Grants Pass School District No. 7

REQUEST FOR PROPOSALS FOR ARCHITECTURE AND ENGINEERING SERVICES

Redwood Elementary School Seismic Rehabilitation

CONTRACT ADMINISTRATOR:
Grants Pass School District No. 7
Tommy Blanchard
Operations Manager
Phone: 541-474-5700 Fax: 541-474-5705
Email: tmblanchard@grantspass.k12.or.us

www.grantspass.k12.or.us

ISSUE DATE:	Date November 22, 2024
RFP CLOSING (DUE) DATE	Date, December 18, 2024 (2:00 PM)

NO LATE RESPONSES WILL BE ACCEPTED

SUBMITTAL LOCATION

Grants Pass School District No. 7
Attention: Tommy Blanchard
725 NE Dean Drive., Grants Pass, OR, 97526

Introduction:
Grants Pass School District No. 7 (the "Owner") is seeking proposals from firms for the architectural, structural, mechanical and electrical design of the

- Seismic Rehabilitation of Redwood Elementary School (the "Project"), located at 3163 Leonard Road, Grants Pass, OR, 97527. In May of 2024, the District was awarded a grant through the Infrastructure Finance Authority: Business Oregon, based on an application prepared by ZCS Engineering and Architecture. The intent of this RFP is for the consultant to provide an integrated design solution for the entire building. The grant award is for $2,496,100.

Project Description:

Redwood Elementary is a single story and a mixture of typical wood framing and concrete masonry unit (CMU) walls with a large metal roof. A large gym is constructed of steel open web joist on 48'with metal deck welded to the joists and located on the East side of the school. The building is approximately 47,000 sq. ft. in size and is occupied primarily by Grants Pass School District. The building was originally constructed in 1991 with additional classrooms added on in 1994 and 2014 (see attached Exhibit "A"). The metal roof is currently failing with leaks happening often.

The District previously procured the Architecture and Engineering Services for a Re-roof project at Redwood Elementary School. The successful vendor would be expected to be in consultation with and work closely with the vendor currently performing the Re-roof design.

The Owner 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 start in June 2025 with the Project completion expected by August 2025. The Project may be vacated during the majority of the construction period, but coordination with the school may be necessary.

The District previously procured a CM/GC to perform the Re-roof project at Redwood Elementary School. The successful vendor would be expected to be in consultation with the re-roof contractor and work closely with the contractor during design for coordination of the roof and seismic scopes of work.

Scope of Work:

Redwood Elementary School

Perform a seismic evaluation of the building if needed, 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 2022 Oregon Structural Specialty Code ("OSSC"). It is the wish of the District to rehabilitate the building to meet the rehabilitation objective of "Life Safety".

Based on research and evaluation efforts performed during the Seismic Rehabilitation Grant ("SRG") preparation, 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.

- 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.

- Coordinate with current design professional and contractor for the seismic and re-roof scope.

- 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 Owner's applicable 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.

- Describe your firm's recent (past ten years) experience designing renovations of public facilities and experience serving as the prime consultant designing seismic rehabilitation projects. Use specific examples. Include information about the size, construction type, building uses, construction budget, construction delivery method, and project timeline/completion date. (15)

- Identify the sub-consultants and the key personnel of the sub-consultants that you propose to use on this project. Describe their recent (past ten years) experience, and their specific role in designing similar facilities. Identify your firm's role in each of these projects (if applicable). Include information about the size, construction type, building uses, construction budget, and project timeline/completion date. (10)

- 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. Three (3) references must be provided, preferably for projects of similar type and size. (20)

- Past performance on similar projects funded with grants through Business Oregon. (20)

- Availability to and familiarity with the area in which the Project is located, including knowledge of design and construction techniques unique to the area. Proposer's plan to maximize and document local participation. (15)

- Proposed cost management techniques to be employed. (20)

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.

The RFP also requires reference information for your firm. The Owner 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 Owner for this Project.

November 22, 2024	Issue RFP
December 5, 2024 at 2:00 PM	Optional Site Visit/Pre-Proposal Conference
December 12, 2024 at 2:00 PM	Questions and Solicitation Protests Deadline
December 13, 2024	Owner's Written Response to Questions
December 18, 2024 at 2:00 PM	RFP Response Due
To Be Determined	Optional Interviews with Selection Committee
December 20, 2025	Notice of Intent to Award
January 14, 2025	Board Action to Approve Contract

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:

Tommy Blanchard
Grants Pass School District 7
725 NE Dean Drive
Phone: 541-474-5700 Fax:541-474-5705

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, 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 Owner 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 Owner that it is in the public interest to do so.

Please note that throughout this Project, the Owner will not accept responses or queries that require the Owner 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 Owner 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 2:00 pm, December 12, 2024. 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 Owner will issue a written disposition of each such protest no less than three (3) business days before proposals are due. If the Owner upholds the protest, in whole or in part, the Owner 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, 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:

Tommy Blanchard
Operations Manager
Grants Pass School District 7
725 NE Dean Drive
Grants Pass, OR 97526
Phone: 541-474-5700 Fax: 541-474-5705
Email: tmblanchard@grantspass.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 the Owner. 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 Owner will proceed to award the Contract as planned. The selection decision notification will be made by the Contract Administrator via email.

Proprietary Information:

The Owner 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 Owner is seeking to award a contract to a design team 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 Owner.

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 Owner is committed to increasing opportunities for Emerging Small Businesses and Minority and Women Owned Businesses, and the Owner strongly encourages its consultants to utilize these businesses in providing services and materials for the Owner 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 Owner's policy prohibiting sexual harassment in their interactions.

Exhibits:

Exhibit A – Seismic Evaluation Report prepared by ZCS Engineering & Architecture for Lincoln Elementary School

Exhibit B – Redwood Evacuation Map

End of RFP

Seismic Evaluation Report For:

REDWOOD ELEMENTARY SCHOOL

3163 Leonard Rd, Grants Pass, OR 97527
Grants Pass School District

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

ZCS ENGINEERING ARCHITECTURE

www.zcsea.com

Project Summary Information						
Building Part	Building Part Name	Included in Retrofit	Year Built	Building Type***	Nonstructural Retrofits Included in Scope Y/N***	Previous Seismic Retrofit Y/N*** (Year if Yes)
A	Classroom & Admin Building	Yes	1990	W2	Yes	No
B	Gymnasium	Yes	1990	RM1	Yes	No
*** Entries required **ONLY** for building parts included in proposed seismic retrofit						
Nonstructural deficiencies posing life safety risk **MUST** be included in the scope of work and budget.						
Seismic fragility inputs for existing buildings with **previous seismic retrofits MUST** be adjusted to reflect previous seismic retrofit measures completed for a building part.						
Total Retrofit Cost	$ 2,496,100					
Retrofit Square Feet	50,800					
Retrofit Cost per Square Foot	$ 49.14					
Is the campus within a tsunami, FEMA flood zone, landslide/slope instability, liquefaction potential or other high hazard area? **If so, provide documentation.**						No

Engineering Report Checklist		
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☒	Project Summary Page	Page 1
☒	Building Parts Identification	Page 4
☒	Statement of the Performance Objective	Page 5
	Summary of Deficiencies	
☒	Structural Seismic Deficiencies	Page 10
☒	Nonstructural Seismic Deficiencies	Page 11
	Summary of Mitigation/Retrofit	
☒	Structural Mitigation/Retrofit	Page 10
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	Summary Construction Cost Estimate	
☒	Direct Cost	Page 15
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	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

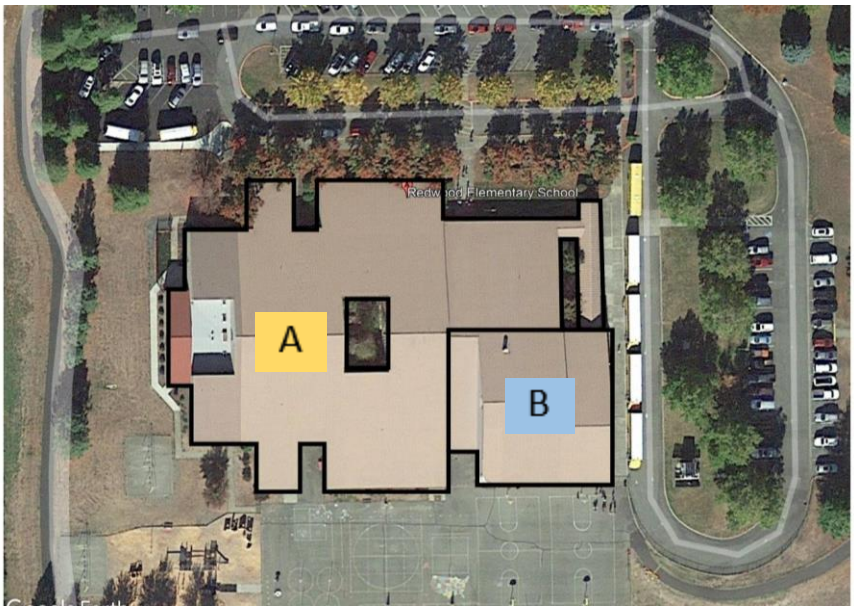
Grants Pass School District is located in Grants Pass, Oregon in Josephine County. The District operates ten schools located within the community including the property of interest, Redwood Elementary School. The District has retained ZCS Engineering and Architecture (ZCS) to perform a seismic evaluation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

SEISMIC EVALUATION SNAPSHOT	
Street Address	3163 Leonard Road, Grants Pass, Oregon 97526
Evaluation Standard	ASCE 41-17 (Tier 1 Analysis)
Target Building Performance Level	Immediate Occupancy – BSE-1E; Life Safety – BSE-2E
Target Non-Structural Performance Level	Position Retention – BSE-1E; Hazard Reduction – BSE-2E
ASCE 41 Building Type	RM1 & W2
Site Soil Classification	D
Seismic Zone Hazard Level	High
Cost Estimate	$ 2,496,100

2.0 Building Description

The framing in the gymnasium, Area 'B', consists of steel open web joist at 48" on center with a metal deck welded to the joists. The roof framing bears on concrete masonry unit walls which is the area's lateral system. The cafeteria and administrative wing, Area 'A', located to the north of the gymnasium, has 3/4" CDX sheathing over wood open web truss joist at 32" on center bearing on conventionally wood framed exterior walls. The classroom area to the west has a similar framing plan to the cafeteria area with 3/4" CDX sheathing spanning open web truss joist at a regular on center spacing. The framing in Area 'A' bears on light timber construction. The foundation throughout the school is composed of a 4" slab on grade with concrete strip footings along load bearing walls and spread footings supporting concentrated loads.

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



A
Construction Year: 1990
Building Name: Classroom & Admin Building
Construction Type: W2
In Scope?: Yes

B
Construction Year: 1990
Building Name: Gymnasium
Construction Type: RM1
In Scope?: Yes

Figure 1
Redwood Elementary School Key Plan

3.0 Definition of Building Types

After reviewing the facility and the existing drawings we have determined the lateral system is defined as reinforced masonry bearing walls with flexible diaphragms (RM1) and wood frames, commercial and industrial (W2). Per ASCE 41-17 the subject structure's lateral system is defined as:

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.

4.0 Seismic Evaluation Methodology

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

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

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

For risk category IV structures, the intent is that the building can be inspected then immediately reoccupied following a seismic event to continue to function as an emergency service building or function as an emergency structure.

In accordance with the table below, this building is categorized as a risk category IV structure and was evaluated to meet the Life Safety structural performance and Hazards Reduced nonstructural performance level for BSE-2E loading and the Immediate Occupancy structural performance and Position Retention nonstructural performance level for BSE-1E loading.

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

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

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

Figure 2

Building Performance Objectives

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

5.0 Seismicity

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

SITE SPECIFIC SEISMICITY	
Soil Density	Stiff Soil
ASCE 7-16 Soil Classification	D
BSE-1E:	
S_{xs}	0.254
S_{x1}	0.191
Soil Condition Amplification Factors (F_V, F_A)	F_V = 2.4 - F_A = 1.6
BSE-2E:	
S_{xs}	0.798
S_{x1}	0.653
Soil Condition Amplification Factors (f_V, f_A)	f_V = 1.968 - f_A = 1.314
ASCE 41 Site Seismicity	High

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

6.0 Site Specific Hazards

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

7.0 Deficiencies and Repairs

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

Tier 1 Deficiency Description	Deficiency Statement	Repair Statement	Plan Key Note
	IO Basic		
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. A: Install drags to transfer loads to shear walls. B: Shear wall footings-wood walls C: Install steel columns and spandrels at the library window wall	S1
MEZZANINES	Interior mezzanine levels are not braced independently from the main structure or are not anchored to the seismic-force-resisting elements of the main structure.	Provide an independent bracing system or anchor the mezzanine to the seismic-force-resisting elements of the main structure. A: Renailing existing plywood B: Sheathing of existing walls C: Diaphragm attachments – out-of-plane	S2
VERTICAL IRREGULARITIES	Vertical elements in the seismic-force-resisting system are not continuous to the foundation.	Provide additional vertical seismic-force-resisting elements as required to transfer laterals to foundation elements. A: New wood drags B: New drag beam attachments C: Sheathing of existing walls D: Infill of roof diaphragm for continuous sheathing.	S3

	W2: IO		
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
DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS	Not all diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 30 ft and have aspect ratios less than or equal to 3-to-1.	A: Install new shear walls to reduce diaphragm spans. B: Renail existing plywood roof sheathing to increase shear capacity.	S5
	RM1: IO		
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.	A: Install new out-of-plane anchorage. B: Install steel columns and spandrels at gym window wall.	S6
WOOD LEDGERS	The connection between the wall panels and the diaphragm induces cross-grain bending or tension in the wood ledgers.	Install new out-of-plane anchorage.	S7
TRANSFER TO SHEAR WALLS	Diaphragms are not connected for transfer of seismic forces to the shear walls, or the connections are not able to develop the lesser of the shear strength of the walls or diaphragms.	Install new hardware for transfer of seismic forces from diaphragm to shear walls.	S8
CROSS TIES	There are not continuous cross ties between diaphragm chords.	Provide new continuous cross ties between diaphragm chords.	S9
NON-CONCRETE FILLED DIAPHRAGMS	Untopped metal deck diaphragms or metal deck diaphragms with fill other than concrete consist of horizontal spans of greater than 40 ft or have aspect ratios greater than 4-to-1.	Strengthen existing untopped metal decking with adequate diaphragm fasteners.	S10
	NONSTRUCTURAL CHECKLIST		
EMERGENCY LIGHTING	Emergency and egress lighting equipment is not anchored or braced.	Anchor and brace emergency and egress lighting equipment.	N1

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.	N2
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.	N3
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.	N4
CLADDING ANCHORS	Cladding components weighing more than 10 lb/ft.2 are not mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft.	Provide additional cladding support anchorage.	N5
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.	A: Seismically anchor existing canopies to the structure. B: Install cantilever columns	N6
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.	N7
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.	N8

HEAVY EQUIPMENT	Floor-supported or platform-supported equipment weighing more than 400lb is not anchored to the structure.	Anchor floor-supported or platform-supported equipment weighing more than 400lb to the structure.	N9
FLEXIBLE COUPLINGS	Fluid and gas piping does not have flexible couplings.	Install flexible couplings for fluid and gas piping.	N10
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.	N11

8.0 Preliminary Construction Cost Estimate

The attached engineer's opinion of probable cost has been developed by ZCS. ZCS has a successful record of completing seismic rehabilitation projects within the State of Oregon. The prices provided in the attached cost estimate have been developed using the extensive list of past projects as a baseline for this project. These prices are based on Oregon BOLI wage rates. The cost estimate is broken down into multiple line items associated with each major task (general conditions, foundation, structural steel, MEP, etc) associated with the rehabilitation. Additional line items are included for design associated permit costs, and owner construction management. A complete breakdown of the cost estimate can be found in Appendix E. Based upon ZCS's previous experience and discussions with site personnel the building likely does not contain hazardous materials based on the date of construction of the building.

DIRECT COST	
Construction	$ 1,778,100
Engineering	$ 290,900
Construction Management	$ 61,300
Relocation	$ 25,500
Construction Contingency	$ 340,300
TOTALS AND SUMMARY	
Total Cost Estimate	**$ 2,496,100**
Match Funds	**$0**
Total Amount Requested from SRGP	**$ 2,496,100**
Total Area	**50,800 S.F.**
Cost/Square Foot	**$ 49.14**

9.0 Conclusion and Certification Statement

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

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

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

Certification Statement

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

Matthew R. Smith, PE, SE

Appendix A: Figures

Figure 1: Entrance

Figure 2: Back of Classroom Building

Figure 3: Interior Courtyard form Hallway

Figure 4: Gymnasium

Figure 5: Hallway Admin Building

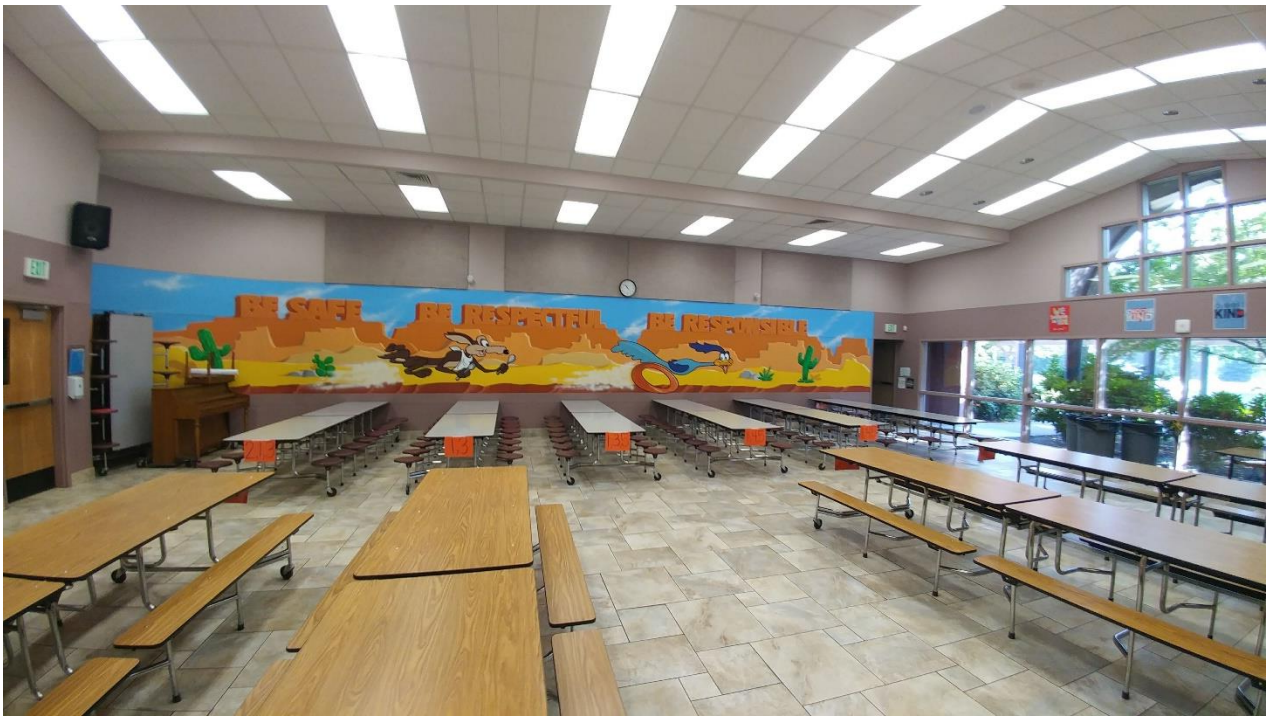


Figure 6: Cafeteria

Appendix B:
Tier 1 Check Sheets

17.1.2IO Basic Configuration Checklist

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status				Evaluation Statement	Tier 2 Reference	Commentary Reference	Comments
Very Low Seismicity							
Building System—General							
C ☐	**NC** ☒	**N/A** ☐	**U** ☐	LOAD PATH: The structure contains a complete, well-defined load path, including structural elements and connections, that serves to transfer the inertial forces associated with the mass of all elements of the building to the foundation.	5.4.1.1	A.2.1.1	No shear walls & footings under mezzanine. No vertical lateral elements under step in roof. No drags to load shear walls.
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	
C ☐	**NC** ☒	**N/A** ☐	**U** ☐	MEZZANINES: Interior mezzanine levels are braced independently from the main structure or are anchored to the seismic-force-resisting elements of the main structure.	5.4.1.3	A.2.1.3	Mezzanine at gym without shear wall to support & without adequate attachments to structure.
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	Moderate vertical irregularity in roof step over gym.

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

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	
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	Overstressed in 2x 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	
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	
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

Project Name _____
Project Number _____

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	
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	
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 have aspect ratios less than or equal to 3-to-1.	5.6.2	A.4.2.3	Unblocked diaphragm with spans greater than 30ft. Install shear walls to reduce diaphragm spans and perform Tier 2.
C	NC	N/A	U				
☒	☐	☐	☐	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							
C	NC	N/A	U				
☒	☐	☐	☐	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	

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

Project Name _____
Project Number _____

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	
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	- Connections specified but overstressed. - Walls don't extend to roof at library and gym.
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	At mezzanine.
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	-Connections specified but overstressed. - Walls don't extend to roof at library and gym.

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	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	
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	
Stiff Diaphragms							
C	NC	N/A	U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab.	5.6.4	A.4.5.1	
C	NC	N/A	U	TOPPING SLAB TO WALLS OR FRAMES: Reinforced concrete topping slabs that interconnect the precast concrete diaphragm elements are doweled for transfer of forces into the shear wall or frame elements.	5.7.2	A.5.2.3	
Foundation System							
C	NC	N/A	U	DEEP FOUNDATIONS: Piles and piers are capable of transferring the lateral forces between the structure and the soil.		A.6.2.3	
C	NC	N/A	U	SLOPING SITES: The difference in foundation embedment depth from one side of the building to another does not exceed one story.		A.6.2.4	
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	No cross ties specified.
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	
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	Untopped metal deck diaphragms span greater than 40 feet.
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

Table 17-38. Nonstructural Checklist

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

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

C	NC	N/A	U			
☐	☐	☒	☐	**HR—MH; LS—MH; PR—MH**. PIPING OR DUCTS CROSSING SEISMIC JOINTS: Piping or ductwork carrying hazardous material that either crosses seismic joints or isolation planes or is connected to independent structures has couplings or other details to accommodate the relative seismic displacements.	13.7.3 13.7.5 13.7.6	A.7.13.6
Partitions						
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY: Unreinforced masonry or hollow-clay tile partitions are braced at a spacing of at most 10 ft (3.0 m) in Low or Moderate Seismicity, or at most 6 ft (1.8 m) in High Seismicity.	13.6.2	A.7.1.1
C	**NC**	**N/A**	**U**			
☒	☐	☐	☐	**HR—LMH; LS—LMH; PR—LMH**. HEAVY PARTITIONS SUPPORTED BY CEILINGS: The tops of masonry or hollow-clay tile partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH**. DRIFT: Rigid cementitious partitions are detailed to accommodate the following drift ratios: in steel moment frame, concrete moment frame, and wood frame buildings, 0.02; in other buildings, 0.005.	13.6.2	A.7.1.2
C	**NC**	**N/A**	**U**			
☒	☐	☐	☐	**HR—not required; LS—not required; PR—MH**. LIGHT PARTITIONS SUPPORTED BY CEILINGS: The tops of gypsum board partitions are not laterally supported by an integrated ceiling system.	13.6.2	A.7.2.1
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—MH**. STRUCTURAL SEPARATIONS: Partitions that cross structural separations have seismic or control joints.	13.6.2	A.7.1.3
C	**NC**	**N/A**	**U**			
☒	☐	☐	☐	**HR—not required; LS—not required; PR—MH**. TOPS: The tops of ceiling-high framed or panelized partitions have lateral bracing to the structure at a spacing equal to or less than 6 ft (1.8 m).	13.6.2	A.7.1.4
Ceilings						
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**HR—H; LS—MH; PR—LMH**. SUSPENDED LATH AND PLASTER: Suspended lath and plaster ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**HR—not required; LS—MH; PR—LMH**. SUSPENDED GYPSUM BOARD: Suspended gypsum board ceilings have attachments that resist seismic forces for every 12 ft^2 (1.1 m^2) of area.	13.6.4	A.7.2.3

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

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

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C	NC	N/A	U				
☒	☐	☐	☐	**HR—not required; LS—not required; PR—H.** PENDANT SUPPORTS: Light fixtures on pendant supports are attached at a spacing equal to or less than 6 ft. Unbraced suspended fixtures are free to allow a 360-degree range of motion at an angle not less than 45 degrees from horizontal without contacting adjacent components. Alternatively, if rigidly supported and/or braced, they are free to move with the structure to which they are attached without damaging adjoining components. Additionally, the connection to the structure is capable of accommodating the movement without failure.	13.7.9	A.7.3.3	
C	**NC**	**N/A**	**U**				
☒	☐	☐	☐	**HR—not required; LS—not required; PR—H**. LENS COVERS: Lens covers on light fixtures are attached with safety devices.	13.7.9	A.7.3.4	
Cladding and Glazing							
C	**NC**	**N/A**	**U**				
☐	☒	☐	☐	**HR—MH; LS—MH; PR—MH**. CLADDING ANCHORS: Cladding components weighing more than 10 lb/ft^2 (0.48 kN/m^2) are mechanically anchored to the structure at a spacing equal to or less than the following: for Life Safety in Moderate Seismicity, 6 ft (1.8 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 ft (1.2 m)	13.6.1	A.7.4.1	Masonry wing walls in area A not not properly braced at roof.
C	**NC**	**N/A**	**U**				
☐	☐	☒	☐	**HR—not required; LS—MH; PR—MH**. CLADDING ISOLATION: For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.3	
C	**NC**	**N/A**	**U**				
☐	☐	☒	☐	**HR—MH; LS—MH; PR—MH**. MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.4	

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

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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 attached.
☐	☐	☒	☐	**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
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

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

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

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

C	NC	N/A	U			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** ELEVATOR EQUIPMENT: Equipment, piping, and other components that are part of the elevator system are anchored.	13.7.11	A.7.16.3
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**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
C	**NC**	**N/A**	**U**			
☐	☐	☒	☐	**HR—not required; LS—not required; PR—H.** GO-SLOW ELEVATORS: The building has a go-slow elevator system.	13.7.11	A.7.16.9

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

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

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

Appendix C: Schematic Seismic Retrofit Drawings

REDWOOD ELEMENTARY SEISMIC RETROFIT

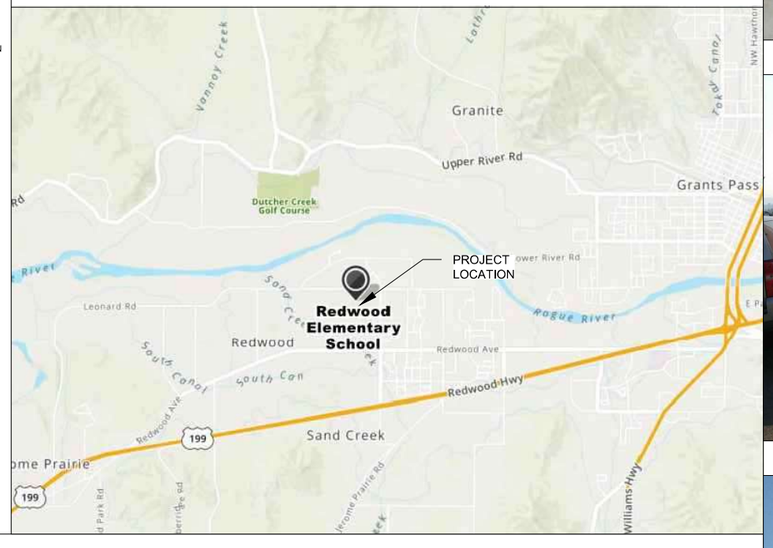
PRELIMINARY DESIGN
3163 LEONARD RD
GRANTS PASS, OREGON 97526

ABBREVIATIONS

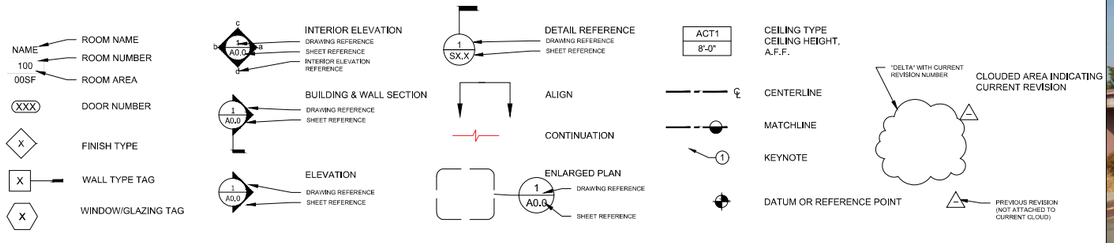
ABBREVIATIONS			
(E)	EXISTING	L.P.	LOW POINT
(N)	NEW	M.C.	MEDICINE CABINET
(R)	REMOVE	M.D.F.	MEDIUM DENSITY FIBERBOARD
A.C.	ASPHALT CONCRETE	M.D.O.	MEDIUM DENSITY OVERLAY
A.C.B.	ACOUSTICAL BOARD	MEMB.	MEMBRANE
A.C.P.	ACOUSTICAL PANEL	MH.	MANHOLE
A.C.T.	ACOUSTICAL CEILING TILE	MIR.	MIRROR
A.D.	AREA DRAIN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

SHEET INDEX

VICINITY MAP



SYMBOLS

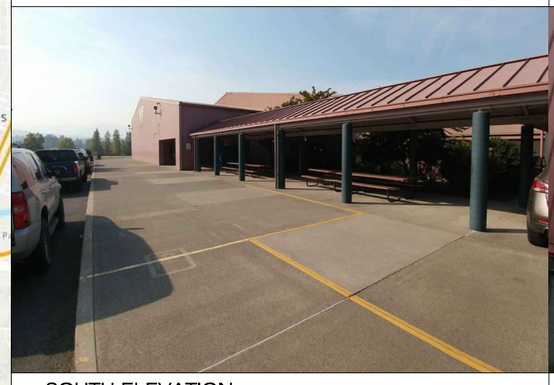


ONE INCH EQUALS FULL SCALE

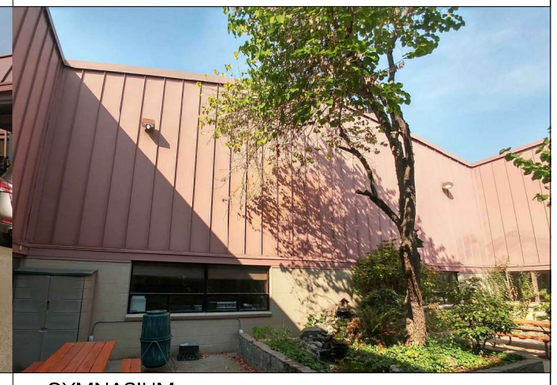
ENTRYWAY:

LIBRARY:

EAST ELEVATION:



COURT YARD:



SOUTH ELEVATION:

GYMNASIUM:

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GRANTS PASS SCHOOL DISTRICT
725 NE DEAN DRIVE
GRANTS PASS, OR 97526

REDWOOD ELEMENTARY SEISMIC RETROFIT

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

REVISION ID:	DATE:

PROJECT NO:	G-1560-22
DRAWN:	JBB/JRE
CHECKED:	MRS
DATE:	DEC. 2023

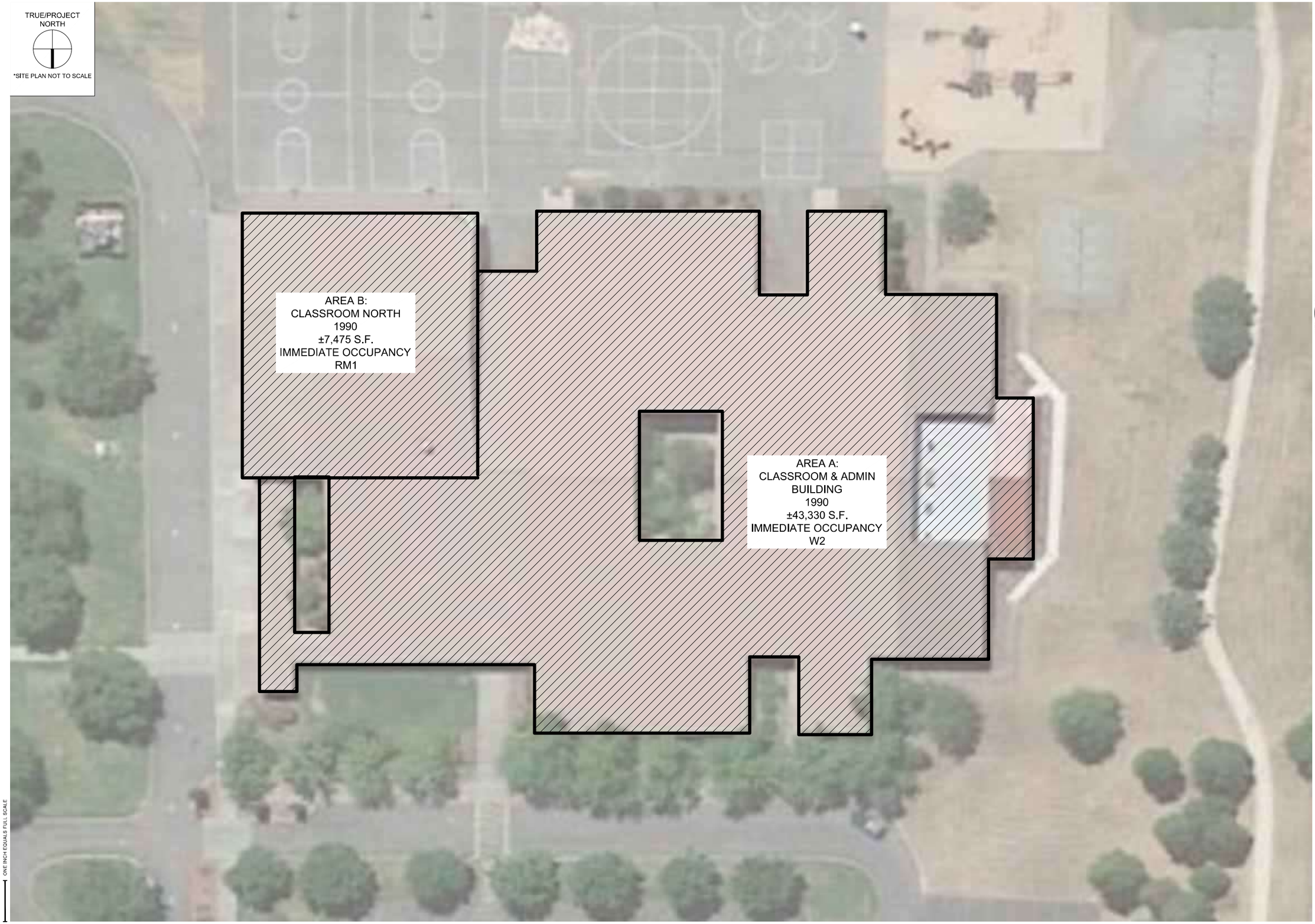
COVER SHEET

G0.0

PRELIMINARY DESIGN

TRUE/PROJECT NORTH

*SITE PLAN NOT TO SCALE



ONE INCH EQUALS FULL SCALE

ZCS
ENGINEERING
ARCHITECTURE

127 NW D Street, Grants Pass,
Oregon 97526 | 541-479-3865

GRANTS PASS SCHOOL DISTRICT
725 NE DEAN DRIVE
GRANTS PASS, OR 97526

REDWOOD ELEMENTARY SEISMIC RETROFIT

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER OREGON 08, 2014 MATTHEW R. SMITH EXPIRES: 06-30-24

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1560-22
DRAWN:	JBBURE
CHECKED:	MRS
DATE:	DEC. 2023

BUILDING KEY PLAN

A1.1

PRELIMINARY DESIGN

STRUCTURAL REPAIRS:

S1. PROVIDE A COMPLETE, WELL-DEFINED LOAD PATH BY INSTALLING NEW ELEMENTS AND CONNECTIONS AS NEEDED TO TRANSFER INERTIAL FORCES FROM ALL ELEMENTS OF THE BUILDING TO THE FOUNDATION.
   A. INSTALL DRAG TO TRANSFER LOADS TO SHEAR WALLS.
   B. SHEAR WALL FOOTINGS - WOOD WALL
   C. INSTALL STEEL COLUMNS AND SPANDRELS AT LIBRARY WINDOW WALL.

S2. PROVIDE AN INDEPENDENT BRACING SYSTEM AND ANCHOR THE MEZZANINE TO THE SEISMIC-FORCE-RESISTING ELEMENTS OF THE MAIN STRUCTURE.
   A. RENAILING EXISTING PLYWOOD
   B. SHEATHING OF EXISTING WALLS
   C. DIAPHRAGM ATTACHMENTS - OUT-OF-PLANE

S3. PROVIDE ADDITIONAL VERTICAL SEISMIC-FORCE-RESISTING ELEMENTS AS REQUIRED TO TRANSFER LATERALS TO FOUNDATION ELEMENTS.
   A. NEW WOOD DRAGS
   B. NEW DRAG BEAM ATTACHMENTS
   C. SHEATHING OF EXISTING WALLS
   D. INFILL OF ROOF DIAPHRAGM FOR CONT. SHEATHING.

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

S5. A. INSTALL NEW SHEAR WALLS TO REDUCE DIAPHRAGM SPANS.
   B. RENAIL EXISTING PLYWOOD ROOF SHEATHING TO INCREASE SHEAR CAPACITY.

S6. A. INSTALL NEW OUT-OF-PLANE ANCHORAGE AT TOP OF MASONRY WALLS TO DIAPHRAGMS.
   B. INSTALL NEW STEEL COLUMNS AND SPANDRELS AT GYM WINDOW WALL.

S7. INSTALL NEW OUT-OF-PLANE ANCHORAGE.

S8. INSTALL NEW HARDWARE FOR TRANSFER OF SEISMIC FORCES FROM DIAPHRAGM TO SHEAR WALLS.

S9. PROVIDE NEW CONTINUOUS CROSS TIES BETWEEN DIAPHRAGM CHORDS.

S10. STRENGTHEN EXISTING UNTOPPED METAL DECKING WITH NEW DIAPHRAGM FASTENING.

NON-STRUCTURAL REPAIRS:

N1. ANCHOR AND BRACE EMERGENCY AND EGRESS LIGHTING EQUIPMENT.

N2. INSTALL SEISMIC BRACING FOR INTEGRATED SUSPENDED CEILINGS.

N3. INSTALL FREE EDGE CLEARANCE FOR INTEGRATED SUSPENDED CEILINGS.

N4. INSTALL FREE EDGE SUPPORT FOR INTEGRATED SUSPENDED CEILINGS.

N5. PROVIDE TOP OF WALL TO ROOF ANCHORAGE AND BLOCKING AT CMU WING WALLS.

N6. A. SEISMICALLY ANCHOR EXISTING CANOPIES TO THE STRUCTURE.
   B. INSTALL CANOPY COLUMNS.

N7. ANCHOR CONTENTS TO THE STRUCTURE.

N8. BRACE EQUIPMENT TO STRUCTURE.

N9. ANCHOR FLOOR-SUPPORTED OR PLATFORM-SUPPORTED EQUIPMENT WEIGHING MORE THAN 400LB TO THE STRUCTURE.

N10. INSTALL FLEXIBLE COUPLINGS FOR FLUID AND GAS PIPING.

N11. ANCHOR AND BRACE FLUID AND GAS PIPING TO THE STRUCTURE.

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REDWOOD ELEMENTARY SEISMIC RETROFIT

REVISION ID:	DATE:

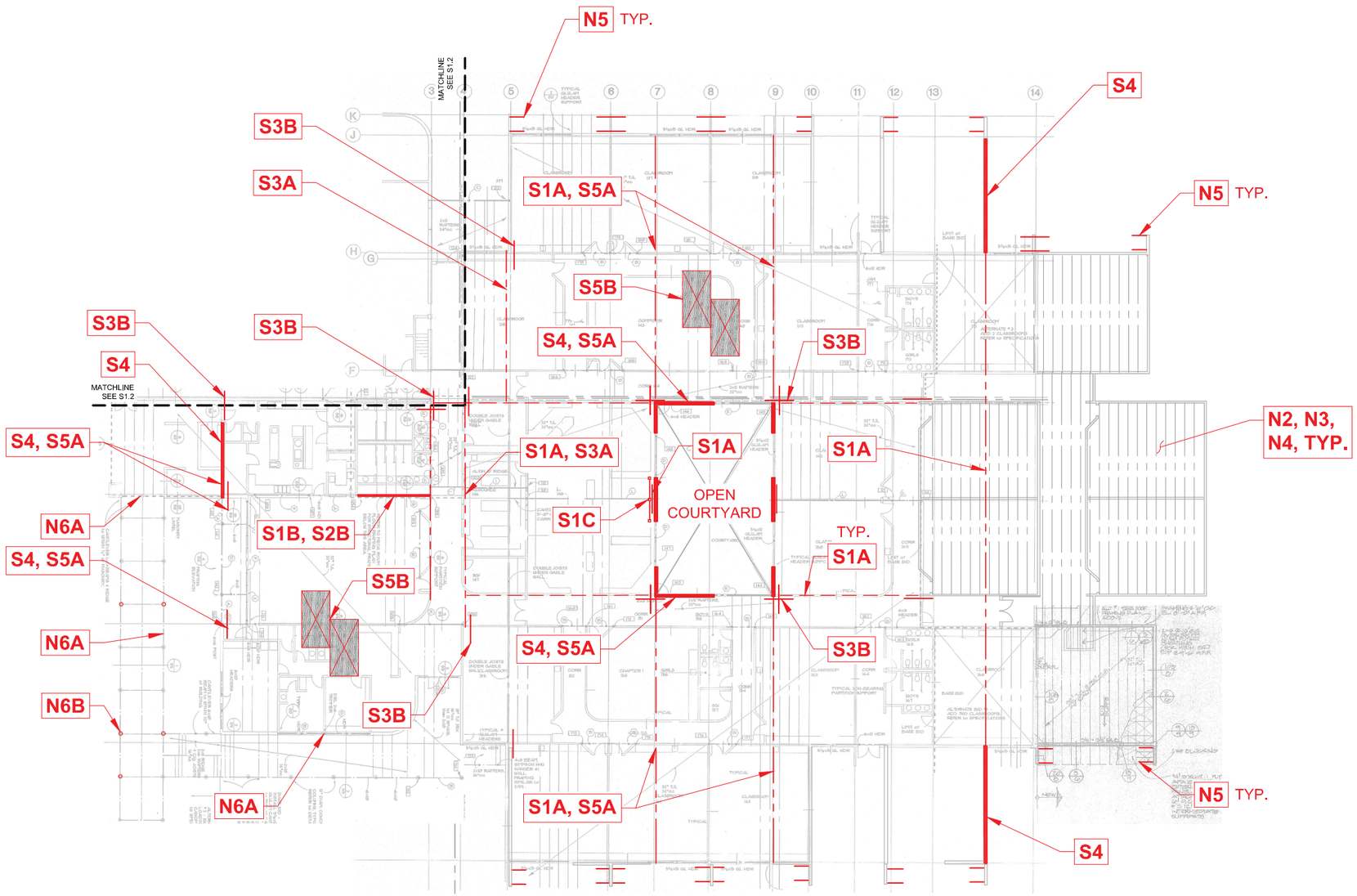
PROJECT NO:	G-1560-22
DRAWN:	JBB/JRE
CHECKED:	MRS
DATE:	DEC. 2023

REPAIR KEY NOTES

S1.1

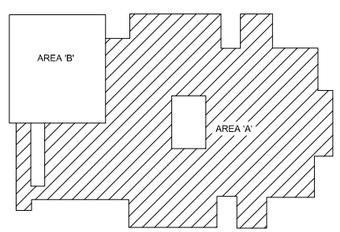
PRELIMINARY DESIGN

ONE INCH EQUALS FULL SCALE



ONE INCH EQUALS FULL SCALE

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



0 S2.1 **CAMPUS KEY** NTS

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GRANTS PASS SCHOOL DISTRICT
725 NE DEAN DRIVE
GRANTS PASS, OR 97526

REDWOOD ELEMENTARY SEISMIC RETROFIT

GRANTS PASS SCHOOL DISTRICT NO. 7

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER OREGON 08, 2014 MATTHEW R. SMITH EXPIRES: 06-30-24

PRELIMINARY - NOT FOR CONSTRUCTION

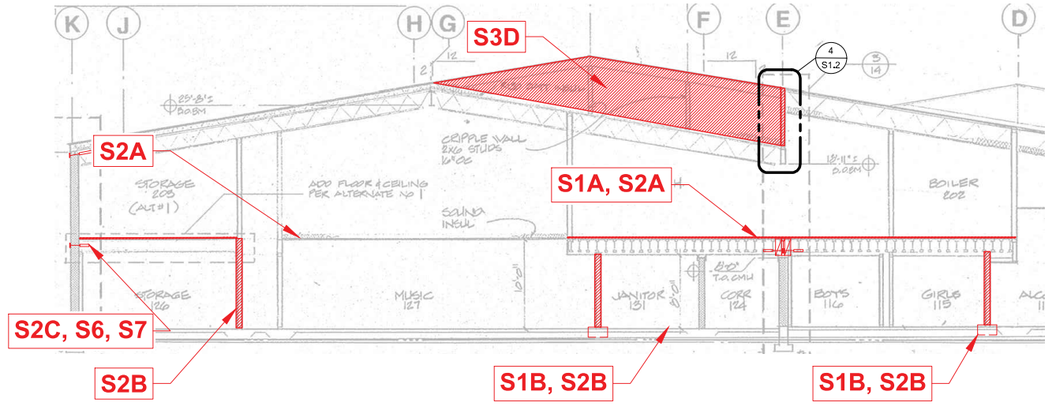
REVISION ID:	DATE:

PROJECT NO:	G-1560-22
DRAWN:	JBB/JRE
CHECKED:	MRS
DATE:	DEC. 2023

AREA 'A' ROOF FRAMING PLAN

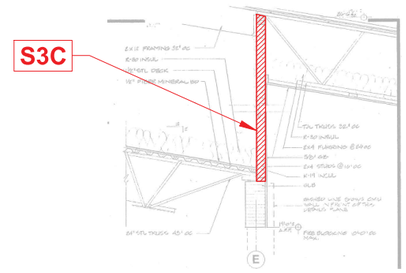
S2.1

PRELIMINARY DESIGN



4 S2.2 **AREA 'B' - BUILDING SECTION**

1/8"=1'-0"



4 S2.2 **AREA 'B' - BUILDING SECTION**

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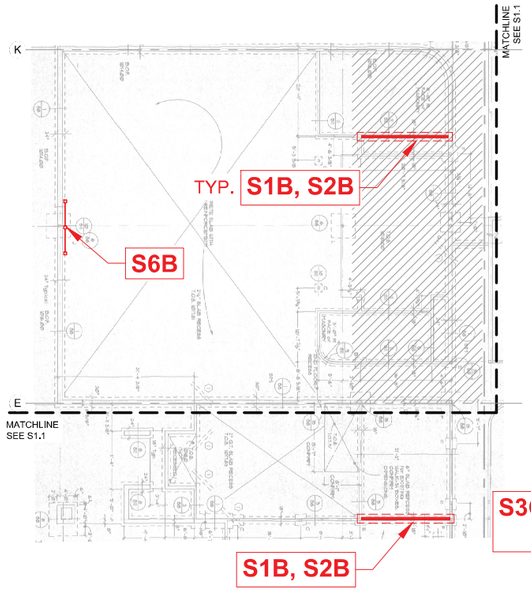

1 S2.2 **AREA 'B' - FOUNDATION PLAN**

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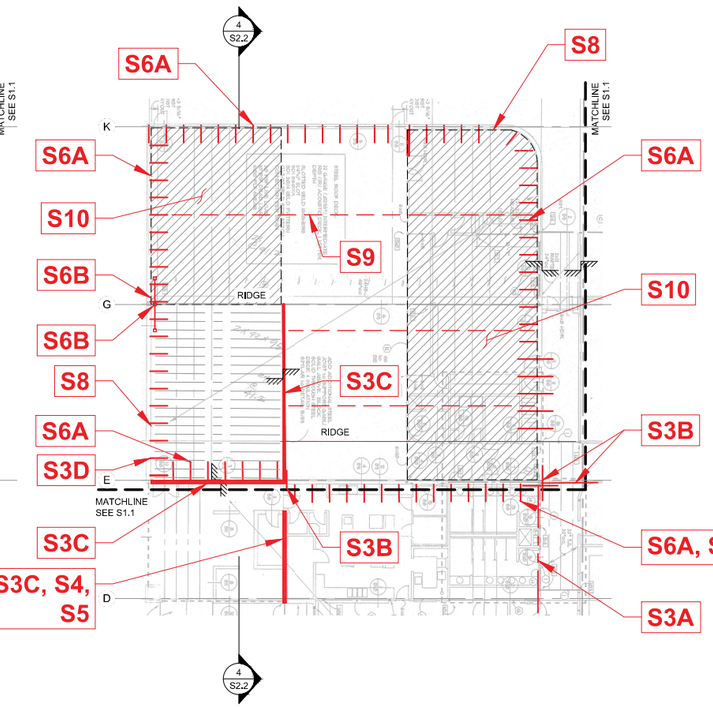
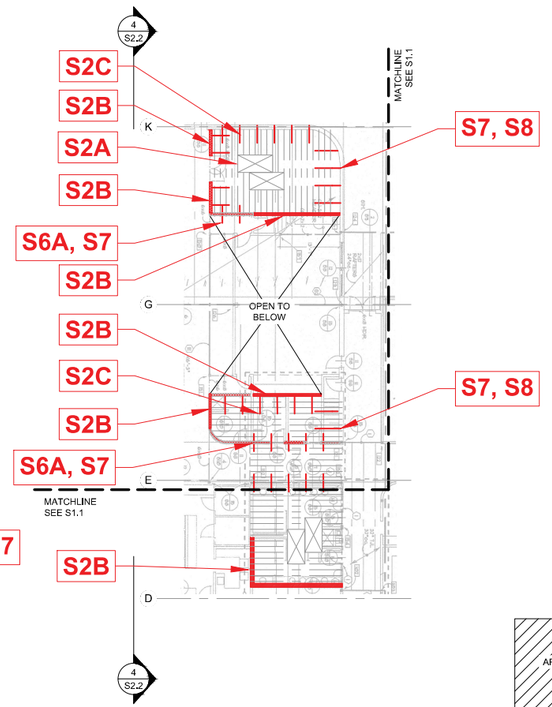


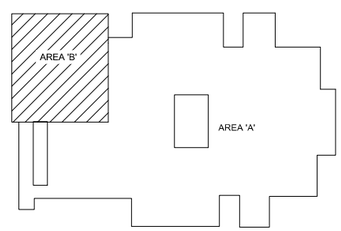
2 S2.2 **AREA 'B' - ROOF FRAMING PLAN**

1/16"=1'-0"



3 S2.2 **AREA 'B' - MEZZANINE FRAMING PLAN**

1/16"=1'-0"



0 S2.2 **CAMPUS KEY**

NTS

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REDWOOD ELEMENTARY SEISMIC RETROFIT

STRUCTURAL REGISTERED PROFESSIONAL ENGINEER OREGON DEC 08, 2014 MATTHEW R. SMITH EXPIRES: 06-30-24

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PROJECT NO:	G-1560-22
DRAWN:	JBB/JRE
CHECKED:	MRS
DATE:	DEC, 2023

AREA 'B' ROOF FRAMING PLAN

S2.2

PRELIMINARY DESIGN

Appendix D:
Geotechnical Information

3163 Leonard Rd, Grants Pass, OR 97527, USA

Latitude, Longitude: 42.4287662, -123.3901802

Date	2/10/2022, 10:02:22 AM
Design Code Reference Document	ASCE41-17
Custom Probability	
Site Class	D - Default (See Section 11.4.3)

Type	Description	Value
Hazard Level		BSE-2N
S_S	spectral response (0.2 s)	0.92
S_1	spectral response (1.0 s)	0.502
S_{XS}	site-modified spectral response (0.2 s)	1.104
S_{X1}	site-modified spectral response (1.0 s)	0.903
F_a	site amplification factor (0.2 s)	1.2
F_v	site amplification factor (1.0 s)	1.798
ssuh	max direction uniform hazard (0.2 s)	1.063
crs	coefficient of risk (0.2 s)	0.865
ssrt	risk-targeted hazard (0.2 s)	0.92
ssd	deterministic hazard (0.2 s)	1.593
s1uh	max direction uniform hazard (1.0 s)	0.585
cr1	coefficient of risk (1.0 s)	0.859
s1rt	risk-targeted hazard (1.0 s)	0.502
s1d	deterministic hazard (1.0 s)	0.855

Type	Description	Value
Hazard Level		BSE-1N
S_{XS}	site-modified spectral response (0.2 s)	0.736
S_{X1}	site-modified spectral response (1.0 s)	0.602

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	0.608
S_1	spectral response (1.0 s)	0.332
S_{XS}	site-modified spectral response (0.2 s)	0.798
S_{X1}	site-modified spectral response (1.0 s)	0.653
f_a	site amplification factor (0.2 s)	1.314
f_v	site amplification factor (1.0 s)	1.968

Type	Description	Value
Hazard Level		BSE-1E
S_S	spectral response (0.2 s)	0.159
S_1	spectral response (1.0 s)	0.08
S_{XS}	site-modified spectral response (0.2 s)	0.254
S_{X1}	site-modified spectral response (1.0 s)	0.191
F_a	site amplification factor (0.2 s)	1.6
F_v	site amplification factor (1.0 s)	2.4

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

Landslide Hazard

February 10, 2022

Landslide Hazard

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

1:960

0 0.01 0.01 0.02 mi

0 0.01 0.01 0.03 km

Maxar, Microsoft

Liquefaction Hazard

February 10, 2022

1:960

0 0.01 0.01 0.02 mi

0 0.01 0.01 0.03 km

Maxar, Microsoft

Active Fault Hazard

February 10, 2022

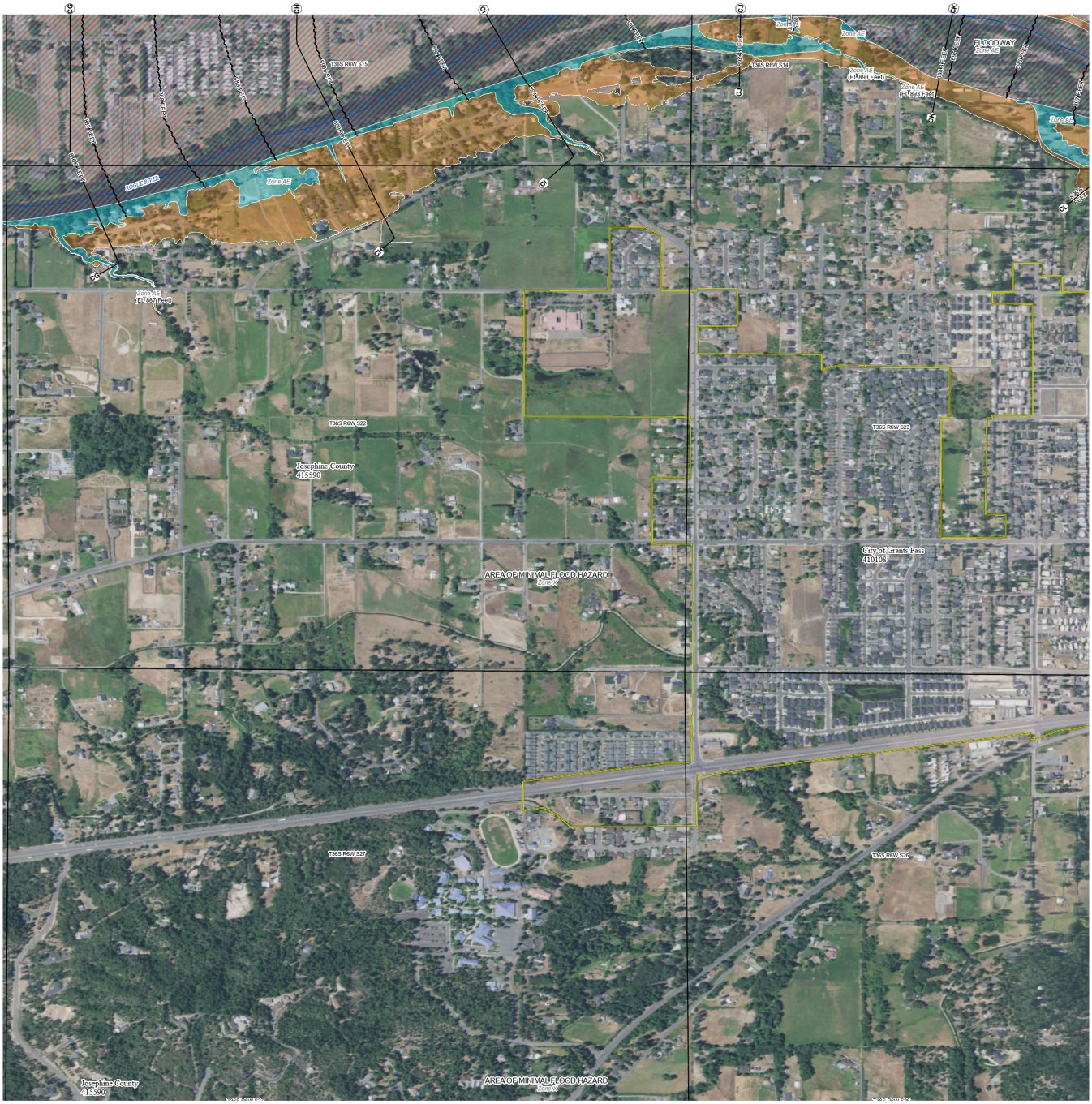
1:960

0 0.01 0.01 0.02 mi

0 0.01 0.01 0.03 km

Maxar, Microsoft

123°24'22.98"W 42°26'21.61"N



123°22'29.62"W 42°24'15.93"N

FLOOD HAZARD INFORMATION

SEE FIS REPORT FOR DETAILED LEGEND AND INDEX MAP FOR DRAFT 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
- Coastal Transect Baseline
- Profile Baseline
- Hydrographic Feature
- 513 Base Flood Elevation Line (BFE)
- Limit of Study
- Jurisdiction Boundary

NOTES TO USERS

For information and questions about this Flood Insurance Rate Map (FIRM), available products associated with this FIRM, including historic versions, the current map date for each FIRM panel, how to order products, or the National Flood Insurance Program (NFIP) in general, please call the FEMA Map Information eXchange at 1-877-FEMA-MAP (1-877-336-2627) or visit the FEMA Flood Map Service Center website at https://msc.fema.gov. Available products may include previously issued Letters of Map Change, a Flood Insurance Study Report, and/or digital versions of this map. Many of these products can be ordered or obtained directly from the website.

Communities annexing land on adjacent FIRM panels must obtain a current copy of the adjacent panel as well as the current FIRM Index. These may be ordered directly from the Flood Map Service Center at the number listed above.

For community and countywide map dates, refer to the Flood Insurance Study Report for this jurisdiction.

To determine if flood insurance is available in this community, contact your Insurance agent or call the National Flood Insurance Program at 1-800-638-6620.

Basemap information shown on this FIRM was provided in digital format by the United States Geological Survey (USGS). The basemap shown is the USGS National Map: Orthoimagery. Last refreshed October, 2020.

This map was exported from FEMA's National Flood Hazard Layer (NFHL) on 12/15/2022 11:29 AM 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. For additional information, please see the Flood Hazard Mapping Updates Overview Fact Sheet at https://www.fema.gov/media-library/assets/documents/118418

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. 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.

SCALE

Map Projection:
GCS: Geodetic Reference System 1980;
Vertical Datum: NAVD88
For information about the specific vertical datum for elevation features, datum conversions, or vertical monuments used to create this map, please see the Flood Insurance Study (FIS) Report for your community at https://msc.fema.gov

1 inch = 500 feet 1:6,000

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

N

0 50 100 200 300 400 Meters

FEMA National Flood Insurance Program

NATIONAL FLOOD INSURANCE PROGRAM
FLOOD INSURANCE RATE MAP

PANEL 492 OF 975

Panel Contains:

COMMUNITY	NUMBER	PANEL
CITY OF GRANTS PASS	410108	0492
JOSEPHINE COUNTY	415590	0492

MAP NUMBER
41033C0492E
EFFECTIVE DATE
December 03, 2009

Appendix E: Construction Cost Estimate Worksheets

ENGINEER'S OPINION OF PROBABLE COST - REDWOOD 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%	%		$ 132,105.00
Preconstruction Services		2%	%		$ 26,421.00
Escalation		7%	%		$ 103,570.32
Bonding & Insurance		3%	%		$ 44,387.28
Contractor Profit & Overhead		5%	%		$ 73,978.80
				General Conditions Subtotal	$ 380,462.40
Non-Structural Elements					
Misc MEP	N1, N5-N7, N16, N20-N27	1	Lump Sum	$ 85,100.00	$ 85,100.00
Misc Non-Structural	N8-N15, N17-N19	1	Lump Sum	$ 34,100.00	$ 34,100.00
Suspended Ceiling Replacement	N2-N4	14700	Square Foot	$ 4.00	$ 58,800.00
				Non-Structural Subtotal	$ 178,000.00
Construction Cost Per Building Part					
				Building Part 'A' Subtotal	$ 694,950.00
				Building Part 'B' Subtotal	$ 448,100.00
				Sub-Total Construction Cost	$ 1,701,500.00
				Contingency 20%	$ 340,300.00
				Total Construction Cost	$ 2,041,800.00
Cost Estimate Summary					
Engineering					$ 290,900.00
Architectural Consulting				$ 30,600.00	
Structural / Rehabilitation Engineering				$ 224,600.00	
Geotechnical Consulting				$ 20,400.00	
Materials Testing for Design				$ 15,300.00	
Construction Management					$ 61,300.00
Construction					$ 1,778,100.00
Sub-Total Construction Cost				$ 1,701,500.00	
Special Inspection Services for Construction				$ 15,300.00	
Permitting Fees				$ 61,300.00	
Relocation of FF&E					$ 25,500.00
Contingency					$ 340,300.00
				Total Project Funding Requirement	$ 2,496,100.00

ENGINEER'S OPINION OF PROBABLE COST - REDWOOD 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	S1A, S3A, S3B, S3C, S4, S5A, S8, N5	6000	Square Foot	$ 2.00	$ 12,000.00
TPO / Comp / Metal Roof Demo	S1A, S3A, S3B, S8	38000	Square Foot	$ 2.00	$ 76,000.00
			Demolition & Asbestos Subtotal		$ 88,000.00
Foundation / Floor Strengthening Construction					
Bolting of Extg Walls to footings	S3C, S4, S5A	270	Linear Foot	$ 35.00	$ 9,450.00
Spread Footings for Columns / Holdown	N5	5	Each	$ 4,000.00	$ 20,000.00
			Foundation Level Subtotal		$ 29,450.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S3C, S4, S5A	2700	Square Foot	$ 5.00	$ 13,500.00
Interior Wall Finish Repair	S3C, S4, S5A	2700	Square Foot	$ 2.00	$ 5,400.00
Painting	S1A, S3A, S3B, S3C, S4, S5A, S8,	3700	Square Foot	$ 3.00	$ 11,100.00
Light Steel Columns	N4, N6B	8	EA	$ 1,600.00	$ 12,800.00
Steel Spandrel	N5	2	Linear Foot	$ 600.00	$ 1,200.00
			Wall Strengthening Subtotal		$ 44,000.00
Roof Strengthening Construction					
Diaphragm Attachments - Out-of-Plane	N5	150	Linear Foot	$ 50.00	$ 7,500.00
Diaphragm Attachments - In-Plane Shear	S1A, S3A, S3B, S5A	1000	Linear Foot	$ 20.00	$ 20,000.00
New Drag Beam Attachments	S1A, S3A, S3B	26	EA	$ 1,500.00	$ 39,000.00
Ceiling Repair	S1A, S3A, S3B, S3C, S4, S5	1000	Square Foot	$ 3.00	$ 3,000.00
New Composite Roof Shingles	S1A, S3A, S3B, S8	38000	Square Foot	$ 10.00	$ 380,000.00
New Wood Beams	S1A, S3A	800	Linear Foot	$ 30.00	$ 24,000.00
Re-Nail Existing Plywood	S5B	20000	Square Foot	$ 3.00	$ 60,000.00
			Roof Strengthening Subtotal		$ 533,500.00
			Building Part 'A' - Total Construction Cost		$ 694,950.00

ENGINEER'S OPINION OF PROBABLE COST - REDWOOD 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 ,S2A-S2C, S3A-S3D, S6A, S10	2700	Square Foot	$ 2.00	$ 5,400.00
Hard Demolition	S1B	300	Square Foot	$ 20.00	$ 6,000.00
TPO / Comp / Metal Roof Demo	S3D, S6A, S6B, S7, S8, S9, S10	7400	Square Foot	$ 2.00	$ 14,800.00
			Demolition & Asbestos Subtotal		$ 26,200.00
Foundation / Floor Strengthening Construction					
Flooring Protection	S3D, S6A, S6B, S7, S8, S9, S10	4700	Square Foot	$ 6.00	$ 28,200.00
Diaphragm Attachments - Out-of-Plane	S2C, S6A	150	Linear Foot	$ 50.00	$ 7,500.00
Re-Nail Existing Plywood	S2A	1800	Square Foot	$ 3.00	$ 5,400.00
Diaphragm Attachments - In-Plane Shear	S3A, S8	200	Linear Foot	$ 20.00	$ 4,000.00
Floor Finish Patch / Replacement	S1B, S2A, S2C, S6A, S7	2000	Square Foot	$ 7.00	$ 14,000.00
Shear Wall Footings - Wood Walls	S1B	50	Linear Foot	$ 300.00	$ 15,000.00
Concrete Repair & Patching	S1B	100	Square Foot	$ 15.00	$ 1,500.00
			Foundation Level Subtotal		$ 75,600.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S2B, S3B	1400	Square Foot	$ 5.00	$ 7,000.00
Interior Wall Finish Repair	S1A, S2A,S4,S8	1400	Square Foot	$ 2.00	$ 2,800.00
Painting	S1A, S2A,S4,S8	2500	Square Foot	$ 3.00	$ 7,500.00
Heavy Steel Columns	S6B	3	EA	$ 10,000.00	$ 30,000.00
Steel Spandrel	S6B	2	EA	$ 600.00	$ 1,200.00
New 2x Framed Shear Walls	S1B, S2B	400	Square Foot	$ 10.00	$ 4,000.00
			Wall Strengthening Subtotal		$ 52,500.00
Roof Strengthening Construction					
Diaphragm Attachments - Out-of-Plane	S2C, S6A, S7	400	Linear Foot	$ 50.00	$ 20,000.00
Diaphragm Attachments - In-Plane Shear	S1A, S2B, S3A, S3B, S8	600	Linear Foot	$ 20.00	$ 12,000.00
New Drag Beam Attachments	S1A, S3A, S3B	2	EA	$ 1,500.00	$ 3,000.00
Ceiling Repair	S1A, S2B-S2C, S6A, S7, S8	600	Square Foot	$ 3.00	$ 1,800.00
New 6" polyisociurinate rigid insulation	S1A, S3, S6A, S6B, S8, S9, S10	7400	Square Foot	$ 10.00	$ 74,000.00
New Composite Roof Shingles	S1A, S3, S6A, S6B, S8, S9, S10	7400	Square Foot	$ 10.00	$ 74,000.00
New Roof Structure Framing - Steel Framing	S3	1300	Square Foot	$ 45.00	$ 58,500.00
Steel Drag Strut	S9	400	Linear Foot	$ 50.00	$ 20,000.00
Add Fasteners to Existing Metal Diaphragm	S10	6100	Square Foot	$ 5.00	$ 30,500.00
			Roof Strengthening Subtotal		$ 293,800.00
			Building Part 'B' - Total Construction Cost		$ 448,100.00

Appendix F:
Rapid Visual Screening

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

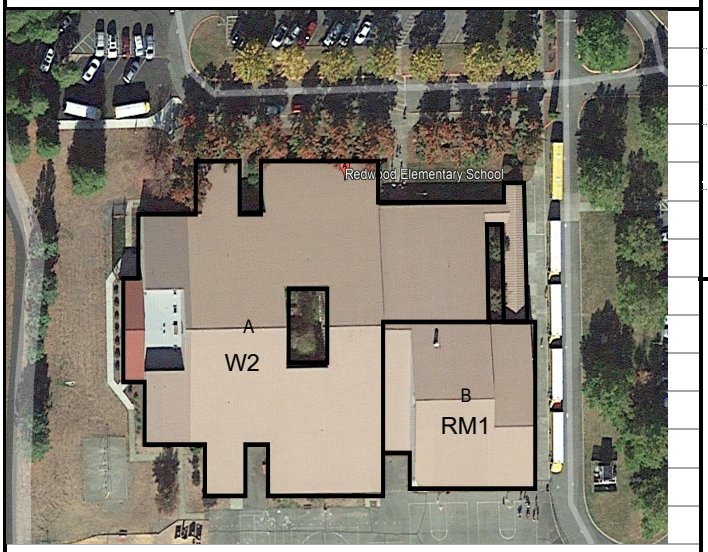
Level 1
HIGH Seismicity

Address: 3163 LEONARD ROAD
GRANTS PASS, OREGON **Zip:** 97526
Other Identifiers: Building A
Building Name: REDWOOD ELEMENTARY
Use: SCHOOL
Latitude: 42.4287 **Longitude:** -123.3902
S_S: 0.608; 0.159 **S_1:** 0.332; 0.08
Screener(s): **Date/Time:** 12/12/23

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1990 ☐ EST
Total Floor Area (sq. ft.): 43,330 **Code Year:**
Additions: ☐ None ■ Yes, Year(s) Built: 1993

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.*



SKETCH

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) MODERATE ☐ Plan (type)

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

COMMENTS:
SOIL TYPE 'D' - ASSUMED

☐ Additional sketches or comments on separate page

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

FEMA BUILDING TYPE W2 ☐ Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score	**3.6**	**3.2**	**2.9**	**2.1**	**2.0**	**2.6**	**2.0**	**1.7**	**1.5**	**2.0**	**1.2**	**1.6**	**1.4**	**1.7**	**1.7**	**1.0**	**1.5**
Severe Vertical Irregularity, V_{L1}	-1.2	-1.2	-1.2	-1.0	-1.0	-1.1	-1.0	-0.8	-0.9	-1.0	-0.7	-1.0	-0.9	-0.9	-0.9	-0.7	NA
Moderate Vertical Irregularity, V_{L1}	-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.4	NA
Plan Irregularity, P_{L1}	-1.1	-1.0	-1.0	-0.8	-0.7	-0.9	-0.7	-0.6	-0.6	-0.8	-0.5	-0.7	-0.6	-0.7	-0.7	-0.4	NA
Pre-Code	-1.1	-1.0	-0.9	-0.6	-0.6	-0.8	-0.6	-0.2	-0.4	-0.7	-0.1	-0.5	-0.3	-0.5	-0.5	0.0	-0.1
Post-Benchmark	1.6	1.9	2.2	1.4	1.4	1.1	1.9	NA	1.9	2.1	NA	2.0	2.4	2.1	2.1	NA	1.2
Soil Type A or B	0.1	0.3	0.5	0.4	0.6	0.1	0.6	0.5	0.4	0.5	0.3	0.6	0.4	0.5	0.5	0.3	0.3
Soil Type E (1-3 stories)	0.2	0.2	0.1	-0.2	-0.4	0.2	-0.1	-0.4	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.4
Soil Type E (> 3 stories)	-0.3	-0.6	-0.9	-0.6	-0.6	NA	-0.6	-0.4	-0.5	-0.7	-0.3	NA	-0.4	-0.5	-0.6	-0.2	NA
Minimum Score, S_{MIN}	*1.1*	*0.9*	*0.7*	*0.5*	*0.5*	*0.6*	*0.5*	*0.5*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.3*	*0.3*	*0.2*	*1.0*

FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$: 1.2

EXTENT OF REVIEW

Exterior: ■ Partial ■ All Sides ■ Aerial
Interior: ☐ None ☐ Visible ■ Entered
Drawings Reviewed: ■ Yes ☐ No
Soil Type Source: ASSUMED
Geologic Hazards Source: DOGOMI
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)*

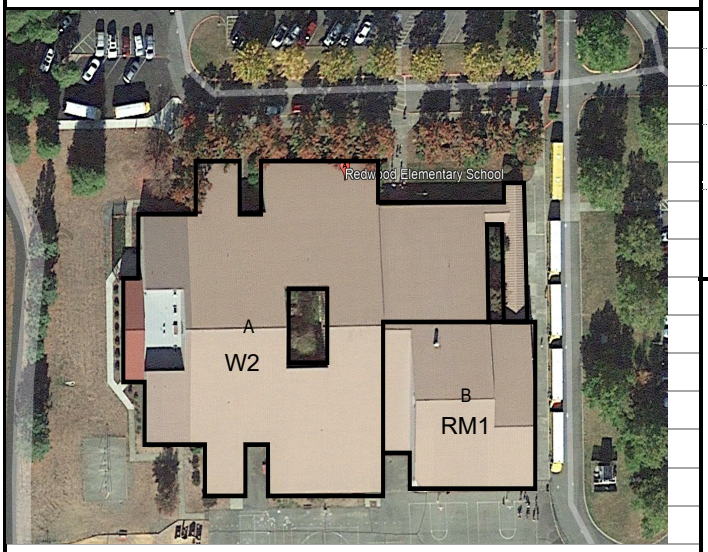
■ Yes, nonstructural hazards identified that should be evaluated
☐ No, nonstructural hazards exist that may require mitigation, but a detailed evaluation is not necessary
☐ No, no nonstructural hazards identified ☐ DNK

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
FEMA P-154 Data Collection Form

Level 1
HIGH Seismicity



SKETCH

Address: 3163 LEONARD ROAD
GRANTS PASS, OREGON **Zip:** 97526
Other Identifiers: Building B
Building Name: REDWOOD ELEMENTARY
Use: SCHOOL
Latitude: 42.4287 **Longitude:** -123.3902
S_S: 0.608; 0.159 **S_1:** 0.332; 0.08
Screener(s): **Date/Time:** 12/12/23

No. Stories: Above Grade: 1 Below Grade: 0 **Year Built:** 1990 ☐ EST
Total Floor Area (sq. ft.): 7,475 **Code Year:**
Additions: ☐ None ■ Yes, Year(s) Built: 1993

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) MODERATE ☐ Plan (type)

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

COMMENTS:
SOIL TYPE 'D' - ASSUMED

☐ Additional sketches or comments on separate page

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

FEMA BUILDING TYPE W2 ☐ Do Not Know	W1	W1A	W2	S1 (MRF)	S2 (BR)	S3 (LM)	S4 (RC SW)	S5 (URM INF)	C1 (MRF)	C2 (SW)	C3 (URM INF)	PC1 (TU)	PC2	RM1 (FD)	RM2 (RD)	URM	MH
Basic Score	**3.6**	**3.2**	**2.9**	**2.1**	**2.0**	**2.6**	**2.0**	**1.7**	**1.5**	**2.0**	**1.2**	**1.6**	**1.4**	**1.7**	**1.7**	**1.0**	**1.5**
Severe Vertical Irregularity, V_{L1}	-1.2	-1.2	-1.2	-1.0	-1.0	-1.1	-1.0	-0.8	-0.9	-1.0	-0.7	-1.0	-0.9	-0.9	-0.9	-0.7	NA
Moderate Vertical Irregularity, V_{L1}	-0.7	-0.7	-0.7	-0.6	-0.6	-0.7	-0.6	-0.5	-0.5	-0.6	-0.4	-0.6	-0.5	-0.5	-0.5	-0.4	NA
Plan Irregularity, P_{L1}	-1.1	-1.0	-1.0	-0.8	-0.7	-0.9	-0.7	-0.6	-0.6	-0.8	-0.5	-0.7	-0.6	-0.7	-0.7	-0.4	NA
Pre-Code	-1.1	-1.0	-0.9	-0.6	-0.6	-0.8	-0.6	-0.2	-0.4	-0.7	-0.1	-0.5	-0.3	-0.5	-0.5	0.0	-0.1
Post-Benchmark	1.6	1.9	2.2	1.4	1.4	1.1	1.9	NA	1.9	2.1	NA	2.0	2.4	2.1	2.1	NA	1.2
Soil Type A or B	0.1	0.3	0.5	0.4	0.6	0.1	0.6	0.5	0.4	0.5	0.3	0.6	0.4	0.5	0.5	0.3	0.3
Soil Type E (1-3 stories)	0.2	0.2	0.1	-0.2	-0.4	0.2	-0.1	-0.4	0.0	0.0	-0.2	-0.3	-0.1	-0.1	-0.1	-0.2	-0.4
Soil Type E (> 3 stories)	-0.3	-0.6	-0.9	-0.6	-0.6	NA	-0.6	-0.4	-0.5	-0.7	-0.3	NA	-0.4	-0.5	-0.6	-0.2	NA
Minimum Score, S_{MIN}	*1.1*	*0.9*	*0.7*	*0.5*	*0.5*	*0.6*	*0.5*	*0.5*	*0.3*	*0.3*	*0.3*	*0.2*	*0.2*	*0.3*	*0.3*	*0.2*	*1.0*

FINAL LEVEL 1 SCORE, $S_{L1} \geq S_{MIN}$: 1.2

EXTENT OF REVIEW

Exterior: ■ Partial ■ All Sides ■ Aerial
Interior: ☐ None ☐ Visible ■ Entered
Drawings Reviewed: ■ Yes ☐ No
Soil Type Source: ASSUMED
Geologic Hazards Source: DOGOMI
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

REDWOOD ELEMENTARY *Evacuation Plan* [Rev. 10/18]