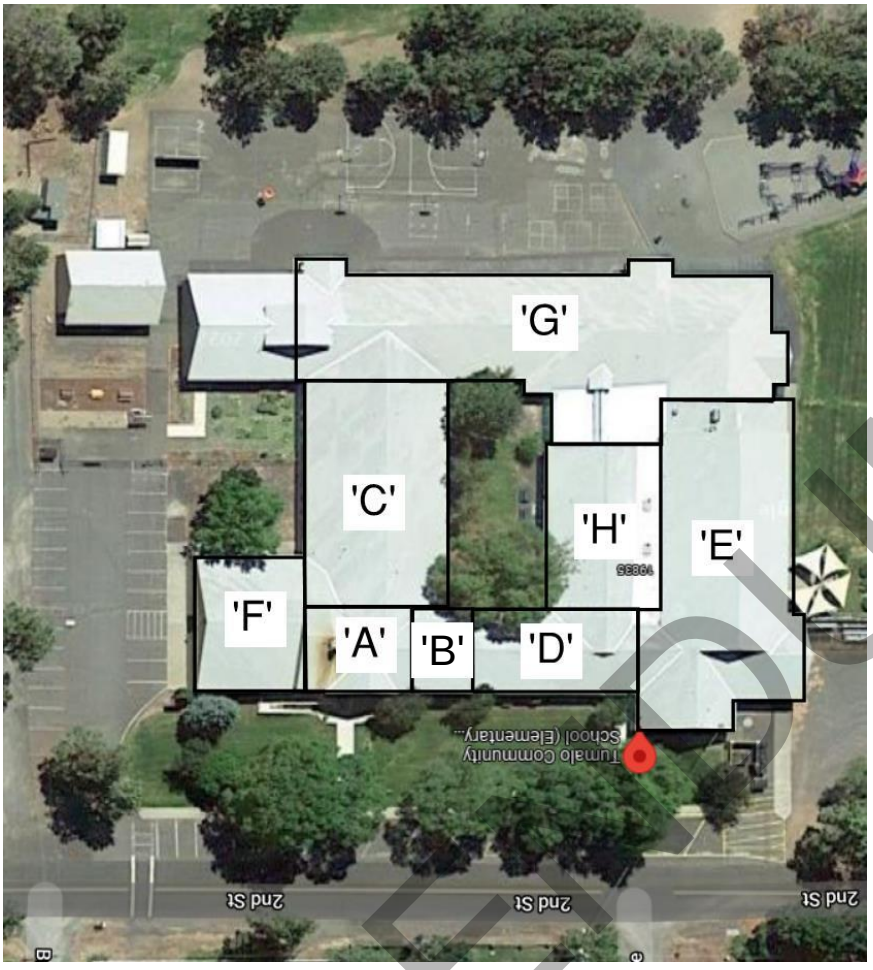
2.0 Building Description

The Gymnasium area 'E' was constructed in 1958 with an approximate footprint 9,000-square-feet. The gymnasium roof consists of 2x4 laminated deck over arched glulam beams with perimeter and interior under-reinforced masonry walls. The exterior masonry walls of the gymnasium are partial height with wood framed walls above. This structure has been classified as URM due to the lack of adequate reinforcement. Foundations consist of slab-on-grade with continuous reinforced concrete footings.

The classroom addition area 'H' was constructed in 1986 with an approximate footprint of 4,000-square-feet. The roof consists of wood trusses with plywood sheathing supported by original under-reinforced masonry walls that were altered during the addition and wood framed walls supporting the roof of area 'H' and the adjacent hallway. The building has been classified as a URM. URM walls are present on two sides and non-compliant wood walls on the other two sides. Foundations consist of slab-on-grade with continuous reinforced concrete footings.

Classroom area 'D' was constructed in the 1950s with an approximate footprint of 2,600-square-feet. The roof consists of wood trusses with straight sheathed roof diaphragm supported by under reinforced masonry walls. This structure has been classified as URM due to the lack of adequate reinforcement. Foundations consist of slab-on-grade with continuous reinforced concrete footings.

Photographs of the building parts included in this report are located in Appendix A.



A
Building Name: Admin
In Scope?: No

B
Building Name: Classroom
In Scope?: No

C
Building Name: Classroom
In Scope?: No

D
Construction Year: 1950
Building Name: Classroom
Construction Type: URM
In Scope?: Yes

E
Construction Year: 1958
Building Name: Gymnasium
Construction Type: URM
In Scope?: Yes

F
Building Name: Library
In Scope?: No

G
Building Name: Classroom
In Scope?: No

H
Construction Year: 1986
Building Name: Classroom
Construction Type: URM
In Scope?: Yes

Figure 1
Tumalo Community School Key Plan

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 – 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.

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, these section(s) D, E, and H of this building are categorized as a risk category IV structure(s) 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

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}	0.164
S_{x1}	0.047
BSE-2E:	
S_{xs}	0.417
S_{x1}	0.318
Soil Condition Amplification Factors (F_V, F_A)	F_v = 2.4 - F_a = 1.6
ASCE 41 Site Seismicity	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 along with a geotechnical report. Unless noted below, the hazards listed above are not present at the site.

Liquefaction

This project is located within a liquefaction hazard area as identified by the DOGAMI Oregon HazVu. To ensure that an acceptable level of due diligence was performed during the application phase of the project a geotechnical from a prior project at this site was reviewed for available information with respect to the severity. Per the geotechnical report, attached in Appendix B, liquefaction is considered a low risk for the site and no mitigation is required.

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 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
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.	Provide an independent bracing system or anchor the mezzanine to the seismic-force-resisting elements of the main structure.	S3
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.	S4

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.	S5
WOOD LEDGERS	The connection between the wall panels and the diaphragm induces cross-grain bending or tension in the wood ledgers.	Install new out-of-plane anchorage.	S6
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.	S7
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.	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
DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS	Not all diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft and aspect ratios less than or equal to 3-to-1.	Install new blocked plywood diaphragm.	S11
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.	S12
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.	S13
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.	N1

HAZARDOUS MATERIAL DISTRIBUTION	Piping or ductwork conveying hazardous materials is not braced or otherwise protected from damage that would allow hazardous material release.	Brace piping or ductwork conveying hazardous materials.	N2
SHUTOFF VALVES	Piping containing hazardous material, including natural gas, does not have shut off valves or other devices to limit spills or leaks.	Install shut off valves for piping containing hazardous material, including natural gas.	N3
FLEXIBLE COUPLINGS	Hazardous material ductwork and piping, including natural gas piping, do not have flexible couplings.	Install flexible couplings for ductwork and piping containing hazardous material, including natural gas piping.	N4
PIPING OR DUCTS CROSSING SEISMIC	Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures does not have couplings or other details to accommodate the relative seismic displacements.	Install seismic joint couplings for piping or ductwork carrying hazardous material.	N5
UNREINFORCED MASONRY	Unreinforced masonry or hollow-clay tile partitions are not braced at a spacing of at most 10 ft in Low or Moderate Seismicity, or at most 6 ft in High Seismicity.	Brace unreinforced masonry or hollow-clay tile partitions.	N6
LENS COVERS	Lens covers on light fixtures are not attached with safety devices.	Install safety devices for light fixture lens covers.	N7
INDUSTRIAL STORAGE RACKS	Industrial storage racks or pallet racks more than 12 ft high do not meet the requirements of ANSI/RMI MH 16.1 as modified by ASCE 7, Chapter 15.	Provide bracing and anchorage of storage racks.	N8
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.	N9
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.	N10
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.	N11
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	Independently support and laterally brace equipment with an operating weight more than 75 lb installed in line with a duct or piping system.	N12

	independent of the duct or piping system.		
FLEXIBLE COUPLINGS	Fluid and gas piping does not have flexible couplings.	Install flexible couplings for fluid and gas piping.	N13
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.	N14
PIPING CROSSING SEISMIC JOINTS	Piping that crosses seismic joints or isolation planes or is connected to independent structures does not have couplings or other details to accommodate the relative seismic displacements.	Install couplings for piping that crosses seismic joints or isolation planes or is connected to independent structures.	N15

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.

Existing glue laminated arches built prior to 1970 were under designed based on inadequate material stress information available at the time. This results in the arch's inability to support code prescribed gravity loading. The arches will be retrofit and strengthened to support code required gravity loading. This is deficiency/repair/plan note S14.

Based upon ZCS's previous experience and discussions with site personnel 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.

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	$1,839,700
Engineering	$289,400
Construction Management	$ 61,000
Relocation	$26,500
Construction Contingency	$265,275
TOTALS AND SUMMARY	
Total Cost Estimate	**$2,481,875**
Match Funds	**$0**
Total Amount Requested from SRGP	**$2,481,875**
Total Area	**16,000**
Cost/Square Foot	**$159.09 / SF**

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: NORTH ENTRANCE

Figure 2: NORTH ELEVATION

Figure 3: BUILDING 'D' NORTH ELEVATION

Figure 4: CAFETERIA NORTH ELEVATION

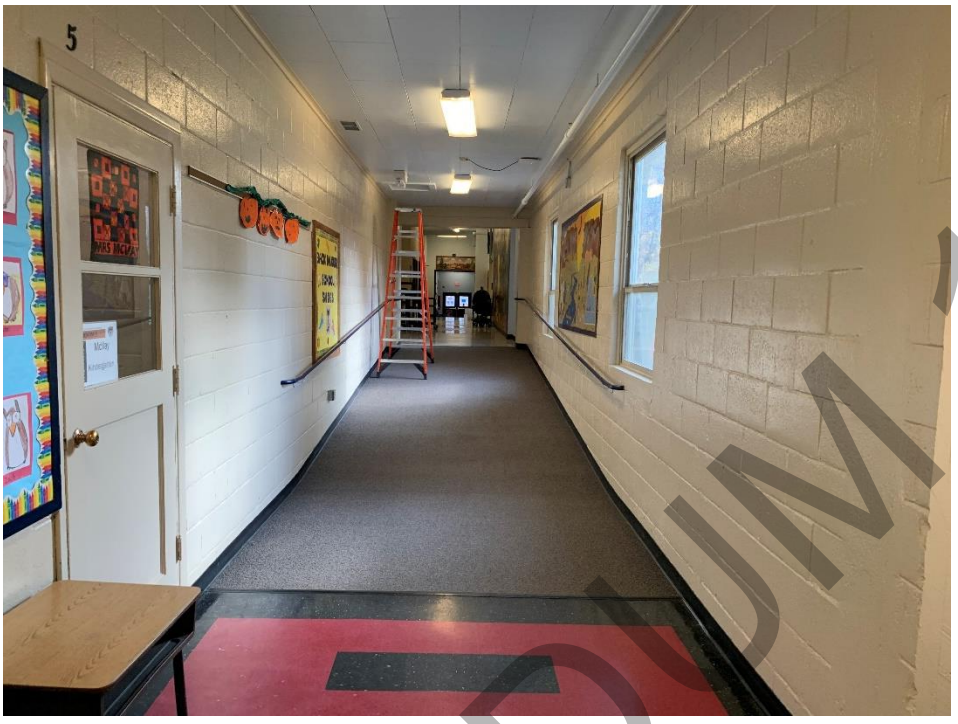


Figure 5: INTERIOR HALLWAY

Figure 6: GYMNASIUM INTERIOR

Appendix B:
Tier 1 Check Sheets

ASCE 41-17 Tier 1 Checklists

FIRM:	ZCS Engineering & Architecture
PROJECT NAME:	Areas 'D', 'E', 'H'
SEISMICITY LEVEL:	High
PROJECT NUMBER:	P-2706-21
COMPLETED BY:	SLC
DATE COMPLETED:	2/23/22
REVIEWED BY:	MRS
REVIEW DATE:	FEBRUARY 2022

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

Project Name Areas 'D', 'E', 'H'
Project Number P-2706-21

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	TOP OF WALL CONNECTIONS MASONRY WALLS ARE PARTIAL HEIGHT AT GYMNASIUM PORTION OF BUILDING
☐	☒	☐	☐				
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	ADJACENT BUIDLING OUTSIDE OF SCOPE
☐	☒	☐	☐				
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	MEZZANINE NOT ANCHORED
☐	☒	☐	☐				
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	LIQUEFACTION MAPPED PER DOGAMI HAZVU; SEE GEOTECHNICAL PORTION OF EVALUATIOIN REPORT AND APPENDIX D
☒	☐	☐	☐				
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

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	INADEQUATE WALL LENGTH AT WINDOW WALLS (AREA 'D')
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	MASONRY WALLS NOT ANCHORED FOR OUT OF PLANE
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	WOOD LEDGER PRESENT WITHOUT OUT OF PLANE ANCHORAGE
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	TOP OF WALL CONNECTION
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	
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 CORNER AT FRONT OF GYM
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	

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 DIAPRAGM DOES NOT MEET 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	STRAIGHT SHEATHED DIAPHRAGM OVER SPANNED
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	UNBLOCKED DIAPHRAGM OVER SPANNED
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	WALL ANCHORS NOT PRESENT
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	SECONDARY SUPPORTS/CONNECTIONS NOT PRESENT

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

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	
☐	☐	☒	☐				
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

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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

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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
☒	☐	☐	☐			
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
☐	☒	☐	☐	**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
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
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
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
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

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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
☐	☐	☒	☐	**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						
☐	☒	☐	☐	**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
☐	☒	☐	☐	**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
☐	☐	☐	☐	**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
☐	☒	☐	☐	**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						
☐	☐	☒	☐	**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
☐	☐	☒	☐	**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
☐	☐	☒	☐	**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						
☐	☐	☒	☐	**HR—not required; LS—H; PR—H**. RETAINER GUARDS: Sheaves and drums have cable retainer guards.	13.7.11	A.7.16.1
☐	☐	☒	☐	**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.

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

Appendix C: Schematic Seismic Retrofit Drawings

TUMALO COMMUNITY SCHOOL SEISMIC RETROFIT

PRELIMINARY DESIGN

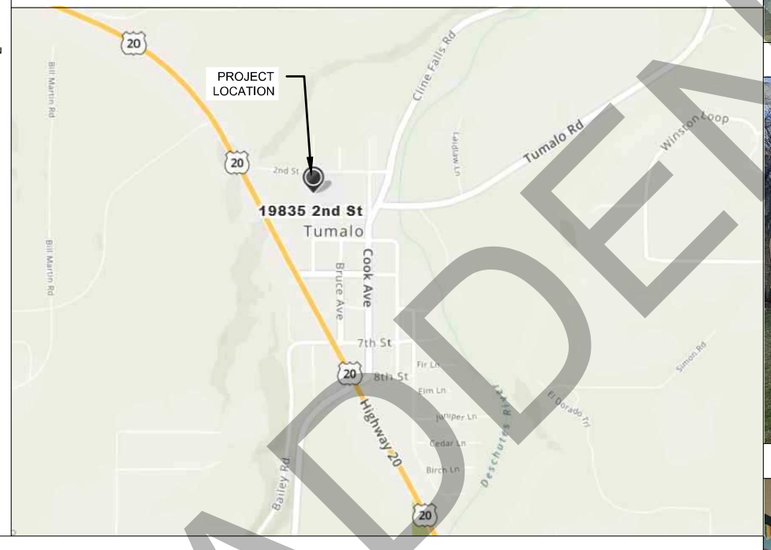
REDMOND SCHOOL DISTRICT
19835 2ND ST.
TUMALO, OREGON 97703

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
C.M.U.	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:

VICINITY MAP



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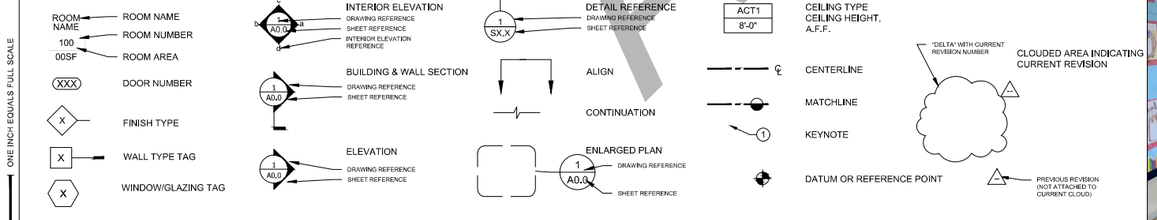


ONE INCH EQUALS FULL SCALE

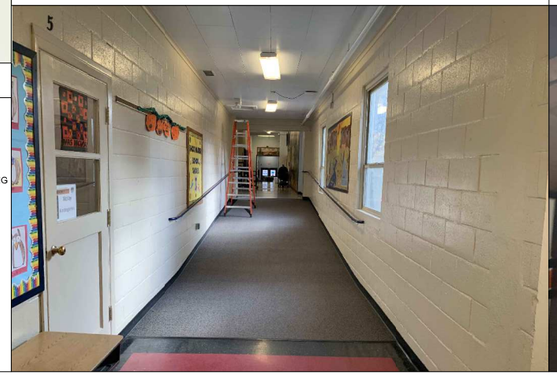
EXTERIOR PHOTO: NORTH ENTRANCE

EXTERIOR PHOTO: NORTH ELEVATION

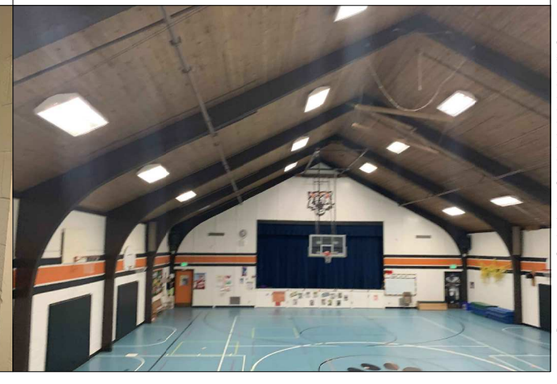
EXTERIOR PHOTO: NORTH ELEVATION

EXTERIOR PHOTO: KITCHEN & CAFETERIA

INTERIOR PHOTO: HALLWAY



INTERIOR PHOTO: GYMNASIUM



ZCS ENGINEERING ARCHITECTURE
524 Main Street, Suite 2, Oregon City, Oregon 97045 | 503-659-2205

REDMOND SCHOOL DISTRICT
145 SE SALMON DRIVE
REDMOND OR 97756

TUMALO COMMUNITY SCHOOL SEISMIC RETROFIT

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 13, 2007
DREW R. SMITH
EXPIRES: 06-30-22

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	P-2706-21
DRAWN:	SLC
CHECKED:	MRS
DATE:	FEB. 2022

COVER SHEET

G0.0

PRELIMINARY DESIGN

*SITE PLAN NOT TO SCALE

TRUE/PROJECT NORTH

CLASSROOMS ADDN
YEAR BUILT: 2012
TOTAL AREA: 2,900 SF
NOT IN SCOPE

AREA 'G'
CLASSROOMS
YEAR BUILT: 1994
TOTAL AREA: 11,100 SF
NOT IN SCOPE

AREA 'H'
CLASSROOM
YEAR BUILT: 1986
TOTAL AREA: 4,000 SF
IMMEDIATE OCCUPANCY
URM

AREA 'C'
CLASSROOMS
YEAR BUILT: 1958
TOTAL AREA: 7,000 SF
NOT IN SCOPE

AREA 'E'
GYMNASIUM
YEAR BUILT: 1958
TOTAL AREA: 9,000 SF
IMMEDIATE OCCUPANCY
URM

AREA 'F'
CLASSROOMS
YEAR BUILT: 1970 EST.
TOTAL AREA: 2,600 SF
NOT IN SCOPE

AREA 'A'
CLASSROOMS
YEAR BUILT: 1918 EST.
TOTAL AREA: 1,600 SF
NOT IN SCOPE

AREA 'B'
CLASSROOMS
YEAR BUILT: 1930 EST.
TOTAL AREA: 1,200 SF
NOT IN SCOPE

AREA 'D'
CLASSROOMS
YEAR BUILT: 1950 EST.
TOTAL AREA: 2,600 SF
URM :10

ONE INCH EQUALS FULL SCALE

ZCS
ENGINEERING
ARCHITECTURE

524 Main Street, Suite 2, Oregon City, Oregon 97045 | 503-659-2205

REDMOND SCHOOL DISTRICT
145 SE SALMON DRIVE
REDMOND OR 97756

TUMALO COMMUNITY SCHOOL SEISMIC RETROFIT

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 13, 2007
STEVEN R. SMITH
EXPIRES: 06-30-22

-PRELIMINARY-
NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	P-Z706-21
DRAWN:	SLC
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. INSTALL DIAPHRAGM ATTACHMENTS - IN-PLANE SHEAR
   B. PARTIAL HEIGHT MASONRY - PROVIDE SPANDREL & STRONGBACK COLUMNS

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 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.
   B. PROVIDE SEISMIC ISOLATION JOINT TO AVOID POUNDING OF THE STRUCTURES. PROVIDE ALL NEW GRAVITY FRAMING AND LATERAL RESISTING ELEMENTS AS NECESSARY TO PROVIDE BUILDING SEPARATION

S3. PROVIDE AN INDEPENDENT BRACING SYSTEM OR ANCHOR THE MEZZANINE TO THE SEISMIC-FORCE-RESISTING ELEMENTS OF THE MAIN STRUCTURE.

S4. PROVIDE NEW VERTICAL LATERAL RESISTING ELEMENTS.
   A. INSTALL NEW REINFORCED CMU WALL AT WINDOW LOCATIONS.
   B. INSTALL NEW PLYWOOD SHEATHING AT EXISTING WOOD FRAMED WALL.

S5. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S6. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S7. INSTALL NEW HARDWARE FOR TRANSFER OF SEISMIC FORCES FROM DIAPHRAGM TO SHEAR WALLS.

S8. PROVIDE NEW DRAG ELEMENTS.

S9. INSTALL NEW PLYWOOD DIAPHRAGM SHEATHING.

S10. INSTALL NEW PLYWOOD DIAPHRAGM SHEATHING.

S11. INSTALL NEW BLOCKED PLYWOOD DIAPHRAGM.

S12. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S13. INSTALL NEW SECONDARY SUPPORTS FOR VERTICAL LOAD CARRYING FRAMING ELEMENTS.

S14. STRENGTHEN (E) GLULAM ARCHES

NON-STRUCTURAL REPAIRS:

N1. INSTALL FLEXIBLE COUPLINGS FOR FIRE SUPPRESSION PIPING IN ACCORDANCE WITH NFPA-13.

N2. BRACE PIPING OR DUCTWORK CONVEYING HAZARDOUS MATERIALS.

N3. INSTALL SHUT OFF VALVES FOR PIPING CONTAINING HAZARDOUS MATERIAL, INCLUDING NATURAL GAS.

N4. INSTALL FLEXIBLE COUPLINGS FOR DUCTWORK AND PIPING CONTAINING HAZARDOUS MATERIAL, INCLUDING NATURAL GAS PIPING.

N5. INSTALL SEISMIC JOINT COUPLINGS FOR PIPING OR DUCTWORK CARRYING HAZARDOUS MATERIAL.

N6. BRACE UNREINFORCED MASONRY OR HOLLOW-CLAY TILE PARTITIONS.

N7. INSTALL SAFETY DEVICES FOR LIGHT FIXTURE LENS COVERS.

N8. PROVIDE BRACING AND ANCHORAGE OF STORAGE RACKS.

N9. ANCHOR CONTENTS TO THE STRUCTURE.

N10. BRACE EQUIPMENT TO STRUCTURE.

N11. BRACE AND ANCHOR EQUIPMENT WEIGHING MORE THAN 20 LB, WHOSE CENTER OF MASS IS MORE THAN 4 FT ABOVE THE ADJACENT FLOOR LEVEL.

N12. INDEPENDENTLY SUPPORT AND LATERALLY BRACE EQUIPMENT WITH AN OPERATING WEIGHT MORE THAN 75 LB INSTALLED IN LINE WITH A DUCT OR PIPING SYSTEM.

N13. INSTALL FLEXIBLE COUPLINGS FOR FLUID AND GAS PIPING.

N14. ANCHOR AND BRACE FLUID AND GAS PIPING TO THE STRUCTURE.

N15. INSTALL COUPLINGS FOR PIPING THAT CROSSES SEISMIC JOINTS OR ISOLATION PLANES OR IS CONNECTED TO INDEPENDENT STRUCTURES.

ZCS ENGINEERING ARCHITECTURE
524 Main Street, Suite 2, Oregon City, Oregon 97045 | 503-659-2205

REDMOND SCHOOL DISTRICT
145 SE SALMON DRIVE
REDMOND OR 97756

TUMALO COMMUNITY SCHOOL SEISMIC RETROFIT

REGISTERED PROFESSIONAL ENGINEER
OREGON
NOV 13, 2007
MATTHEW R. SMITH
EXPIRES: 06-30-22

PRELIMINARY- NOT FOR CONSTRUCTION

REVISION ID:	DATE:

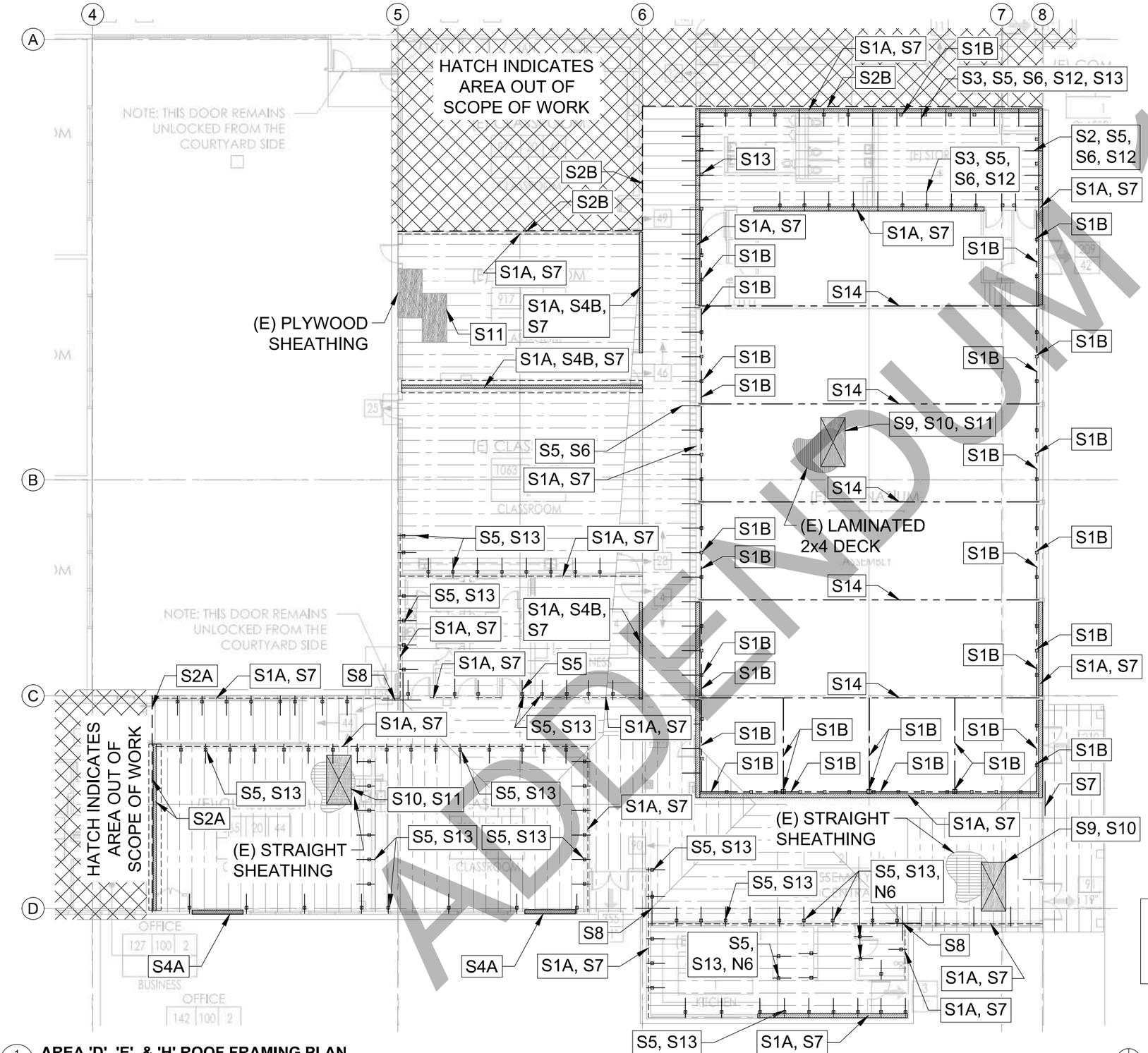
PROJECT NO:	P-2706-21
DRAWN:	SLC
CHECKED:	MRS
DATE:	FEB. 2022

REPAIR KEY NOTES

S1.1

PRELIMINARY DESIGN

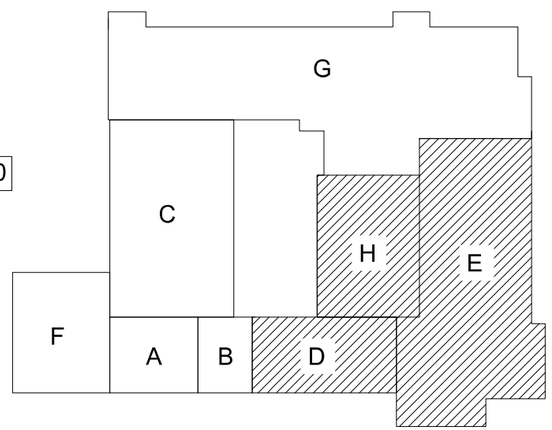
ONE INCH EQUALS FULL SCALE



1 S1.1 **AREA 'D', 'E', & 'H' ROOF FRAMING PLAN**

N.T.S.

N



2 S1.1 **KEY PLAN**

N.T.S.

ADDENDUM 1

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE
524 Main Street, Suite 2, Oregon City, Oregon 97045 | 503-659-2205

REDMOND SCHOOL DISTRICT
145 SE SALMON DRIVE
REDMOND OR 97756

TUMALO COMMUNITY SCHOOL SEISMIC RETROFIT

REGISTERED PROFESSIONAL ENGINEER OREGON JANUARY 13, 2006 MATTHEW R. SMITH
EXPIRES: 06-30-22
PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	P-2706-21
DRAWN:	SLC
CHECKED:	MRS
DATE:	FEB. 2022

AREA 'D' & 'E' ROOF FRAMING PLAN

S2.1

PRELIMINARY DESIGN

Appendix D: Geotechnical Information

PIN
- Approximate location based on user input and does not represent an authoritative property location

MAP PANELS
- Selected FloodMap Boundary
- Digital Data Available
- No Digital Data Available
- Unmapped

OTHER AREAS
- NO SCREEN — Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*
- Otherwise Protected Area
- Coastal Barrier Resource System Area

SPECIAL FLOOD HAZARD AREAS
- Without Base Flood Elevation (BFE) *Zone A, V, A99*
- With BFE or Depth
- Regulatory Floodway *Zone AE, AO, AH, VE, AR*

OTHER AREAS OF FLOOD HAZARD
- 0.2% Annual Chance Flood Hazard, Areas of 1% annual chance flood with average depth less than one foot or with drainage areas of less than one square mile *Zone X*
- Future Conditions 1% Annual Chance Flood Hazard *Zone X*
- Area with Reduced Flood Risk due to Levee. See Notes. *Zone X*
- Area with Flood Risk due to Levee *Zone D*

OTHER FEATURES
- 20.2 / 17.5 — Cross Sections with 1% Annual Chance Water Surface Elevation
- Coastal Transect
- Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature

GENERAL STRUCTURES
- Channel, Culvert, or Storm Sewer
- Levee, Dike, or Floodwall

Tumalo ES Liquefaction Map

December 16, 2022

High Moderate Low

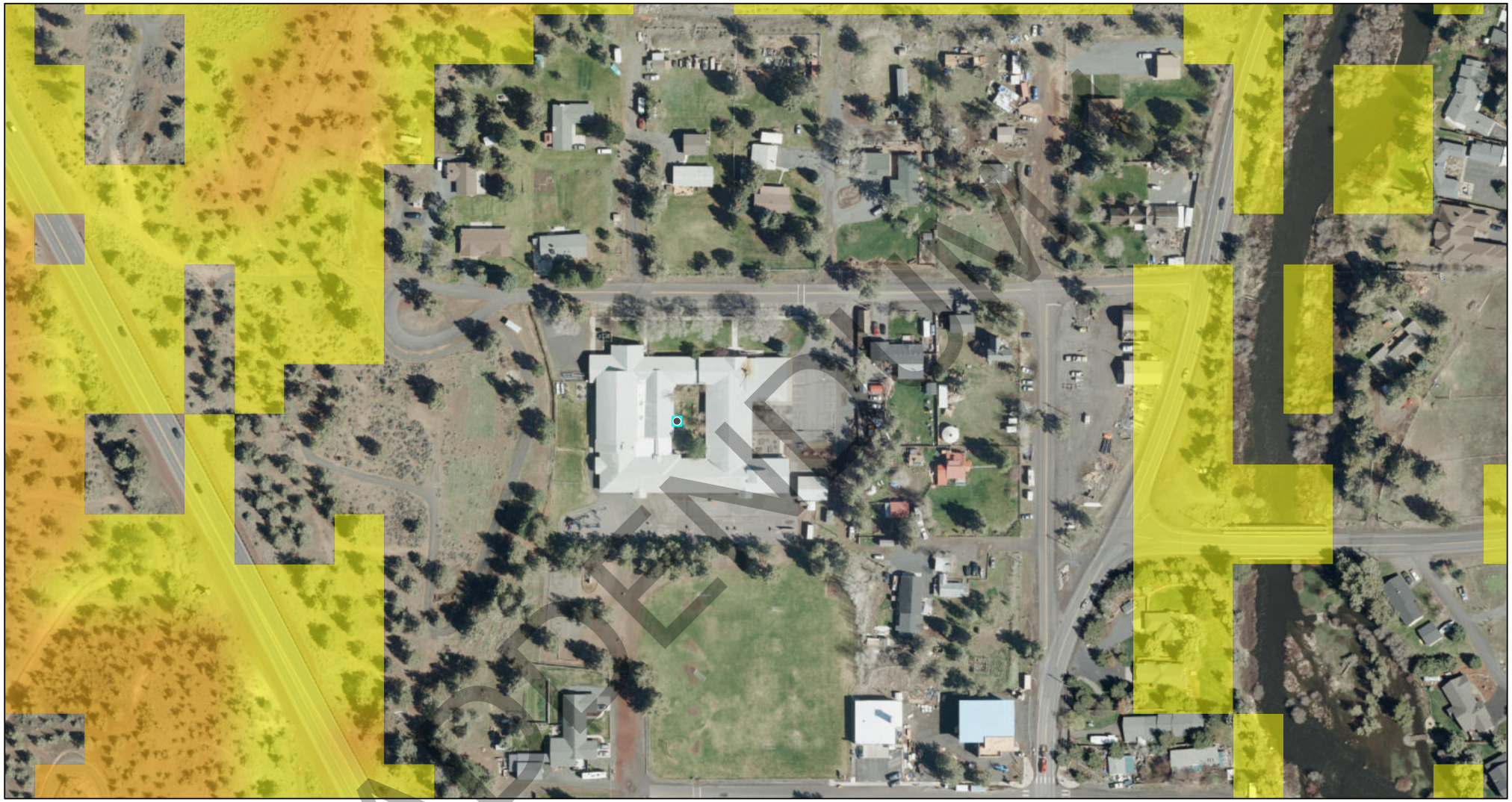
1:1,080

0 0.01 0.01 0.02 mi

0 0.01 0.02 0.04 km

City of Bend, OR, Maxar, Microsoft

Tumalo ES Landslide Map



December 16, 2022

Landslide Hazard

- Low - Landsliding Unlikely
- Moderate - Landsliding Possible
- High - Landsliding Likely
- Very High - Existing Landslide

1:2,257

0 0.02 0.04 0.08 mi

0 0.03 0.06 0.12 km

City of Bend, OR, Maxar

Tumalo Community School

19835 2nd St, Bend, OR 97701, USA

Latitude, Longitude: 44.1512948, -121.3328812

Date	11/3/2021, 5:00:26 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)	0.386
S_1	spectral response (1.0 s)	0.2
S_{XS}	site-modified spectral response (0.2 s)	0.575
S_{X1}	site-modified spectral response (1.0 s)	0.44
F_a	site amplification factor (0.2 s)	1.491
F_v	site amplification factor (1.0 s)	2.201
ssuh	max direction uniform hazard (0.2 s)	0.426
crs	coefficient of risk (0.2 s)	0.905
ssrt	risk-targeted hazard (0.2 s)	0.386
ssd	deterministic hazard (0.2 s)	1.5
s1uh	max direction uniform hazard (1.0 s)	0.227
cr1	coefficient of risk (1.0 s)	0.881
s1rt	risk-targeted hazard (1.0 s)	0.2
s1d	deterministic hazard (1.0 s)	0.6

Type	Description	Value
Hazard Level		BSE-1N
S_{XS}	site-modified spectral response (0.2 s)	0.384
S_{X1}	site-modified spectral response (1.0 s)	0.293

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	0.262
S_1	spectral response (1.0 s)	0.136
S_{XS}	site-modified spectral response (0.2 s)	0.417
S_{X1}	site-modified spectral response (1.0 s)	0.318
f_a	site amplification factor (0.2 s)	1.59
f_v	site amplification factor (1.0 s)	2.327

Type	Description	Value
Hazard Level		BSE-1E
S_S	spectral response (0.2 s)	0.103
S_1	spectral response (1.0 s)	0.047
S_{XS}	site-modified spectral response (0.2 s)	0.164
S_{X1}	site-modified spectral response (1.0 s)	0.113
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

DISCLAIMER

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GEOTECHNICAL INVESTIGATION

PROPOSED ADDITION
TUMALO ELEMENTARY SCHOOL
19835 SECOND STREET
TUMALO, OREGON 97701

MARCH 1994

PREPARED FOR:

GARY GROFF
MORRISON KNUDSON
C/O REDMOND SCHOOL DISTRICT 2J
716 SW EVERGREEN AVENUE
REDMOND, OREGON 97756

PREPARED BY:

CENTURY WEST ENGINEERING CORPORATION
1444 NW COLLEGE WAY
BEND, OREGON 97701

Project No: 11053.002.05

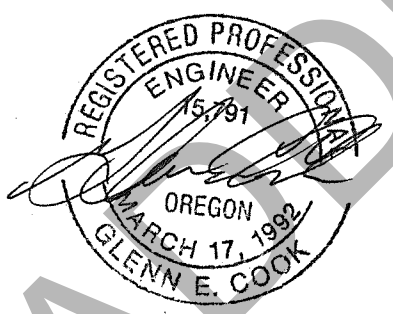
The findings of this report are valid as of the present date; however, changes in the condition of a property can occur with the passage of time, whether they be due to natural process, or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur in the future from legislation and the broadening of knowledge.

Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of our control. These opinions have been derived in accordance with the current standard of practice and no warranty is expressed or implied.

If you have any questions concerning this report or the exploration, do not hesitate to contact our office.

Sincerely

Glenn E. Cook, P.E.
Geotechnical Engineer



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FIGURES

GEOTECHNICAL INVESTIGATION
PROPOSED ADDITION - TUMALO ELEMENTARY SCHOOL
19835 SECOND STREET
TUMALO, OREGON 97701

INTRODUCTION

This report presents results of a Geotechnical Investigation at the site of the proposed addition to the Tumalo Elementary School in Tumalo, Oregon. The facility is located at 19835 Second Street as shown on the Vicinity Map (Figure 1). The majority of the addition will be located at the South end of the existing school. The purpose of the investigation is to provide information and design guidelines for foundation systems, drainage, site grading, excavation, and pavement recommendations.

Data obtained during the field exploration is summarized in Figures 3-6. The recommendations, conclusions, and opinions presented in this report are based on field data obtained, and on our experience with similar projects.

SUMMARY AND CONCLUSIONS

1. Sub-surface conditions were explored by drilling five air-track borings and excavating three backhoe test pits on November 11, 1993.

2. The proposed addition should be founded on conventional spread footings bearing on recompacted native sand material. Recompaction requirements and design criteria for spread footings are given in this report. Boring cross sections within the building areas are shown in Figure 6.

3. The on-site sand overburden can be used as structural fill. If import material is required for development of the project a granular material is recommended.

4. The sand overburden can be excavated with conventional excavation equipment. If excavation of the underlying hard basalt is required, blasting and/or chipping with hydraulic hammers is anticipated.

PROPOSED CONSTRUCTION

As presently planned, the addition will be a single story structure consisting of a new cafeteria/multi-use building, a new library, and six new classrooms. The cafeteria/multi-use building will be located at the Northwest corner of the school and the library and the classroom will be located at the South end of the school. Total square footage of the new addition will be approximately 12,400 square feet. Approximate wall loads for this type of structure would be 2.0 kips per linear foot. It appears that the existing septic system located South of the proposed library will require relocation.

EXISTING SITE CONDITIONS

The site for the proposed library and classrooms is partially occupied by an asphalt play area, lawn, and miscellaneous landscape. An in place septic system is located along the South wall of the proposed library.

The site for the proposed cafeteria/multi-use building is occupied by lawn and landscape area. A concrete septic tank cover is located along the North wall of the addition. It appears that the in place septic systems will require relocation. The site topography map also indicates underground sewer lines in the area of the proposed addition.

FIELD EXPLORATION

Subsurface conditions were explored by performing five air-track boring and three test pits at the subject site. The boring and pit locations are shown in Figure 2. The air-track drilling method provides a profile of the rock, but does not provide engineering information on the overburden soils. The air-track logs and penetration rates are shown in Figures 3 and 4.

Air-track borings indicate overburden soil material of over five feet. Because of the soil depths observed, additional exploration was conducted using backhoe test pits. The test pits were excavated with a John Deere 410 backhoe to obtain adequate engineering information of the soil materials.

At intervals of approximately two feet, in-place density tests were taken using a Troxler moisture-density gauge. Disturbed bag samples were also taken within the soil profile.

LABORATORY TESTING

Samples were returned to the laboratory where they were visually classified. Soil classification tests, including gradation and moisture content, were conducted on representative samples of the various soil layers. Standard proctor testing was also conducted. The results of the laboratory testing are presented in Figure 5.

SUBSURFACE CONDITIONS

The air-track borings indicate five to six feet of sand overburden overlying river cobbles with a sand and gravel matrix and a moderately hard basalt rock. The basalt rock is slightly fractures and has a variable penetration rate. Occasionally, the penetration rates change abruptly, indicating a possible contact zone of two successive lava flows. In a few instances the drill rod would penetrate rapidly for several inches. This generally indicates a thin void, vertical crevice, or possible soil filled void. In general, penetration rates of less than 10 seconds/inch would be characteristic of a void, crevice, or soil layer. Rates of 10 to 30 seconds/inch indicate rock which is moderately massive with closely spaced fractures and thin void, crevices, or soil layers.

The backhoe test pits excavated at the South and West end of the existing building confirmed the basalt rock depth of approximately six feet below existing surface. The sand overburden is dry to moist in moisture content, and medium dense in consistency The in-place dry density of the sand overburden at approximate proposed footing depth varied from 80.0 to 87.7 pounds per cubic foot (pcf), which equates to a relative compaction of 84.6 to 92.8 percent of standard proctor.

FOUNDATION RECOMMENDATIONS

The proposed addition will use a slab-on-grade foundation system with conventional spread footings. Floor elevation will generally match the floor elevation of the adjacent existing structures.

The footings should be designed for an allowable soil bearing pressure not to exceed 2,500 pounds per square foot for dead load plus live load. Due to the variable in place relative densities at proposed footing depths, the bottom of all footing trenches should be compacted to 95% of standard proctor. The exposed footing bottom should be compacted using a small self propelled smooth drum vibrating roller, or a hoe-pack. All exterior foundations should bear below the frost depth. The following design criteria should be observed:

a) Frost depth for the Redmond area is estimated at 24 inches.

b) All footing should have a minimum width of 18 inches.

c) Allowable soil bearing pressure may be increased one-third for wind and/or seismic condition.

d) Maximum settlement should not exceed one inch under full dead load plus live load conditions. In general, differential settlement should be less than 1/2 inch. Most settlement will occur during construction, about seven days after loads are initially applied.

e) We recommend that continuous concrete foundation walls be reinforced to span a distance of six feet in length. This should reduce the potential effect of differential settlement.

f) In general, all vegetation, asphalt paving, concrete walks, and the upper four inches of organic top soil (lawn area) should be stripped off the building area. After the site has been cleared, the footing trenches excavated and the footing trenches compacted the site should be observed by the Geotechnical Engineer. The purpose of this visit is to confirm the recommended bearing pressures and to verify that sufficient organics have been removed.

FLOOR SLABS

It is our understanding that the structure will have a slab-on-grade floor system. Depending on finish slab elevations, structural fill may be required. The vegetation, asphalt paving, concrete walks, and the upper 4 inches of organic top soil (lawn area) should be stripped from the building area.

The exposed soils should be moistened and compacted prior to placement of fill. The fill should be placed in 8 inch loose layers and compacted with heavy compaction equipment to 95 percent of standard proctor density ASTM D698. In the building area, a six inch layer of clean underslab crushed gravel is recommended. The crushed gravel should be compacted to 95 percent of standard proctor ASTM D698.

DRAINAGE

The site topography map (Figure 2) indicates the area of the proposed addition is relatively flat. If pavement and/or surface grades in the building area slope toward the building, it is recommended that a foundation sub-drain and visqueen moisture barrier be installed. If the building level is high enough to allow positive drainage away from the building, and water is not allowed to pond next to the building, then a foundation drain and moisture barrier are probably not warranted. A minimum surface grade of three percent is recommended.

SITE GRADING AND EXCAVATIONS

At the time of this writing, final grading plans were not available. It is assumed that minimal site grading will be required in development of the new addition. If fill is required around the proposed structure, it is recommended that the top 4 inches of top soil (lawn area) be removed and that the existing asphalt paving and concrete walk be removed. Tree stumps and root systems should be removed. After removals have been completed, the exposed silty sand should be scarified 8 inches and compacted with heavy compaction equipment. The exposed soils and structural fill should be compacted to 95 percent of standard proctor.

The native sand material can be used as structural fill. Import fill, if required, should be granular in nature and be approved by the Geotechnical Engineer prior to hauling to the site. In general, acceptable fill material would be well graded with less than ten percent passing a No. 200 sieve with maximum particle size of one inch. Placement of structural fill should be observed and tested by a qualified technician working under the direction of the Geotechnical Engineer. A suitable testing frequency would be to test every one foot of fill depth as it is placed.

The sand overburden can be excavated with conventional excavation equipment. If excavation is required in the basalt rock (six feet below existing surface), blasting and/or chipping with a hydraulic hammer is anticipated.

PAVEMENT RECOMMENDATIONS

The shallow sub-grade soils will probably consist of the overburden silty sand material which will provide good pavement support. Most of the vehicular traffic is expected to be automobile or light trucks. We recommend a pavement section of 2.5 inches of Asphaltic Concrete Surface (ACS) underlain by four inches of crushed Aggregate Base Course (ABC) for automobile parking areas. If bus lanes and/or service driveways are required, we recommend a pavement section of three inches of ACS overlying 8 inches of ABC. The ACS should be compacted to 90 percent of Marshall density (ASTM D1559). The asphalt aggregate should meet the requirements for Class B or C, per Oregon Department of Transportation (ODOT) specifications. The ABC should consist of a 3/4-inch minus crushed aggregate. The subgrade and ABC should be compacted to 95 percent of standard Proctor density, ASTM D698.

LIMITATIONS

The recommendations of this report pertain only to the site investigated and are based upon the assumption that the soil conditions do not deviate substantially from those encountered or indicated during this investigation. If significant variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from the construction planned at the present time, Century West Engineering Corporation should be notified so that supplemental recommendations can be given.

This report is issued with the understanding that it is the responsibility of the Owner, or of his representative, to insure that the information and recommendations contained herein are brought to the attention of the Structural Engineer for the project and incorporated into the plans, and that the necessary steps are taken by the Owner to carry out such recommendations in the field. Placement and compaction of fill and construction materials should be observed and tested by a certified materials testing lab working under the direction of a Geotechnical Engineer.

The findings of this report are valid as of the present date; however, changes in the condition of a property can occur with the passage of time, whether they be due to natural process, or the works of man on this or adjacent properties. In addition, changes in applicable or appropriate standards may occur in the future from legislation and the broadening of knowledge.

Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of our control. These opinions have been derived in accordance with the current standard of practice and no warranty is expressed or implied.

If you have any questions concerning this report or the exploration, do not hesitate to contact our office.

Sincerely

Glenn E. Cook, P.E.
Geotechnical Engineer

ADDENDUM 1

Figure 1

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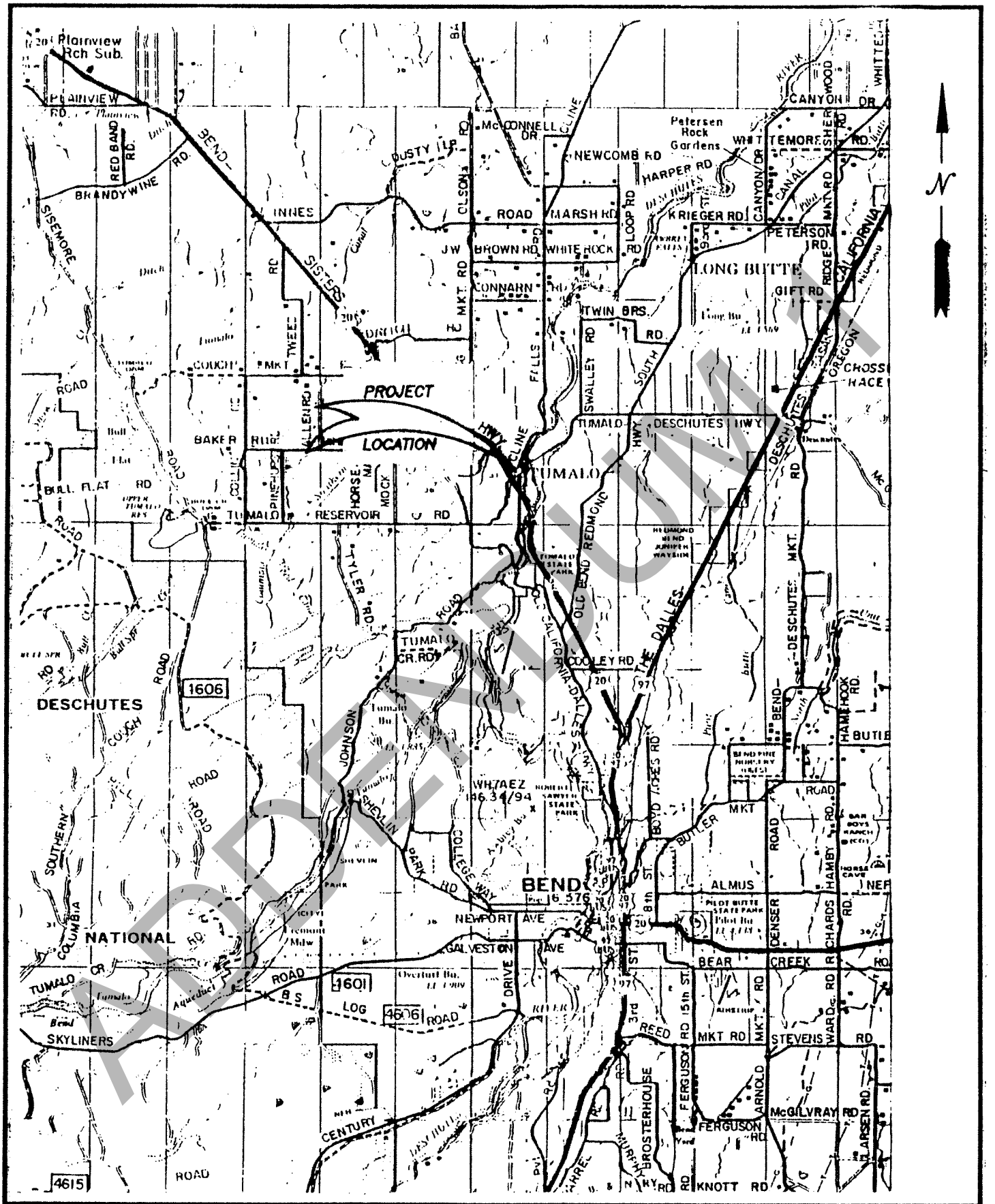
ENGINEERING CORPORATION

LEADING THROUGH EFFECTIVE SOLUTIONS



DESIGNED BY: GEC	CHECKED BY: GEC	VICINITY MAP TUMALO ELEMENTARY SCHOOL TUMALO, OREGON	DATE: 12/93	FIGURE: 1
DRAWN BY: REH	SCALE: NA		CENTURY WEST ENGINEERING	
PROJECT NO.: 11053.002.05				

Figure 2

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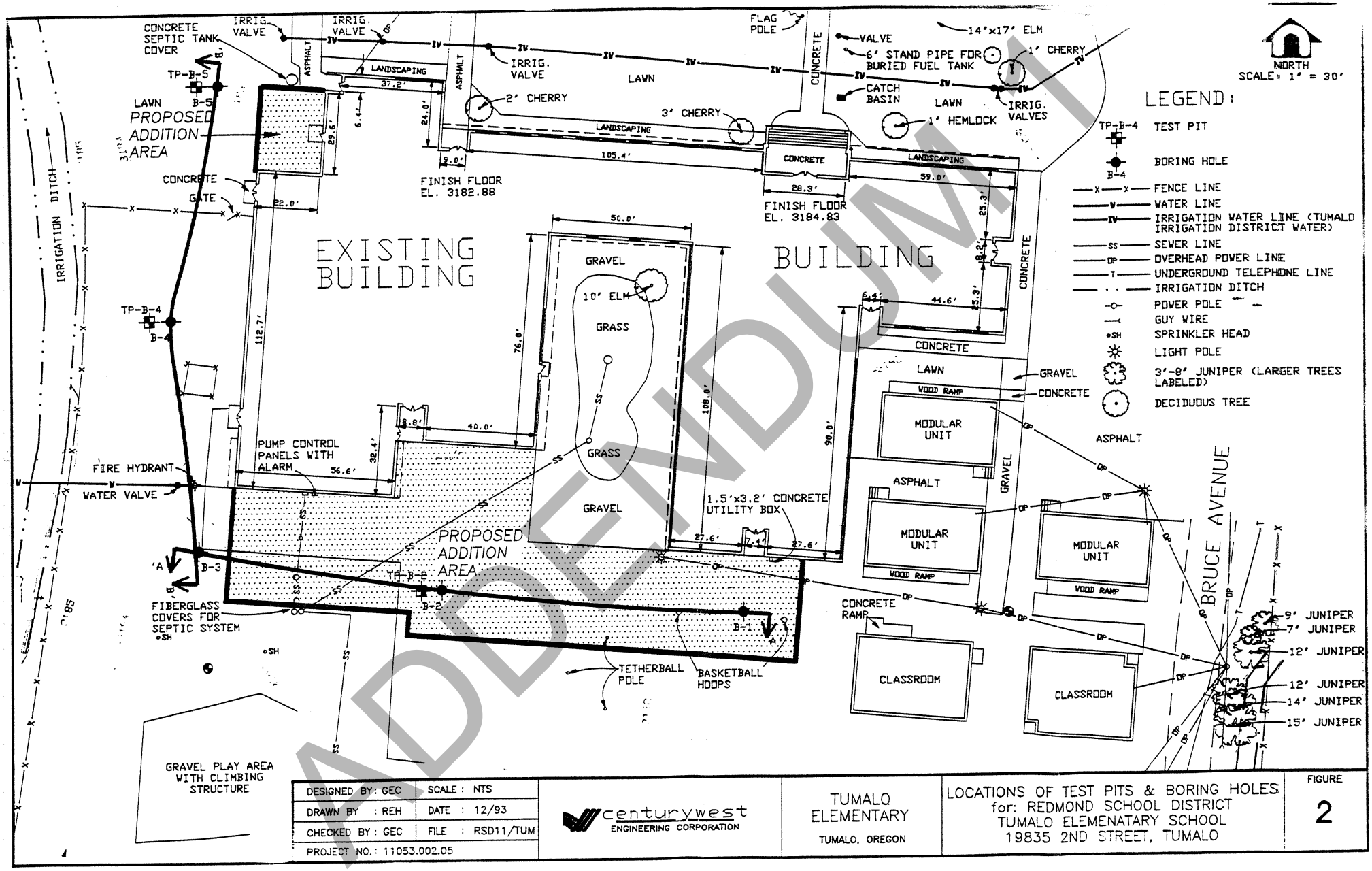
ENGINEERING CORPORATION

LEADING THROUGH EFFECTIVE SOLUTIONS



ADDENDUM 1

DESIGNED BY: GEC	SCALE: NTS
DRAWN BY: REH	DATE: 12/93
CHECKED BY: GEC	FILE: RSD11/TUM
PROJECT NO.: 11053.002.05	

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TUMALO ELEMENTARY
TUMALO, OREGON

LOCATIONS OF TEST PITS & BORING HOLES
for: REDMOND SCHOOL DISTRICT
TUMALO ELEMENATARY SCHOOL
19835 2ND STREET, TUMALO

FIGURE 2

Figure 3

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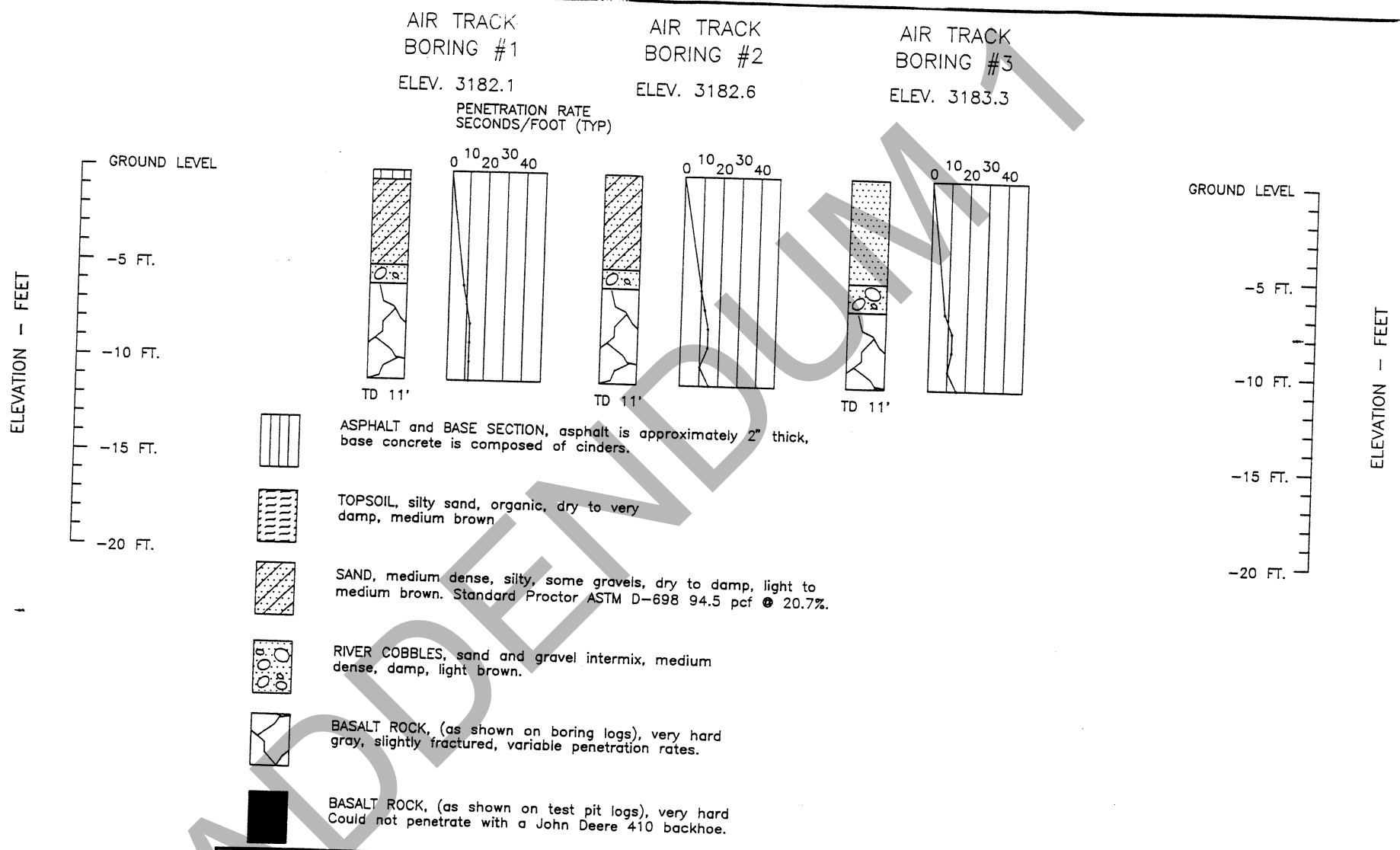
LEADING THROUGH EFFECTIVE SOLUTIONS



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DRAWN BY : REH	DATE : 11/93
CHECKED BY : GEC	FILE : RSD11\TUM
PROJECT NO.: 11053.002.05	

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TUMALO ELEMENTARY
TERREBONNE, OREGON

PROFILES AND LOGS OF EXPLORATORY BORINGS for: REDMOND SCHOOL DISTRICT

FIGURE 3

Figure 4

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LEADING THROUGH EFFECTIVE SOLUTIONS

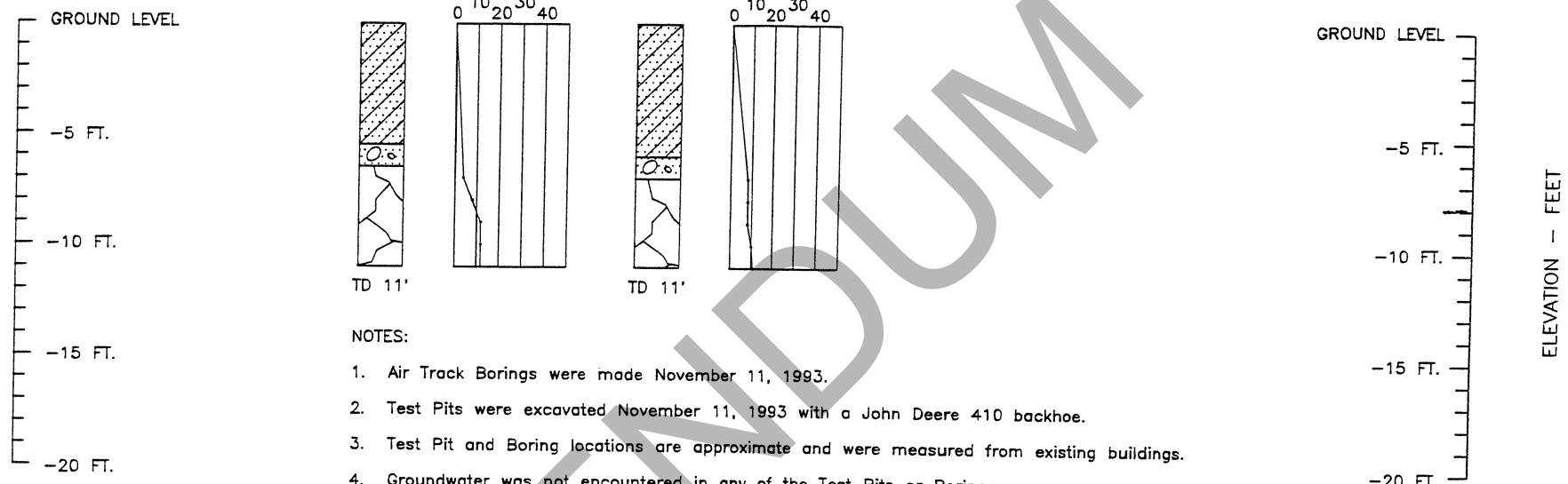
AIR TRACK
BORING #1

ELEV. 3183.4

AIR TRACK
BORING #5

ELEV. 3183.2

PENETRATION RATE
SECONDS/FOOT (TYP)



NOTES:

1. Air Track Borings were made November 11, 1993.
2. Test Pits were excavated November 11, 1993 with a John Deere 410 backhoe.
3. Test Pit and Boring locations are approximate and were measured from existing buildings.
4. Groundwater was not encountered in any of the Test Pits or Borings.
5. Test Pit and Boring Logs are reprensentative of the locations explored. Conditions could be different elsewhere.
6. Logs shown are subject to the explanations, conclusions, recommendations and limitations of this report.

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DRAWN BY : REH	DATE : 11/93
CHECKED BY : GEC	FILE : RSD11\TUM
PROJECT NO.: 11053.002.05	

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ENGINEERING CORPORATION

TUMALO
ELEMENTARY
TUMALO, OREGON

PROFILES AND
LOGS OF EXPLORATORY BORINGS
for: REDMOND SCHOOL DISTRICT

FIGURE
4

Figure 5

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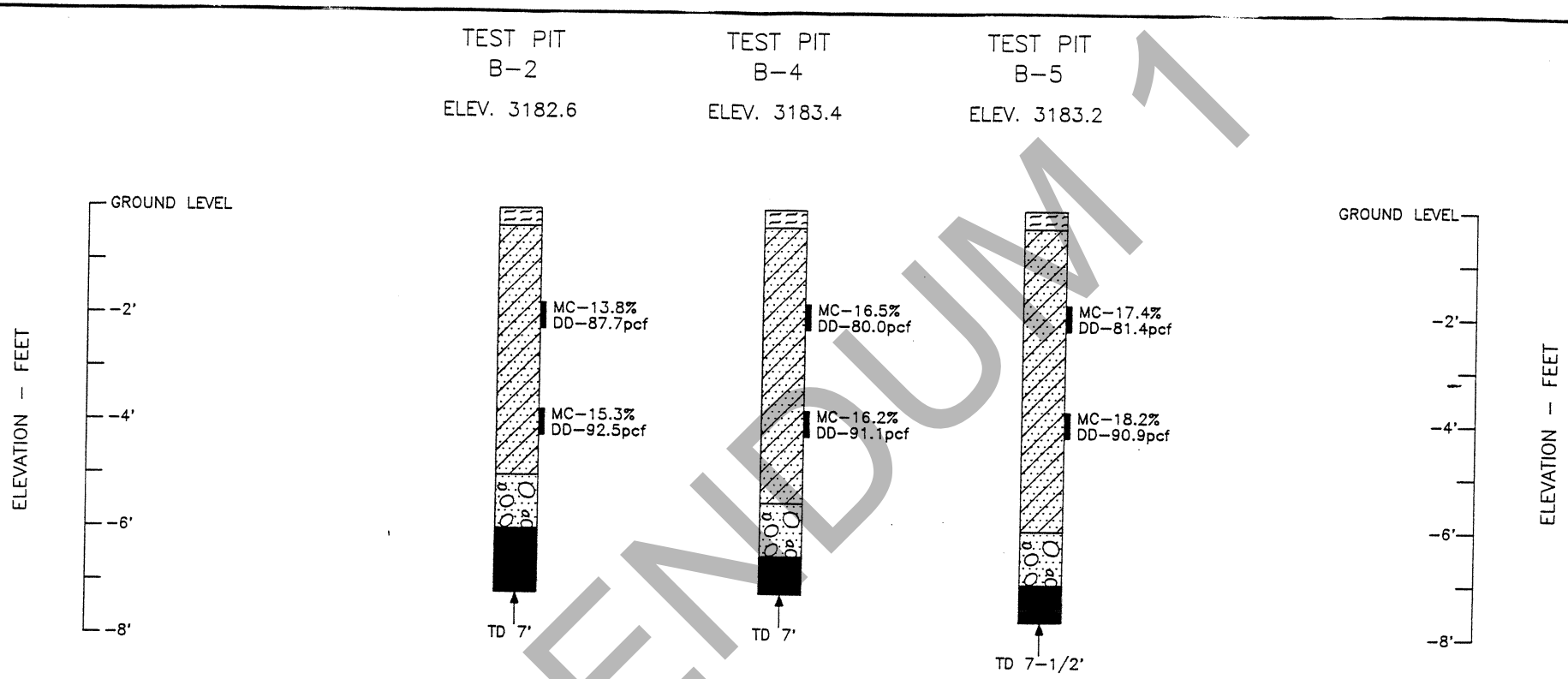
ENGINEERING CORPORATION

LEADING THROUGH EFFECTIVE SOLUTIONS



Indicates depth at which bulk sample of soils was taken.

Indicates the depth at which refusal was encountered a John Deere 410 backhoe.

MC- Indicates moisture content of sample in percent of dry weight

DD- Indicates dry density of soil in pounds per cubic foot

DESIGNED BY: GEC	SCALE : NA
DRAWN BY : REH	DATE : 11/93
CHECKED BY : GEC	FILE : RSD11\TUM
PROJECT NO.: 11053.002.05	

centurywest ENGINEERING CORPORATION

TUMALO ELEMENTARY
TUMALO, OREGON

PROFILES AND LOGS OF EXPLORATORY BORINGS for: REDMOND SCHOOL DISTRICT

FIGURE 5

Figure 6

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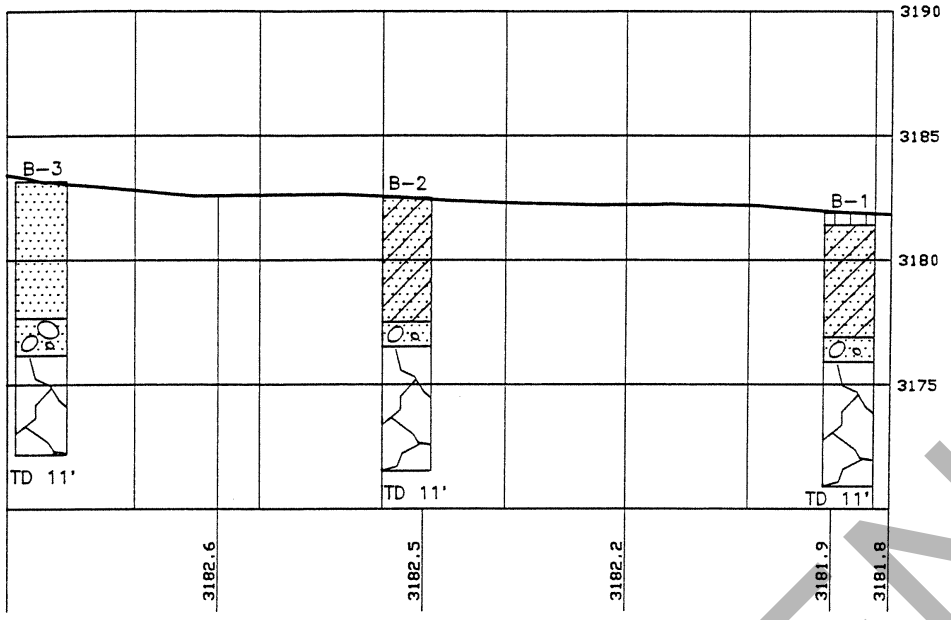
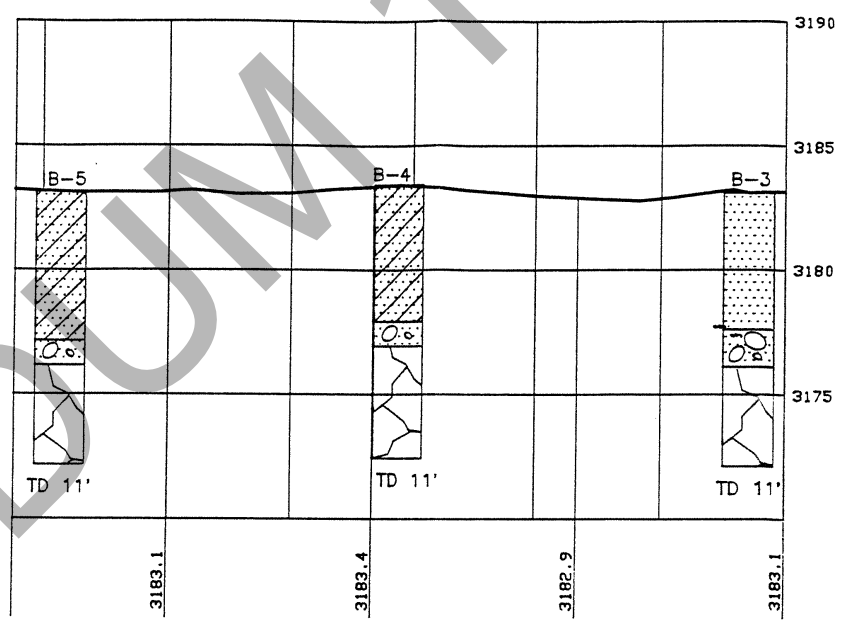
ENGINEERING CORPORATION

LEADING THROUGH EFFECTIVE SOLUTIONS

SEC 'A – A'



SEC 'B – B'



HORIZONTAL SCALE: 1" = 30'
VERTICAL SCALE: 1" = 5'

DESIGNED BY: GEC	SCALE: NA
DRAWN BY : REH	DATE : 11/83
CHECKED BY: GEC	FILE : RSD11\TUM
PROJECT NO.: 11053.002.05	

centurywest ENGINEERING CORPORATION

TUMALO ELEMENTARY
TUMALO, OREGON

CROSS SECTIONS
OF EXPLORATORY BORINGS
for: REDMOND SCHOOL DISTRICT

FIGURE
6

THE GALLI GROUP
Geotechnical Consulting

02-6101-01
February 28, 2022

Sy Allen, Principal Engineer
ZCS Engineering & Architecture
900 Klamath Avenue
Klamath Falls, Oregon 97601

C/o Stephen Chase, Lead Designer
ZCS Engineering & Architecture
127 NW D Street
Grants Pass, Oregon 97526

SUBJECT: SEISMIC HAZARDS REVIEW
TUMALO COMMUNITY SCHOOL
19835 2nd STREET
TUMALO, OREGON

Mr. Chase:

This report presents the results of our preliminary review and evaluation of the Tumalo Community School for a potential Seismic Retrofit of the existing school structures. The subject school is located at 19835 2nd Street, in Tumalo, Oregon.

The purpose of this memo report was to conduct a planning level review and seismic risk assessment (office studies) in order to provide preliminary geologic information and evaluate the likelihood and consequences of geotechnical/geologic related seismic failures, including liquefaction and landslide potential during the design seismic event, for consideration regarding the potential seismic retrofit.

SITE AND PROJECT DESCRIPTION

The site is currently occupied by a functioning elementary school. The school facilities currently consist of a complex of multiple structures with direct/adjacent connections. The school complex is surrounded by lawn/landscaping areas, access roads, parking lots, walkways, play fields and open space. The site is relatively flat and the undeveloped portions of the site consist of well-maintained lawn and scattered trees.

We understand the ZCS Engineering and Architecture consulting design team is conducting a preliminary facilities review to determine the level and extent of seismic retrofit needed for the structures on this campus. Their review will be based, in part, on the evaluation of the potential geologic hazards (such as liquefaction) provided in this report, and an evaluation of the potential structural damage to these facilities associated with the design seismic event.

This evaluation and the findings and conclusions of the facilities review will also likely be used to pursue grant funding for completion of the seismic retrofit work.

SITE SOIL AND WATER CONDITIONS

The site subsurface soils and water conditions were reviewed based on information provided in a previous geotechnical investigation accomplished by Century West Engineering Corporation at this site (accomplished in March 1994 as part of the large addition to southern end of the school structure). We also reviewed the available nearby water well and geotechnical boring logs (Oregon Water Resources Department website).

Soils. From our review, it appears the upper subsurface soils across the site are relatively uniform across the site. The surficial soils in the upper 5 to 6 feet beneath the surface consist of medium dense to dense silty, Sands with scattered gravels. This is underlain by a 2' to 3' layer of medium dense to dense sandy Gravels and Cobbles. Practical refusal in the test pits, accomplished using a John Deere 410 backhoe, was encountered at depths ranging 7' to 7.5' below the surface at the top of the underlying fractured basalt rock. All of the Test Pits and Borings accomplished on the subject parcel terminated in the very dense, stable unit of fractured basalt rock.

Groundwater. Groundwater was not encountered in any of the Test Pits or Borings during Century West's geotechnical investigation. We do not anticipate the water table getting close to the surface, given the subsurface conditions encountered and underlying fractured basalt rock. Ground water will likely not be an issue on this site during construction of the project. Regional groundwater levels will be 100 feet or deeper. However, due to the shallow, dense, weathered to fractured rock it would appear that during very wet months there could be small amounts of seepage of perched water on top of the underlying rock.

Please note that the soils and water conditions are described as distinct layers, while in nature they may change more gradually. Soils conditions may also change somewhat at other locations across the project site.

SITE GEOLOGY AND SEISMIC INDUCED HAZARDS REVIEW

Summary of Site Geology. Mapped geologic units in the project area consist primarily of Alluvial Fan deposits and volcanic bedrock members of the Deschutes Bend Tuffs Formations (Sherrod, et al., 2004). Beneath the surficial Sand and Gravel/Cobble soils, the mapped bedrock unit at the project site consists of the deeply embedded volcanic rocks comprised of basaltic andesite and volcaniclastic ashflow tuff. Based on the site subsurface information provided by Century West, the bedrock encountered on the subject site was described as basalt bedrock.

Flooding. The site is not within a 100-year floodplain of any river or streams according to FEMA and Oregon HazVu mapping.

Landslides/Slope Instability. The project site is relatively flat and is not located within a mapped Quaternary landside area (Qls), based on our review of the state landslide database (Statewide Landslide Information Database for Oregon; SLIDO, 2017) and aerial photos

(Google Earth, 2020), as well as from the subsurface data obtained from Century West's subsurface investigation. Therefore, possibility of slope failure, rock fall or slide run out damage at the site is considered low.

Liquefaction and Lateral Spread Hazard Potential. The project is underlain by medium dense to dense Sands and sandy Gravels and Cobbles. Soils with densities similar to the conditions indicated in the Test Pit and Boring exploration have not been known to liquefy in a seismic event. In addition, groundwater levels appear to be over 100 feet below the ground surface based on nearby well log data. Therefore, liquefaction and lateral spread is considered to be a low to very low potential hazard for this site. See more information in the Preliminary Liquefaction Evaluation section of this report.

Ground Rupture. No large Quaternary faults were identified at the project site. However, mapped fault lines of the Sister Fault Zone are located approximately 0.5 to 1.0 mile from the project. Therefore, the risk of damage at the site due to ground rupture is considered low.

Ground Shaking. Project structures, including foundations and retaining walls, must be designed for very severe ground shaking potential during the anticipated seismic event. The peak modified horizontal acceleration (PGA_M) at this site is 0.253g. This is based on a Site Class D designation, determined for the project from our review of the subsurface Boring and Test Pit data provided by Century West and from our review of nearby well logs. This PGA_M value may be used with an appropriate seismic coefficient in pseudo static analysis, for existing structures evaluation purposes and for design of the seismic upgrades.

Seismic Ground Amplification or Resonance. No unusually hazardous amplification or resonance effects from seismic waves have been associated with the subsurface soil/bedrock conditions in the project area.

Tsunami and Seiche. The site is approximately 85 miles inland from the coast, and not subject to tsunami hazard. The site is not located adjacent to a large lake or body of water, and therefore, not subject to seiche hazard.

PRELIMINARY LIQUEFACTION EVALUATION

The liquefaction phenomenon occurs in cohesionless soils (non-plastic silts and sands) that are saturated and loose (low density, uncompacted or poorly compacted). When loose cohesionless soils are saturated, which is the case when soil is below the water table, then water fills the soil pores. In response to compression (i.e. when a load is applied to the loose, saturated soil), the increases in pressure on the water causes it to attempt to migrate or dissipate towards zones of low pressure (i.e. the water gets pushed/pumped to portions of the soil where the soil pores are not already filled). It should be noted that water, in a practical sense, is an incompressible liquid (very highly resistant to changes in volume when subjected to changes in pressure). Therefore, if the applied load is rapid and large enough, or if it is repeated many times (cyclic loading) like during an earthquake, such that there is not enough time for the water to dissipate before the next cycle of loading is applied, then the water pressure may build up in the pores to a degree where it becomes greater than the grain-to-grain contact stresses of the soil. The grain-to-grain contact stresses are the source of the soil

shear strength and stability which supports structures foundations and overburden soils. This buildup of excess pore water pressure can result in a partial or total loss of the soil strength, at which point the soil will lose all its stability, be deformed (may be observed to flow like a liquid, hence "liquefaction"), and will not likely be able to support structures.

Based on our review, the site is underlain by medium dense to dense Sand and Gravels/Cobbles. Groundwater was not encountered in any of the borings or test pits and nearby well logs show that groundwater is at least 100 feet deep. Soils with these densities and in an unsaturated condition are not known to liquefy in a seismic event. Therefore, in our professional opinion, the potential for liquefaction of the medium dense to dense, sandy and gravelly/cobbly soils that could adversely affect the site or have significant adverse impacts on the structures during a seismic event is low.

CONCLUSIONS AND RECOMMENDATIONS

Based on our field investigation and office review, in our professional opinion the soils conditions at the site are suitable for a conventional seismic retrofit. This school site is not susceptible to large scale liquefaction that will adversely impact the structure. However, prior to final design and construction, more detailed geotechnical investigation and laboratory testing will be necessary to provide support/mitigation recommendations.

Given the alluvial nature of the site soils, additional borings around the structures may encounter sandy soils layers. These soils could potentially be liquefiable. However, these are likely to be moderate to small in size/thickness and should not adversely impact the overall site stability or increase the potential damage to the school structures during a seismic event.

If/when the final design and construction phase of work for this seismic retrofit project begins, we anticipate the following additional tasks will need to be accomplished:

1. 2 or 3 additional borings.
2. Laboratory testing for determining expansive index, strength and settlement characteristics of the site soils.
3. Evaluation of data for developing geotechnical design parameters and recommendations (excavations/embedment depths, subgrade preparations, cuts/fills, and foundation/slab support, etc.).
4. Ground motion hazard analysis to determine spectral acceleration parameters for the school structures and retrofit elements.

These items would be provided as part of a final Seismic Retrofit Geotechnical Design Report.

LIMITATIONS

The analyses, conclusions and recommendations contained in this report are based on site conditions as they existed at the time of the study, and assume our review of the soils, rock and groundwater conditions specified in the Century West Geotechnical Investigation Report are representative of soils and groundwater conditions throughout the site. If subsurface

conditions or assumed design information is found to be different, we should be advised at once so that we can review this report and reconsider our recommendations in light of the changed conditions. If there is a significant lapse of time (5 years) between submission of this report and the start of work at the site, if the project is changed, or if conditions have changed due to acts of God or construction at or adjacent to the site, it is recommended that this report be reviewed in light of the changed conditions and/or time lapse.

This report was prepared for the use of the ZCS Engineering and Architecture and their design team for evaluation purposes. It should be made available to contractors for information and factual data only. This report should not be used for contractual purposes as a warranty of site subsurface conditions. It should also not be used at other sites or for projects other than the one intended.

We have performed these services in accordance with generally accepted geotechnical engineering and professional geology practices in Oregon, at the time the study was accomplished. No other warranties, either expressed or implied, are provided.

THE GALLI GROUP
GEOTECHNICAL CONSULTING

Dennis Duru, M.Sc., R.G.
Project Geologist

EXPIRES: 01/01/23

Melvin J. Galli III, P.E.
Senior Principal Engineer

Bibliography

Sherrod, D., Taylor, E., Ferns, M., Scott, W., Smith, G., & Conrey, R. (2004). *Geologic map of the Bend 30- x 60- Minute Quadrangle, Central Oregon.* USGS.

Appendix E: Construction Cost Estimate Worksheets

ENGINEER'S OPINION OF PROBABLE COST - TUMALO COMMUNITY 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%	%		$ 137,307.50
Preconstruction Services		2%	%		$ 27,461.50
Escalation		7%	%		$ 107,649.08
Bonding & Insurance		3%	%		$ 46,135.32
Contractor Profit & Overhead		5%	%		$ 76,892.20
				General Conditions Subtotal	$ 395,445.60
Non-Structural Elements					
Misc MEP	N1, N2, N3, N4, N5, N11, N12, N13 N14 N15	1	Lump Sum	$ 90,000.00	$ 90,000.00
Misc Non-Structural	N7, N8, N9, N10	1	Lump Sum	$ 36,000.00	$ 36,000.00
				Non-Structural Subtotal	$ 126,000.00
Construction Cost Per Building Part					
				Building Part 'A' Subtotal	$ -
				Building Part 'E' Subtotal	$ 898,000.00
				Building Part 'H' Subtotal	$ 161,075.00
				Building Part 'D' Subtotal	$ 188,000.00
				Sub-Total Construction Cost	$ 1,768,500.00
				Contingency 15%	$ 265,275.00
				Total Construction Cost	$ 2,033,775.00
Cost Estimate Summary					
Engineering					$ 289,400.00
Architectural Consulting				$ 30,500.00	
Structural / Rehabilitation Engineering				$ 223,700.00	
Geotechnical Consulting				$ 20,000.00	
Materials Testing for Design				$ 10,200.00	
URM Tier 3 Analysis				$ 5,000.00	
Construction Management					$ 61,000.00
Construction					$ 1,839,700.00
Sub-Total Construction Cost				$ 1,768,500.00	
Special Inspection Services for Construction				$ 10,200.00	
Permitting Fees				$ 61,000.00	
Relocation of FF&E					$ 26,500.00
Contingency					$ 265,275.00
				Total Project Funding Requirement	$ 2,481,875.00

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

BUILDING PART - 'D'

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	S2A, S10, S11	3000	Square Foot	$ 2.00	$ 6,000.00
Soft Demolition	S1A, S2A, S4A, S5, S6, S13	2000	Square Foot	$ 2.00	$ 4,000.00
Hard Demolition	S2A, S4A	400	Square Foot	$ 20.00	$ 8,000.00
Abatement	S4A	200	Square Foot	$ 5.00	$ 1,000.00
			Demolition & Asbestos Subtotal		$ 19,000.00
Foundation / Floor Strengthening Construction					
Shear Wall Footings - Wood Walls	S2A	30	Linear Foot	$ 300.00	$ 9,000.00
			Foundation Level Subtotal		$ 9,000.00
Wall Strengthening Construction					
Interior Wall Finish Repair	S1A, S4A, S5, S13	600	Square Foot	$ 2.00	$ 1,200.00
Painting	S1A, S4A, S5, S13	2000	Square Foot	$ 3.00	$ 6,000.00
Light Steel Columns	S13	44	EA	$ 1,500.00	$ 66,000.00
New CMU / Concrete Shear Walls	S4A	200	Square Foot	$ 30.00	$ 6,000.00
			Wall Strengthening Subtotal		$ 79,200.00
Roof Strengthening Construction					
New Roof Sheathing	S10, S11	3000	Square Foot	$ 4.00	$ 12,000.00
New Composite Roof Shingles	S10, S11	3000	Square Foot	$ 10.00	$ 30,000.00
Diaphragm Attachments - Out-of-Plane	S5. S6, S12	240	Linear Foot	$ 50.00	$ 12,000.00
Diaphragm Attachments - In-Plane Shear	S1A, S7	240	Linear Foot	$ 20.00	$ 4,800.00
Seismic Isolation from Adjacent Building	S2A	40	Linear Foot	$ 400.00	$ 16,000.00
Ceiling Repair	S1A, S2A, S4A, S5, S6, S13	2000	Square Foot	$ 3.00	$ 6,000.00
			Roof Strengthening Subtotal		$ 80,800.00
			Building Part 'D' - Total Construction Cost		$ 188,000.00

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

BUILDING PART - 'E'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 7.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Abatement	S1A, S1B, S2A, S3, S5, S6, S7, S12	4400	Square Foot	$ 5.00	$ 22,000.00
TPO / Comp / Metal Roof Demo	S9, S10, S11	9000	Square Foot	$ 2.00	$ 18,000.00
Hard Demolition	S1B, S13	200	Square Foot	$ 20.00	$ 4,000.00
Soft Demolition	S1B	3000	Square Foot	$ 2.00	$ 6,000.00
			Demolition & Asbestos Subtotal		$ 50,000.00
Foundation / Floor Strengthening Construction					
Flooring Protection	S14	5500	Square Foot	$ 6.00	$ 33,000.00
Concrete Repair & Patching	S1B, S13	1600	Square Foot	$ 15.00	$ 24,000.00
Bolting of Extg Walls to footings	S1A, S4B	300	Linear Foot	$ 35.00	$ 10,500.00
Spread Footings for Columns / Holdown	S1B, S13	3	Each	$ 4,000.00	$ 12,000.00
			Foundation Level Subtotal		$ 79,500.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S1A, S4B	3000	Square Foot	$ 5.00	$ 15,000.00
Interior Wall Finish Repair	S1A, S4B	3000	Square Foot	$ 2.00	$ 6,000.00
Painting	S1A, S4B	6000	Square Foot	$ 3.00	$ 18,000.00
Steel Spandrel	S1B	250	Linear Foot	$ 600.00	$ 150,000.00
Light Steel Columns	S1B	103	EA	$ 1,500.00	$ 154,500.00
Heavy Steel Columns	S1B	3	EA	$ 7,500.00	$ 22,500.00
			Wall Strengthening Subtotal		$ 366,000.00
Roof Strengthening Construction					
New Roof Sheathing	S9, S10, S11	9000	Square Foot	$ 4.00	$ 36,000.00
Diaphragm Attachments - In-Plane Shear	S1A, S7	400	Linear Foot	$ 20.00	$ 8,000.00
Existing Beam Strengthening	S14	5	EA	$ 15,000.00	$ 75,000.00
New 6" polyisociurinate rigid insulation	S9, S10, S11	6400	Square Foot	$ 15.00	$ 96,000.00
New Composite Roof Shingles	S9, S10, S11	9000	Square Foot	$ 10.00	$ 90,000.00
Seismic Isolation from Adjacent Building	S2B	130	Linear Foot	$ 400.00	$ 52,000.00
Diaphragm Attachments - Out-of-Plane	S3, S5, S6, S12	300	Linear Foot	$ 50.00	$ 15,000.00
Ceiling Repair	S1A, S1B, S2A, S3, S5, S6, S7, S12	3000	Square Foot	$ 3.00	$ 9,000.00
New Drag Beam Attachments	S7, S8	8	EA	$ 2,500.00	$ 20,000.00
New Wood Beams	S1B, S8	50	Linear Foot	$ 30.00	$ 1,500.00
			Roof Strengthening Subtotal		$ 402,500.00
			Building Part 'E' - Total Construction Cost		$ 898,000.00

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

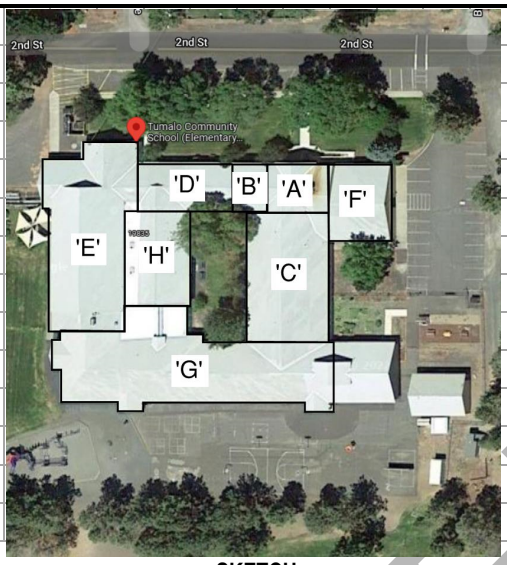
BUILDING PART - 'H'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 4.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Abatement	S1A, S4B, S5, S6, S7, S12	1800	Square Foot	$ 5.00	$ 9,000.00
TPO / Comp / Metal Roof Demo	S11	4000	Square Foot	$ 2.00	$ 8,000.00
Hard Demolition	S4B	200	Square Foot	$ 20.00	$ 4,000.00
Soft Demolition	S1A, S4B, S5, S6, S7, S12	1800	Square Foot	$ 2.00	$ 3,600.00
			Demolition & Asbestos Subtotal		$ 24,600.00
Foundation / Floor Strengthening Construction					
Shear Wall Footings - Wood Walls	S4B	50	Linear Foot	$ 300.00	$ 15,000.00
Concrete Repair & Patching	S4B	200	Square Foot	$ 15.00	$ 3,000.00
Bolting of Extg Walls to footings	S4B	75	Linear Foot	$ 35.00	$ 2,625.00
Floor Finish Patch / Replacement	S4B	200	Square Foot	$ 7.00	$ 1,400.00
			Foundation Level Subtotal		$ 22,025.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S4B	750	Square Foot	$ 5.00	$ 3,750.00
Interior Wall Finish Repair	S4B	1500	Square Foot	$ 2.00	$ 3,000.00
Painting	S4B	1500	Square Foot	$ 3.00	$ 4,500.00
Light Steel Columns	S5, S6, S12, S13	22	EA	$ 1,500.00	$ 33,000.00
			Wall Strengthening Subtotal		$ 44,250.00
Roof Strengthening Construction					
Re-Nail Existing Plywood	S11	4000	Square Foot	$ 3.00	$ 12,000.00
New Composite Roof Shingles	S11	4000	Square Foot	$ 10.00	$ 40,000.00
Diaphragm Attachments - In-Plane Shear	S1A, S7	260	Linear Foot	$ 20.00	$ 5,200.00
Diaphragm Attachments - Out-of-Plane	S5, S6, S12	100	Linear Foot	$ 50.00	$ 5,000.00
Ceiling Repair	S1A, S4B, S5, S6, S7, S12	1000	Square Foot	$ 3.00	$ 3,000.00
New Drag Beam Attachments	S8	2	EA	$ 2,500.00	$ 5,000.00
			Roof Strengthening Subtotal		$ 70,200.00
			Building Part 'H' - Total Construction Cost		$ 161,075.00

Appendix F:
Rapid Visual Screening

Rapid Visual Screening of Buildings for Potential Seismic Hazards
FEMA P-154 Data Collection Form

Desc_sch11A **Level 1**
MODERATELY HIGH Seismicity



SKETCH

Address: 19835 2nd Street
Tumalo, OR **Zip:** 97703
Other Identifiers: Classroom
Building Name: Tumalo Community School
Use: Education
Latitude: 44.1512 **Longitude:** 121.3328
S_S: 0.386 **S_1:** 0.20
Screener(s): SLC **Date/Time:** 11/05/21

No. Stories: Above Grade: 1 Below Grade: 1 **Year Built:** 1918 ☑ EST
Total Floor Area (sq. ft.): 1,600 **Code Year:**
Additions: ☐ None ☑ Yes, Year(s) Built: 1930, 1958, 1970

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) Elevation Step
☐ Plan (type)

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 URM ☐ 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, $S_{L1} \geq S_{MIN}$: 0.6 FEMA-154 Collapse Potential - High > 10%

EXTENT OF REVIEW

Exterior: ☐ Partial ☑ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☑ Entered
Drawings Reviewed: ☐ Yes ■ No
Soil Type Source: N/A
Geologic Hazards Source: DOGAMI
Contact Person: Stephen Chase

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

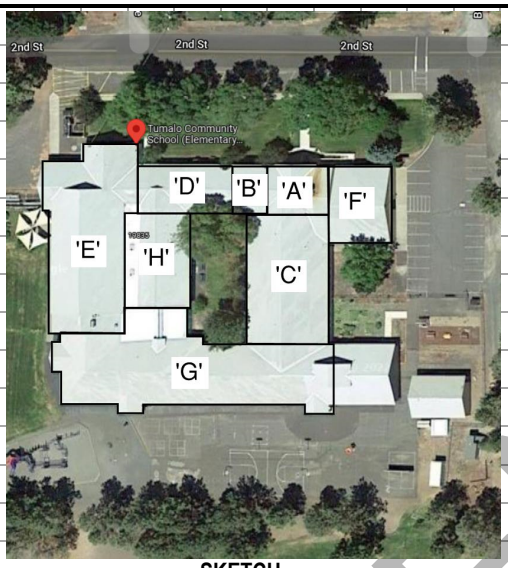
Detailed Nonstructural Evaluation Recommended? *(check one)*

☐ 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

Rapid Visual Screening of Buildings for Potential Seismic Hazards Desc_sch11B **Level 1**
FEMA P-154 Data Collection Form **MODERATELY HIGH Seismicity**



SKETCH

Address: 19835 2nd Street
Tumalo, OR **Zip:** 97703
Other Identifiers: Classroom
Building Name: Tumalo Community School
Use: Education
Latitude: 44.1512 **Longitude:** 121.3328
S_S: 0.386 **S_1:** 0.20
Screener(s): SLC **Date/Time:** 11/05/21

No. Stories: Above Grade: 1 Below Grade: **Year Built:** 1930 ☑ EST
Total Floor Area (sq. ft.): 1,200 **Code Year:**
Additions: ☐ None ☑ Yes, Year(s) Built: 1950

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) Elevation Step
☐ Plan (type)

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 URM ☐ 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, $S_{L1} \geq S_{MIN}$: 0.6 FEMA-154 Collapse Potential - High > 10%

EXTENT OF REVIEW

Exterior: ☐ Partial ☑ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☑ Entered
Drawings Reviewed: ☐ Yes ■ No
Soil Type Source: N/A
Geologic Hazards Source: DOGAMI
Contact Person: Stephen Chase

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)*

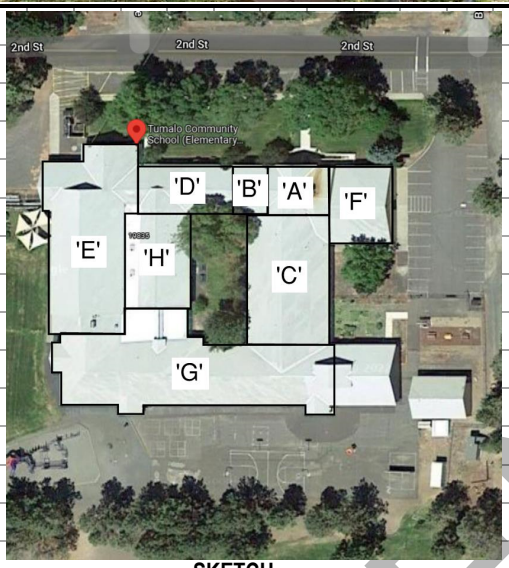
☐ Yes, nonstructural hazards identified that should be evaluated
☑ No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
☐ No, no nonstructural hazards identified ☐ DNK

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

Rapid Visual Screening of Buildings for Potential Seismic Hazards
FEMA P-154 Data Collection Form

Desc_sch11C **Level 1**
MODERATELY HIGH Seismicity



SKETCH

Address: 19835 2nd Street
Tumalo, OR **Zip:** 97703
Other Identifiers: Classroom
Building Name: Tumalo Community School
Use: Education
Latitude: 44.1512 **Longitude:** 121.3328
S_S: 0.386 **S_1:** 0.20
Screener(s): SLC **Date/Time:** 11/05/21

No. Stories: Above Grade: 1 Below Grade: **Year Built:** 1958 ☑ EST
Total Floor Area (sq. ft.): 7,000 **Code Year:**
Additions: ☐ None ☑ Yes, Year(s) Built: 1994

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 Corner

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

COMMENTS:
Masonry walls are under-reinforced, URM building type screening required.

☐ Additional sketches or comments on separate page

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

FEMA BUILDING TYPE URM ☐ 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, $S_{L1} \geq S_{MIN}$: 0.6 FEMA-154 Collapse Potential - High > 10%

EXTENT OF REVIEW

Exterior: ☐ Partial ☑ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☑ Entered
Drawings Reviewed: ☐ Yes ☑ No
Soil Type Source: N/A
Geologic Hazards Source: DOGAMI
Contact Person: Stephen Chase

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

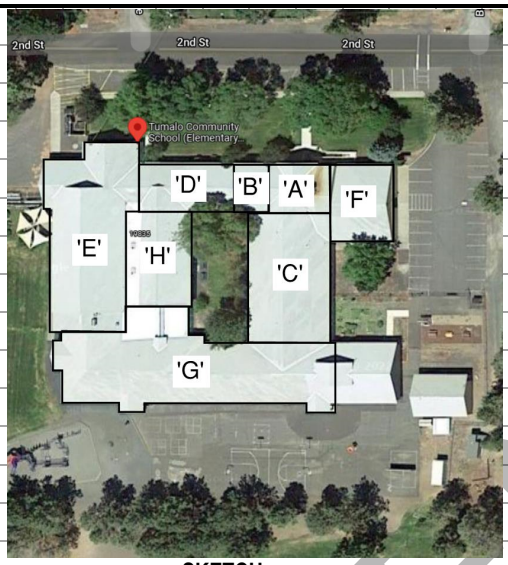
Detailed Nonstructural Evaluation Recommended? *(check one)*

☐ 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

Rapid Visual Screening of Buildings for Potential Seismic Hazards Desc_sch11D **Level 1**
FEMA P-154 Data Collection Form **MODERATELY HIGH Seismicity**



SKETCH

Address: 19835 2nd Street
Tumalo, OR **Zip:** 97703
Other Identifiers: Classroom
Building Name: Tumalo Community School
Use: Education
Latitude: 44.1512 **Longitude:** 121.3328
S_S: 0.386 **S_1:** 0.20
Screener(s): SLC **Date/Time:** 11/05/21

No. Stories: Above Grade: 1 Below Grade: **Year Built:** 1950 ☑ EST
Total Floor Area (sq. ft.): 2,600 **Code Year:**
Additions: ☐ None ☑ Yes, Year(s) Built: 1958, 1986

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 Corner

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

COMMENTS:
Masonry walls are under-reinforced, URM building type screening required.

☐ Additional sketches or comments on separate page

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

FEMA BUILDING TYPE URM ☐ 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, $S_{L1} \geq S_{MIN}$: 0.6 FEMA-154 Collapse Potential - High > 10%

EXTENT OF REVIEW

Exterior: ☐ Partial ■ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☑ Entered
Drawings Reviewed: ☐ Yes ■ No
Soil Type Source: N/A
Geologic Hazards Source: DOGAMI
Contact Person: Stephen Chase

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)*

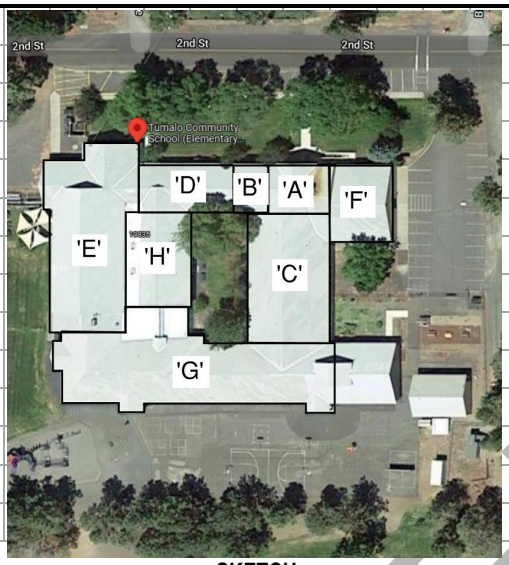
☐ Yes, nonstructural hazards identified that should be evaluated
■ No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
☐ No, no nonstructural hazards identified ☐ DNK

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

Rapid Visual Screening of Buildings for Potential Seismic Hazards
FEMA P-154 Data Collection Form

Desc_sch11E **Level 1**
MODERATELY HIGH Seismicity



SKETCH

Address: 19835 2nd Street
Tumalo, OR **Zip:** 97703
Other Identifiers: Gym, Cafeteria
Building Name: Tumalo Community School
Use: Education
Latitude: 44.1512 **Longitude:** 121.3328
S_S: 0.386 **S_1:** 0.20
Screener(s): SLC **Date/Time:** 11/05/21

No. Stories: Above Grade: 1 Below Grade: **Year Built:** 1958 ☐ EST
Total Floor Area (sq. ft.): 9,000 **Code Year:**
Additions: ☐ None ■ Yes, Year(s) Built: 1986, 1994

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) Adjacent Building
■ Plan (type) Re-entrant Corner

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

COMMENTS:
Masonry walls are under-reinforced, URM building type screening required.

☐ Additional sketches or comments on separate page

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

FEMA BUILDING TYPE URM ☐ 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 FEMA-154 Collapse Potential - High > 10%

EXTENT OF REVIEW

Exterior: ☐ Partial ■ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ■ Entered
Drawings Reviewed: ☐ Yes ■ No
Soil Type Source: N/A
Geologic Hazards Source: DOGAMI
Contact Person: Stephen Chase

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)*

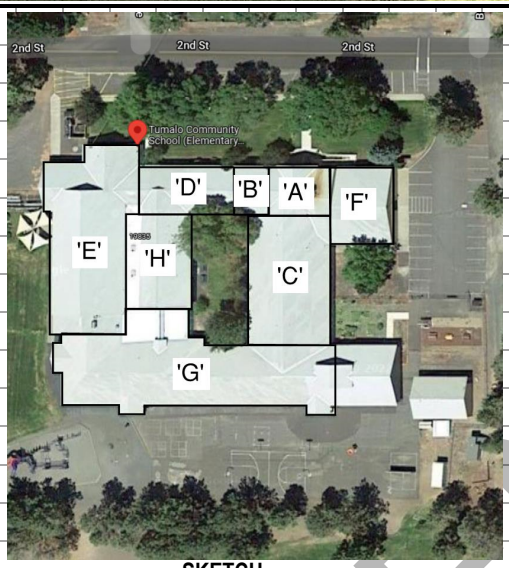
☐ Yes, nonstructural hazards identified that should be evaluated
■ No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
☐ No, no nonstructural hazards identified ☐ DNK

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

Rapid Visual Screening of Buildings for Potential Seismic Hazards
FEMA P-154 Data Collection Form

Desc_sch11F **Level 1**
MODERATELY HIGH Seismicity



SKETCH

Address: 19835 2nd Street
Tumalo, OR **Zip:** 97703
Other Identifiers: Library
Building Name: Tumalo Community School
Use: Education
Latitude: 44.1512 **Longitude:** 121.3328
S_S: 0.386 **S_1:** 0.20
Screener(s): SLC **Date/Time:** 11/05/21

No. Stories: Above Grade: 1 Below Grade: **Year Built:** 1970 ☑ EST
Total Floor Area (sq. ft.): 2,600 **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) Adjacent Building
☑ 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 URM ☐ 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, $S_{L1} \geq S_{MIN}$: 0.3 FEMA-154 Collapse Potential - High > 10%

EXTENT OF REVIEW

Exterior: ☐ Partial ☑ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☑ Entered
Drawings Reviewed: ☐ Yes ☑ No
Soil Type Source: N/A
Geologic Hazards Source: DOGAMI
Contact Person: Stephen Chase

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

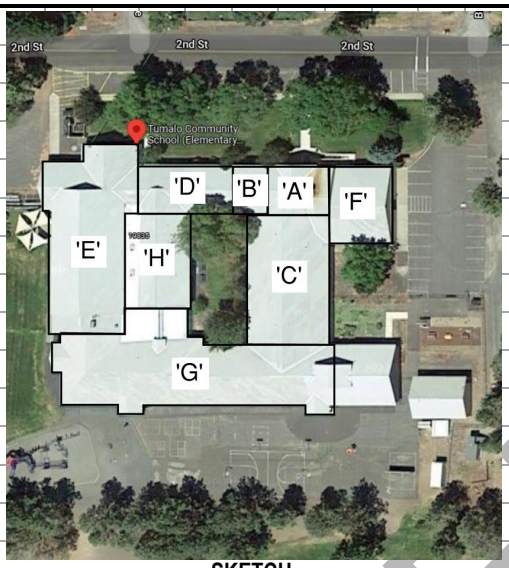
Detailed Nonstructural Evaluation Recommended? *(check one)*

☐ 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

Rapid Visual Screening of Buildings for Potential Seismic Hazards Desc_sch11G **Level 1**
FEMA P-154 Data Collection Form **MODERATELY HIGH Seismicity**



SKETCH

Address: 19835 2nd Street
Tumalo, OR **Zip:** 97703
Other Identifiers: Classroom
Building Name: Tumalo Community School
Use: Education
Latitude: 44.1512 **Longitude:** 121.3328
S_S: 0.386 **S_1:** 0.20
Screener(s): SLC **Date/Time:** 11/05/21

No. Stories: Above Grade: 1 Below Grade: **Year Built:** 1994 ☑ EST
Total Floor Area (sq. ft.): 11,100 **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) Adjacent Building
☑ 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 URM ☐ 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, $S_{L1} \geq S_{MIN}$: 1.3 FEMA-154 Collapse Potential - Moderate < 1%

EXTENT OF REVIEW

Exterior: ☐ Partial ■ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☑ Entered
Drawings Reviewed: ☐ Yes ■ No
Soil Type Source: N/A
Geologic Hazards Source: DOGAMI
Contact Person: Stephen Chase

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)*

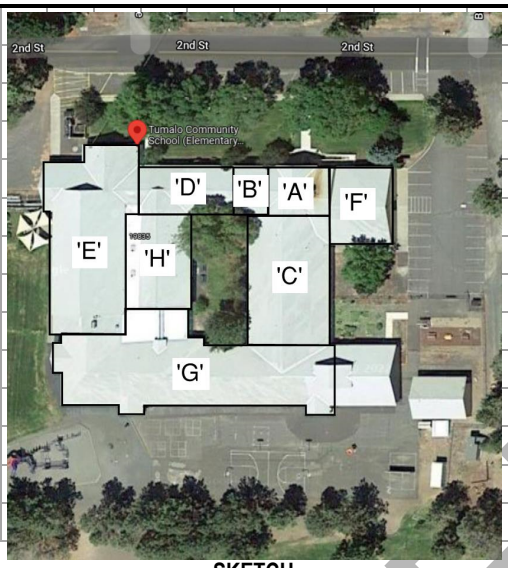
☐ Yes, nonstructural hazards identified that should be evaluated
☑ No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
☐ No, no nonstructural hazards identified ☐ DNK

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

Rapid Visual Screening of Buildings for Potential Seismic Hazards
FEMA P-154 Data Collection Form

Desc_sch11H **Level 1**
MODERATELY HIGH Seismicity



SKETCH

Address: 19835 2nd Street
Tumalo, OR **Zip:** 97703
Other Identifiers: Classroom
Building Name: Tumalo Community School
Use: Education
Latitude: 44.1512 **Longitude:** 121.3328
S_S: 0.386 **S_1:** 0.20
Screener(s): SLC **Date/Time:** 11/05/21

No. Stories: Above Grade: 1 Below Grade: **Year Built:** 1986 ☑ EST
Total Floor Area (sq. ft.): 4,000 **Code Year:**
Additions: ☐ None ☑ Yes, Year(s) Built: 1994

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) Adjacent High Roof
☐ Plan (type)

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

COMMENTS:
Masonry walls are under-reinforced, URM building type screening required.

☐ Additional sketches or comments on separate page

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

FEMA BUILDING TYPE URM ☐ 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, $S_{L1} \geq S_{MIN}$: 0.6 FEMA-154 Collapse Potential - High > 10%

EXTENT OF REVIEW

Exterior: ☐ Partial ■ All Sides ☐ Aerial
Interior: ☐ None ☐ Visible ☑ Entered
Drawings Reviewed: ☐ Yes ■ No
Soil Type Source: N/A
Geologic Hazards Source: DOGAMI
Contact Person: Stephen Chase

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