SWEET HOME SCHOOL DISTRICT

REQUEST FOR PROPOSALS FOR ENGINEERING SERVICES

Oak Heights Elementary School Seismic Rehabilitation Project

CONTRACT ADMINISTRATOR:
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Business Manager
Sweet Home School District
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ISSUE DATE:	Wednesday, April 26, 2023
RFP CLOSING (DUE) DATE	Friday, May 19, 2023 at 4 p.m.

NO LATE RESPONSES WILL BE ACCEPTED

SUBMITTAL LOCATION

Sweet Home School District Business Office
Attention: Kevin Strong
1920 Long Street
Sweet Home, OR 97386

Introduction:
The Sweet Home School District (the "District") is seeking proposals from firms for the structural, mechanical and electrical design for the Seismic Rehabilitation of Oak Heights Elementary School (the "Project"), located at 605 Elm Street, Sweet Home, OR 97386.

In April 2023 the District was awarded a Seismic Rehabilitation Grant ("SRG") for the project through the Infrastructure Finance Authority: Business Oregon, based on the application prepared by ZCS Engineering & Architecture. The intent of this RFP is for the consultant to provide an integrated design solution for the entire building. As part of this grant, a preliminary rehabilitation feasibility report was prepared for each portion of the project and is enclosed. The District was awarded $2,500,000 for the design and construction of the project.

The approximate size of the area at Oak Heights Elementary School to be seismically retrofitted is 32,500 square feet. Most of the school was constructed in the 1950s with additions in the 1970s.

The District is currently working with GLAS Architects for architectural consulting for the project including some modifications to the building layout that will take place during construction allowing for a better learning environment.

The District intends to use either the typical Design-Bid-Build procurement project delivery method or the CM/GC procurement project delivery method for this Project. Pre-Design/Schematic Design would begin immediately upon award and approval of the resulting design contract. Construction is anticipated to occur during the summer of 2024, The Project may be vacated during the construction period.

Scope of Work:

Perform a seismic evaluation of the building, per American Society of Civil Engineers ("ASCE") Standard 41-17 "Seismic Evaluation of Existing Buildings". Develop rehabilitation and mitigation strategies per ASCE Standard 41-17 and the 2019 Oregon Structural Specialty Code ("OSSC"). It is the wish of the District to rehabilitate the building to meet the rehabilitation objective of Immediate Occupancy.

Based on research and evaluation efforts performed during the Seismic Rehabilitation Grant ("SRG") in preparation for the project, the structural improvements listed in the enclosed evaluation report should be considered for the existing structure. Preliminary rehabilitation drawings (enclosed) were prepared to assist in defining the necessary scope of potential rehabilitation work for this structure.

The scope of work also includes the following services:

- Develop all construction documents required for a CM/GC or hard bid construction delivery methods.

    1. Assist the District in the selection process for a CM/GC firm if CM/GC is selected as the method of delivery. The selection process will include the preparation and administration of the "Facts and Finding Report" and the "RFP" for the proposed alternative contracting method as outlined in OAR 137-049-0600.

- Assist the District with the entitlement of the project through the Authorities Having Jurisdiction and the State Historical Preservation Office.

- Provide all construction administration services necessary for the implementation of the project. Services include but are not limited to: Administering a project Log, RFI administration, manage progress meetings, submittal review, change order review and verification of certified pay requests.

- Assist District Staff with SRG reporting requirements as required.

- Conduct project closeout procedures as required by the SRG.

Selection Process:

This Request for Proposals ("RFP") and the selection process will be conducted pursuant to the terms of this RFP, the Oregon Attorney General's Model Rules for Consultant Selection, OAR Chapter 137, Division 48, and the District's applicable Board Policies.

Compensation:

Compensation will be based on a total "not-to-exceed" amount for services and reimbursable expenses, with "not-to-exceed" maximums for the following individual phases of the design: Pre-Design/ Schematic Design, Design Development, Construction Documents, Bidding, and Construction Administration services, including record documentation. The amount of compensation will be negotiated with the Apparent Successful Proposer.

Proposal Requirements:

The Proposer and all firms, subsidiaries and individuals providing professional services shall be currently licensed to practice in each of their respective areas of professional expertise in the State of Oregon, and shall comply with all State of Oregon Architect and Professional Engineer licensure requirements.

The submittal must include the following, in addition to what is required to comply with the Evaluation Criteria below:

- The firm's name, address, phone number, and facsimile number;
- The name of the contact person within the firm and his/her email address;
- A list of the firm's key personnel who would be assigned to this Project, by discipline;
- The name and Oregon registration number of the Project engineer who will serve as the Engineer of Record;
- The names of additional Project engineer(s) the firm proposes to provide services on this project, along with specific projects each of these persons has worked on in the past three years;
- Illustrations or photographs of at least three (3) relevant projects completed by the firm and involving the above named individuals; and
- The construction cost and building area (in gross square feet) of each reference project;

- Date of completion of each reference project;
- Location of each reference project;
- The function of each reference project;
- The construction delivery method used for each reference project;
- Whether the project was completed on schedule and within the budget or not;
- Responsibilities of those involved on each reference project who would provide services on these projects;
- Name, address and current telephone number of the owner representative most appropriate to discuss your firm's performance on each reference project;
- A Gantt chart providing a proposed schedule for the Pre-Design/Schematic Design, Design Development, and Construction Documents phases for each project.

If awarded the Contract, the Proposer must accept, as Contract performance obligations, the duty to actively pursue the plans as set forth in the Proposer's response.

Evaluation Criteria:

Please indicate in writing the following information about your firm's ability and desire to perform this work. Firms will be rated based upon the weight assigned to each item as noted in parentheses at the end of each statement below.

1) Firm Capabilities (15 points)
   a) Describe your firm's background and experience, including company history, length of time in the industry, service area, staffing size and capabilities.
   b) Describe your firm's design philosophy.
   c) Describe your firm's recent (past ten years) experience with design of renovations to public agency facilities (i.e. Fire Stations, Police Stations, Education facilities, etc.), and implementing the agency's design criteria.

2) Project Team (15 points)
   a) Provide your firm's staffing plan and specify key personnel to be assigned to this project. Include an organizational chart, staff roles and a current resume of key personnel.
   b) Describe what scope of services will be provided by proposing firm and whether sub-consultants are needed to complete this work. Identify the sub-consultants and the key personnel of the sub-consultants that you propose to use on this project.

3) Experience with the State of Oregon Seismic Rehabilitation Grant Program (20 points)
   a) Describe your experience completing seismic rehabilitation projects funded by the Business Oregon SRG Program.
   b) Provide record of performance on previously completed projects funded by the Business Oregon SRG Program. Indicate whether the project met budget and schedule expectations.
   c) Provide case studies on three (3) similar projects completed within the last five years. Include information about the size, construction type, building uses, construction delivery method and whether the project was completed on time and within budget.

4) Record of Performance & References (20 points)
    a) Describe your firm's past record of performance on contracts with governmental agencies and private owners with respect to such factors as cost control, quality of work, ability to meet schedules, and contract administration.
    b) Three (3) letters of reference must be provided, preferably for projects of similar type and size. Provide contact information for each reference.

5) Project Approach (20 points)
    a) Describe your approach to completing seismic rehabilitation projects and what special services, systems, or qualifications the firm has that would benefit the District in this project. Include familiarity with this project specifically and its specific requirements.
    b) Provide examples of lessons learned and examples of how your firm has worked with Owners and Contractors to minimize surprises during seismic rehabilitation projects.
    c) Proposed cost management & quality control techniques to be employed.

6) Project Location (10 points)
    a) Describe your availability to and familiarity with the area in which the Project is located, including knowledge of design and construction techniques unique to the area.
    b) Describe proposer's plan to maximize and document local participation.

Evaluation Process:

The selection committee will score each submittal on the basis of responses to the evaluation categories. Submittals will be rated based upon the weights assigned to each item as noted in the parentheses at the end of the categories.

Each category will be assigned a weight. Each member of the evaluation committee will rank each firm in each category between 0 and 5, and multiply that number by the weight assigned to the category. The individual evaluation committee members will then total the weighted score from all of the criteria to obtain the total score. The result of this total score will be used to rank all respondents.

The RFP also requires reference information for your firm. The District will utilize this information and any other independently obtained references that can provide background on the firm. This information will not be separately scored, but results obtained from these and/or other reference checks will be utilized in evaluating and scoring in the other categories and in the final ranking.

The evaluation committee will meet and use the individual evaluation committee member rankings as a beginning of their discussion. The discussion of the responses will include firm strengths and weaknesses and the individual evaluation committee member scorings. The committee reserves the option to interview finalists as ranked from the results of the evaluation committee discussion and scoring.

Selection Procedure and Timetable:

The selection procedure described below will be used to evaluate the capabilities of interested firms to provide the professional services to the District for this Project.

Wednesday, April 26, 2023	Issue RFP
Wednesday, May 3, 2023 at 2 p.m.	Optional Site Visit
Wednesday, May 10, 2023 at 2 p.m.	Questions and protests due
Friday, May 12, 2023 at 4 p.m.	Owner's written response to questions
Friday, May 19, 2023 at 4 p.m.	RFP response due
Tuesday, May 23, 2023	Optional interviews with Selection Committee
Monday, June 5, 2023	Notice of Intent to Award
Monday, June 12, 2023 at 4 p.m.	Selection Protest Deadline
Monday, June 12, 2023 at 6:30 p.m.	Board Action to Approve Contract
Tuesday, June 13, 2023	District Finalized Contract with Successful Proposer

Submission:

Submit one original and three (3) copies of your written proposal, along with an electronic version on a USB flash drive, to be received by the closing date and time listed in this document to:

Kevin Strong
Sweet Home School District
1920 Long Street
Sweet Home, OR 97386
Phone: 541-367-7122

Your response must be contained in a document not to exceed fifteen (15) single-sided pages including pictures, charts, graphs, tables and text the firm deems appropriate to be part of the review of the firm's response. Resumes of key individuals proposed to be involved in this project are exempted from the 15-page limit and should be appended to the end of your response. No supplemental information to the 15-page Proposal will be allowed. Appended resumes of the proposed key individuals and client reference letters, along with a transmittal letter, table of contents, front and back covers, and blank section/numerical dividers, etc., will not be counted in the 15-page limit.

Information shall be presented in the same order as the above evaluation criteria. The response should be submitted in soft-bound (comb or spiral, spiral preferred – no three-ring binders) format. The basic text information of the response should be presented in standard business font size (minimum 10-point), and reasonable (prefer 1 (one) inch) margins. Your response must be signed by an officer of your firm with the authority to commit the firm.

The District may reject any submittal not in compliance with all prescribed public bidding procedures and requirements, and may cancel this solicitation or reject for good cause, all responses upon finding by The District that it is in the public interest to do so.

Please note that throughout this Project, the District will not accept responses or queries that require the District to pay the cost of production or delivery.

Telephone, facsimile, or electronically transmitted submittals will not be accepted. Responses received after the closing date and time will not be considered.

Questions:

All questions and contacts with the District regarding any information in this RFP must be addressed in written form to the Contract Administrator at the address, email or fax listed in this document.

Solicitation Protests:

Respondents may submit a written request for clarification or change or protest of particular solicitation provisions and specifications and contract terms and conditions (including comments on any specifications that a firm believes limits competition) to the Contract Administrator at the address, email or fax listed in this document. Such requests and protests must be received no later than 2 p.m. on May 10, 2023. Such requests or protests must state the reasons for the request or protest and any proposed changes to the solicitation provisions and specifications and contract terms and conditions.
Failure to file a protest by this time will be deemed a waiver of any claim by a respondent. The District will issue a written disposition of each such protest no less than three (3) business days before proposals are due. If the District upholds the protest, in whole or in part, the District may, in its sole discretion, issue an addendum reflecting its disposition or take other appropriate action.

Change or Modification:

Any change or modification to the specifications or the procurement process will be in the form of an addendum to the RFP and will be made available to all firms via email from the Contract Administrator. No information received in any manner different than as described herein will serve to change the RFP in any way, regardless of the source of the information. Any request for clarification or change or protest of anything contained in an addendum must be received by the date and time stated in the addendum, or they will not be considered.

Selection Protests:

Any respondent to this RFP who claims to have been adversely affected or aggrieved by the selection of a competing respondent may submit a written protest of the selection to the Contract Administrator at the following address within seven days after notification of that selection:

Kevin Strong
Business Manager
Sweet Home School District
1920 Long Street
Sweet Home, OR 97386
Phone: 541-367-7122
Email: kevin.strong@sweethome.k12.or.us

Any such protests received by the Contract Administrator after the seven days will not be considered. The protest must state clearly the basis (or bases) for the protest and any legal authority in support thereof. At the request of the protester, a hearing will be conducted before District staff. At such hearing, the protester and other interested parties will have the opportunity to appear and make an oral presentation of the basis for protest. The Director of Business Services will either uphold or deny the protest. If the protest is denied, the District will proceed to award the Contract as planned. The selection decision notification will be made by the Contract Administrator via email.

Proprietary Information:

The District will retain this RFP and one copy of each original response received, together with copies of all documents pertaining to the award of a contract. These documents will be made part of a file or record, which will be open to public inspection after responder selection and award is announced. If a response contains any information that is considered a trade secret under ORS 192.501(2), mark each sheet with the following legend: "This data constitutes a trade secret under ORS 192.501(2), and must not be disclosed except in accordance with the Oregon Public Records Law, ORS Chapter 192."

The Oregon Public Records Law exempts from disclosure only bone fide trade secrets, and the exception from disclosure applies only "unless the public interest requires disclosure in the particular instance". Therefore, non-disclosure of documents or any portion of a document submitted as part of a response may depend upon official or judicial determination made pursuant to the Public Records Law.

In order to facilitate public inspection of the non-confidential portion of the response, material designated as confidential must accompany the response, but must be readily separable from it. Prices, makes, model or catalog numbers of items offered, scheduled delivery dates, and terms of payment will be publicly available regardless of any designation to the contrary. Any response marked as a trade secret in its entirety will be considered non-responsive and will be rejected.

Project Contract:

The District is seeking to award a contract to an engineering firm for programming, schematic design, design development, construction documents, bidding, and construction phases. The successful proposer is required to provide and execute a contract satisfactory to the District.

Certification of Compliance with Tax Laws:

By submission of your proposal, the signatory (a duly authorized representative of the submitting firm) must certify that the firm is not, to the best of their knowledge, in violation of any Oregon tax law. For purpose of this certification, "Oregon Tax Laws" means a state tax imposed by ORS 320.005 to 320.150 and 403.200 to 403.250, ORS Chapters 118, 314, 316, 317, 318, 321 and 323; the elderly rental assistance program under ORS 310.630 to 310.706; and local taxes administered by the Oregon Department of Revenue under ORS 305.620.

Insurance Provisions:

During the term of the resulting contract, the successful proposer will be required to maintain in full force, at its own expense, from insurance companies authorized to transact business of insurance in the state of Oregon, each insurance coverage/policy as set forth in the contract.

ESB/MBE/WBE:

The District is committed to increasing opportunities for Emerging Small Businesses and Minority and Women Owned Businesses, and the District strongly encourages its consultants to utilize these businesses in providing services and materials for the District contracts and projects.

Additional Requirements:

Pursuant to OAR 580-061, by submitting a proposal, the proposer certifies that the proposer has not discriminated against Minority, Women or Emerging Small Business Enterprises in obtaining any required subcontracts.

Pursuant to OAR 580-061-0040, Proposers are hereby notified that policies applicable to consultants and contractors have been adopted that prohibit sexual harassment and that proposers and their employees are required to adhere to the District's policy prohibiting sexual harassment in their interactions.

Exhibits:

Exhibit A - Structural Seismic Evaluation Report (including Preliminary Rehabilitation Drawings) prepared by ZCS Engineering & Architecture – Oak Heights Elementary School, Sweet Home School District

End of RFP

Seismic Evaluation Report For:

OAK HEIGHTS ELEMENTARY SCHOOL

605 Elm St, Sweet Home, OR 97386
Sweet Home 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	Main Building	Y	1955	W2	Y	N
B	Gymnasium	Y	1955	W2	Y	N
C	Kindergarten	N				
D	Locker Room	Y	1976	RM1	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	$3,820,150					
Retrofit Square Feet	32,500					
Retrofit Cost per Square Foot	$117.54					
Is the campus within a tsunami, FEMA flood zone, landslide/slope instability, liquefaction potential or other high hazard area? **If so, provide documentation (e.g. the Oregon Statewide Hazards Viewer by DOGAMI). ** Projects within the code defined Tsunami Design Zone require consultation with DOGAMI prior to application submittal. Applicant shall include such documentation with the application.**						**Yes per HazVu, ruled out per Geotech report.**

Note: The hazard level of tsunami, flood zone, landslide/slope instability, and liquefaction must be explicitly answered either via DOGAMI website, DOGAMI consultation, and/or a geotechnical report. If the hazard level is unknown, it must be assumed to exist and be mitigated or otherwise resolved in the conceptual retrofit scope of work.

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 12
	Summary of Mitigation/Retrofit	
☒	Structural Mitigation/Retrofit	Page 10
☒	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

Sweet Home School District is located in Sweet Home, Oregon in Linn County. The District operates six schools located within the community including the property of interest, Oak Heights Elementary. The District or Department has retained ZCS Engineering and Architecture (ZCS) to perform a seismic evaluation of Oak Heights Elementary that provides the District or Department 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	605 Elm St, Sweet Home, OR 97386
Evaluation Standard	ASCE 41-17 (Tier 1 Analysis)
Building's Risk Category	IV
Target Building Performance Level	Immediate Occupancy for BSE-1E and Life Safety for BSE-2E
Target Non-Structural Performance Level	Position Retention for BSE-1E and Hazards Reduced for BSE-2E
ASCE 41 Building Type	W2, RM1
FEMA P-154 Seismicity Region (Table 2-2)	Moderately High
ASCE 41-17 Level of Seismicity (Table 2-4)	High
Cost Estimate	$3,820,150
Cost/Square Foot	$117.54

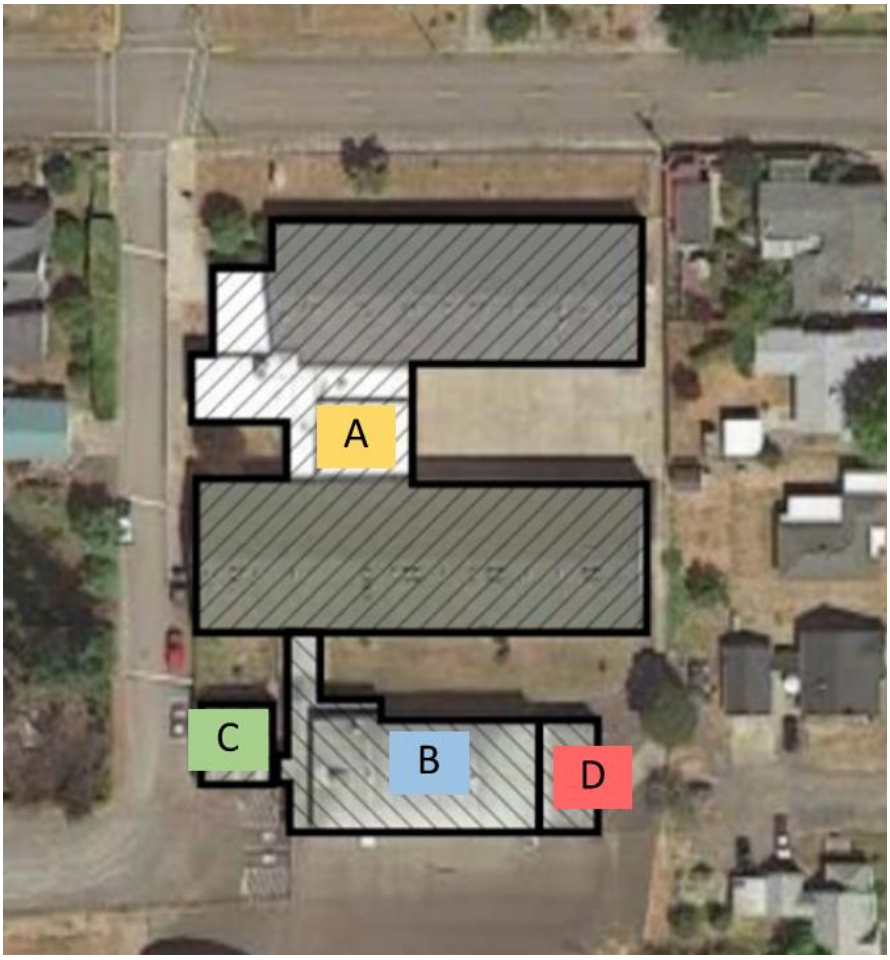
2.0 Building Description

The buildings being considered in this report is the classroom building, gymnasium, and the locker room building. ZCS has reviewed the buildings and their construction to classify their lateral systems as identified in ASCE 41-17. These lateral systems will be used throughout this evaluation. The lateral systems present consist of W2 and RM1. These determinations were made after observing the subject facilities and reviewing the available existing drawings. Descriptions of these structure types are listed below and specifically identify the lateral load resisting systems. In addition to the lateral systems present, ZCS has summarized the gravity load carrying systems of the subject facilities including later in this section.

Wood Frames, Commercial and Industrial W2 – These buildings are commercial or industrial buildings with a floor area of 5,000 ft^2 or more. There are few, if any, interior walls. The floor and roof framing consists of wood or steel trusses, glulam or steel beams, and wood posts or steel columns. The foundation system may consist of a variety of elements. Seismic forces are resisted by wood diaphragms and exterior stud walls sheathed with plywood, oriented strand board, stucco, plaster, or straight or diagonal wood sheathing, or they may be braced with rod bracing. Wall openings for storefronts and garages, where present, are framed by a post-and-beam framing.

Reinforced Masonry Bearing Walls with Flexible Diaphragms RM1 – These buildings have bearing walls that consist of reinforced brick or concrete block masonry. The floor and roof framing consists of steel or wood beams and girders or open web joists and are supported by steel, wood, or masonry columns. Seismic forces are resisted by the reinforced brick or concrete block masonry shear walls. Diaphragms consist of straight or diagonal wood sheathing, plywood, or unstopped metal deck and are flexible relative to the walls. The foundation system may consist of a variety of elements.

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



BUILDING PARTS	
A	Construction Year: 1955 Building Name: Classrooms ASCE 41-17 Building Type: W2 In Scope?: Yes
B	Construction Year: 1955 Building Name: Gym ASCE 41-17 Building Type: W2 In Scope?: Yes
C	Construction Year: 1979 Building Name: Classrooms In Scope?: No
D	Construction Year: 1976 Building Name: Locker Rooms ASCE 41-17 Building Type: RM1 In Scope?: Yes

Figure 1

Oak Heights Elementary School Key Plan

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

Building Part A Construction:

- ASCE 41-17 Building Type(s):
  - W2
- Roof Structure:
  - Straight sheathed roof diaphragm supported by light timber joists
- Walls:
  - Dimensional studs with straight sheathing and brick exterior veneer
- Foundation:
  - Slab-on-grade and concrete strip footing foundation
- Notable Structural Features/Concerns:
  - Window wall on multiple sides of the structure
  - Heavy exterior veneer
  - Buildings are connected with covered exterior canopies consisting of straight sheathed diaphragms, beams, and posts

Building Part B Construction:

- ASCE 41-17 Building Type(s):
  - W2
- Roof Structure:
  - Straight sheathed roof diaphragm supported by light timber joists
- Walls:
  - Dimensional studs with straight sheathing
- Foundation:
  - Slab-on-grade and concrete strip footing foundation
- Notable Structural Features/Concerns:
  - Buildings are connected with covered exterior canopies consisting of straight sheathed diaphragms, beams, and posts

Building Part D Construction:

- ASCE 41-17 Building Type(s):
  - RM1
- Roof Structure:
  - Straight sheathed roof diaphragm supported by light timber joists
- Walls:
  - Reinforced masonry walls
- Foundation:
  - Slab-on-grade and concrete strip footing foundation

3.0 Seismic Evaluation Methodology

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

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

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

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

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

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

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

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

Figure 2

Building Performance Objectives

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

4.0 Seismicity

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

SITE SPECIFIC SEISMICITY	
ASCE 7-16 Site Soil Classification	D
FEMA P-154 Seismicity Region (Table 2-2)	Moderately High
ASCE 41-17 Level of Seismicity (Table 2-4)	High
BSE-1E:	
S_{xs}	0.222
S_{x1}	0.143
Soil Condition Amplification Factors (F_a, F_v)	F_a = 1.6 | F_v = 2.4
BSE-2E:	
S_{xs}	0.639
S_{x1}	0.498
Soil Condition Amplification Factors (F_a, F_v)	F_a = 1.447 | F_v = 2.133

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

5.0 Site Specific Hazards

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

Landslide (Slope Failure)

This project is located within a slope failure/landslide hazard area as identified by the DOGAMI Oregon HazVu. A geotechnical evaluation and report by Galli was conducted on the site. Included in the report is a review of potential site hazards. Per the geotechnical report, attached in Appendix D, landslide is considered a low risk for the site and remediation is not required.

6.0 Deficiencies and Repairs

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

Tier 1 Deficiency Description	Deficiency Statement	Repair Statement	Plan Key Note
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
REDUNDANCY	The number of lines of shear walls in each principal direction is less than 2.	Install new shear walls or steel frames to ensure a minimum of 2 lines of vertical resisting elements in each principal direction.	S3
SHEAR STRESS CHECK	The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is higher than the following values: Structural panel sheathing 1,000 lb/ft Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft All other conditions 100 lb/ft	Install new plywood shear walls to ensure adequate shear capacity.	S4
WOOD SILLS	All wood sills are not bolted to the foundation.	Provide new anchor bolts from wood sills to the foundation.	S5
ROOF CHORD CONTINUITY	Chord elements are discontinuous.	Install new shear walls and drag elements at discontinuous chords.	S6
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.	S7

SPANS	Not all wood diaphragms with spans greater than 12 ft consist of wood structural panels or diagonal sheathing.	Install new plywood diaphragm sheathing and blocking and install new shear walls to reduce diaphragm spans.	S8
WOOD SILL BOLTS	Sill bolts are not spaced at 4ft or less with acceptable edge and end distance provided for wood and concrete.	Provide new anchor bolts from wood sills to the foundation.	S9
REDUNDANCY	The number of lines of shear walls in each principal direction is less than 2.	Provide additional lateral resisting elements.	S10
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.	S11
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 lesser of the shear strength of the walls or diaphragms.	Install new hardware for transfer of seismic forces from diaphragm to shear walls.	S12
CROSS TIES	There are not continuous cross ties between diaphragm chords.	Provide new continuous cross ties between diaphragm chords.	S13
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.	Block and renail existing plywood diaphragm.	S14
BOWSTRINGS	Bowstring trusses are markedly under-designed, exhibiting on-going symptoms of structural distress and can no longer be relied upon to support code prescribed seismic loading.	Retrofit and strengthen bowstring trusses to support code required seismic loading.	S15
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
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.	N2
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	N3

		material, including natural gas piping.	
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 partitions.	N4
INTEGRATED CEILINGS	Integrated suspended ceilings with continuous areas greater than 144 ft2 and ceilings of smaller areas that are not surrounded by restraining partitions are not laterally restrained at a spacing less than 12ft with members attached to the structure above. Each restraint location does not have a minimum of four diagonal wires and compression struts, nor diagonal members capable of resisting compression.	Install seismic bracing for integrated suspended ceilings.	N5
EDGE CLEARANCE	The free edges of integrated suspended ceilings with continuous areas greater than 144ft.2 does not have clearances from the enclosing wall or partition of at least the following: in Moderate Seismicity, 1/2 in.; in High Seismicity, 3/4 in.	Install free edge clearance for integrated suspended ceilings.	N6
EDGE SUPPORT	The free edges of integrated suspended ceilings with continuous areas greater than 144ft.2 are not supported by closure angles or channels not less than 2 in. wide.	Install free edge support for integrated suspended ceilings.	N7
INDEPENDENT SUPPORT	Light fixtures that weigh more per square foot than the ceiling they penetrate are not supported independent of the grid ceiling suspension system by a minimum of two wires at diagonally opposite corners of each fixture.	Provide independent support for light fixtures.	N8

PENDANT SUPPORTS	Light fixtures on pendant supports are not attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are not 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 not free to move with the structure to which they are attached without damaging adjoining components. The connection to the structure is not capable of accommodating the movement without failure.	Provide independent support for light fixtures.	N9
LENS COVERS	Lens covers on light fixtures are not attached with safety devices.	Install safety devices for light fixture lens covers.	N10
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.	N11
CANOPIES	Canopies at building exits are not anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft; for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft.	Seismically anchor existing canopies to the structure.	N12
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.	N13
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.	N14
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.	N15

IN-LINE EQUIPMENT	Equipment installed in line with a duct or piping system, with an operating weight more than 75 lb, is not supported or laterally braced independent of the duct or piping system.	Independently support and laterally brace equipment with an operating weight more than 75 lb installed in line with a duct or piping system.	N16
TALL NARROW EQUIPMENT	Equipment more than 6ft high with a height-to-depth or height-to-width ratio greater than 3-to-1 is not anchored to the floor slab or adjacent structural walls.	Anchor equipment more than 6ft high with a height-to-depth or height-to-width ratio greater than 3-to-1 to the floor slab or adjacent structural walls.	N17
FLEXIBLE COUPLINGS	Fluid and gas piping does not have flexible couplings.	Install flexible couplings for fluid and gas piping.	N18
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.	N19

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 retrofitted and strengthened to support code required gravity loading. This is deficiency/repair/plan note S15.

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.

7.0 Preliminary Construction Cost Estimate

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

DIRECT COST	
Construction	$2,835,200
Engineering	$443,300
Construction Management	$93,700
Relocation	$40,700
Construction Contingency	$407,250
TOTALS AND SUMMARY	
Total Cost Estimate	**$3,820,150**
Match Funds	**$1,320,150**
Total Amount Requested from SRGP	**$2,500.000**
Total Area	**32,500 S.F.**
Cost/Square Foot	**$117.54**

8.0 Conclusion and Certification Statement

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

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

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

Certification Statement

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

Matthew R. Smith, PE, SE

Appendix A: Figures

Figure 1: SOUTH ELEVATION AT CLASSROOM BUILDING

Figure 2: SOUTH ELEVATION AT COURTYARD

Figure 3: INTERIOR WINDOW WALL OF CLASSROOMS

Figure 4: EXTERIOR NORTH ELEVATION

Figure 5: NORTHEAST ELEVATION

Figure 6: GYM BOWSTRING TRUSSES

Appendix B:
Tier 1 Check Sheets

AREA A: CLASSROOMS
AREA B: GYM
AREA D: LOCKER ROOMS

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	Wall sheathing at Gymnasium is deteriorated
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 Buildings not separated
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	5.4.1.3	A.2.1.3	
Building System—Building Configuration							
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	WEAK STORY: The sum of the shear strengths of the seismic-force-resisting system in any story in each direction is not less than 80% of the strength in the adjacent story above.	5.4.2.1	A.2.2.2	
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	SOFT STORY: The stiffness of the seismic-force-resisting system in any story is not less than 70% of the seismic-force-resisting system stiffness in an adjacent story above or less than 80% of the average seismic-force-resisting system stiffness of the three stories above.	5.4.2.2	A.2.2.3	
C ☒	**NC** ☐	**N/A** ☐	**U** ☐	VERTICAL IRREGULARITIES: All vertical elements in the seismic-force-resisting system are continuous to the foundation.	5.4.2.3	A.2.2.4	

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

C	NC	N/A	U			
☒	☐	☐	☐	GEOMETRY: There are no changes in the net horizontal dimension of the seismic-force-resisting system of more than 30% in a story relative to adjacent stories, excluding one-story penthouses and mezzanines.	5.4.2.4	A.2.2.5
C	**NC**	**N/A**	**U**	MASS: There is no change in effective mass of more than 50% from one story to the next. Light roofs, penthouses, and mezzanines need not be considered.	5.4.2.5	A.2.2.6
☒	☐	☐	☐			
C	**NC**	**N/A**	**U**	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	5.4.2.6	A.2.2.7
☒	☐	☐	☐			

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

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

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Moderate and High Seismicity (Complete the Following Items in Addition to the Items for Low Seismicity)							
Foundation Configuration							
C ☒	**NC** ☐	**N/A** ☐	**U** ☐	OVERTURNING: The ratio of the least horizontal dimension of the seismic-force-resisting system at the foundation level to the building height (base/height) is greater than $0.6S_a$.	5.4.3.3	A.6.2.1	
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	TIES BETWEEN FOUNDATION ELEMENTS: The foundation has ties adequate to resist seismic forces where footings, piles, and piers are not restrained by beams, slabs, or soils classified as Site Class A, B, or C.	5.4.3.4	A.6.2.2	

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

Project Name _____
Project Number _____

17.3IO Structural Checklist for Building Type W2: Wood Frames, Commercial and Industrial

AREA A: CLASSROOMS
AREA B: GYMNASIUM

Table 17-7. Immediate Occupancy Checklist for Building Type W2

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	No shear walls at longitudinal classroom window walls
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	SHEAR STRESS CHECK: The shear stress in the shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the following values: Structural panel sheathing 1,000 lb/ft (14.6 kN/m) Diagonal sheathing 700 lb/ft (10.2 kN/m) Straight sheathing 100 lb/ft (1.5 kN/m) All other conditions 100 lb/ft (1.5 kN/m)	5.5.3.1.1	A.3.2.7.1	Shear capacity not adequate at classroom transverse walls
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	STUCCO (EXTERIOR PLASTER) SHEAR WALLS: Multi-story buildings do not rely on exterior stucco walls as the primary seismic-force-resisting system.	5.5.3.6.1	A.3.2.7.2	
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	GYPSUM WALLBOARD OR PLASTER SHEAR WALLS: Interior plaster or gypsum wallboard is not used for shear walls on buildings more than one story high with the exception of the uppermost level of a multi-story building.	5.5.3.6.1	A.3.2.7.3	
C ☒	**NC** ☐	**N/A** ☐	**U** ☐	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 2-to-1 are not used to resist seismic forces.	5.5.3.6.1	A.3.2.7.4	
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	WALLS CONNECTED THROUGH FLOORS: Shear walls have an interconnection between stories to transfer overturning and shear forces through the floor.	5.5.3.6.2	A.3.2.7.5	
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	HILLSIDE SITE: For structures that are taller on at least one side by more than one-half story because of a sloping site, all shear walls on the downhill slope have an aspect ratio less than 1-to-2.	5.5.3.6.3	A.3.2.7.6	
C ☐	**NC** ☐	**N/A** ☐	**U** ☐	CRIPPLE WALLS: Cripple walls below first-floor-level shear walls are braced to the foundation with wood structural panels.	5.5.3.6.4	A.3.2.7.7	

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	OPENINGS: Walls with openings greater than 80% of the length are braced with wood structural panel shear walls with aspect ratios of not more than 1.5-to-1 or are supported by adjacent construction through positive ties capable of transferring the seismic forces.	5.5.3.6.5	A.3.2.7.8	wall lines w/ shearwalls do not have openings greater than 80%
C	NC	N/A	U	HOLD-DOWN ANCHORS: All shear walls have hold-down anchors attached to the end studs constructed in accordance with acceptable construction practices.	5.5.3.6.6	A.3.2.7.9	
Connections							
C	NC	N/A	U	WOOD POSTS: There is a positive connection of wood posts to the foundation.	5.7.3.3	A.5.3.3	
C	NC	N/A	U	WOOD SILLS: All wood sills are bolted to the foundation.	5.7.3.3	A.5.3.4	attachment not present
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	
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	NARROW WOOD SHEAR WALLS: Narrow wood shear walls with an aspect ratio greater than 1.5-to-1 are not used to resist seismic forces.	5.5.3.6.1	A.3.2.7.4	
Diaphragms							
C	NC	N/A	U	DIAPHRAGM CONTINUITY: The diaphragms are not composed of split-level floors and do not have expansion joints.	5.6.1.1	A.4.1.1	

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

C	NC	N/A	U				
☐	☐	☐	☐	ROOF CHORD CONTINUITY: All chord elements are continuous, regardless of changes in roof elevation.	5.6.1.1	A.4.1.3	Chords not continuous
☐	☐	☐	☐	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	
☐	☐	☐	☐	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	Classroom and gymnasium straight sheathed diaphragms have aspect ratios less then 1-1
☐	☐	☐	☐	SPANS: All wood diaphragms with spans greater than 12 ft (3.6 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2	Exceeds span
☐	☐	☐	☐	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 have aspect ratios less than or equal to 3-to-1.	5.6.2	A.4.2.3	
☐	☐	☐	☐	OTHER DIAPHRAGMS: The diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1	
Connections							
☐	☐	☐	☐	WOOD SILL BOLTS: Sill bolts are spaced at 4 ft or less with acceptable edge and end distance provided for wood and concrete.	5.7.3.3	A.5.3.7	Bolts not present

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

Project Name _____
Project Number _____

AREA D: LOCKER ROOMS

17.17IO Structural Checklist for Building Types RM1: Reinforced Masonry Bearing Walls with Flexible Diaphragms and RM2: Reinforced Masonry Bearing Walls with Stiff Diaphragms

Table 17-35. Immediate Occupancy Structural Checklist for Building Types RM1 and RM2

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	no shear line adjacent to gymnasium
C ☒	**NC** ☐	**N/A** ☐	**U** ☐	SHEAR STRESS CHECK: The shear stress in the reinforced masonry shear walls, calculated using the Quick Check procedure of Section 4.4.3.3, is less than 70 lb/in.^{2} (4.83 MPa).	5.5.3.1.1	A.3.2.4.1	
C ☒	**NC** ☐	**N/A** ☐	**U** ☐	REINFORCING STEEL: The total vertical and horizontal reinforcing steel ratio in reinforced masonry walls is greater than 0.002 of the wall with the minimum of 0.0007 in either of the two directions; the spacing of reinforcing steel is less than 48 in., and all vertical bars extend to the top of the walls.	5.5.3.1.3	A.3.2.4.2	
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	Not adequately attached
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 nor present
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	In-plane connection does not occur

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

C	NC	N/A	U			
☒	☐	☐	☐	FOUNDATION DOWELS: Wall reinforcement is doweled into the foundation, and the dowels are able to develop the lesser of the strength of the walls or the uplift capacity of the foundation.	5.7.3.4	A.5.3.5
☒	☐	☐	☐	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
Stiff Diaphragms						
☐	☐	☐	☐	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	5.6.4	A.4.5.1
☐	☐	☐	☐	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	5.7.2	A.5.2.3
Foundation System						
☐	☐	☐	☐	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.		A.6.2.3
☐	☐	☐	☐	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.		A.6.2.4

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Low, Moderate, and High Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)							
Seismic-Force-Resisting System							
C	**NC**	**N/A**	**U**	REINFORCING AT WALL OPENINGS: All wall openings that interrupt rebar have trim reinforcing on all sides.	5.5.3.1.5	A.3.2.4.3	
☒	☐	☐	☐				
C	**NC**	**N/A**	**U**	PROPORTIONS: The height-to-thickness ratio of the shear walls at each story is less than 30.	5.5.3.1.2	A.3.2.4.4	
☒	☐	☐	☐				
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	
☒	☐	☐	☐				

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

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	Cross ties not present
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	
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	
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	Exceeds span.
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. before engagement of the anchors.	5.7.1.2	A.5.1.4	

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

Project Name _____

Project Number _____

17.19 Nonstructural Checklist

AREA A, B, and D

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	Not braced
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	Does not occur
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	Does not occur

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	top of locker room walls
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	Not braced
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	Does not occur
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	Does not occur
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	Bracing does not occur

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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	Bracing not present
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	Does not occur
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	

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

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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	Contents not braced
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	Contents not braced

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

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

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

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

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

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

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

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

Appendix C: Preliminary Seismic Retrofit Drawings

OAK HEIGHTS ELEMENTARY SCHOOL SEISMIC RETROFIT

PRELIMINARY DESIGN

SWEET HOME SCHOOL DISTRICT
605 ELM STREET
SWEET HOME, OR 97386

REPAIR KEYNOTES

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. REPLACE DETERIORATED WOOD STRUCTURAL PANEL SIDING
   B. INSTALL NEW IN-PLANE WALL CONNECTIONS AT TOP OF WALL.

S2. PROVIDE SEISMIC ISOLATION JOINT TO AVOID POUNDING OF THE TALLER STRUCTURE INTO THE LOWER STRUCTURE. PROVIDE NEW JOINT BY CUTTING LOWER ROOF BACK FROM ADJACENT WALL.
   • PROVIDE NEW CANTILEVER COLUMNS AND FOOTING TO SUPPORT CANOPY EDGE

S3. INSTALL NEW SHEAR WALLS AND STEEL FRAMES TO ENSURE A MINIMUM OF 2 LINES OF VERTICAL RESISTING ELEMENTS IN EACH PRINCIPAL DIRECTION.

S4. INSTALL NEW PLYWOOD SHEAR WALLS TO ENSURE ADEQUATE SHEAR CAPACITY.

S5. PROVIDE NEW ANCHOR BOLTS FROM WOOD SILLS TO THE FOUNDATION.

S6. INSTALL NEW SHEAR WALLS AND DRAG ELEMENTS AT DISCONTINUOUS CHORDS.

S7. INSTALL NEW PLYWOOD DIAPHRAGM SHEATHING.

S8. INSTALL NEW PLYWOOD DIAPHRAGM SHEATHING AND BLOCKING AND INSTALL NEW SHEAR WALLS TO REDUCE DIAPHRAGM SPANS.

S9. PROVIDE NEW ANCHOR BOLTS FROM WOOD SILLS TO THE FOUNDATION.

S10. PROVIDE ADDITIONAL LATERAL RESISTING ELEMENTS.

S11. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S12. INSTALL NEW HARDWARE FOR TRANSFER OF SEISMIC FORCES FROM DIAPHRAGM TO SHEAR WALLS.

S13. PROVIDE NEW CONTINUOUS CROSS TIES BETWEEN DIAPHRAGM CHORDS.

S14. BLOCK AND RENAIL EXISTING PLYWOOD DIAPHRAGM.

S15. EXISTING TRUSSES TO BE STRENGTHENED

NON-STRUCTURAL REPAIRS:

N1. BRACE PIPING OR DUCTWORK CONVEYING HAZARDOUS MATERIALS.

N2. INSTALL SHUT OFF VALVES FOR PIPING CONTAINING HAZARDOUS MATERIAL, INCLUDING NATURAL GAS.

N3. INSTALL FLEXIBLE COUPLINGS FOR DUCTWORK AND PIPING CONTAINING HAZARDOUS MATERIAL, INCLUDING NATURAL GAS PIPING.

N4. INDEPENDENTLY BRACE THE TOPS OF MASONRY PARTITIONS.

N5 INSTALL SEISMIC BRACING FOR INTEGRATED SUSPENDED CEILINGS.

N6. INSTALL FREE EDGE CLEARANCE FOR INTEGRATED SUSPENDED CEILINGS.

N7. INSTALL FREE EDGE SUPPORT FOR INTEGRATED SUSPENDED CEILINGS.

N8. PROVIDE INDEPENDENT SUPPORT FOR LIGHT FIXTURES.

N9. PROVIDE INDEPENDENT SUPPORT FOR LIGHT FIXTURES.

N10. INSTALL SAFETY DEVICES FOR LIGHT FIXTURE LENS COVERS.

N11. SECURE EXISTING MASONRY VENEER WITH NEW STITCH TIES.

N12. SEISMICALLY ANCHOR EXISTING CANOPIES TO THE STRUCTURE.
   A. PROVIDE NEW CANTILEVER COLUMNS AND FOOTINGS TO SUPPORT CANOPY.
   B. ATTACH OUT-OF-PLANE TIES FROM WALL TO LOWER CANOPY

N13. ANCHOR CONTENTS TO THE STRUCTURE.

N14. BRACE EQUIPMENT TO STRUCTURE.

N15. BRACE AND ANCHOR EQUIPMENT WEIGHING MORE THAN 20 LB, WHOSE CENTER OF MASS IS MORE THAN 4 FT ABOVE THE ADJACENT FLOOR LEVEL.

N16. INDEPENDENTLY SUPPORT AND LATERALLY BRACE EQUIPMENT WITH AN OPERATING WEIGHT MORE THAN 75 LB INSTALLED IN LINE WITH A DUCT OR PIPING SYSTEM.

N17. ANCHOR EQUIPMENT MORE THAN 6FT HIGH WITH A HEIGHT-TO-DEPTH OR HEIGHT-TO-WIDTH RATIO GREATER THAN 3-TO-1 TO THE FLOOR SLAB OR ADJACENT STRUCTURAL WALLS.

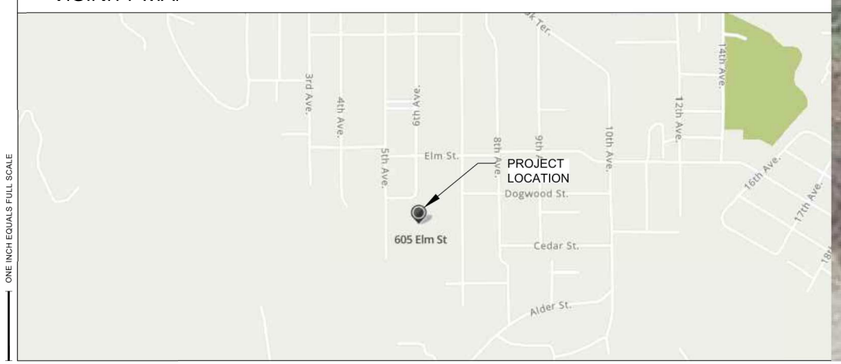
N18. INSTALL FLEXIBLE COUPLINGS FOR FLUID AND GAS PIPING.

N19. ANCHOR AND BRACE FLUID AND GAS PIPING TO THE STRUCTURE.

SHEET INDEX

BUILDING KEY PLAN

VICINITY MAP



ONE INCH EQUALS FULL SCALE

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

SWEET HOME
SCHOOL DISTRICT
1920 LONG STREET
SWEET HOME, OR 97386

OAK HEIGHTS ELEMENTARY SCHOOL SEISMIC RETROFIT

OAK HEIGHTS

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER
OREGON
JUNE 08, 2014
MATTHEW R. SMITH
EXPIRES: 06-30-24
PRELIMINARY - NOT FOR CONSTRUCTION

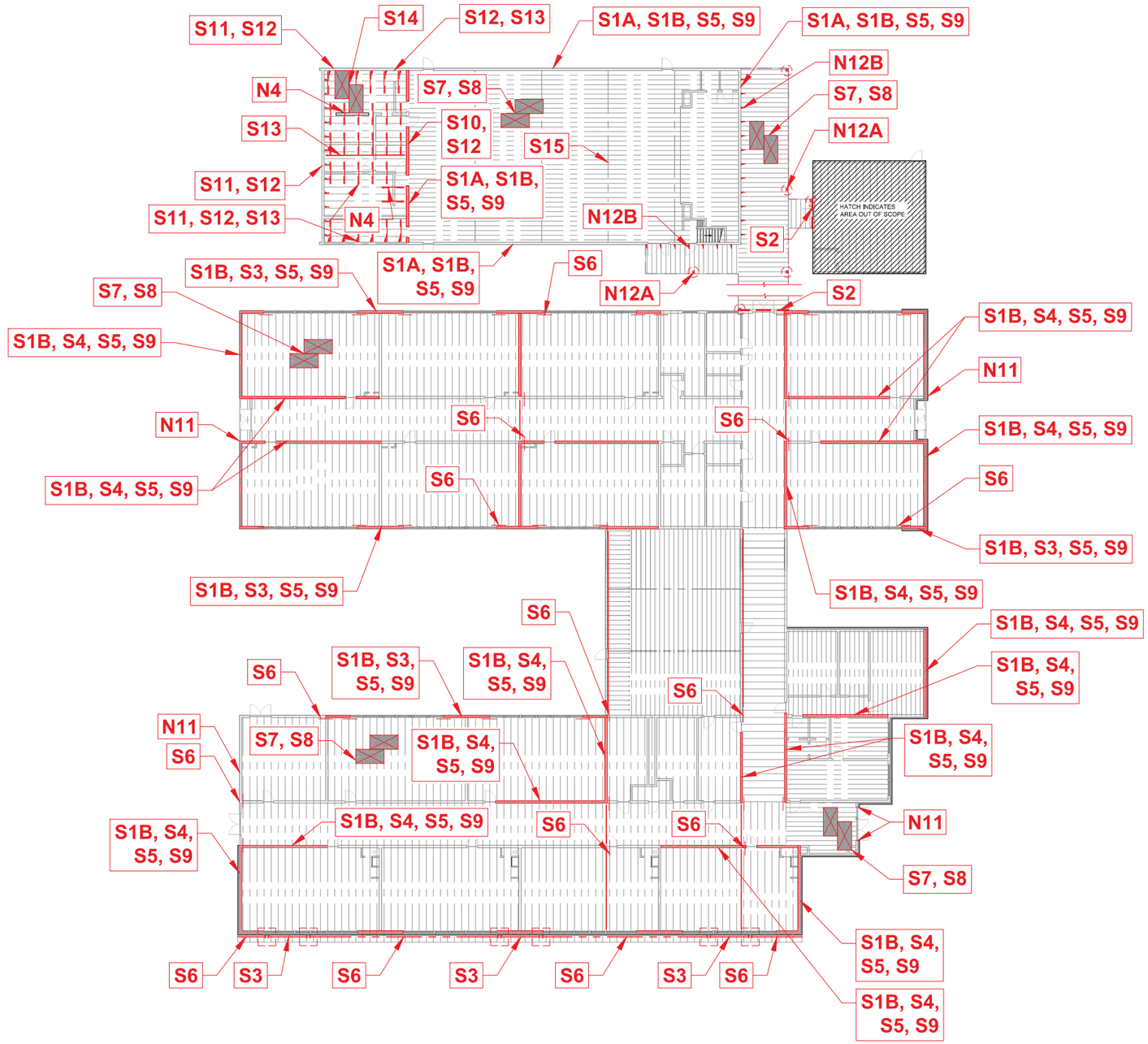
REVISION ID:	DATE:

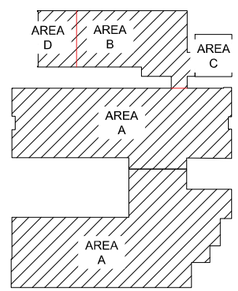
PROJECT NO:	P-2801-22
DRAWN:	BJS
CHECKED:	MRS
DATE:	DEC. 2022

COVER SHEET

G0.0

PRELIMINARY DESIGN





ONE INCH EQUALS FULL SCALE

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

0 S1.1 **CAMPUS KEY** NTS

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

SWEET HOME SCHOOL DISTRICT
1920 LONG STREET
SWEET HOME, OR 97386

OAK HEIGHTS ELEMENTARY SCHOOL SEISMIC RETROFIT

OAK HEIGHTS

STRUCTURAL ENGINEER — REGISTERED PROFESSIONAL ENGINEER — OREGON — 08. 20TH — ANDREW R. SMITH — EXPIRES: 06-30-24

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	P-2801-22
DRAWN:	BJS
CHECKED:	MRS
DATE:	DEC. 2022

AREA A ROOF FRAMING PLAN

S1.1

PRELIMINARY DESIGN

Appendix D:
Geotechnical Information

605 Elm St, Sweet Home, OR 97386, USA

Latitude, Longitude: 44.3914795, -122.73680630000001

Date	10/10/2018, 9:21:13 AM
Design Code Reference Document	ASCE41-17
Custom Probability	
Site Class	D - Stiff Soil

Type	Description	Value
Hazard Level		BSE-2N
S_S	spectral response (0.2 s)	0.627
S_1	spectral response (1.0 s)	0.34
S_{XS}	site-modified spectral response (0.2 s)	0.814
S_{X1}	site-modified spectral response (1.0 s)	0.666
F_a	site amplification factor (0.2 s)	1.298
F_v	site amplification factor (1.0 s)	1.96
ssuh	max direction uniform hazard (0.2 s)	0.721
crs	coefficient of risk (0.2 s)	0.87
ssrt	risk-targeted hazard (0.2 s)	0.627
ssd	deterministic hazard (0.2 s)	1.5
s1uh	max direction uniform hazard (1.0 s)	0.396
cr1	coefficient of risk (1.0 s)	0.858
s1rt	risk-targeted hazard (1.0 s)	0.34
s1d	deterministic hazard (1.0 s)	0.6

Type	Description	Value
Hazard Level		BSE-1N
S_{XS}	site-modified spectral response (0.2 s)	0.543
S_{X1}	site-modified spectral response (1.0 s)	0.444

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	0.442
S_1	spectral response (1.0 s)	0.233
S_{XS}	site-modified spectral response (0.2 s)	0.639
S_{X1}	site-modified spectral response (1.0 s)	0.498
f_a	site amplification factor (0.2 s)	1.447
f_v	site amplification factor (1.0 s)	2.133

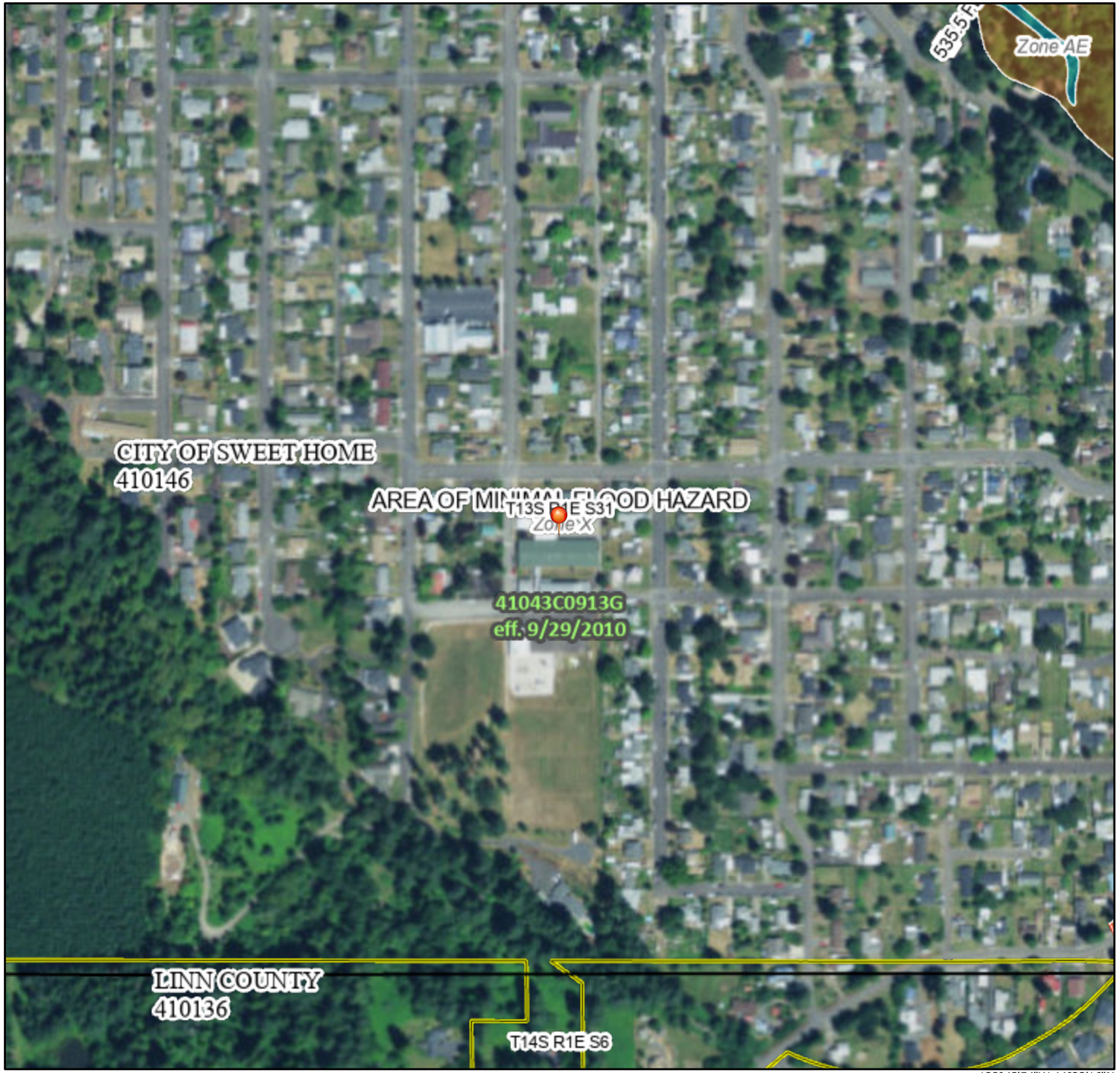
Type	Description	Value
Hazard Level		BSE-1E
S_S	spectral response (0.2 s)	0.139
S_1	spectral response (1.0 s)	0.059
S_{XS}	site-modified spectral response (0.2 s)	0.222
S_{X1}	site-modified spectral response (1.0 s)	0.143
F_a	site amplification factor (0.2 s)	1.6
F_v	site amplification factor (1.0 s)	2.4

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

National Flood Hazard Layer FIRMette

FEMA

122°44'31"W 44°23'42"N



122°43'54"W 44°23'16"N

0 250 500 1,000 1,500 2,000 Feet

1:6,000

Basemap: USGS National Map: Orthoimagery: Data refreshed October, 2020

Legend

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR FIRM PANEL LAYOUT

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

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 AREAS
- NO SCREEN Area of Minimal Flood Hazard *Zone X*
- Effective LOMRs
- Area of Undetermined Flood Hazard *Zone D*

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

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

MAP PANELS
- Digital Data Available
- No Digital Data Available
- Unmapped

N

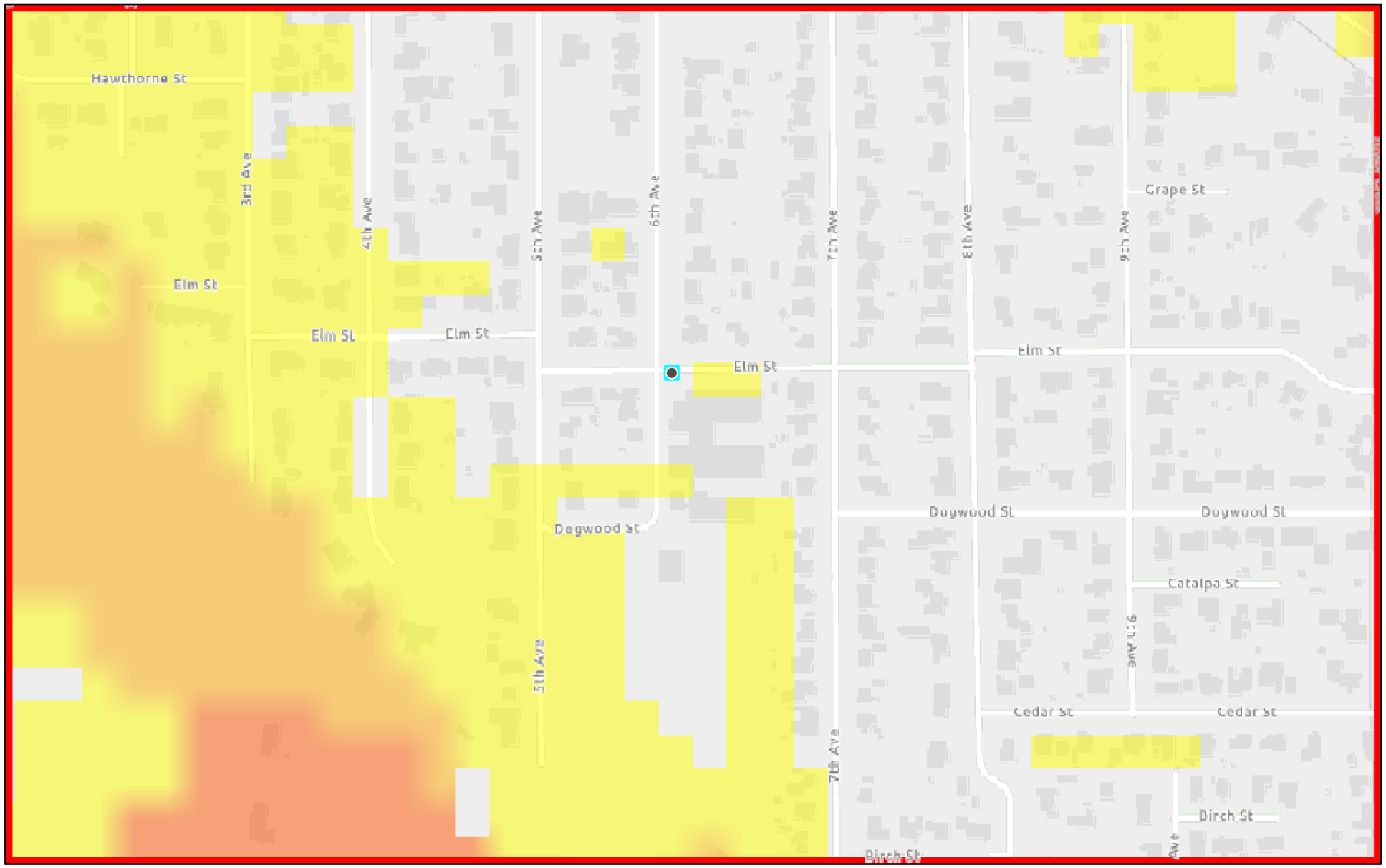
The pin displayed on the map is an approximate point selected by the user and does not represent an authoritative property location.

This map complies with FEMA's standards for the use of digital flood maps if it is not void as described below. The basemap shown complies with FEMA's basemap accuracy standards

The flood hazard information is derived directly from the authoritative NFHL web services provided by FEMA. This map was exported on 12/15/2022 at 6:02 PM and does not reflect changes or amendments subsequent to this date and time. The NFHL and effective information may change or become superseded by new data over time.

This map image is void if the one or more of the following map elements do not appear: basemap imagery, flood zone labels, legend, scale bar, map creation date, community identifiers, FIRM panel number, and FIRM effective date. Map images for unmapped and unmodernized areas cannot be used for regulatory purposes.

Oak Heights E.S. Landsliding Hazard



October 8, 2018

Landslide Hazard

Green: Band_2

Blue: Band_3

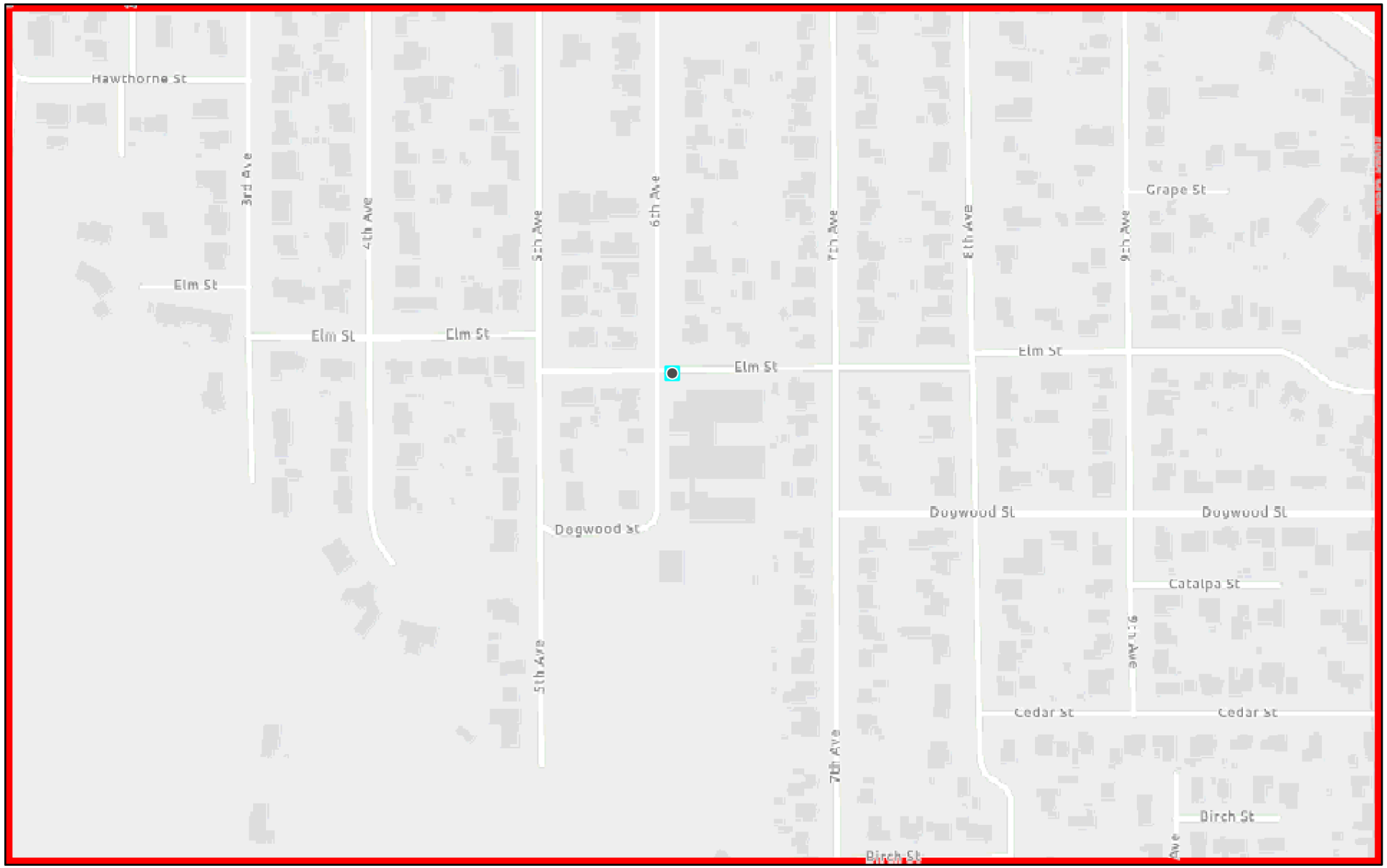
Red: Band_1

1:4,800

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Oak Heights E.S. Faults and Liquefaction



October 8, 2018

1:4,800

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Active Faults

Moderate

High

Low

THE GALLI GROUP
Geotechnical Consulting

02-6216-01
December 15, 2022

Kristofer Tonning
ZCS Engineering and Architecture
524 Main Street, Suite, 2
Oregon City, OR 97045

SUBJECT: **PRELIMINARY SEISMIC EVALUATION LETTER**
OAK HEIGHTS ELEMENTARY SCHOOL
605 ELM STREET
SWEET HOME, OREGON

Mr. Tonning:

This letter presents the results of our preliminary planning level (office study) seismic risk assessment of Oak Heights Elementary School for a potential Seismic Retrofit of the school structures. The subject school is located at 605 Elm Street, at the southeast corner of its intersection with 6th Avenue, in Sweet Home, Oregon.

This assessment was done in order to provide preliminary geotechnical and 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.

This assessment was prepared by a professional engineer under the direct supervision of Dennis Duru, PE, CEG, RG, who is a professional engineer in the state of Oregon and also licensed as a certified engineering geologist by the Oregon State Board of Geologist Examiners (OSBGE). It should be noted that no subsurface exploration of the site was conducted. This study was based solely on the review of readily available data. Some of the data reviewed included: online DOGAMI Interactive Maps, Open-file sourced OGDC-6 Geology Mapping (loaded in ArcGIS), Google Earth 2022, NRCS Web Soil Survey, and well log and geotechnical boring log data from Oregon Water Resources Department Well Report Query.

This preliminary evaluation has been provided for consideration by the school district and their design team, for preliminary project planning and design purposes.

SITE AND PROJECT DESCRIPTION

The site is currently occupied by a functioning elementary school. The school facilities consist of interconnected school buildings which are surrounded by lawn/landscaping areas, access roads, parking lots, walkways, play fields and open space. The site generally has mild slopes (3-5%) down to the northeast. There are some small retaining walls along the north and east edges of the site as well. Undeveloped areas of the site consist of well-maintained lawn and a few scattered trees.

We understand the School District and their consulting design team are conducting 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 letter, 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.

SUBSURFACE CONDITIONS

Soil. According to the *Custom Soil Resource Report* for this area, provided by the USDA Natural Resources Conservation Service (NRCS) Web Soil Survey website, the soil in the upper 5 feet of the project site subsurface is mapped as follows:

- The 9D-Bellpine Silty Clay Loam: This soil unit is mapped to cover a small portion of the southwest field area of the school premises and is not located beneath or near any of the facility structures. Based on the soil mapping, the upper 3.5 feet of the subsurface consists of medium to high plasticity silty Clay, which is underlain by weathered bedrock. The Liquid Limit (LL) of the soils is between 35 and 60 and the fine content (percent silt and clay) is between 70% and 90% for the clayey Silt.
- The 16B-Briedwell Silt Loam: This soil unit is mapped to cover the majority of the school premises. Based on the soil mapping, the upper 5 feet of the subsurface consists of mixed grain soils (clay, silt, sand and gravel) of low to medium plasticity. The Liquid Limit (LL) of the soils is between 25 and 40 and the fine content (percent silt and clay) is between 15% and 85%.

Review of well and geotechnical boring log data in the immediate vicinity of the project site indicates that the upper clayey and sandy Silt soils extend to depths of between 2 and 15 feet from the ground surface before encountering the sandy gravels.

Groundwater. The well log data reviewed show static groundwater levels near the project site at between 15 and 25 feet below the ground surface (at the time of completion of the wells).

GEOLOGIC OR SEISMIC INDUCED HAZARDS

Summary of Site Geology and Seismicity. The mapped geologic unit in the project area consist of Quaternary surficial deposits (Qtg) comprising of unconsolidated sediments, which at this location are talus colluvium of an old landslide that originated upslope of the project area. Silty clay and clayey gravel were part of this deposit. The surficial deposits are underlain by the Early High Cascade Volcanics (Tms), predominately basalt in the project area. Reviewed well log data shows that the cemented gravels, claystone and sandstone extend to between 60 and 160 feet before encountering the basalt.

The project site is in relatively close proximity (within 85 km) to the Cascadia Subduction Zone (CSZ) off the Oregon coast which is considered capable of Magnitude 8.5 or greater earthquakes.

Landslides/Slope Instability. The project site is located on a parcel of land that has mild slopes. Some short (2-5 feet tall) retaining walls have been constructed in localized areas along the east edge of the site, within 5 to 8 feet of the structures and near Elm Street on the north edge of the project site in landscape areas.

A landslide feature is mapped in the project area by the State Landslide Information Database for Oregon (SLIDO, 2021), however, the feature appears to be deposits of an old landslide originating from upslope, consistent with the air photos (Google Earth, 2016) and Lidar imagery (bare earth and highest hit imagery) of the Sweet Home Quadrangle (DOGAMI, 2021). It is possible the talus colluvium at the project site has consolidated over time. Site specific geotechnical investigation will verify the density of these deposits. There is no indication that the ancient landslide that deposited these soils is still active. The State Landslide Information Database for Oregon (SLIDO, 2021) mapped portions of the site as having low to moderate risk for a regional scale landslide. However, given that the natural slopes are mild; in our professional opinion, the risk of the site being impacted by a landslide during the design seismic event is **low**.

Liquefaction and Lateral Spread Hazard Potential. The project is underlain by silty Clay and clayey Gravel to depths of between 2.5 and 5 feet over weathered bedrock. As stated earlier, static groundwater was observed (by others) at depths between 15 and 25 feet below the ground surface near the project site. Given the relatively deep groundwater level, and the possible range of fine content of the site's subsurface, liquefaction and lateral spread is considered to be a very **low** potential hazard for this site. See more information in the Liquefaction evaluation section below.

Expansive Soils. The NRCS web soil survey mapping shows that the silts and clays mapped on the project site have a plasticity index (PI) of between 0 and 25. Soils with a PI in this range have zero to moderate expansion potential.

Ground Rupture. No active fault traces or local faults are mapped within the project site (USGS; 2021). 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 strong ground shaking potential during the anticipated seismic event.

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

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 (when a load is applied to the loose, saturated soil), the increase 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 structure 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 and may be observed to flow like a liquid, hence "liquefaction", and will not likely be able to support structures.

As observed in the NRCS soil mapping and in the geotechnical and well logs reviewed, the site is underlain by silty clays and clayey Gravels to depths of between 2.5 and 5 feet, over mixed Sandstone/Claystone bedrock. Groundwater was observed between 15 and 25 feet below the ground surface within cemented gravels or the sandstone bedrock unit. Unsaturated Soils with the fine content as shown in gradation analyses found on the NRCS Web soil survey data, and with consistencies described in the well and geotechnical boring logs reviewed, are not known to liquefy in a seismic event. Therefore, in our professional opinion, the potential for liquefaction of the site soils that could adversely affect the site or have significant adverse impacts on the structures during a seismic event is very **low**.

CONCLUSIONS

Based on the evaluation contained in this letter, in our professional opinion the soils conditions at the site are suitable for a conventional seismic retrofit. The soils conditions we identified during this desk study are **not** susceptible to large scale liquefaction or landslides that will adversely impact the structure. Prior to final retrofit design and construction, additional geotechnical investigation and laboratory testing are highly recommended in order to confirm these preliminary findings and to provide more detailed analyses and recommendations.

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. Subsurface Exploration.
2. Laboratory testing for determining soil gradation and strength characteristics of the site soils.
3. Evaluation of data for developing geotechnical design parameters and recommendations (site response seismic analysis, 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 letter are based on inferred site conditions as they were reported in the various documents and online resources reviewed. They may not represent the actual subsurface condition present at the project site.

This letter was prepared for the use of the School District and their design team for evaluation purposes. It should be made available to others for informational data only. This letter 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

Lyn Chand, PE
Project Professional

Dennis Duru, PE, CEG, RG.
Senior Engineer/Geologist

Appendix E: Construction Cost Estimate Worksheets

ENGINEER'S OPINION OF PROBABLE COST - OAK HEIGHTS 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%	%		$ 210,794.00
Preconstruction Services		2%	%		$ 42,158.80
Escalation		7%	%		$ 165,262.50
Bonding & Insurance		3%	%		$ 70,826.78
Contractor Profit & Overhead		5%	%		$ 118,044.64
				General Conditions Subtotal	$ 607,086.72
Non-Structural Elements					
Misc MEP	N1-N3, N8-N10, N14-N18	1	Lump Sum	$ 135,800.00	$ 135,800.00
Misc Non-Structural	N4-N7, N11-N13	1	Lump Sum	$ 54,300.00	$ 54,300.00
				Non-Structural Subtotal	$ 190,100.00
Construction Cost Per Building Part					
				Building Part 'A' Subtotal	$ 1,366,850.00
				Building Part 'B' Subtotal	$ 461,540.00
				Building Part 'D' Subtotal	$ 89,450.00
				Sub-Total Construction Cost	**$ 2,715,000.00**
				Contingency 15%	**$ 407,250.00**
				Total Construction Cost	**$ 3,122,250.00**
Cost Estimate Summary					
Engineering					$ 443,300.00
Architectural Consulting				$ 46,800.00	
Structural / Rehabilitation Engineering				$ 343,400.00	
Geotechnical Consulting				$ 29,700.00	
Materials Testing for Design				$ 23,400.00	
Construction Management					$ 93,700.00
Construction					$ 2,835,200.00
Sub-Total Construction Cost				$ 2,715,000.00	
Special Inspection Services for Construction				$ 26,500.00	
Permitting Fees				$ 93,700.00	
Relocation of FF&E					$ 40,700.00
Contingency					$ 407,250.00
				Total Project Funding Requirement	**$ 3,820,150.00**

ENGINEER'S OPINION OF PROBABLE COST - OAK HEIGHTS ELEMENTARY SCHOOL SEISMIC REHABILITATION

BUILDING PART - 'A'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 7.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Soft Demolition	S1, S3, S4, S7, S8	270000	Square Foot	$ 2.00	$ 540,000.00
Hard Demolition	S3	1700	Square Foot	$ 20.00	$ 34,000.00
				Demolition & Asbestos Subtotal	$ 574,000.00
Foundation / Floor Strengthening Construction					
Bolting of Extg Walls to footings	S5, S9	650	Linear Foot	$ 35.00	$ 22,750.00
Spread Footings for Columns / Holdown	S3	6	Each	$ 4,000.00	$ 24,000.00
				Foundation Level Subtotal	$ 46,750.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S4	5100	Square Foot	$ 5.00	$ 25,500.00
New 2x Framed Shear Walls	S1B, S3, S5	1500	Square Foot	$ 10.00	$ 15,000.00
Interior Wall Finish Repair	S4, S5	6600	Square Foot	$ 2.00	$ 13,200.00
Exterior Finish Repair / Installation	S1B, S3, S4, S5	1500	Square Foot	$ 25.00	$ 37,500.00
Brick Veneer Ties	N11	550	Square Foot	$ 30.00	$ 16,500.00
Painting	S1, S2, S3, S4, S5, S9	26500	Square Foot	$ 3.00	$ 79,500.00
Structural Steel Frame	S3	3	Tonn	$ 21,800.00	$ 65,400.00
				Wall Strengthening Subtotal	$ 252,600.00
Roof Strengthening Construction					
Diaphragm Attachments - In-Plane Shear	S1B, S6, S7, S8	650	Linear Foot	$ 20.00	$ 13,000.00
New Drag Beam	S6	19	EA	$ 2,500.00	$ 47,500.00
Seismic Isolation from Adjacent Building	S2	15	Linear Foot	$ 400.00	$ 6,000.00
New Ceiling Sheathing	S6, S7, S8	26500	Square Foot	$ 5.00	$ 132,500.00
New Wood Beams	S6	100	Linear Foot	$ 30.00	$ 3,000.00
New Batt Insulation in Attic	S7, S8	26500	Square Foot	$ 5.00	$ 132,500.00
New Suspended Ceiling	S6, S7, S8	26500	Square Foot	$ 6.00	$ 159,000.00
				Roof Strengthening Subtotal	$ 493,500.00
				Building Part 'A' - Total Construction Cost	$ 1,366,850.00

ENGINEER'S OPINION OF PROBABLE COST - OAK HEIGHTS ELEMENTARY SCHOOL SEISMIC REHABILITATION

BUILDING PART - 'B'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 7.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Soft Demolition	S1A	3400	Square Foot	$ 2.00	$ 6,800.00
Roof Structure Demolition	S7, S8	4800	Square Foot	$ 6.00	$ 28,800.00
Abatement	S7, S8	4800	Square Foot	$ 5.00	$ 24,000.00
Built-Up Roof Demo	S7, S8	4800	Square Foot	$ 4.00	$ 19,200.00
			Demolition & Asbestos Subtotal		$ 78,800.00
Foundation / Floor Strengthening Construction					
Spread Footings for Columns / Holdown	N13A	5	Each	$ 4,000.00	$ 20,000.00
Bolting of Extg Walls to footings	S5, S9	230	Linear Foot	$ 35.00	$ 8,050.00
Concrete Repair & Patching	N13A	80	Square Foot	$ 3.00	$ 240.00
			Foundation Level Subtotal		$ 28,290.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S1A	3400	Square Foot	$ 5.00	$ 17,000.00
Light Steel Columns	N13A	5	EA	$ 1,600.00	$ 8,000.00
Painting	N1A, S7, S8	4800	Square Foot	$ 3.00	$ 14,400.00
Exterior Finish Repair / Installation	S1A	3400	Square Foot	$ 25.00	$ 85,000.00
			Wall Strengthening Subtotal		$ 124,400.00
Roof Strengthening Construction					
Existing Truss Strengthening	S15	4	EA	$ 30,000.00	$ 120,000.00
New Roof Sheathing	S7, S8	4800	Square Foot	$ 4.00	$ 19,200.00
Diaphragm Attachments - Out-of-Plane	N13B	65	Linear Foot	$ 50.00	$ 3,250.00
Diaphragm Attachments - In-Plane Shear	S1B	300	Linear Foot	$ 20.00	$ 6,000.00
New 3-ply Built Up Roof	S7, S8	4800	Square Foot	$ 17.00	$ 81,600.00
			Roof Strengthening Subtotal		$ 230,050.00
			Building Part 'B' - Total Construction Cost		**$ 461,540.00**

ENGINEER'S OPINION OF PROBABLE COST - OAK HEIGHTS ELEMENTARY 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					
Soft Demolition	S11, S12	1200	Square Foot	$ 2.00	$ 2,400.00
TPO / Comp / Metal Roof Demo	S14	1200	Square Foot	$ 2.00	$ 2,400.00
			Demolition & Asbestos Subtotal		$ 4,800.00
Foundation / Floor Strengthening Construction					
Floor Finish Patch / Replacement	S10	150	Square Foot	$ 7.00	$ 1,050.00
			Foundation Level Subtotal		$ 1,050.00
Wall Strengthening Construction					
New 2x Framed Shear Walls	S10	1000	Square Foot	$ 10.00	$ 10,000.00
Interior Wall Finish Repair	S10	1000	Square Foot	$ 2.00	$ 2,000.00
Painting	S10	1200	Square Foot	$ 3.00	$ 3,600.00
			Wall Strengthening Subtotal		$ 15,600.00
Roof Strengthening Construction					
New 6" polyisociurinate rigid insulation	S14	1200	Square Foot	$ 15.00	$ 18,000.00
Re-Nail Existing Plywood	S14	1200	Square Foot	$ 3.00	$ 3,600.00
New 3-ply Built Up Roof	S14	1200	Square Foot	$ 17.00	$ 20,400.00
Diaphragm Attachments - Out-of-Plane	N4, S11	350	Linear Foot	$ 50.00	$ 17,500.00
Diaphragm Attachments - In-Plane Shear	S12	300	Linear Foot	$ 20.00	$ 6,000.00
New Drag Beam	S13	1	EA	$ 2,500.00	$ 2,500.00
			Roof Strengthening Subtotal		$ 68,000.00
			Building Part 'D' - Total Construction Cost		$ 89,450.00

Appendix F:
Rapid Visual Screening

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

SKETCH

Address: 605 Elm St.
Sweet Home, OR **Zip:** 97386
Other Identifiers: Part A
Building Name: Original Classroom Building
Use:
Latitude: 44.391 **Longitude:** -122.736
S_S: 0.627 **S_1:** 0.340
Screener(s): MRS **Date/Time:** DEC. 2022

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1955 ☐ EST
Total Floor Area (sq. ft.): 26,500 **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) Steps in elevation (moderate)
☒ Plan (type) Re-entrant corners

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

COMMENTS:

☐ Additional sketches or comments on separate page

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

FEMA BUILDING TYPE (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, $S_{L1} \geq S_{MIN}$: 0.8 High Collapse Potential

EXTENT OF REVIEW

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

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 — **MODERATELY HIGH Seismicity**

SKETCH

Address: 605 Elm St.
Sweet Home, OR **Zip:** 97386
Other Identifiers: Part B
Building Name: Gymnasium
Use:
Latitude: 44.391 **Longitude:** -122.736
S_S: 0.627 **S_1:** 0.340
Screener(s): MRS **Date/Time:** DEC. 2022

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1955 ☐ EST
Total Floor Area (sq. ft.): 4,800 **Code Year:**
Additions: ☐ None ☒ Yes, Year(s) Built: 1976, 1979

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

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

Geologic Hazards: Liquefaction: Yes (No) DNK Landslide: Yes (No) DNK Surf. Rupt.: Yes (No) DNK

Adjacency: ☐ Pounding ☐ Falling Hazards from Taller Adjacent Building

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

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

COMMENTS:

☐ Additional sketches or comments on separate page

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

FEMA BUILDING TYPE (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, $S_{L1} \geq S_{MIN}$: 1.2 Moderate Collapse Potential

EXTENT OF REVIEW

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

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 — **MODERATELY HIGH Seismicity**

SKETCH

Address: 605 Elm St.
Sweet Home, OR **Zip:** 97386
Other Identifiers: Part C
Building Name: Classrooms
Use:
Latitude: 44.391 **Longitude:** -122.736
S_S: 0.627 **S_1:** 0.340
Screener(s): MRS **Date/Time:** DEC. 2022

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1979 ☐ EST
Total Floor Area (sq. ft.): 1020 **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)

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	**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, $S_{L1} \geq S_{MIN}$: 3.2 Low Collapse Potential

EXTENT OF REVIEW

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

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 — **MODERATELY HIGH Seismicity**

SKETCH

Address: 605 Elm St.
Sweet Home, OR **Zip:** 97386
Other Identifiers: Part D
Building Name: Locker Room Addition
Use:
Latitude: 44.391 **Longitude:** -122.736
S_S: 0.627 **S_1:** 0.340
Screener(s): MRS **Date/Time:** DEC. 2022

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1976 ☐ EST
Total Floor Area (sq. ft.): 1200 **Code Year:**
Additions: ☒ None ☐ Yes, Year(s) Built:

Occupancy: Assembly ☐ Commercial ☐ Emer. Services ☐ Historic ☐ Shelter
Industrial ☐ Office ☐ School (circled) ☐ 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	**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** (circled)	**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, $S_{L1} \geq S_{MIN}$: 1.8 High Collapse Potential

EXTENT OF REVIEW

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

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