Oregon Seismic Status Report - 2017

Oregon law requires school districts and education service districts to provide DOGAMI with notice of construction projects that may affect a school's seismic risk.
This report was generated by DOGAMI from submitted data.

School District/ESD: **Pilot Rock 2**

County: UMATILLA

Contact Name: Steve Staniak

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Structures Replaced? No

Name and Address:

Kind of Structure:

Type of Replacement:

Max Occupancy:

Date Occupied:

Structures Modified? No

Name and Address:

Kind of Structure:

Type of Modification:

Date Re-occupied:

Optional:

Engineering Report? Yes *If yes, attachments are appended to this report.*

Cost of Rehab:

Method of Funding:

Notes: This is a DRAFT copy of the seismic rehabilitation report. I do not have a final draft yet.

Submission Date: 9/11/2017

District Wide Seismic Evaluation

for the

Pilot Rock School District 2R

Umatilla County, Oregon

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September, 2017

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REGISTERED PROFESSIONAL
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DIGITAL SIGNATURE
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July 16, 1996
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1.0 Executive Summary

1.1 Background

The Pilot Rock School (District) is located in Pilot Rock, Oregon in Umatilla County approximately 14 miles south of Pendleton, Oregon. The District operates 3 schools and support facilities located within the community, which will be the subject of this evaluation.

The purpose of this report is to provide a comprehensive seismic evaluation of the aging facilities throughout the District. The school facilities cover approximately 90,100-square-feet total, and are used for classrooms, administrative offices, and assembly areas. All of the structures vary in style, age, type of construction, condition, and use. All of the schools evaluated have received multiple additions. The schools and support facilities studied as part of this planning effort include:

- Pilot Rock Elementary School
- Pilot Rock Middle School
- Pilot Rock High School

To provide an all-encompassing seismic evaluation we performed visual observations and/or review of available construction documents at each of the above mentioned schools. We also interviewed District staff to obtain any knowledge on known structural deficiencies. After field data was collected, each facility was evaluated in accordance with the American Society of Civil Engineers “Seismic Evaluation and Retrofit of Existing Buildings ASCE/SEI 41-13”. The evaluation tool outlined in ASCE 41-13 allows us to determine seismic deficiencies when the aging District facilities are compared to building design using modern building codes.

This study provides the District with recommendations to rehabilitate the found seismic deficiencies to provide a structure that meets the expectations of “Life Safety” as outlined in ASCE 41-13. Planning level budgetary construction values for each school and support facilities are included in section 5.0.

The most significant deficiencies are referenced to help the District develop repair plans as budgets allow. It is recommended that the District use this report to prioritize improvements and determine interest in seeking grant funding through the seismic rehabilitation grant programs and/or develop a comprehensive capital improvements plan and budget.

1.2 Evaluation Observation Results

The following table summarizes the results of our observations and ranks each school based on the relative hazard severity of the observed deficiencies.

School	Relative Hazard Severity*
Pilot Rock Elementary School	High
Pilot Rock Middle School	High
Pilot Rock Elementary School	High

***Relative Hazard Severity levels indicate perceived risk of substantial damage potential in the event of a seismic event based on our observations of the structural systems present and our past experience with similar structures and their performance during seismic events.*

**High relative hazard severities indicate buildings and/or portions of buildings that have a high collapse potential when exposed to loading from a code seismic event. It is our opinion that structures with a moderate relative hazard severity will experience structural damage during similar events, but the likelihood of collapse is reduced. Low relative hazard severities indicate buildings which will experience damage, but collapse is unlikely.*

1.3 Recommended Improvements

Section 3.0 covers the specific deficiencies and subsequent recommendations.

1.4 Conclusions

Generally speaking, the condition of the District's schools and support facilities are good based on their respective ages. The schools are, for the most part, well cared for buildings. The recommended improvements listed above reflect items that do not pose a substantial immediate risk to the life safety of occupants (unless noted otherwise) outside of code lateral events. It should be noted that structural deficiencies in schools of this age group are fully expected and the severity of the deficiencies noted above is not uncommon.

Many of these buildings started as small community schools and therefore the deficiency lists and recommended improvements may not be as large as expected. They were constructed in a redundant fashion using lightweight materials. Typically we start to see larger problems from a seismic standpoint when we come across heavy structures with few walls. Schools with higher priority deficiencies listed above fall into this category. The smaller outlying schools have far less high priority deficiencies than the larger schools.

Construction costs to retrofit each of the schools observed will vary highly based on the degree of deficiencies being rectified. Seismic retrofit costs for structural improvements will likely range from $46 to $73 per square foot depending on the building being considered. These numbers are based on our experience retrofitting similar schools and cover both the highest priority deficiencies along with the lower priority deficiencies summarized for each building in Section 3.0.

It is clear based on the condition of the buildings that the District is invested in maintaining the buildings to get the most possible use out of each structure. To ensure that the District continues to get the most out of their schools and provide a safe learning environment for the students, we would recommend generating a priority list for capital improvement projects to systematically address deficiencies as funds become available. Additionally, incremental improvements should be considered during projects that may make performing the work easier. For example, during a roof replacement project a good time to install connections from the roof diaphragm to the walls or a window replacement project is a good time to install shearwalls in place of windows in a wall line that does not have enough shearwall length.

Attention should be paid to the potential for upcoming seismic retrofit grant programs. Several of the schools noted above are good candidates for programs that can fund some or all of the expenses related to seismic retrofit of school buildings. Should the District be interested in pursuing grant funding for one or more schools, ZCS would be happy to provide proposals for assisting in the preparation of grant packages.

The balance of the report provides specific details regarding the construction of each school, observed deficiencies, and recommended repairs.

2.0 Project Overview

The (District) is located in a high seismicity zone and contains 3 schools, which are the focus of this evaluation. The objective of this planning effort is to perform visual observations and/or review of construction documents at each of the above mentioned schools and support facilities to identify general structural deficiencies. Perform a seismic performance review of the structural systems in accordance with the American Society of Civil Engineers "Seismic Evaluation and Retrofit of Existing Buildings ASCE/SEI 41-13", in order to identify deficiencies provide rehabilitation recommendations. Planning level budgetary construction costs for each school have been determined based on the deficiencies and recommendation outlined. It is recommended that the District use this report to prioritize improvements and determine interest in seeking grant funding through the seismic rehabilitation grant programs.

In order to accurately report the deficiencies for each school, a visit to each facility with inadequate construction documents was required. During the visit to each facility, construction type and framing methods were noted along with any observed, obvious structural deficiencies.

The facilities covered by this evaluation total approximately 90,100-square-feet, and are used as elementary, middle, and high schools. The age of each school and their additions are included and reflect the best information available. Each facility contained areas used for classrooms, administrative staff, assembly, etc. While each school was constructed differently, access to their structural systems was limited to observation only. Observed construction type for each school and a summary of each facility's additions and their respective construction types are located in Section 3.0.

2.1 Inspection Process and Participants

The following sections detail the inspection process and the individuals who participated in the inspections, and our methodology for review of deficiencies.

2.1.1 Inspection Process

Each school investigation was performed using a similar inspection process. The process was as follows:

- Compile all available documentation citing relevant information to be used on-site
- Review available as-constructed building information
- Inspect the exterior of the school and note obvious deficiencies
- Begin inspections at the entrance of the school and document each observable deficiency. Comment on general condition of each building.
- Photograph each deficiency
- Document structural framing methods used for each building
- Advance through each structurally independent portion of the building and make observations
- Complete interior and exterior photographic documentation
- Collate Findings and deficiencies

2.1.2 Participants

In order to identify deficiencies, improvement needs, condition, and other qualities of the existing schools, a detailed inspection effort was planned utilizing several individuals offering different perspectives and areas of expertise. Inspections were performed on

A list of those who participated in the inspection process is provided in the table below:

Name	Company
Russell C. Carter	ZCS Engineering Inc.
Stephen L. Chase	ZCS Engineering Inc.

Additionally, custodial and maintenance staff were interviewed when available during the inspections regarding any concerns with their respective schools and the subject school's overall performance.

2.2 Building Deficiency Review

The report provides a brief description of the deficiencies observed during our on-site investigation for each school. Each of the deficiencies identified corresponds to the items outlined in *ASCE 41-13: Seismic Evaluation and Retrofit of Existing Buildings.* As a guideline for each of the inspections and the building review, checklists known as Tier 1 were performed for the structure types within each school. A summary of each building's structural systems and observed deficiencies is provided in Section 3.0.

It is the intent of the District, as part of this study, to determine the structural deficiencies of the building as compared to current prescribed loading and detailing requirements for lateral (wind/seismic) loading to a performance level of "Life Safety" per ASCE 41-13. The level of performance is defined per ASCE 41-13 as:

> *"Structural performance level, life safety, means post-earthquake damage state in which significant damage to the structure has occurred but some margin against either partial or total structural collapse remains. Some structural elements and components are severely damaged but this has not resulted in large falling debris hazards, either inside or outside the building. Injuries may occur during the earthquake; however, the overall risk of life-threatening injury as a result of structural damage is expected to be low. It should be possible to repair the structure; however, for economic reasons this may not be practical. Although the damaged structure is not an imminent collapse risk, it would be prudent to implement structural repairs or install temporary bracing prior to reoccupancy."*

Per ASCE 41-13 a seismic hazard level is required. In order to obtain a performance level of "Life Safety" the seismic hazard shall be BSE-1N as defined in section 2.4.1.2 and C2.4.1.2. The BSE-1N hazard level earthquake has a probability of occurring once in every 475 years, or 10% chance in 50 years. This design level earthquake has a similar rate of occurrence and magnitude as the current state adopted building codes. A 25% reduction in force is recommended. This follows the recommendation of the City of Portland City Code for the evaluation and rehabilitation of existing buildings per chapter 24.85. We feel this provides an appropriate level of performance for this facility.

The following are the types of construction found throughout the District's facilities. We have included the definitions from ASCE 41-13. We have referenced each of the different building construction types for each facility or addition in section 3.0.

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.

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.

Concrete Shear Walls with Flexible Diaphragms [C2A] - These buildings have floor that consists of cast-in-place concrete slabs, concrete beams, one-way joists, two-way waffle joists, or flat slabs. Roof framing and diaphragms consist of wood sheathing with large aspect ratios and are flexible relative to the walls. Buildings may also have steel beams, columns, and concrete slabs for the gravity framing. Floors are supported on concrete columns or bearing walls. Seismic forces are resisted by cast-in-place concrete shear walls. In older construction, shear walls are lightly reinforced but often extend throughout the building. In more recent construction, shear walls occur in isolated locations, are more heavily reinforced, and have concrete slabs that are stiff relative to the walls. The foundation system may consist of a variety of elements.

3.0 Structure Summaries, Observed Deficiencies, and General Repair Recommendations

The information obtained through the on-site observations outlined in Section 2.0 is summarized below. A general summary of each structurally independent portion of the building is provided followed by a table summarizing the deficiencies observed. Lastly, a list of repair recommendations is provided.

3.1 Pilot Rock Elementary School – "High" Seismic Hazard

200 McGowan Dr. Pilot Rock, OR 97868

Figure 1: Pilot Rock Elementary School

3.1.1 Structure Summary

The following summarizes the structural systems for each portion of Pilot Rock Elementary School:

- **1948 Original [RM1]:** The original single story classroom structure consists of CMU walls with a flexible wood roof diaphragm. The roof consists of straight sheathing over wood joists bearing on wood pony walls and CMU walls. The foundation consists of slab-on-grade with cast-in-place concrete footings. This structure houses multiple classrooms, and an office with an approximate footprint of 23,300-square-feet.

- **1948 Gym [C2A]:** The original Gymnasium structure consists of concrete walls and areas of CMU infill walls with a flexible wood roof diaphragm. The roof consists of straight or diagonal sheathing over wood joists on glulam beams bearing on concrete walls. The foundation consists of cast-in-place concrete stem walls and footings. This structure has an approximate footprint of 6,000-square-feet.

- **1962 Addition [RM1]:** This addition consists of cast-in-place reinforced concrete exterior walls and wood framed interior walls with a flexible wood roof diaphragm. The roof consists of plywood sheathing over wood joists bearing on beams and exterior walls. The foundation consists of concrete slab-on-grade with cast-in-place concrete stem walls and footings. The approximate footprint of this structure is 7,400-square-feet.

3.1.2 Observed Deficiencies:

The following list summarizes the deficiencies observed during our visual inspections and/or original construction documents:

Building	Deficiency
1948 Original [RM1] **Seismic Hazard: High**	• WALL ANCHORAGE: Out-of-plane connections at the top of wall are not present. • DIAPHRAGM ATTACHMENT: The diaphragms are not properly attached to shear walls below. • STRAIGHT SHEATHING: The straight sheathed diaphragm does not have adequate in-plane shear capacity. • DIAPHRAGM SPAN: The unblocked diaphragm spans greater than 40-feet. • WOOD STRUCTURAL SHEAR WALLS: The wood sheathed shear walls do not have adequate capacity. • LARGE WINDOW LENGTHS: The glazing package along the longitudinal walls reduces the available shear wall lengths and do not have adequate capacity. • HOLDOWNS: Holdown devices are not present to transfer overturning forces to foundation elements. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.
1948 Gym [C2A] **Seismic Hazard: High**	• WALL ANCHORAGE: Out-of-plane connections at the top of wall are not present. • DIAPHRAGM ATTACHMENT: The diaphragms are not properly attached to shear walls below. • STRAIGHT SHEATHING: The straight

	sheathed diaphragm does not have adequate in-plane shear capacity. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.
1962 Addition [C2A] **Seismic Hazard: High**	• WALL ANCHORAGE: Out-of-plane connections at the top of wall are not present. • DIAPHRAGM ATTACHMENT: The diaphragms are not properly attached to shear walls below. • DIAPHRAGM SPAN: The unblocked diaphragm spans greater than 40-feet. • LARGE WINDOW LENGTHS: The glazing package along the longitudinal walls reduces the available shear wall lengths and do not have adequate capacity. • GYPSUM SHEAR WALLS: The gypsum sheathed shear walls do not have adequate capacity. • HOLDOWNS: Holdown devices are not present to transfer overturning forces to foundation elements. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.

3.1.3 Recommendations:

The following are rehabilitation recommendations to address the observed deficiencies and achieve adequate standards for Life Safety. Alternate repair strategies may be presented.

Building	Deficiency
1948 Original [RM1] **Seismic Hazard: High**	• WALL ANCHORAGE: Provide out-of-plane attachment between walls and roof diaphragms • DIAPHRAGM ATTACHMENT: Provide new in-plane hardware directly attaching the diaphragms to the shear walls below. • STRAIGHT SHEATHING: Remove the existing roofing and install a new layer of plywood over the existing straight sheathing providing an adequate diaphragm. • WOOD STRUCTURAL SHEAR WALLS: Provide additional nailing or sheathing as necessary to

	increase the available shear walls capacity to acceptable levels. • LARGE WINDOW LENGTHS: Remove and replace existing window packages in strategic locations and infill. • HOLDOWNS: Provide new foundation elements as necessary and new holdowns to properly. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.
1948 Gym **[C2A]** **Seismic Hazard:** **High**	• WALL ANCHORAGE: Provide out-of-plane attachment between walls and roof diaphragms • DIAPHRAGM ATTACHMENT: Provide new in-plane hardware directly attaching the diaphragms to the shear walls below. • STRAIGHT SHEATHING: Remove the existing roofing and install a new layer of plywood over the existing straight sheathing providing an adequate diaphragm. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.
1962 Addition **[C2A]** **Seismic Hazard:** **High**	• WALL ANCHORAGE: Provide out-of-plane attachment between walls and roof diaphragms • DIAPHRAGM ATTACHMENT: Provide new in-plane hardware directly attaching the diaphragms to the shear walls below. • DIAPHRAGM SPAN: Provide new blocking at over spanned diaphragms. • LARGE WINDOW LENGTHS: Remove and replace existing window packages in strategic locations and infill. • GYPSUM SHEAR WALLS: Provide plywood sheathing and nailing as necessary to increase the available shear walls capacity to acceptable levels. • HOLDOWNS: Provide new foundation elements as necessary and new holdowns to properly. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.

3.2 Pilot Rock Middle School – "High" Seismic Hazard

101 NE Cherry St. Pilot Rock, OR 97868

Figure 2: Pilot Rock Middle School

3.2.1 Structure Summary

The following summarizes the structural systems for each portion of Pilot Rock Middle School:

Due to the lack of existing construction documents for Pilot Rock Middle School the construction types and structural deficiencies are limited to visual observations / inspections.

- **1919 Original [URM]:** The original two story structure consists of unreinforced clay brick walls with flexible wood second floor and roof diaphragms. The second floor consists of diagonal sheathing over wood joists bearing on interior wood walls and exterior URM walls. The roof consists of straight sheathing over wood joists bearing on timber beams, interior wood walls, and exterior URM walls. The foundation consists of slab-on-grade with cast-in-place concrete footings. This structure houses multiple classrooms, and an office with an approximate footprint of 11,300-square-feet.

- **Mid 1900s Additions [URM]:** The single and two story additions consist of unreinforced clay brick walls with flexible wood second floor and roof diaphragms. The second floor consists of diagonal sheathing over wood joists bearing on interior wood walls and exterior URM walls. The roof consists of straight sheathing over wood joists bearing on timber beams, interior wood walls, and exterior URM walls. The foundation consists of slab-on-grade with cast-in-place concrete footings. This structure houses multiple classrooms, music room, a stage, and a multipurpose room with an approximate footprint of 11,900-square-feet.

3.2.2 Observed Deficiencies:

The following list summarizes the deficiencies observed during our visual inspections and/or original construction documents:

Building	Deficiency
1919 Original [URM] **Seismic Hazard: High**	• WALL ANCHORAGE: Out-of-plane connections at the top of wall are not present. • DIAPHRAGM ATTACHMENT: The diaphragms are not properly attached to shear walls below. • STRAIGHT SHEATHING: The straight sheathed diaphragm does not have adequate in-plane shear capacity. • DIAPHRAGM SPAN: The unblocked diaphragm spans greater than 40-feet. • WOOD STRUCTURAL SHEAR WALLS: The wood walls in the attic are not sheathed for transfer of in-plane shear forces. • LARGE WINDOW LENGTHS: The glazing package along the longitudinal walls reduces the available shear wall lengths and do not have adequate capacity. • HOLDOWNS: Holdown devices are not present to transfer overturning forces to foundation elements. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.
Mid 1900s Additions [URM] **Seismic Hazard: High**	• WALL ANCHORAGE: Out-of-plane connections at the top of wall are not present. • DIAPHRAGM ATTACHMENT: The diaphragms are not properly attached to shear walls below. • STRAIGHT SHEATHING: The straight sheathed diaphragm does not have adequate in-plane shear capacity. • DIAPHRAGM SPAN: The unblocked diaphragm spans greater than 40-feet. • WOOD STRUCTURAL SHEAR WALLS: The wood walls in the attic are not sheathed for transfer of in-plane shear forces. • LARGE WINDOW LENGTHS: The glazing package along the longitudinal walls reduces the available shear wall lengths and do not have adequate capacity. • HOLDOWNS: Holdown devices are not present

	to transfer overturning forces to foundation elements. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.

3.2.3 Recommendations:

The following are rehabilitation recommendations to address the observed deficiencies and achieve adequate standards for Life Safety. Alternate repair strategies may be presented.

Building	Deficiency
1919 Original [URM] **Seismic Hazard: High**	• WALL ANCHORAGE: Provide out-of-plane attachment between walls and roof diaphragms • DIAPHRAGM ATTACHMENT: Provide new in-plane hardware directly attaching the diaphragms to the shear walls below. • STRAIGHT SHEATHING: Remove the existing roofing and install a new layer of plywood over the existing straight sheathing providing an adequate diaphragm. • WOOD STRUCTURAL SHEAR WALLS: Provide additional nailing or sheathing as necessary to increase the available shear walls capacity to acceptable levels. • LARGE WINDOW LENGTHS: Remove and replace existing window packages in strategic locations and infill. • HOLDOWNS: Provide new foundation elements as necessary and new holdowns to properly. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.
Mid 1900s Additions [RM1] **Seismic Hazard: High**	• WALL ANCHORAGE: Provide out-of-plane attachment between walls and roof diaphragms • DIAPHRAGM ATTACHMENT: Provide new in-plane hardware directly attaching the diaphragms to the shear walls below. • STRAIGHT SHEATHING: Remove the existing roofing and install a new layer of plywood over the existing straight sheathing providing an adequate diaphragm. • WOOD STRUCTURAL SHEAR WALLS: Provide

	additional nailing or sheathing as necessary to increase the available shear walls capacity to acceptable levels. • LARGE WINDOW LENGTHS: Remove and replace existing window packages in strategic locations and infill. • HOLDOWNS: Provide new foundation elements as necessary and new holdowns to properly. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.

3.3 Pilot Rock High School – "High" Seismic Hazard

101 NE Cherry St. Pilot Rock, OR 97868

Figure 3: Pilot Rock High School

3.3.1 Structure Summary

The following summarizes the structural systems for each portion of Pilot Rock High School:

- **1955 Original [C2A] [RM1]:** The original single story classroom structure consists of concrete exterior walls, interior CMU and wood framed walls with a flexible wood roof diaphragm. The roof consists of plywood sheathing over wood joists bearing on timber beams, interior wood walls and concrete walls. The foundation consists of slab-on-grade with cast-in-place concrete footings. This structure houses multiple classrooms, and an office with an approximate footprint of 9,500-square-feet.

  The original gymnasium consists of concrete walls with concrete pilasters, and interior CMU walls with a flexible wood roof diaphragm. The roof consists of straight sheathing over wood joists bearing on large bowstring trusses. There is a wood framed mezzanine with locker rooms below. The floor consists of wood joists bearing on beams and exterior walls. The foundation consists of cast-in-place concrete walls and footings. The approximate footprint of the gymnasium is 18,500-square-feet.

- **1962 Addition [RM1]:** This addition houses the current library and consists of reinforced concrete walls with a flexible wood roof diaphragm. The roof consists of plywood sheathing over wood joists bearing on beams and exterior walls. The foundation consists of concrete slab-on-grade with cast-in-place concrete stem walls and footings. The approximate footprint of this structure is 2,200-square-feet.

3.3.2 Observed Deficiencies:

The following list summarizes the deficiencies observed during our visual inspections and/or original construction documents:

Building	Deficiency
1955 Original [C2A] [RM1] **Seismic Hazard: High**	• WALL ANCHORAGE: Out-of-plane connections at the top of wall and mezzanine to wall are not present. • DIAPHRAGM ATTACHMENT: The diaphragms are not properly attached to shear walls below. • STRAIGHT SHEATHING: The straight sheathed diaphragm does not have adequate in-plane shear capacity. • DIAPHRAGM SPAN: The unblocked diaphragm spans greater than 40-feet. • WOOD STRUCTURAL SHEAR WALLS: The wood walls in the attic are not sheathed for transfer of in-plane shear forces. • LARGE WINDOW LENGTHS: The glazing package along the longitudinal walls reduces the available shear wall lengths and do not have adequate capacity. • HOLDOWNS: Holdown devices are not present to transfer overturning forces to foundation elements. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.
1962 Addition [RM1] **Seismic Hazard: High**	• WALL ANCHORAGE: Out-of-plane connections at the top of wall are not present. • DIAPHRAGM ATTACHMENT: The diaphragms are not properly attached to shear walls below. • DIAPHRAGM SPAN: The unblocked diaphragm spans greater than 40-feet. • WOOD STRUCTURAL SHEAR WALLS: The wood walls in the attic are not sheathed for transfer of in-plane shear forces. • LARGE WINDOW LENGTHS: The glazing package along the longitudinal walls reduces the available shear wall lengths and do not have adequate capacity. • HOLDOWNS: Holdown devices are not present to transfer overturning forces to foundation elements. • INCIDENTAL NON-STRUCTURAL ITEMS:

	There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.

3.3.3 Recommendations:

The following are rehabilitation recommendations to address the observed deficiencies and achieve adequate standards for Life Safety. Alternate repair strategies may be presented.

Building	Deficiency
1956 Original [C2A] [RM1] **Seismic Hazard: High**	• WALL ANCHORAGE: Provide out-of-plane attachment between walls and roof diaphragms and walls and mezzanine floor. • DIAPHRAGM ATTACHMENT: Provide new in-plane hardware directly attaching the diaphragms to the shear walls below. • STRAIGHT SHEATHING: Remove the existing roofing and install a new layer of plywood over the existing straight sheathing providing an adequate diaphragm. • WOOD STRUCTURAL SHEAR WALLS: Provide additional nailing or sheathing as necessary to increase the available shear walls capacity to acceptable levels. • LARGE WINDOW LENGTHS: Remove and replace existing window packages in strategic locations and infill. • HOLDOWNS: Provide new foundation elements as necessary and new holdowns to properly. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.
1950s Addition [RM1] **Seismic Hazard: High**	• WALL ANCHORAGE: Provide out-of-plane attachment between walls and roof diaphragms • DIAPHRAGM ATTACHMENT: Provide new in-plane hardware directly attaching the diaphragms to the shear walls below. • WOOD STRUCTURAL SHEAR WALLS: Provide additional nailing or sheathing as necessary to increase the available shear walls capacity to acceptable levels. • LARGE WINDOW LENGTHS: Remove and replace existing window packages in strategic locations and infill.

	• HOLDOWNS: Provide new foundation elements as necessary and new holdowns to properly. • INCIDENTAL NON-STRUCTURAL ITEMS: There are typically many non-structural items found in similar buildings. These consist of HVAC equipment, heavy tall cabinetry, unbraced suspended ceiling, hot water piping, etc.

4.0 Building Condition Summary

The following section summarizes the building deficiency information presented above for each of the schools reviewed in Section 3.0. Each school was ranked as either a high, moderate or low relative hazard based on the number and degree of deficiencies present. A table is provided listing the relative hazard severity at each of the three schools.

4.1 Building Deficiencies Summary

Throughout the inspections there were three observable types of deficiencies. High priority deficiencies were generally considered to increase the likelihood of structural failure and collapse during a seismic event. Low priority deficiencies were considered to be items that result in the building being less equipped to handle the effects of seismic events but would not lead to structural collapse without other deficiencies present. Low priority deficiencies will still damage a structure during a seismic event but they generally will not result in structural failure alone. In addition to the observed deficiencies it is assumed that unseen deficiencies such as the following are present in many of the schools:

- Roof and floor-to-wall connections
- Wall-to-foundation attachments
- Capacity of shear walls
- Seismic bracing for conduits, ductwork, HVAC, and other non-structural items

4.2 Observed Deficiency Ranking

After assembling a list of deficiencies in Section 3.0, the table below was created to illustrate the results of this study and identify the schools with the highest level of concern. The ranking for each school was based on the presence, severity, and quantity of high and/or low priority hazards. Low priority deficiencies include items such as brick veneer without wall ties and the presence of unreinforced masonry chimneys. High priority deficiencies included items such as unreinforced masonry walls and a lack of lateral load path to the foundation which increase the collapse potential.

The building inspections performed for this report were limited to observations and review of available construction documents only. As such, the deficiencies listed above are not expected to be all-encompassing. Previous seismic investigations and knowledge of construction methods during the eras in which the four structures were built have allowed us to consider expected deficiencies that were unobservable given the scope of our investigation. These deficiencies are common and their inclusion is useful in ranking and determining a rough cost for improvements at each school.

Using the above deficiencies with life safety in mind, the following table was developed to provide a school-by-school comparison of observable hazards when each school is considered under loading conditions from a code seismic event:

School	Relative Hazard Severity*
Pilot Rock Elementary School	High
Pilot Rock Middle School	High
Pilot Rock Elementary School	High

Relative Hazard Severity levels indicate perceived risk of substantial damage potential in the event of a seismic event based on our observations of the structural systems present and our past experience with similar structures and their performance during seismic events.

**High relative hazard severities indicate buildings and/or portions of buildings that have a high collapse potential when exposed to loading from a code seismic event. It is our opinion that structures with a moderate relative hazard severity will experience structural damage during similar events, but the likelihood of collapse is reduced. Low relative hazard severities indicate buildings which will experience damage, but collapse is unlikely.*

5.0 Planning Level Budgets

In order to assist the District in maintenance and improvement planning, planning level budgetary construction costs have been developed for each school as detailed in this report. These rough order of magnitude costs are an estimate of the costs associated with structural improvements based on the visual observations and assumptions included in this report and our prior experiences. These values are not to be used for specific project planning purposes, but are meant to assist the District in planning processes.

5.1 Budgetary Construction Costs

Retrofit solutions for each school have not been developed or hard quoted and as such these values are subject to change as projects are developed and further evaluation and design is performed. These costs are related to rectifying the deficiencies noted in Section 3.0, but do include anticipated costs for incidental work required to complete the upgrades. In addition to the hard costs noted below, an additional 15% for soft costs such as engineering and permitting and 25% for contingency should be included for each project the District pursues. If the District decides to advance specific projects, the contingency percentage may be reduced as the design is advanced. The table below provides a summary of the planning level budgetary construction costs developed for each of the schools reviewed:

School	Budgetary Costs
Pilot Rock Elementary School	$1,680,550
Pilot Rock Middle School	$1,719,480
Pilot Rock High School	$1,601,440

Please note that while total costs are presented for individual schools above, additional divisions may be practical to separate projects at each school. This may be particularly useful at schools with localized high deficiency areas.

6.0 Conclusion

The findings described in this report have been limited to the seismic lateral force resisting structural systems present at each school and were the result of visual observations and/or review of construction documents. Generally speaking, the condition of the District's schools was good based on their respective ages. The schools are, for the most part, well cared for buildings. The recommended improvements listed above reflect items that do not pose a substantial immediate risk to the life safety of occupants (unless noted otherwise) outside of code lateral events. It should be noted that structural deficiencies in schools of this age group are fully expected and the severity of the deficiencies noted above common.

It is clear based on the condition of the buildings that the District has invested in maintaining the buildings to get the most possible use out of each structure. To ensure that the District continues to get the most out of their schools and provide a safe learning environment for the students, we would recommend generating a priority list for capital projects to systematically address deficiencies as funds become available. Additionally, incremental updates should be considered during projects that may make performing the work easier. For example, during a roof replacement project is a good time to install connections from the roof diaphragm to the walls and rectify deficient roof sheathing. Similarly, a window replacement project is a good time to install shearwalls in place of windows in a wall line that does not have enough shearwall length.

Attention should be paid to the potential for upcoming seismic retrofit grant programs. Several of the schools noted above are good candidates for programs that can fund some or all of the expenses related to seismic retrofit of school buildings. Should the District be interested in pursuing grant funding for one or more schools, ZCS would be happy to provide proposals for assisting in the preparation of grant packages.

Based on our visual observations, we find the school structures to be in good condition and generally safe for occupancy.

Given the current condition of the structures, the code governing existing buildings does not mandate that upgrades are required unless the building is scheduled for repairs, alterations, additions, or a change in occupancy. However, voluntary seismic upgrades are permitted and encouraged.

Please contact our office if you would like to discuss our findings.

Appendix A: Construction Cost Estimate Worksheets

ENGINEER'S OPINION OF PROBABLE COST - PILOT ROCK ELEMENTARY SEISMIC REHABILITATION

Description	Quanity	Units	Unit Price	Total Price for Construction Item
GENERAL CONDITIONS				
General Conditions	6%	%		$55,800.00
Preconstruction Services	1%	%		$9,900.00
Safety Measures	0.5%	%		$5,000.00
Equipment Rental	3	Month	$ 5,000.00	$15,000.00
Toilet Rental	3	Month	$ 1,800.00	$5,400.00
Cleanup Continuous	3	Month	$ 4,000.00	$12,000.00
Clean Up Dumpsters	3	Month	$ 2,400.00	$7,200.00
Temporary Conditions		Lump Sum		
Final Clean UP	36700	Square Foot	$ 0.35	$12,800.00
Foundation Layout	0	Square Foot	$ 0.40	$0.00
Wall Framing Layout	10000	Square Foot	$ 0.25	$2,500.00
Roofing Framing Layout	29100	Square Foot	$ 0.50	$14,550.00
Interior Finishes Layout	0	Square Foot	$ 0.50	$0.00
Escalation	2%	%		$20,100.00
Bonding & Insurance	3%	%		$30,200.00
Contractor Profit & Overhead	7%	%		$73,900.00
		General Conditons Subtotal		$264,400.00
Demolition & Asbestos Abatement				
Soft Demolition	29100	Square Foot	$ 4.00	$116,400.00
Hard Demolition	1680		$ 10.00	$16,800.00
Gypsum Wall Demolition / Abatement	0		$ 6.50	$0.00
		Demolition & Asbestos Subtotal		$ 133,200.00
Foundation / Floor Strengthening Construction				
Shear Wall Footings - CMU / Concrete	200	Linear Foot	$ 150.00	$30,000.00
Concrete Repair & Patching	200	Square Foot	$ 15.00	$3,000.00
Floor Finish Reinstallation	800	Square Foot	$ 13.00	$10,400.00
Bolting of Extg Walls to footings	1000	Linear Foot	$ 150.00	$150,000.00
		Foundation Level Subtotal		$ 193,400.00
Wall Strengthening Construction				
Exterior Finish Repair / Installation	2400	Square Foot	$ 25.00	$60,000.00
Sheathing of Existing Walls	10000	Square Foot	$ 5.00	$50,000.00
Interior Wall Finish Repair	0	Square Foot	$ 2.00	$0.00
Painting of Wall	2400	Square Foot	$ 3.00	$7,200.00
		Wall Strengthening Subtotal		$ 117,200.00
Roof Strengthening Construction				
New Batt Insulation in Attic	0	Square Foot	$ 1.00	$0.00
New Drag Beam Attachments	31	EA	$ 2,340.00	$72,540.00
New 60 mil self-adherring TPO roof membrane	5700	Square Foot	$ 7.00	$39,900.00
New 3" polyisociurinate rigid insulation	5700	Square Foot	$ 3.75	$21,375.00
Diaphragm Attachments - Out-of-Plane	1056	Linear Foot	$ 50.00	$52,800.00
Diaphragm Attachments - In-Plane Shear	29100	Square Foot	$ 3.00	$87,300.00
New Composite Roof Shingles	29100	Square Foot	$ 4.00	$116,400.00
		Roof Strengthening Subtotal		$ 390,315.00
Miscellaneous Elements				
Misc Electrical / HVAC / Plumbing	1	Lump Sum	$125,000.00	$125,000.00
Non-Structural Attachments	1	Lump Sum	$40,000.00	$40,000.00
		Miscellaneous Subtotal		$ 165,000.00
		Sub-Total Construction Cost		**$1,263,500.00**
		Contingency	**10.0%**	**$126,350.00**
		Total Construction Cost		**$1,389,850.00**
Associated Design / Soft Costs				
Architectural Consulting				$20,800.00
Structural / Rehabilitation Engineering				$145,900.00
Geotechnical Consulting				$6,900.00
Special Inspection Services for Construction				$6,900.00
Structural Observations during Construction				$6,900.00
Materials Testing for Design				$6,900.00
Construction Management / Owner Representation				$41,700.00
Permitting Fees				$41,700.00
Seismic Feasibility Study Reimbursment				$5,000.00
Relocation of FF&E				$8,000.00
		Design / Soft Cost Subtotal		**$290,700.00**
		Total Project Funding Requirement		**$1,680,550.00**

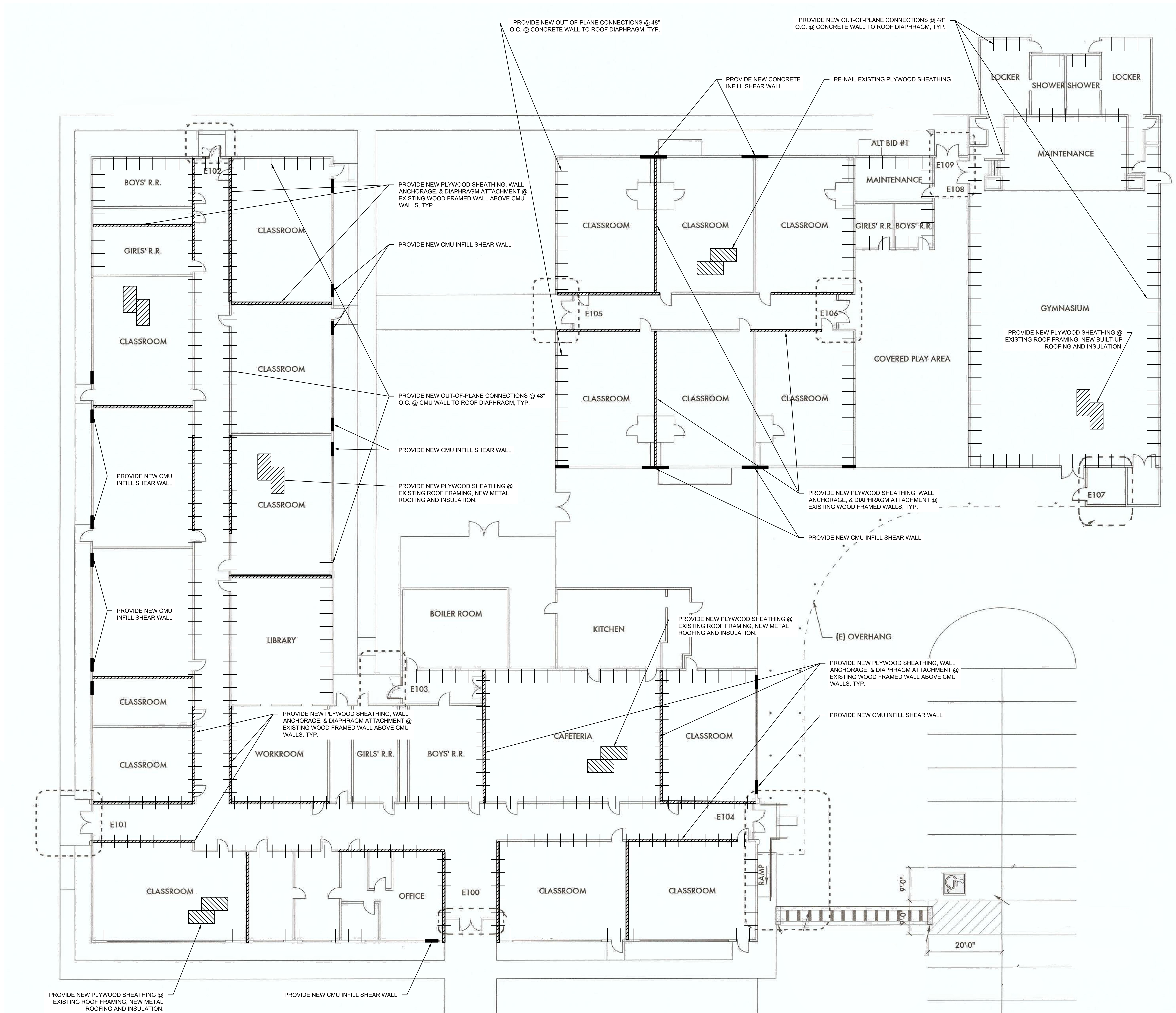
ENGINEER'S OPINION OF PROBABLE COST - PILOT ROCK MIDDLE SCHOOL SEISMIC REHABILITATION

Description	Quanity	Units	Unit Price	Total Price for Construction Item
GENERAL CONDITIONS				
General Conditions	6%	%		$57,100.00
Preconstruction Services	1%	%		$10,100.00
Safety Measures	0.5%	%		$5,100.00
Equipment Rental	3	Month	$ 5,000.00	$15,000.00
Toilet Rental	3	Month	$ 1,800.00	$5,400.00
Cleanup Continuous	3	Month	$ 4,000.00	$12,000.00
Clean Up Dumpsters	3	Month	$ 2,400.00	$7,200.00
Temporary Conditions		Lump Sum		
Final Clean UP	23200	Square Foot	$ 0.35	$8,100.00
Foundation Layout	240	Square Foot	$ 0.40	$96.00
Wall Framing Layout	10340	Square Foot	$ 0.25	$2,585.00
Roofing Framing Layout	23200	Square Foot	$ 0.50	$11,600.00
Interior Finishes Layout	10340	Square Foot	$ 0.50	$5,170.00
Escalation	2%	%		$20,600.00
Bonding & Insurance	3%	%		$30,900.00
Contractor Profit & Overhead	7%	%		$75,600.00
		General Conditons Subtotal		$266,600.00
Demolition & Asbestos Abatement				
Soft Demolition	34300	Square Foot	$ 4.00	$137,200.00
Hard Demolition	500		$ 10.00	$5,000.00
		Demolition & Asbestos Subtotal		$ 142,200.00
Foundation / Floor Strengthening Construction				
Shear Wall Footings - CMU / Concrete	300	Linear Foot	$ 150.00	$45,000.00
		Foundation Level Subtotal		$ 45,000.00
Wall Strengthening Construction				
Sheathing of Existing Walls	7200	Square Foot	$ 5.00	$36,000.00
New CMU / Concrete Shear Walls	500	Square Foot	$ 30.00	$15,000.00
Interior Wall Finish Repair	10340	Square Foot	$ 2.00	$20,680.00
Painting of Wall	10340	Square Foot	$ 3.00	$31,020.00
New 2x Framed Shear Walls	3200	Square Foot	$ 10.00	$32,000.00
New Steel Columns	16	EA	$ 2,600.00	$41,600.00
		Wall Strengthening Subtotal		$ 176,300.00
Roof Strengthening Construction				
New Batt Insulation in Attic	16000	Square Foot	$ 1.00	$16,000.00
New Roof Sheathing	16000	Square Foot	$ 6.50	$104,000.00
Diaphragm Attachments - Out-of-Plane	1105	Linear Foot	$ 50.00	$55,250.00
Diaphragm Attachments - In-Plane Shear	23200	Square Foot	$ 3.00	$69,600.00
New 60 mil self-adherring TPO roof membrane	16000	Square Foot	$ 7.00	$112,000.00
New Steel Beams	600	Linear Foot	$ 90.00	$54,000.00
New Drag Beam Attachments	20	EA	$ 2,340.00	$46,800.00
		Roof Strengthening Subtotal		$ 457,650.00
Miscellaneous Elements				
Misc Electrical / HVAC / Plumbing	1	Lump Sum	$125,000.00	$125,000.00
Non-Structural Attachments	2	Lump Sum	$40,000.00	$80,000.00
		Miscellaneous Subtotal		$ 205,000.00
		Sub-Total Construction Cost		**$1,292,800.00**
		Contingency	**10.0%**	**$129,280.00**
		Total Construction Cost		**$1,422,080.00**
Associated Design / Soft Costs				
Architectural Consulting				$21,300.00
Structural / Rehabilitation Engineering				$149,300.00
Geotechnical Consulting				$7,100.00
Special Inspection Services for Construction				$7,100.00
Structural Observations during Construction				$7,100.00
Materials Testing for Design				$7,100.00
Construction Management / Owner Representation				$42,700.00
Permitting Fees				$42,700.00
Seismic Feasibility Study Reimbursment				$5,000.00
Relocation of FF&E				$8,000.00
		Design / Soft Cost Subtotal		**$297,400.00**
		Total Project Funding Requirement		**$1,719,480.00**

ENGINEER'S OPINION OF PROBABLE COST - PILOT ROCK HIGH SCHOOL SEISMIC REHABILITATION

Description	Quanity	Units	Unit Price	Total Price for Construction Item
GENERAL CONDITIONS				
General Conditions	6%	%		$55,800.00
Preconstruction Services	1%	%		$9,900.00
Safety Measures	0.5%	%		$5,000.00
Equipment Rental	3	Month	$ 5,000.00	$15,000.00
Toilet Rental	3	Month	$ 1,800.00	$5,400.00
Cleanup Continuous	3	Month	$ 4,000.00	$12,000.00
Clean Up Dumpsters	3	Month	$ 2,400.00	$7,200.00
Temporary Conditions		Lump Sum		
Final Clean UP	30200	Square Foot	$ 0.35	$10,600.00
Foundation Layout	0	Square Foot	$ 0.40	$0.00
Wall Framing Layout	2280	Square Foot	$ 0.25	$570.00
Roofing Framing Layout	15000	Square Foot	$ 0.50	$7,500.00
Interior Finishes Layout	3900	Square Foot	$ 0.50	$1,950.00
Escalation	2%	%		$20,100.00
Bonding & Insurance	3%	%		$30,200.00
Contractor Profit & Overhead	7%	%		$73,900.00
		General Conditons Subtotal		**$255,100.00**
Demolition & Asbestos Abatement				
Soft Demolition	22500	Square Foot	$ 4.00	$90,000.00
Hard Demolition	400		$ 10.00	$4,000.00
Gypsum Wall Demolition / Abatement	3900		$ 6.50	$25,350.00
		Demolition & Asbestos Subtotal		**$ 119,350.00**
Foundation / Floor Strengthening Construction				
Floor Finish Reinstallation	1600	Square Foot	$ 13.00	$20,800.00
Bolting of Extg Walls to footings	400	Linear Foot	$ 150.00	$60,000.00
		Foundation Level Subtotal		**$ 80,800.00**
Wall Strengthening Construction				
Painting of Wall	3900	Square Foot	$ 3.00	$11,700.00
Sheathing of Existing Walls	3900	Square Foot	$ 5.00	$19,500.00
New CMU / Concrete Shear Walls	648	Square Foot	$ 30.00	$19,440.00
Interior Wall Finish Repair	3900	Square Foot	$ 2.00	$7,800.00
New Steel Columns	10	EA	$ 2,600.00	$26,000.00
		Wall Strengthening Subtotal		**$ 84,440.00**
Roof Strengthening Construction				
New Batt Insulation in Attic	0	Square Foot	$ 1.00	$0.00
New Roof Sheathing	15000	Square Foot	$ 6.50	$97,500.00
Diaphragm Attachments - Out-of-Plane	1176	Linear Foot	$ 50.00	$58,800.00
Diaphragm Attachments - In-Plane Shear	30200	Square Foot	$ 3.00	$90,600.00
New 60 mil self-adherring TPO roof membrane	15000	Square Foot	$ 7.00	$105,000.00
New Composite Roof Shingles	11700	Square Foot	$ 4.00	$46,800.00
Existing Truss Strengthening	5	EA	$ 20,000.00	$100,000.00
New Steel Beams	0	Linear Foot	$ 90.00	$0.00
		Roof Strengthening Subtotal		**$ 498,700.00**
Miscellaneous Elements				
Misc Electrical / HVAC / Plumbing	1	Lump Sum	$125,000.00	$125,000.00
Non-Structural Attachments	1	Lump Sum	$40,000.00	$40,000.00
		Miscellaneous Subtotal		**$ 165,000.00**
		Sub-Total Construction Cost		**$1,203,400.00**
		Contingency	**10.0%**	**$120,340.00**
		Total Construction Cost		**$1,323,740.00**
Associated Design / Soft Costs				
Architectural Consulting				$19,900.00
Structural / Rehabilitation Engineering				$139,000.00
Geotechnical Consulting				$6,600.00
Special Inspection Services for Construction				$6,600.00
Structural Observations during Construction				$6,600.00
Materials Testing for Design				$6,600.00
Construction Management / Owner Representation				$39,700.00
Permitting Fees				$39,700.00
Seismic Feasibility Study Reimbursment				$5,000.00
Relocation of FF&E				$8,000.00
		Design / Soft Cost Subtotal		**$277,700.00**
		Total Project Funding Requirement		**$1,601,440.00**

Appendix B: Schematic Retrofit Drawings



SEISMIC REHABILITATION SCHEMATIC
PILOT ROCK ELEMENTARY SCHOOL

1
S1.0

NTS

IF THIS BAR DOES NOT MEASURE 1-INCH IN LENGTH, THEN THE DRAWING IS NOT TO SCALE

NO.	REVISIONS	BY	DATE

PILOT ROCK SCHOOL DISTRICT 2R

SEISMIC EVALUATION OF SCHOOL STRUCTURES

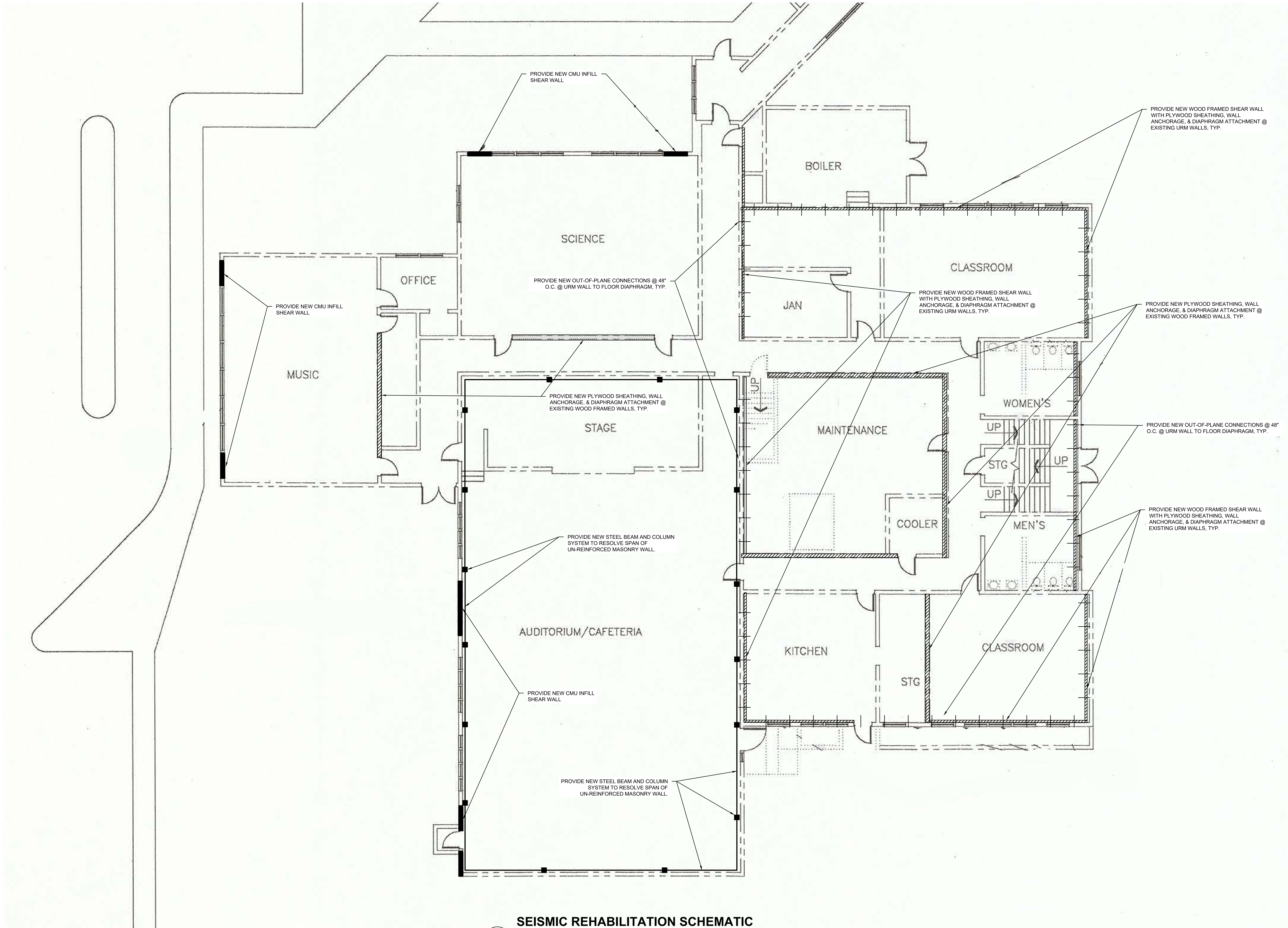
ZCS ENGINEERING
900 Klamath Avenue, Klamath Falls, OR 97601
(541) 884-7421 phone (541) 883-8804 fax

PROJECT NO:	K-5763-16
DRAWN:	SLC
CHECKED:	RCC
DATE:	09-11-17

ELEMENTARY SCHOOL SEISMIC REHAB. SCHEMATIC

S1.0

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



SEISMIC REHABILITATION SCHEMATIC
PILOT ROCK MIDDLE SCHOOL 1ST FLOOR

1
S2.0

NTS

IF THIS BAR DOES NOT MEASURE 1-INCH IN LENGTH, THEN THE DRAWING IS NOT TO SCALE

NO.	REVISIONS	BY	DATE

PILOT ROCK SCHOOL DISTRICT 2R

SEISMIC EVALUATION OF SCHOOL STRUCTURES

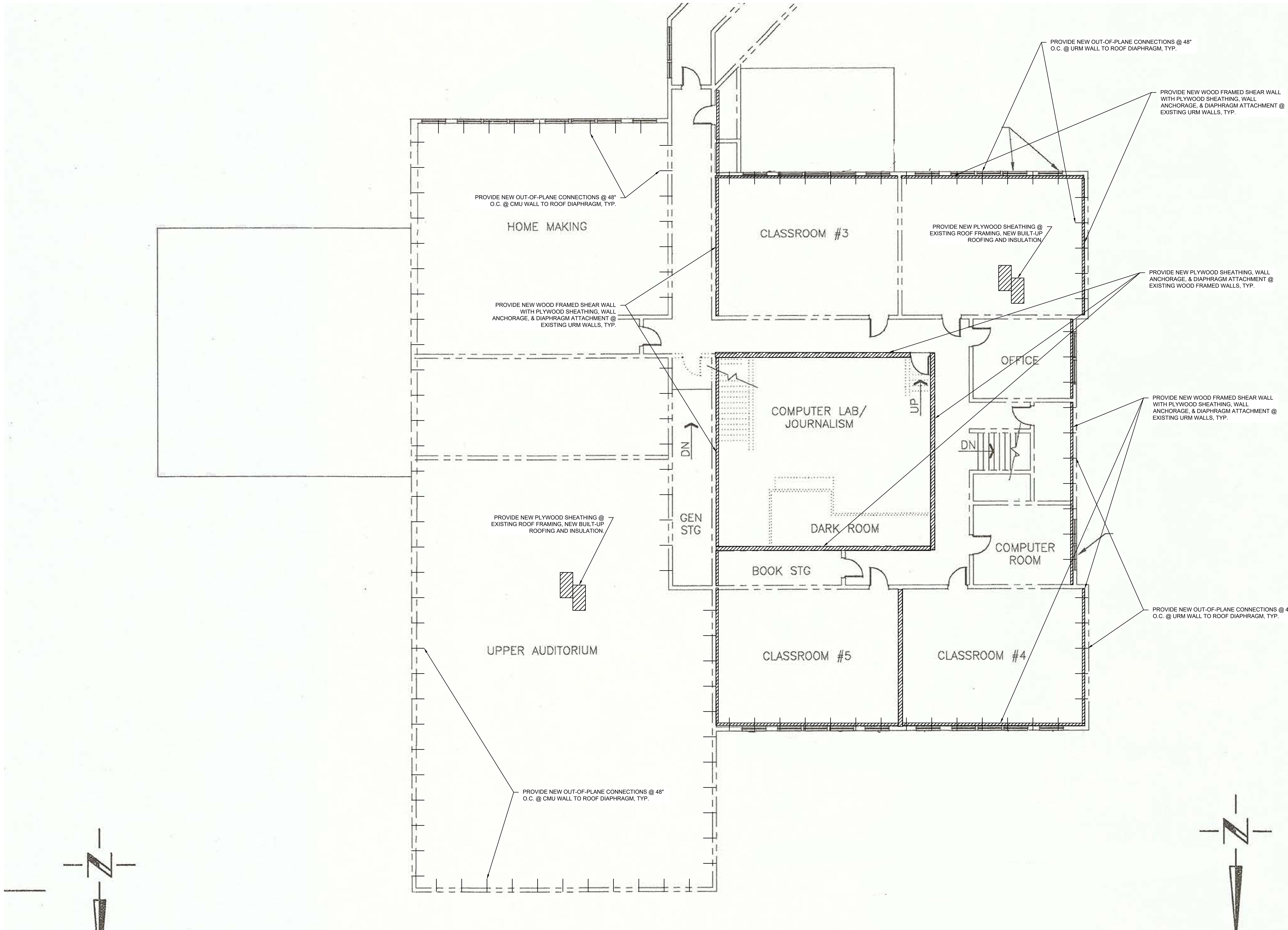
ZCS ENGINEERING
900 Klamath Avenue, Klamath Falls, OR 97601
(541) 884-7421 phone (541) 883-8804 fax

PROJECT NO:	K-5763-16
DRAWN:	SLC
CHECKED:	RCC
DATE:	09-11-17

MIDDLE SCHOOL SEISMIC REHAB. SCHEMATIC

S2.0

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1
S2.1

SEISMIC REHABILITATION SCHEMATIC
PILOT ROCK MIDDLE SCHOOL 2ND FLOOR
NTS

IF THIS BAR DOES NOT MEASURE 1-INCH IN LENGTH, THEN THE DRAWING IS NOT TO SCALE

NO. | REVISIONS | BY | DATE

PILOT ROCK SCHOOL DISTRICT 2R

SEISMIC EVALUATION OF SCHOOL STRUCTURES

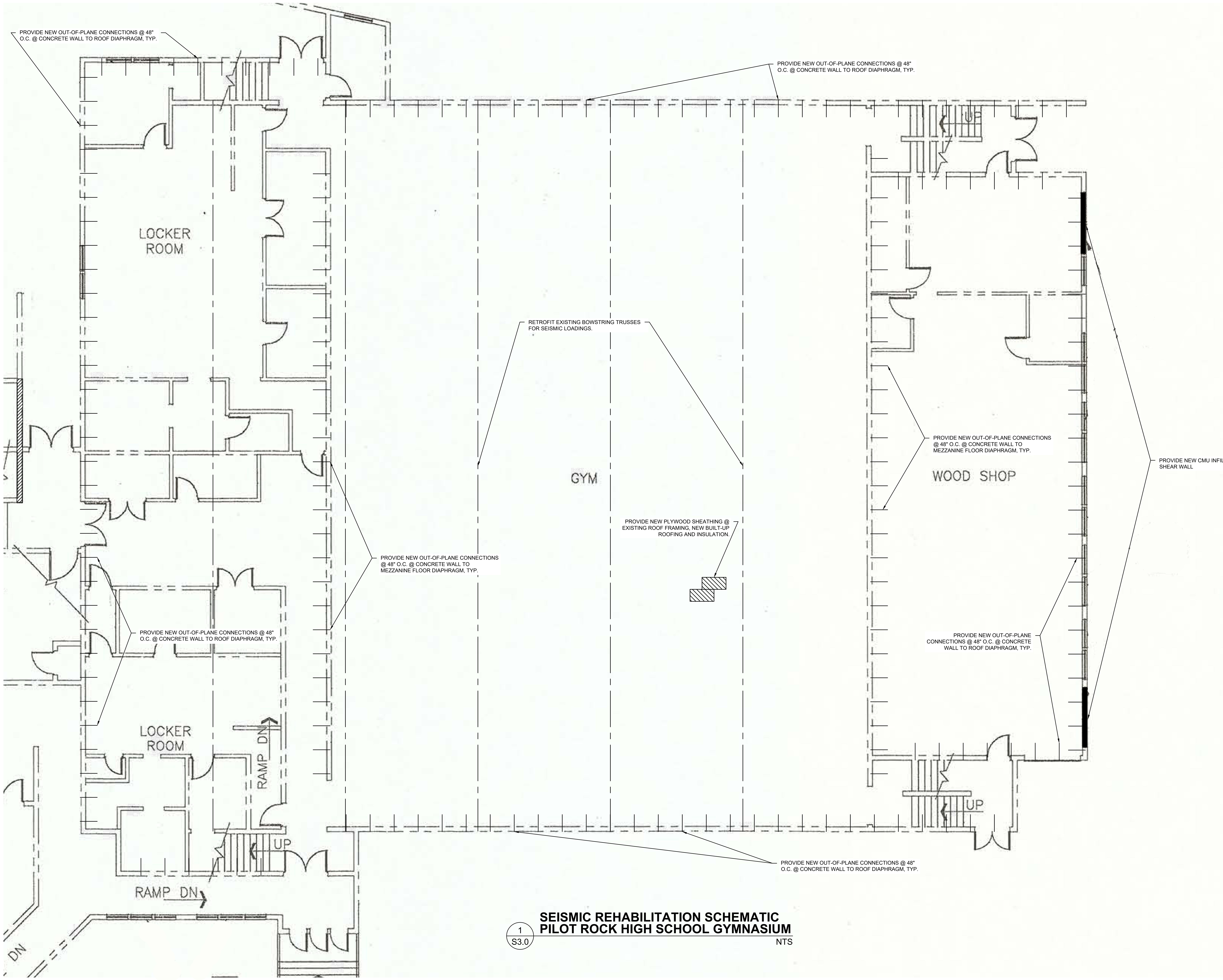
ZCS ENGINEERING
900 Klamath Avenue, Klamath Falls, OR 97601
(541) 884-7421 phone (541) 883-8804 fax

PROJECT NO:	K-5763-16
DRAWN:	SLC
CHECKED:	RCC
DATE:	09-11-17

MIDDLE SCHOOL
SEISMIC REHAB.
SCHEMATIC

S2.1

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1
S3.0

SEISMIC REHABILITATION SCHEMATIC
PILOT ROCK HIGH SCHOOL GYMNASIUM
NTS

IF THIS BAR DOES NOT MEASURE 1-INCH IN LENGTH, THEN THE DRAWING IS NOT TO SCALE

NO.	REVISIONS	BY	DATE

PILOT ROCK SCHOOL DISTRICT 2R

SEISMIC EVALUATION OF SCHOOL STRUCTURES

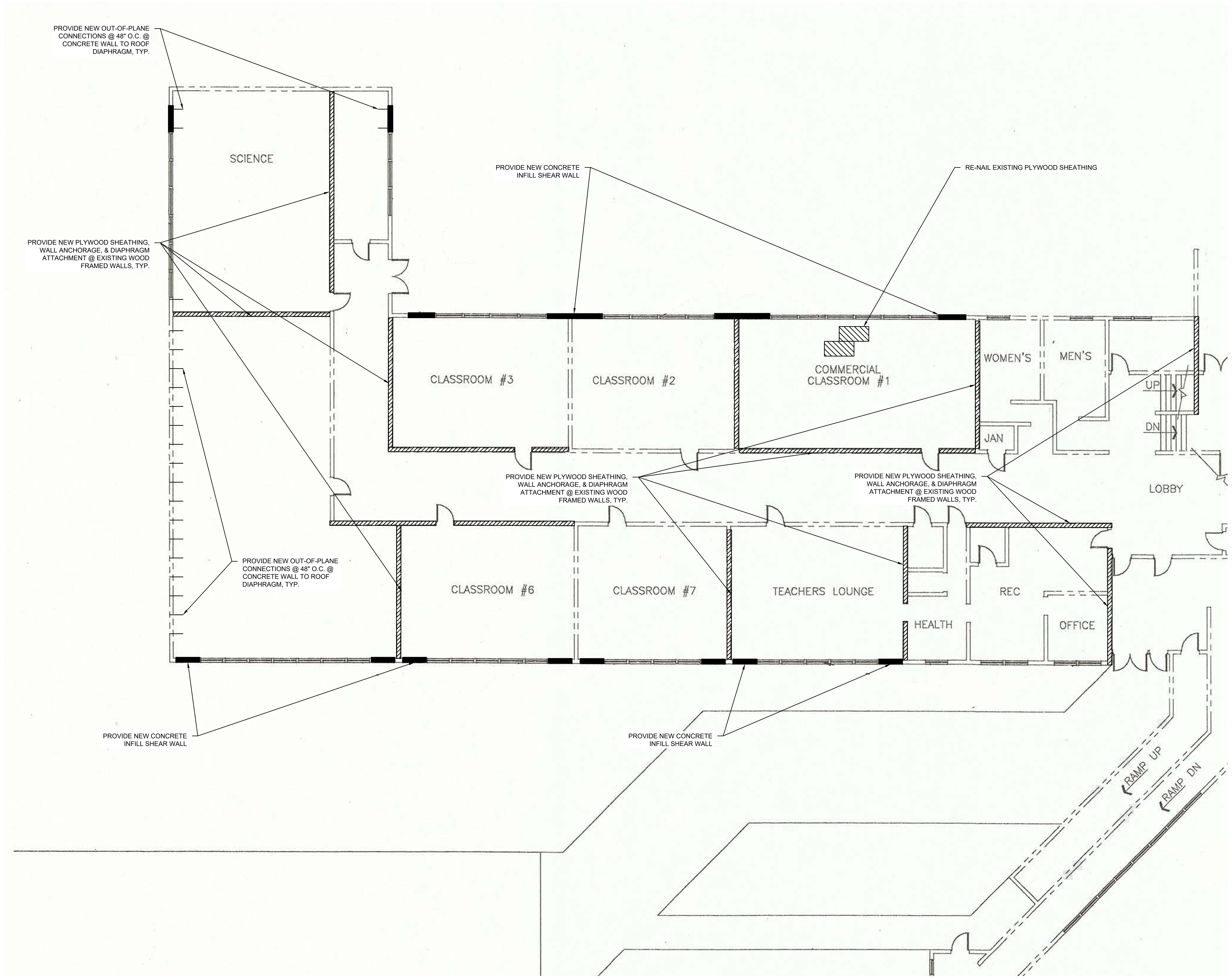
ZCS ENGINEERING
900 Klamath Avenue, Klamath Falls, OR 97601
(541) 884-7421 phone fax (541) 883-8804

PROJECT NO:	K-5763-16
DRAWN:	SLC
CHECKED:	RCC
DATE:	09-11-17

HIGH SCHOOL SEISMIC REHAB. SCHEMATIC

S3.0

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



SEISMIC REHABILITATION SCHEMATIC
PILOT ROCK HIGH SCHOOL

1
S3.1

NTS

IF THIS BAR DOES NOT MEASURE 1-INCH IN LENGTH, THEN THE DRAWING IS NOT TO SCALE

NO.	REVISIONS	BY	DATE

PILOT ROCK SCHOOL DISTRICT 2R

SEISMIC EVALUATION OF SCHOOL STRUCTURES

ZCS ENGINEERING
900 Klamath Avenue, Klamath Falls, OR 97601
(541) 884-7421 phone (541) 883-8804 fax

PROJECT NO:	K-5763-16
DRAWN:	SLC
CHECKED:	RCC
DATE:	09-11-17

HIGH SCHOOL SEISMIC REHAB. SCHEMATIC

S3.1

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION