Seismic Evaluation

for the

Siuslaw School District 97J

Lane County, Oregon

Prepared for:

Kari Blake

2111 Oak Street

Florence, OR 97439

January, 2019

Prepared by:

Stephen L. Chase, EIT

Project Manager

and

Russell C. Carter, PE, SE

Principal in Charge

ZCS ENGINEERING ARCHITECTURE

550 SW 6th Street, Suite C, Grants Pass, OR 97526

T: 541.479.3865 • F: 541.479.3870

Table of Contents

1.0 Executive Summary

1.1 Background

The Siuslaw School District 97J is located in Florence, Oregon within Lane County. The District operates three schools ranging from K-12 and other ancillary support facilities located within the community. Three schools, Siuslaw Elementary, Siuslaw Middle and Siuslaw High School will be included in 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, in total, approximately 301,200 square feet. The spaces are used for classrooms, administrative offices, and assembly areas. All of the structures vary in style, age, type of construction, condition, and use and have received multiple additions over the years. The schools studied as part of this planning effort include:

- Siuslaw Elementary School
- Siuslaw Middle School
- Siuslaw High School

To provide an all-encompassing seismic evaluation, visual observations and/or review of available construction documents was conducted for each of the above-mentioned school facilities. In addition, District staff were interviewed to obtain available information on known existing or potential 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 41-17”. The evaluation tool outlined in ASCE 41-17 allows for determination of seismic deficiencies present in these facilities with respect to modern building codes.

This study provides the District with recommendations to rehabilitate the identified seismic deficiencies to achieve a structure that meets the expectations associated with a performance level of “Limited Safety” or “Life Safety”/ “Immediate Occupancy” as outlined in ASCE 41-17. Planning level budgetary construction estimates for each school and support facilities are included in section 5.0.

The significant deficiencies are referenced to help the District develop a seismic rehabilitation methodology 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*
Siuslaw Elementary School	High
Siuslaw Middle School	Low
Siuslaw High 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, 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.

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 $60 to $120 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 might be a good time to install connections from the roof diaphragm to the walls or a window replacement project could be a good time to install shearwalls in place of windows in a wall line that does not have adequate shearwall length.

Attention should be given to the potential for upcoming seismic retrofit grant programs. A number 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 above-mentioned schools are located in Lane County, Oregon, and will be the subjects 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 to identify general structural deficiencies. A seismic performance review of the structural systems was performed in accordance with the American Society of Civil Engineers "Seismic Evaluation and Retrofit of Existing Buildings ASCE/SEI 41-17" in order to identify deficiencies provide rehabilitation recommendations. Planning level budgetary construction costs for each school have been determined based on the deficiencies and recommendations 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 incomplete record 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 301,200 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 used is 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 in the fall of 2017.

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

Name	Company
Russell C. Carter, PE, SE	ZCS Engineering & Architecture, Inc.
Stephen Chase, PM	ZCS Engineering & Architecture, 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

This 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 41-17: 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 each building as compared to current prescribed loading and detailing requirements for lateral (wind/seismic) loading to a performance level of either "Limited Safety" or "Life Safety"/ "Immediate Occupancy" per ASCE 41-17. Life Safety/Immediate occupancy was used for all areas that have a potential to be utilized as an emergency shelter. This included gymnasiums, cafeterias, and multipurpose rooms. The different levels of performance are defined per ASCE 41-17 as:

-Limited Safety (S-4)-
"The Limited Safety Structural Performance Level is set forth as a midway point between Life Safety and Collapse Prevention. It is intended to provide a structure with a greater reliability of resisting collapse than a structure that only meets the Collapse Prevention Performance Level, but not to the full level of safety that the Life Safety Performance Level would imply."

-Collapse Prevention (S-5)-
"Structural Performance Level, Collapse Prevention, means the post-earthquake damage state in which the building is on the verge of partial or total collapse. Substantial damage to the structure has occurred, potentially including significant degradation in the stiffness and strength of the lateral-force-resisting system, large permanent lateral deformation of the structure, and - to a more limited extent - degradation in vertical-load-carrying capacity. However, all significant components of the gravity-load-resisting system must continue to carry their gravity loads. Significant risk of injury caused by

falling hazards from structural debris might exist. The structure might not be technically practical to repair and is not safe for reoccupancy because after shock activity could induce collapse."

-Life Safety (S-3)-
"Structural Performance Level S-3, 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 re-occupancy."

-Immediate Occupancy (S-1)-
"Structural Performance Level S-1, Immediate Occupancy, means the post-earthquake damage state in which only very limited structural damage has occurred. The basic vertical- and lateral-force resisting systems of the building retain nearly all of their pre-earthquake strength and stiffness. The risk of life threatening injury as a result of structural damage is very low and although some minor structural repairs may be appropriate, these would generally not be required prior to re-occupancy."

Per ASCE 41-17 a seismic hazard level is required in order to perform the Tier 1 screening. In order to obtain a performance level of "Limited Safety" and "Life Safety", the seismic hazard shall be BSE-2E as defined in section 2.4.1.3 and C2.4.1.3. The BSE-2E hazard level earthquake has a probability of occurring once in every 975 years, or 5% chance in 50 years. This design level earthquake represents ground motions approximately 75% as large as those prescribed for new buildings. In addition, to obtain a performance level of "Immediate Occupancy," the BSE-1E design level as defined in the ASCE 41-17 section 2.4.1.4 was selected. The BSE-1E design earthquake has the probability of occurring once in every 227 years or 20% chance in 50 years. 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 41-17. We have referenced each of the different building construction types for each facility or addition in section 3.0.

Wood Frames, Commercial and Industrial [W2] – These buildings are commercial or industrial buildings with a floor area up 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.

Steel Moment Frames with Stiff Diaphragms [S1]
These buildings consist of a frame assembly of steel beams and steel columns. Floor and roof framing is stiff, including cast-in-place concrete slabs or metal deck with concrete fill supported on steel beams, open web joists, or steel trusses. Seismic forces are resisted by steel moment frames that develop their stiffness through rigid or semi rigid beam–column connections. Where all connections are moment-resisting connections, the entire frame participates in seismic force resistance. Where only selected connections are moment-resisting connections, resistance is provided along discrete frame lines. Columns are oriented so that each principal direction of the building has columns resisting forces in strong axis bending. Diaphragms consist of rigid construction that is stiff relative to the frames. The exterior of the structure is permitted to be concealed; the environmental closure walls consist of any type, including both ductile, flexible systems, and rigid, nonductile systems (e.g., unreinforced masonry either interior or exterior to the frame line). Where the interior of the structure is finished, frames are concealed by ceilings, partition walls, and architectural column furring. The foundation system is permitted to consist of a variety of elements.

Steel Moment Frames with Flexible Diaphragms [S1a]
These buildings are similar to S1 buildings, except that diaphragms are untopped metal deck or metal deck with lightweight insulating concrete, poured gypsum, wood, or similar nonstructural topping and are flexible relative to the frames. Support for the diaphragm is permitted to be solid elements or truss members made of wood and/or metal.

Precast or Tilt-Up Concrete Shear Walls [PC1] (with Flexible Diaphragms) – These buildings have precast concrete perimeter wall panels and often, interior walls, that are typically cast on site and tilted into place. The panels are interconnected by weldments, cast-in-place concrete pilasters, or collector elements. Floor and roof framing consists of wood joists, glulam beams, steel beams, or open web joists. Framing is supported on interior steel or wood columns and perimeter concrete bearing walls. The floors and roof consist of wood sheathing or untopped metal deck. Seismic forces are resisted by the precast concrete perimeter wall panels. Wall panels are permitted to be solid or have large window and door openings that cause the panels to behave more as frames than as shear walls. In older construction, wood framing is attached to the walls with wood ledgers. The roof framing is permitted to have tension-capable connections between elements. The foundation system is permitted to consist of a variety of elements.

Our observation focused specifically on items of known concerns associated with the varying building types referenced above and were based strictly on visual observation. Some deficiencies noted in Section 3.0 may not be present upon further exploratory inspection and evaluation. Additionally, there are other deficiencies that may be present upon further inspection despite our attempts to cover all areas of concern. Contingency values are recommended on top of the budgetary construction costs presented in Section 5.0 to cover unexpected costs.

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 with a seismic hazard ranking followed by a table summarizing the deficiencies observed. Lastly, a list of repair recommendations is provided along with anticipated costs to rectify the deficiencies.

3.1 Siuslaw Elementary School: 2221 Oak Street, Florence, OR 97439

Figure 1: Siuslaw Elementary School

3.1.1 Structure Summary

- **1965 Original Classroom Building Area A [PC1/W2]: Seismic Hazard – High**

The original school building was built in 1965 and contains classrooms and restrooms with an approximate footprint of 19,800 square-feet. The original structure was built with reinforced tilt-up concrete panel construction for both the North and South exterior walls. The East and West, and interior walls are of wood framed construction. The roof consists of 5/8 in. plywood sheathing over truss joists bearing over exterior/interior walls. The foundation consists of a concrete slab-on-grade with cast-in-place concrete stem walls and footings.

- **1982 Classroom Addition Building Area B [PC1/W2]: Seismic Hazard – High**

A 6,800 square-foot classroom addition at the East wall line of the original school was constructed in 1982 and consist of concrete tilt panels and wood framed walls. The roof consists of 5/8 in. plywood sheathing over truss joists bearing over exterior/interior walls. The foundation consists of a concrete slab-on-grade with cast-in-place concrete stem walls and footings.

- **1985 Classroom / Multi-Purpose Addition Building Area C [RM1/W2]: Seismic Hazard – High**

The 1985 Classroom addition was constructed to the east of the1982 classroom addition building with an approximate footprint of 14,000 square-feet. The Multi-Purpose wing consists of reinforced masonry walls on the exterior. The classroom wing consists of wood framed walls with brick veneer. The roof structure consists of 5/8 in. plywood over truss joists bearing on interior and exterior walls. The floor structure consists of concrete slab-on-grade with cast-in-place concrete stem walls and footings.

- **1992 Classroom / Gymnasium Addition Building Area D & E [RM1/W2]: Seismic Hazard – High**

The 1992 Classroom / Gymnasium addition was constructed at east wall of the1985 Multi-Purpose addition building with an approximate footprint of 52,600 square-feet. The Gymnasium / Cafeteria wing consists of reinforced masonry walls on the exterior. The classroom wing consists of wood framed walls with brick veneer. The roof structure of Gymnasium / Cafeteria consists of steel deck over open bar-web joists bearing on perimeter masonry walls. the roof structure over remaining portions consists of 5/8 in. plywood sheathing over truss joists bearing on exterior and interior walls. The floor structure consists of concrete slab-on-grade with cast-in-place concrete stem walls and footings.

3.1.2 Lateral Resisting Element Deficiencies

The evaluation of the facility indicates that rehabilitation of existing lateral system components is necessary to meet the requirements for Life Safety/Immediate Occupancy for the multipurpose building and Limited Safety for the remaining facility as outlined in ASCE 41-17. See Appendix C for Tier 1 evaluations. The following is a list of the major seismic deficiencies encountered:

S1. The roof diaphragms in all buildings are not properly attached to walls for in-plane loading.
S2. Wood framed shear walls lack adequate shear capacity for prescribed seismic forces.
S3. Wood framed shear walls are not properly attached to the foundation.
S4. Unblocked plywood diaphragm span exceeds 40 feet.
S5. The precast concrete tilt up walls and masonry walls are not properly attached to the roof for out-of-plane loading.
S6. The precast concrete tilt up walls and masonry walls are not properly attached to the roof for in-plane loading.
S7. Precast concrete tilt up walls are not properly attached to foundation elements for transfer of in-plane forces.
S8. Connection configuration between diaphragm and wall induces cross-grain bending in wood ledgers.

S9. Hold down devices are not present to counter over-turning forces at ends of wood framed shear walls.
S10. The site is located within a high liquefaction risk zone per DOGAMI HAZVU map (further geotechnical evaluation required to determine extent of hazard).

3.1.3 Gravity Resisting Systems and General Observations

The gravity resisting system was found to be in good general condition based on the visual observations performed.

3.1.4 Evaluation of Incidental Items

Incidental, non-structural items can play a major role in the overall expense associated with the rehabilitation of an existing building. These costs can be significant, and can be very difficult to estimate prior to construction. The following are examples of non-structural items typically found in similar facilities.

N1. Fire suppression piping is not properly anchored or braced in accordance with NFPA-13
N2. Fluid and gas piping do not have flexible couplings. Fluid and gas piping is not properly anchored to structure to limit spills or leaks.
N3. Lighting over egress paths are not adequately anchored to the structure.
N4. Hazardous material piping is not braced to the structure, emergency shut off valves have not been confirmed, flexible couplings at hazardous material piping and gas piping are not present.
N5. Ceiling lacks proper wires and compression struts with a spacing of 12 feet or less. Free edges or suspended ceilings do not have at least 3/4" clearance from walls/partitions. Free edges of ceilings are not supported by closure angles at least 2” wide.
N6. Light fixtures that weight more per square foot than ceiling gird are not suspended by a minimum of 2 wires at diagonal corners. Lens covers are not attached to fixtures with safety devices.
N7. Cladding anchors or ties at masonry veneer are not spaced at 24” on-center at exits. Masonry veneer does not contain weep holes.
N8. Covered walkway at building exit is not properly anchored to the structure.
N9. Contents taller than 6 feet with height-to-with ratio greater than 3 are not anchored to structure. Contents weighing more than 20lbs more than 4 feet above the floor are not braced or otherwise restrained.
N10. Equipment in-line with a duct or piping system weighing more than 75lbs is not laterally braced independent of duct or piping system. Equipment taller than 6 feet with height-to-with ratio greater than 3 are not anchored to structure. Equipment without lateral bracing is not free to swing without damaging itself.

3.1.5 Structural Rehabilitation Recommendations

The following structural improvements are required to resolve the deficiencies noted in section 3.1.2. These improvements are detailed below.

S1. Provide new in-plane connection hardware at the top of wall to roof diaphragm for transfer of seismic forces.
S2. Provide new plywood sheathing at existing wood framed walls to provide adequate in-plane shear capacity.
S3. Provide new anchorage hardware at wood framed shear walls for transfer of seismic forces to foundation elements.
S4. Provide new interior shear walls at strategic locations and re-nail existing plywood sheathing at roof to provide adequate shear capacity.
S5. Provide new out-of-plane connection hardware at precast concrete tilt up walls and masonry walls to the roof framing.
S6. Provide new in-plane connection hardware at the top of precast concrete tilt up walls and masonry walls to roof diaphragms for transfer of in-plane forces.
S7. Provide new connection hardware at the bottom of precast concrete tilt up walls to foundation elements for transfer of in-plane forces.
S8. Provide new out-of-plane connection hardware where wood ledgers are present at concrete tilt-up panels and CMU walls.
S9. Provide new hold down devices to counter over-turning forces at ends of wood framed shear walls.
S10. Provide new micropiles and concrete strip footings at existing footings to address liquefaction risk (further geotechnical evaluation required to determine extent of mitigation efforts).

3.1.6 Non-Structural Rehabilitation Recommendations

N1. Provide bracing of fire suppression piping.
N2. Provide flexible couplings and anchorage of fluid and gas piping.
N3. Provide anchorage of lighting over egress paths.
N4. Provide bracing of hazardous material piping, verify emergency shutoff valves are present and flexible couplings.
N5. Provide seismic bracing of suspended ceiling systems and proper edge tracks.
N6. Provide independent support elements at light fixtures within suspended ceilings.
N7. Provide cladding anchors or ties at masonry veneer at 24” on-center at exits. Provide weep holes at masonry veneer.
N8. Provide out-of-plane anchorage at exterior canopy system.
N9. Provide adequate bracing of contents taller than 6 feet with height-to-with ratio greater than 3 and contents weighing more than 20lbs more than 4 feet above the floor.

N10. Provide adequate bracing of equipment in-line with a duct or piping system weighing more than 75lbs and equipment taller than 6 feet with height-to-with ratio greater than 3.

3.1.7 Preliminary Construction Cost Estimate

The attached engineer's opinion of probable cost in Appendix A has been developed by ZCS for Siuslaw Elementary School. 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.

The preliminary opinion of probable cost is **$11,650,295.**

3.2 Siuslaw Middle School: 2575 Oak Street, Florence, OR 97439

Figure 2: Siuslaw Middle School

3.2.1 Structure Summary

- **2000 Original School Building [S1a/PC1]: Seismic Hazard – Low**

  The original main school building was constructed in 2000 and contains classrooms, two gymnasiums, a library, and a shop with an approximate footprint of 98,800-square-feet. The original structure was built with a combination of steel frames with steel stud infill walls and precast concrete tilt-up panels. The roof consists of steel deck over open bar web joists bearing on steel beams and columns and precast concrete panels. The second floor consists of concrete slab over steel deck. The foundation is slab-on-grade with cast-in-place concrete stem walls and footings.

  Per the ASCE 41-17 evaluations, this structure is considered a benchmark building due to the codes in effect during the time of design and construction and considered adequate therefore no further analysis was performed.

3.2.3 Gravity Resisting Systems and General Observations

The gravity resisting system was found to be in good general condition based on the visual observations performed.

3.3 Siuslaw High School: 2975 Oak Street, Florence, OR 97439

Figure 3: Siuslaw High School

3.3.1 Structure Summary

- **1968 Original School Building [PC1/W2]: Seismic Hazard - High**

  The original high school building was constructed in 1968 and contains classrooms, a gymnasium, Library, and Shop with an approximate footprint of 104,200-square-feet. The original structure consists of pre-cast concrete tilt-up walls and wood framed walls. areas of the gymnasium and one classroom wing consist of partial height pre-cast concrete walls with wood framed walls above. The roof consists of plywood sheathing over timber joists bearing on interior timber beams and exterior/interior walls. The foundation is slab-on-grade with cast-in-place concrete stem walls and footings.

- **2000 Gymnasium Addition [PC1]: Seismic Hazard – Low**

  In 2000 an auxiliary gymnasium was added to the Southwest of the original gymnasium. The Auxiliary gym was constructed using precast concrete tilt-up panels with an approximate footprint of 10,000-square-feet. The roof consists of un-topped steel deck over steel open bar-web joists bearing an interior steel beam and exterior concrete tilt-up walls. The foundation consists of slab-on-grade with cast-in-place concert stem walls and footings.

  Per the ASCE 41-17 evaluations, this structure is considered a benchmark building due to the codes in effect during the time of design and construction and considered adequate therefore no further analysis was performed.

3.3.2 Lateral Resisting Element Deficiencies

The evaluation of the facility indicates that rehabilitation of existing lateral system components is necessary to meet the requirements for Life Safety/Immediate Occupancy for the gymnasium and multipurpose building and Limited Safety for the remaining facility as outlined in ASCE 41-17. See Appendix C for Tier 1 evaluations. The following is a list of the major seismic deficiencies encountered:

S1. The roof diaphragms in all buildings are not properly attached to walls for in-plane loading.
S2. The precast concrete tilt up walls are not properly attached to the roof and mezzanine framing for out-of-plane loading.
S3. Areas of partial height concrete tilt-up panel wall with wood framed walls above create a hinge condition.
S4. Gypsum sheathed wood framed shear walls lack adequate shear capacity for prescribed seismic forces.
S5. Unblocked plywood diaphragm span exceeds 40 feet.
S6. Hold down devices are not present to counter over-turning forces at ends of wood framed shear walls.
S7. Wood framed shear walls are not properly attached to the foundation.
S8. The site is located within a high liquefaction risk zone per DOGAMI HAZVU map (further geotechnical evaluation required to determine extent of hazard).

3.3.3 Gravity Resisting Systems and General Observations

The gravity resisting system was found to be in good general condition based on the visual observations performed.

3.3.4 Evaluation of Incidental Items

Incidental, non-structural items can play a major role in the overall expense associated with the rehabilitation of an existing building. These costs can be significant and can be very difficult to estimate prior to construction. The following are examples of non-structural items typically found in similar facilities.

N1. Emergency power equipment is not properly braced to the structure.
N2. Lighting over egress paths are not adequately anchored to the structure.
N3. Hazardous material piping is not braced to the structure, emergency shut off valves have not been confirmed, flexible couplings at hazardous material piping and gas piping are not present.

N4. Ceiling lacks proper wires and compression struts with a spacing of 12 feet or less. Free edges or suspended ceilings do not have at least 3/4" clearance from walls/partitions. Free edges of ceilings are not supported by closure angles at least 2” wide.
N5. Light fixtures that weight more per square foot than ceiling gird are not suspended by a minimum of 2 wires at diagonal corners. Lens covers are not attached to fixtures with safety devices.
N6. Contents taller than 6 feet with height-to-with ratio greater than 3 are not anchored to structure. Contents weighing more than 20lbs more than 4 feet above the floor are not braced or otherwise restrained.
N7. Equipment in-line with a duct or piping system weighing more than 75lbs is not laterally braced independent of duct or piping system. Equipment taller than 6 feet with height-to-with ratio greater than 3 are not anchored to structure. Equipment without lateral bracing is not free to swing without damaging itself.

3.3.5 Seismic Rehabilitation Recommendations

The following structural improvements are required to resolve the deficiencies noted in section 3.3.2. These improvements are detailed below.

S1. Provide new in-plane connection hardware between diaphragms and shear walls below for transfer of seismic forces.
S2. Provide new out-of-plane connection hardware between concrete tilt-up panels to roof and mezzanine diaphragm framing.
S3. At partial height concrete tilt-up panels provide new steel columns and out-of-plane connection hardware to resolve hinge condition.
S4. Provide new plywood sheathing at strategic gypsum sheathed shear walls to provide adequate in-plane shear capacity.
S5. Provide new plywood shear walls at strategic locations to reduce diaphragm span and re-nail existing roof and mezzanine diaphragm sheathing.
S6. Provide new hold down devices at ends of new shear walls for transfer of overturning forces to foundation elements.
S7. Provide new in-plane connection hardware at wood framed shear walls for transfer of seismic forces.
S8. Provide new micropiles and concrete strip footings at existing footings to address liquefaction risk (further geotechnical evaluation required to determine extent of mitigation efforts).

3.3.6 Non-Structural Rehabilitation Recommendations

N1. Provide proper bracing of emergency power equipment to the structure.
N2. Provide proper bracing of emergency lighting over egress paths.

N3. Provide bracing of hazardous material piping, verify/install emergency shut off valves, provide flexible couplings at hazardous material piping and gas piping.
N4. Provide seismic bracing of suspended ceiling system and new closure angles for adequate support.
N5. Provide independent supports at light fixtures within suspended ceiling grid. Provide proper attachment of lens covers.
N6. Provide adequate bracing of contents taller than 6 feet with height-to-with ratio greater than 3 and contents weighing more than 20lbs more than 4 feet above the floor.
N7. Provide proper bracing of equipment in-line with a duct or piping system weighing more than 75lbs and bracing of equipment taller than 6 feet with height-to-with ratio greater than 3.

3.3.7 Preliminary Construction Cost Estimate

The attached engineer's opinion of probable cost in Appendix A has been developed by ZCS for Siuslaw High School. 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.

The preliminary opinion of probable cost is **$11,930,000.**

4.0 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 review of construction documents. Generally, the condition of the 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 given to the potential for upcoming seismic retrofit grant programs. Each 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.

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. It is our opinion the structures evaluated and noted to have lateral system deficiencies have the potential to benefit from future seismic upgrades.

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

Appendix A: Figures

SIUSLAW ELEMENTARY SCHOOL
TAP GRANT APPLICATION

SIUSLAW SCHOOL DISTRICT
2221 OAK STREET
FLORENCE, OR 97439

ABBREVIATIONS

ABBREVIATIONS

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

PROJECT INFORMATION

PROJECT NARRATIVE

INTENT OF THESE DRAWINGS IS TO ILLUSTRATE THE LEVEL OF UNDERSTANDING THE APPLICANT HAS WITH REGARDS TO THE EFFORT THAT WILL BE REQUIRED TO SEISMICALLY REHABILITATE THE BUILDING. THESE SCHEMATIC DRAWINGS HAVE BEEN PREPARED USING THE CURRENT OREGON STRUCTURAL SPECIALITY CODE (OSSC) AND THE ASCE 41 (SEISMIC REHABILITATION OF EXISTING BUILDINGS) AS THE REFERENCES FOR PRESCRIBED LOADING AND BUILDING PERFORMANCE LEVEL RATINGS.

THE DRAWING ILLUSTRATES BOTH EXISTING CONDITIONS AND GENERAL REPAIRS THAT WOULD NEED TO BE ACCOMPLISHED TO REACH AN ACCEPTABLE LEVEL OF PERFORMANCE (LIMITED SAFETY) AND (IMMEDIATE OCCUPANCY) ACCORDING TO CURRENT CODE.

"STRUCTURAL PERFORMANCE LEVEL, LIMITED 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"

"STRUCTURAL PERFORMANCE LEVEL IMMEDIATE OCCUPANCY MEANS THE POST-EARTHQUAKE DAMAGE STATE IN WHICH ONLY VERY LIMITED STRUCTURAL DAMAGE HAS OCCURRED. THE BASIC VERTICAL- AND LATERAL-FORCE RESISTING SYSTEMS OF THE BUILDING RETAIN NEARLY ALL OF THEIR PRE-EARTHQUAKE STRENGTH AND STIFFNESS. THE RISK OF LIFE THREATENING INJURY AS A RESULT OF STRUCTURAL DAMAGE IS VERY LOW AND ALTHOUGH SOME MINOR STRUCTURAL REPAIRS MAY BE APPROPRIATE, THESE WOULD GENERALLY NOT BE REQUIRED PRIOR TO REOCCUPANCY."

SEISMIC DEFICIENCIES

- S1: DIAPHRAGMS ARE NOT PROPERLY ATTACHED FOR TRANSFER OF IN-PLANE SEISMIC FORCES
- S2: WOOD FRAMED SHEAR WALLS LACK ADEQUATE SHEAR CAPACITY FOR PRESCRIBED SEISMIC FORCES
- S3: WOOD FRAMED SHEAR WALLS ARE NOT PROPERLY ATTACHED TO FOUNDATION ELEMENTS FOR TRANSFER OF SEISMIC FORCES
- S4: PLYWOOD ROOF DIAPHRAGMS ARE OVER-SPANNED AND LACK ADEQUATE SHEAR CAPACITY
- S5: CONCRETE TILT-UP WALLS AND CMU WALLS ARE NOT PROPERLY ATTACHED TO THE ROOF DIAPHRAGM FOR OUT-OF-PLANE LOADING
- S6: CONCRETE TILT-UP WALLS AND CMU WALLS ARE NOT PROPERLY ATTACHED TO THE ROOF DIAPHRAGM FOR IN-PLANE FORCES
- S7: CONCRETE TILT-UP PANELS ARE NOT PROPERLY ANCHORED TO FOUNDATION ELEMENTS FOR TRANSFER OF IN-PLANE FORCES
- S8: WOOD LEDGERS WILL EXPERIENCE CROSS GRAIN BENDING
- S9: HOLD DOWN DEVICES ARE NOT PRESENT FOR TRANSFER OF OVER-TURNING FORCES TO THE FOUNDATION
- S10: THE SITE IS LOCATED WITHIN A HIGH LIQUEFACTION RISK ZONE PER DOGAMI HAZVU MAP (FURTHER GEOTECHNICAL EVALUATION REQUIRED TO DETERMINE EXTENT OF HAZARD)

SEISMIC CONSIDERATIONS FOR NON STRUCTURAL COMPONENTS

- N1: FIRE SUPPRESSION PIPING IS NOT BRACED
- N2: FLEXIBLE COUPLINGS AT FIRE SUPPRESSION PIPING ARE NOT PRESENT
- N3: EMERGENCY AND EGRESS LIGHTING IS NOT PROPERLY BRACED
- N4: HAZARDOUS MATERIAL PIPING IS NOT BRACED, EMERGENCY SHUT OFF VALVES HAVE NOT BEEN CONFIRMED, FLEXIBLE COUPLINGS ARE NOT PRESENT
- N5: SUSPENDED CEILINGS LACK ADEQUATE BRACING AND DO NOT HAVE ADEQUATE EDGE SUPPORT
- N6: LIGHT FIXTURES ARE NOT INDEPENDENTLY SUPPORTED FROM SUSPENDED CEILING SYSTEM
- N7: ANCHORS AND TIES AT MASONRY VENEER ARE NOT PRESENT

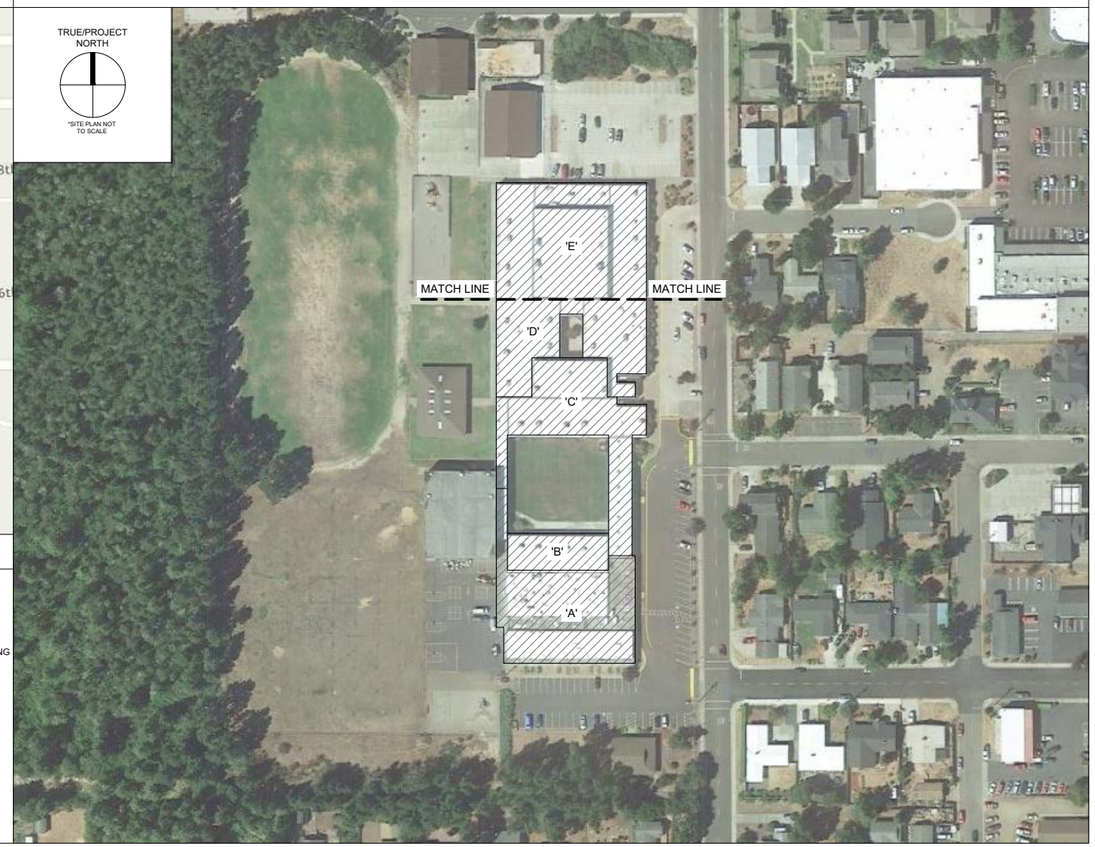
EXTERIOR PHOTO: BUILDING A

EXTERIOR PHOTO: BUILDING C & D

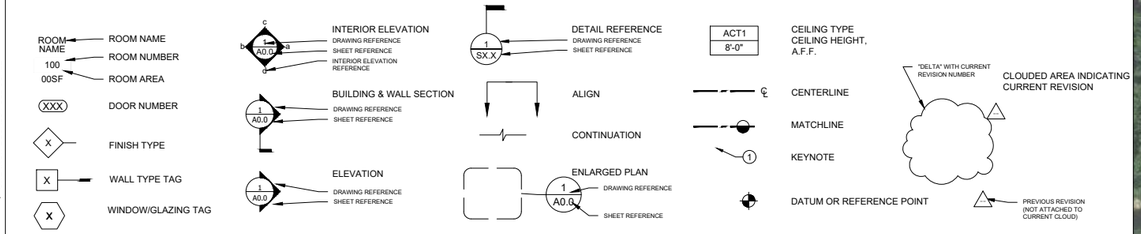
SHEET INDEX

VICINITY MAP

SITE LAYOUT



SYMBOLS



ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE

550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW ELEMENTARY SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER 16,196 OREGON JULY 16, 1996 SCOTT C. CARTER

PRELIMINARY - NOT FOR CONSTRUCTION

EXPIRES: 12-31-19

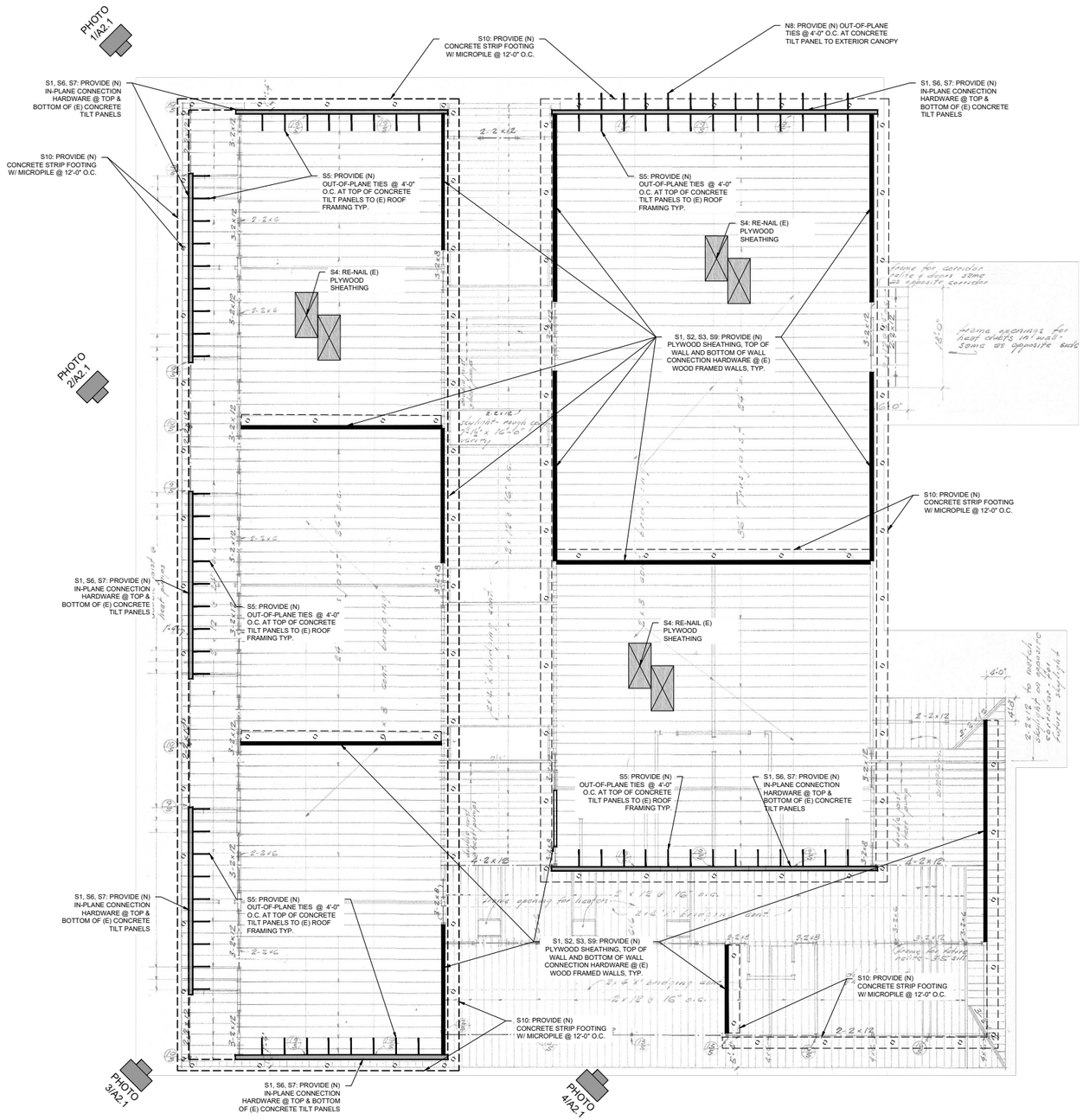
REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

COVER SHEET

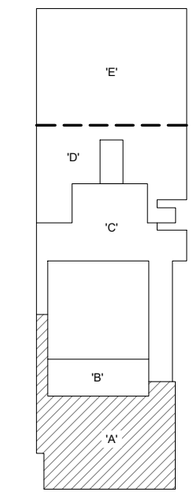
G0.0

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1 S1.1 **AREA 'A' ROOF FRAMING PLAN**

NTS



2 S1.1 **CAMPUS KEY**

NTS

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE

550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW ELEMENTARY SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER OREGON DECEMBER 16, 1986 SHELL C. CARTER

-PRELIMINARY- NOT FOR CONSTRUCTION

EXPIRES: 12-31-19

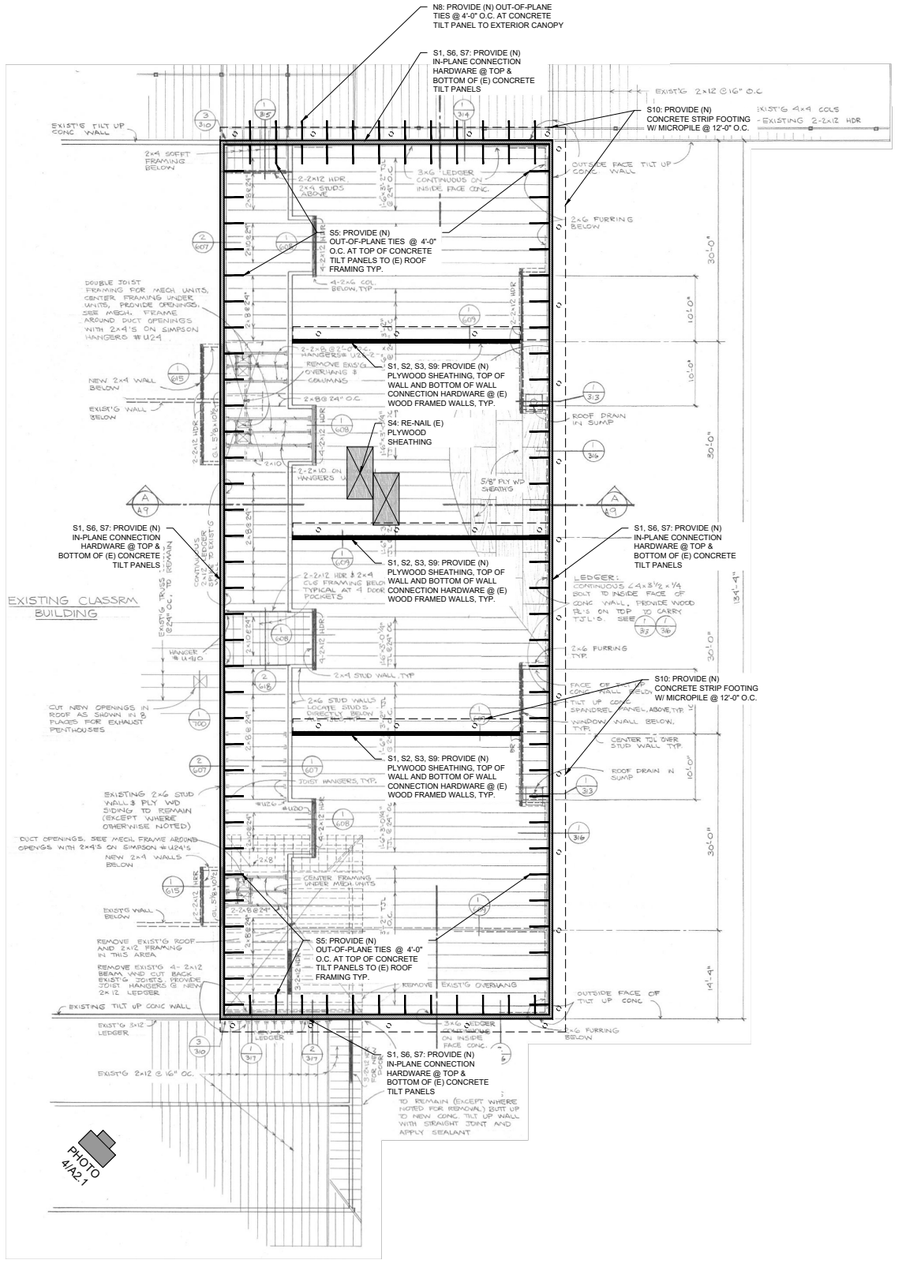
REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

AREA 'A' ROOF FRAMING PLAN

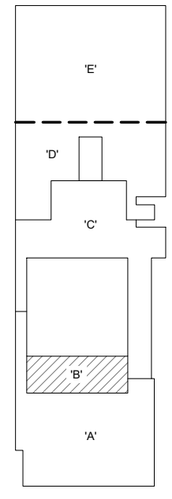
S1.1

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1 S1.2 **AREA 'B' ROOF FRAMING PLAN**

NTS



2 S1.2 **CAMPUS KEY**

NTS

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW ELEMENTARY SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 16, 1986
SCOTT C. CARTER
-PRELIMINARY- NOT FOR CONSTRUCTION
EXPIRES: 12-31-19

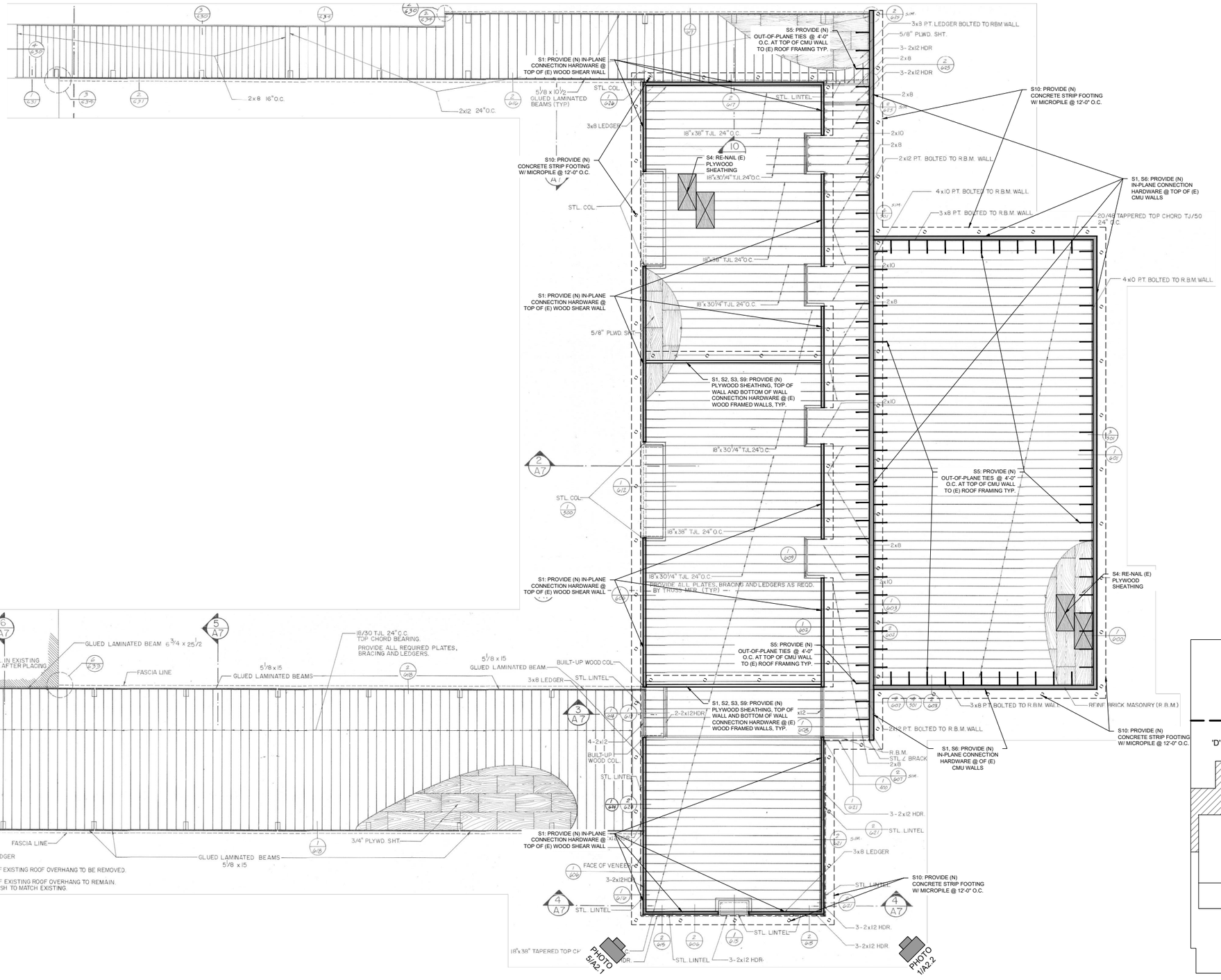
REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

AREA 'B' ROOF FRAMING PLAN

S1.2

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



ONE INCH EQUALS FULL SCALE

1 S1.3 AREA 'C' ROOF FRAMING PLAN

NTS

2 S1.3 CAMPUS KEY

NTS

ZCS ENGINEERING ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW ELEMENTARY SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER 18 OREGON DEC 16, 1998 STEVE C. CARTER
PRELIMINARY - NOT FOR CONSTRUCTION
EXPIRES: 12-31-19

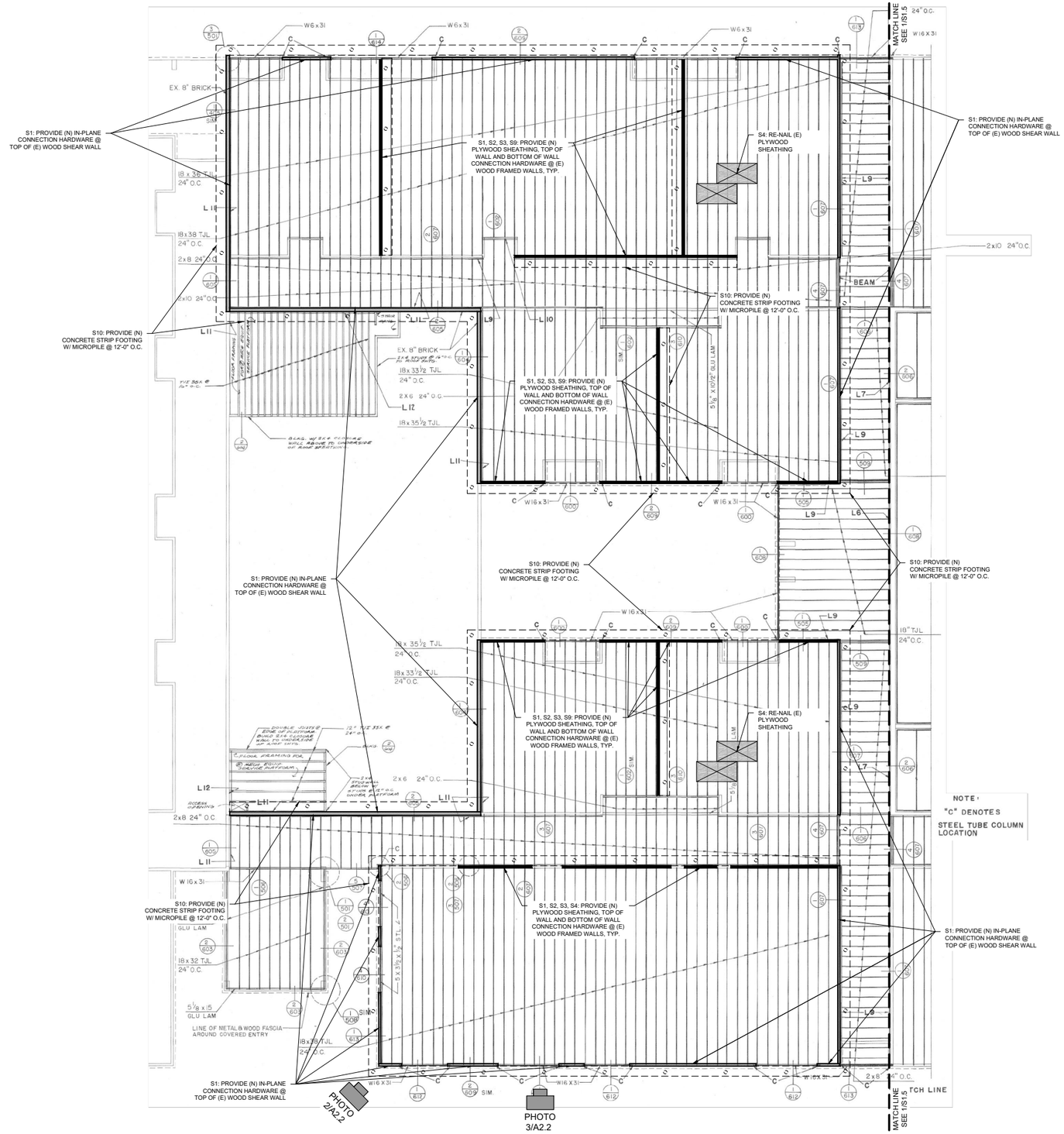
REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

AREA 'C' ROOF FRAMING PLAN

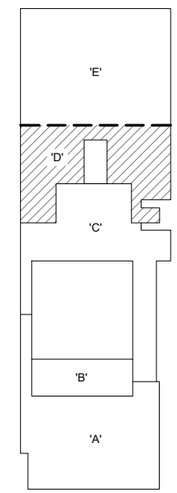
S1.3

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1 S1.4 **AREA 'D' ROOF FRAMING PLAN**

NTS



2 S1.4 **CAMPUS KEY**

NTS

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW ELEMENTARY SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER — OREGON — JULY 16, 1996 — CLAYTON C. CARTER — EXPIRES: 12-31-19

PRELIMINARY - NOT FOR CONSTRUCTION

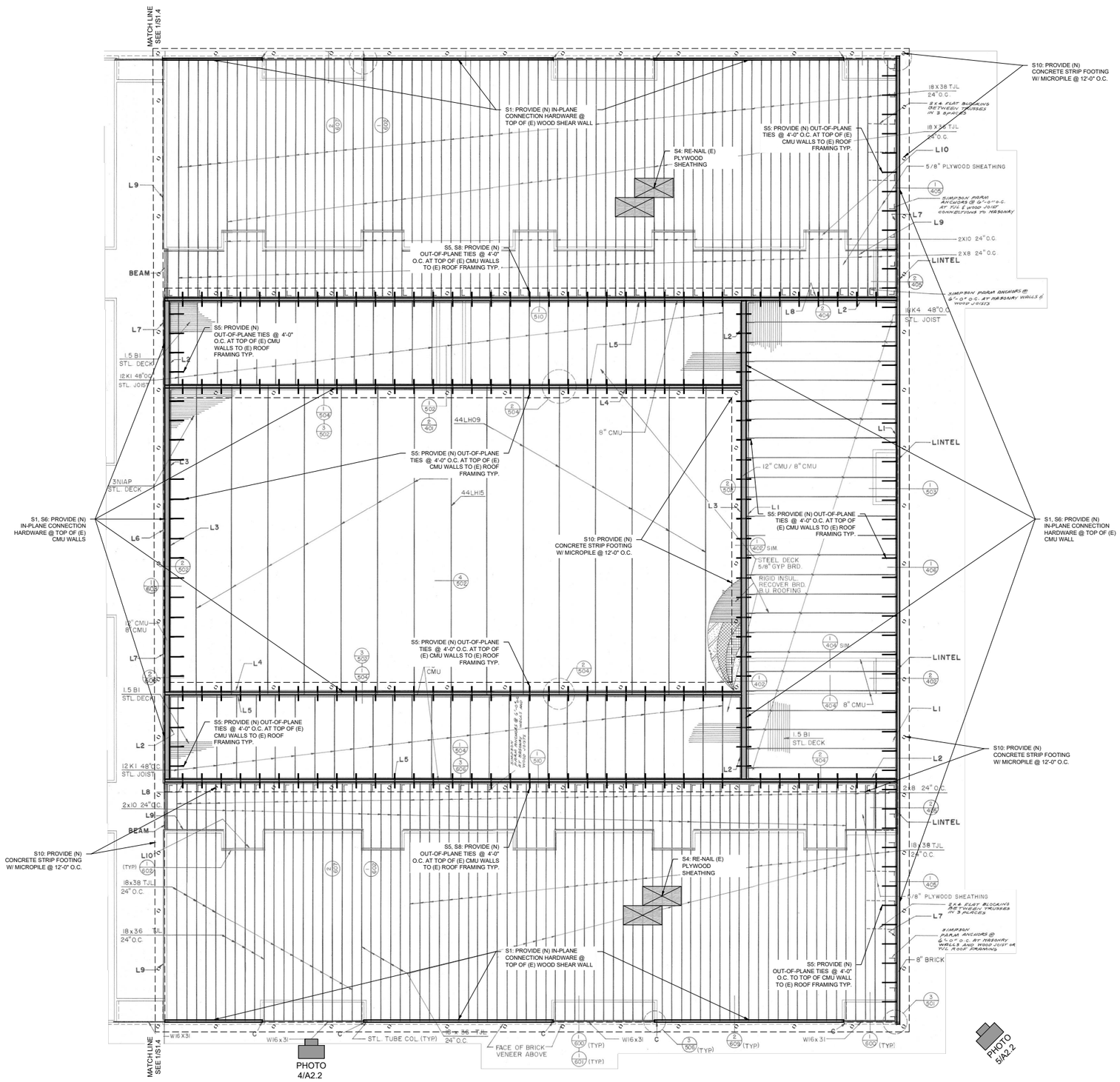
REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

AREA 'D' ROOF FRAMING PLAN

S1.4

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1 S1.5 **AREA 'E' ROOF FRAMING PLAN**

NTS

2 S1.5 **CAMPUS KEY**

NTS

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW ELEMENTARY SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER 18 OREGON JULY 16, 1996 SCOTT C. CARTER EXPIRES: 12-31-19

-PRELIMINARY- NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

AREA 'E' ROOF FRAMING PLAN

S1.5

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

1 A2.1 **PHOTO**

1/4"= 1'-0"

3 A2.1 **PHOTO**

1/4"= 1'-0"

2 A2.1 **PHOTO**

1/4"= 1'-0"

4 A2.1 **PHOTO**

1/4"= 1'-0"

5 A2.1 **PHOTO**

1/4"= 1'-0"

ONE INCH EQUALS FULL SCALE

ZCS
ENGINEERING
ARCHITECTURE

550 SW 6th Street, Suite C. Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW ELEMENTARY SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER
18
OREGON
JULY 16, 1996
SCOTT C. CARTER
EXPIRES: 12-31-19

PRELIMINARY NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

PHOTOS

A2.1

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

1 A2.2 **PHOTO**

1/4"= 1'-0"

3 A2.2 **PHOTO**

1/4"= 1'-0"

2 A2.2 **PHOTO**

1/4"= 1'-0"

4 A2.2 **PHOTO**

1/4"= 1'-0"

5 A2.2 **PHOTO**

1/4"= 1'-0"

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE

550 SW 6th Street, Suite C. Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW ELEMENTARY SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 16, 1996
SCOTT L. C. CARTER
EXPIRES: 12-31-19

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

PHOTOS

A2.2

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

SIUSLAW HIGH SCHOOL
TAP GRANT APPLICATION

SIUSLAW SCHOOL DISTRICT
2975 OAK STREET
FLORENCE, OR 97439

ABBREVIATIONS

ABBREVIATIONS

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

PROJECT INFORMATION

PROJECT NARRATIVE

INTENT OF THESE DRAWINGS IS TO ILLUSTRATE THE LEVEL OF UNDERSTANDING THE APPLICANT HAS WITH REGARDS TO THE EFFORT THAT WILL BE REQUIRED TO SEISMICALLY REHABILITATE THE BUILDING. THESE SCHEMATIC DRAWINGS HAVE BEEN PREPARED USING THE CURRENT OREGON STRUCTURAL SPECIALITY CODE (OSSC) AND THE ASCE 41 (SEISMIC REHABILITATION OF EXISTING BUILDINGS) AS THE REFERENCES FOR PRESCRIBED LOADING AND BUILDING PERFORMANCE LEVEL RATINGS.

THE DRAWING ILLUSTRATES BOTH EXISTING CONDITIONS AND GENERAL REPAIRS THAT WOULD NEED TO BE ACCOMPLISHED TO REACH AN ACCEPTABLE LEVEL OF PERFORMANCE (LIMITED SAFETY) AND (IMMEDIATE OCCUPANCY) ACCORDING TO CURRENT CODE.

"STRUCTURAL PERFORMANCE LEVEL, LIMITED 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"

"STRUCTURAL PERFORMANCE LEVEL IMMEDIATE OCCUPANCY MEANS THE POST-EARTHQUAKE DAMAGE STATE IN WHICH ONLY VERY LIMITED STRUCTURAL DAMAGE HAS OCCURRED. THE BASIC VERTICAL- AND LATERAL-FORCE RESISTING SYSTEMS OF THE BUILDING RETAIN NEARLY ALL OF THEIR PRE-EARTHQUAKE STRENGTH AND STIFFNESS. THE RISK OF LIFE THREATENING INJURY AS A RESULT OF STRUCTURAL DAMAGE IS VERY LOW AND ALTHOUGH SOME MINOR STRUCTURAL REPAIRS MAY BE APPROPRIATE, THESE WOULD GENERALLY NOT BE REQUIRED PRIOR TO REOCCUPANCY."

SEISMIC DEFICIENCIES

S1: THE ROOF DIAPHRAGMS ARE NOT PROPERLY ATTACHED TO THE SHEAR WALLS BELOW.

S2: THE PRECAST CONCRETE TILT-UP WALLS ARE NOT PROPERLY ATTACHED TO THE ROOF AND MEZZANINE DIAPHRAGMS FOR OUT-OF-PLANE LOADING.

S3: AREAS OF PARTIAL HEIGHT CONCRETE TILT-UP WALLS WITH WOOD FRAMED WALLS ABOVE CREATE A HINGE CONDITION FOR OUT-OF-PLANE FORCES.

S4: GYPSUM SHEATHED SHEAR WALLS DO NOT HAVE ADEQUATE CAPACITY FOR PRESCRIBED SEISMIC FORCES.

S5: UNBLOCKED PLYWOOD DIAPHRAGMS ARE OVER-SPANNED AND LACK ADEQUATE SHEAR CAPACITY.

S6: HOLD DOWN DEVICES ARE NOT PRESENT TO COUNTER OVER-TURNING FORCES.

S7: WOOD FRAMED SHEAR WALLS ARE NOT PROPERLY ATTACHED TO THE FOUNDATION FOR TRANSFER OF SEISMIC FORCES.

S8: THE SITE IS LOCATED WITHIN A HIGH LIQUEFACTION RISK ZONE PER DOGAMI HAZVU MAP (FURTHER GEOTECHNICAL EVALUATION REQUIRED TO DETERMINE EXTENT OF HAZARD)

SEISMIC CONSIDERATIONS FOR NON STRUCTURAL COMPONENTS

N1: ATTACHMENT OF EMERGENCY POWER EQUIPMENT.

N2: ATTACHMENT OF ALL EMERGENCY LIGHTING, POWER EQUIPMENT AND ASSOCIATED WIRING.

N3: VERIFICATION/INSTALLATION OF BRACING FOR OVERHEAD PIPING.

N4: SUSPENDED CEILING SYSTEM IS NOT SEISMICALLY BRACED AND LACK CLOSURE ANGLES.

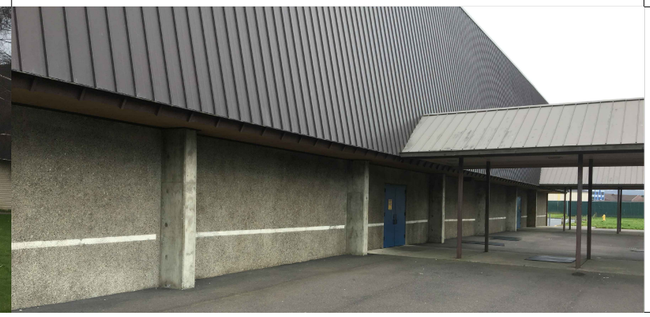
N5: LIGHT FIXTURES WITHIN SUSPENDED CEILING SYSTEMS ARE NOT INDEPENDENTLY ANCHORED TO THE STRUCTURE.

N6: BRACING OF TALL NARROW CONTENTS.

N7: BRACING OF IN-LINE AND TALL NARROW EQUIPMENT.

EXTERIOR PHOTO: BUILDING 'A'

EXTERIOR PHOTO: GYM

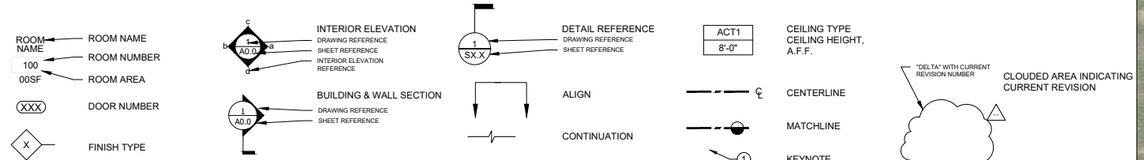


SHEET INDEX

VICINITY MAP

SITE LAYOUT

SYMBOLS



ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE

550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 16, 1996
S. L. C. CARTER
EXPIRES: 12-31-19

PRELIMINARY - NOT FOR CONSTRUCTION

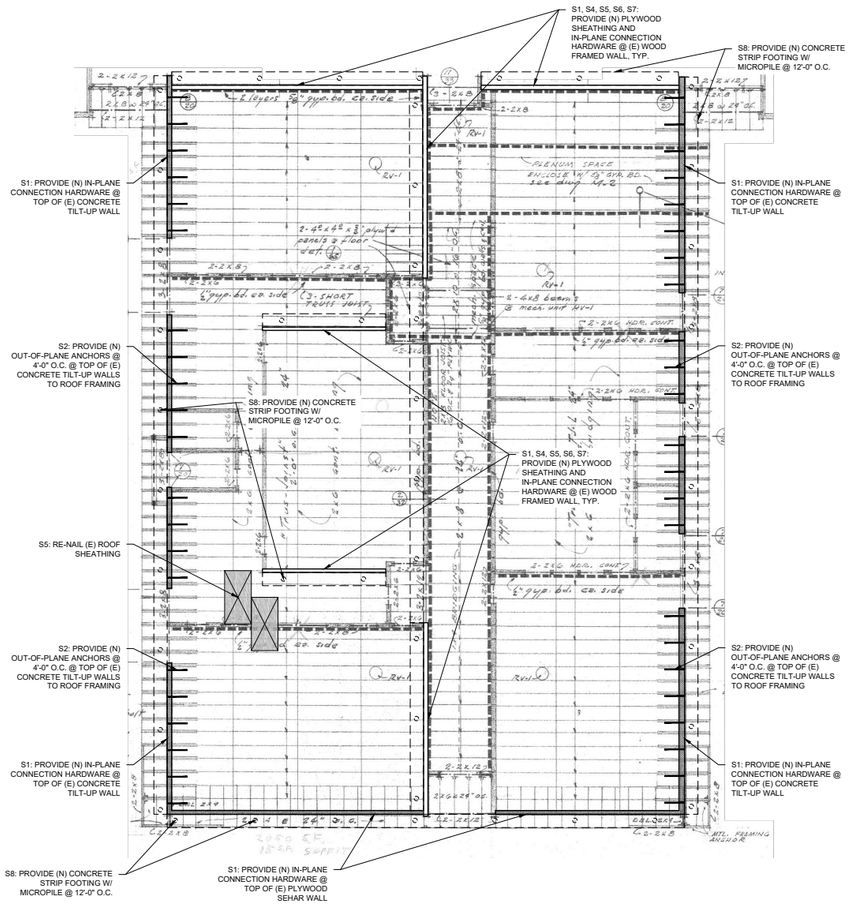
REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

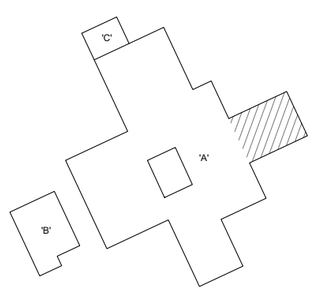
COVER SHEET

G0.0

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1 S1.1 **MATH & SCIENCE WING ROOF FRAMING PLAN** NTS



2 S1.1 **CAMPUS KEY** NTS

ONE INCH EQUALS FULL SCALE

ZCS
ENGINEERING
ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 16, 1996
SCOTT C. CARTER
EXPIRES: 12-31-19

PRELIMINARY, NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

ROOF FRAMING PLANS

S1.1

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

PHOTO 4/A2.1

PHOTO 3/A2.1

S1: PROVIDE (N) IN-PLANE CONNECTION HARDWARE @ TOP OF (E) CONCRETE TILT-UP WALL

S1: PROVIDE (N) IN-PLANE CONNECTION HARDWARE @ TOP OF (E) PLYWOOD SHEAR WALL

S2: PROVIDE (N) OUT-OF-PLANE ANCHORS @ 4'-0" O.C. @ TOP OF (E) CONCRETE TILT-UP WALLS TO ROOF FRAMING

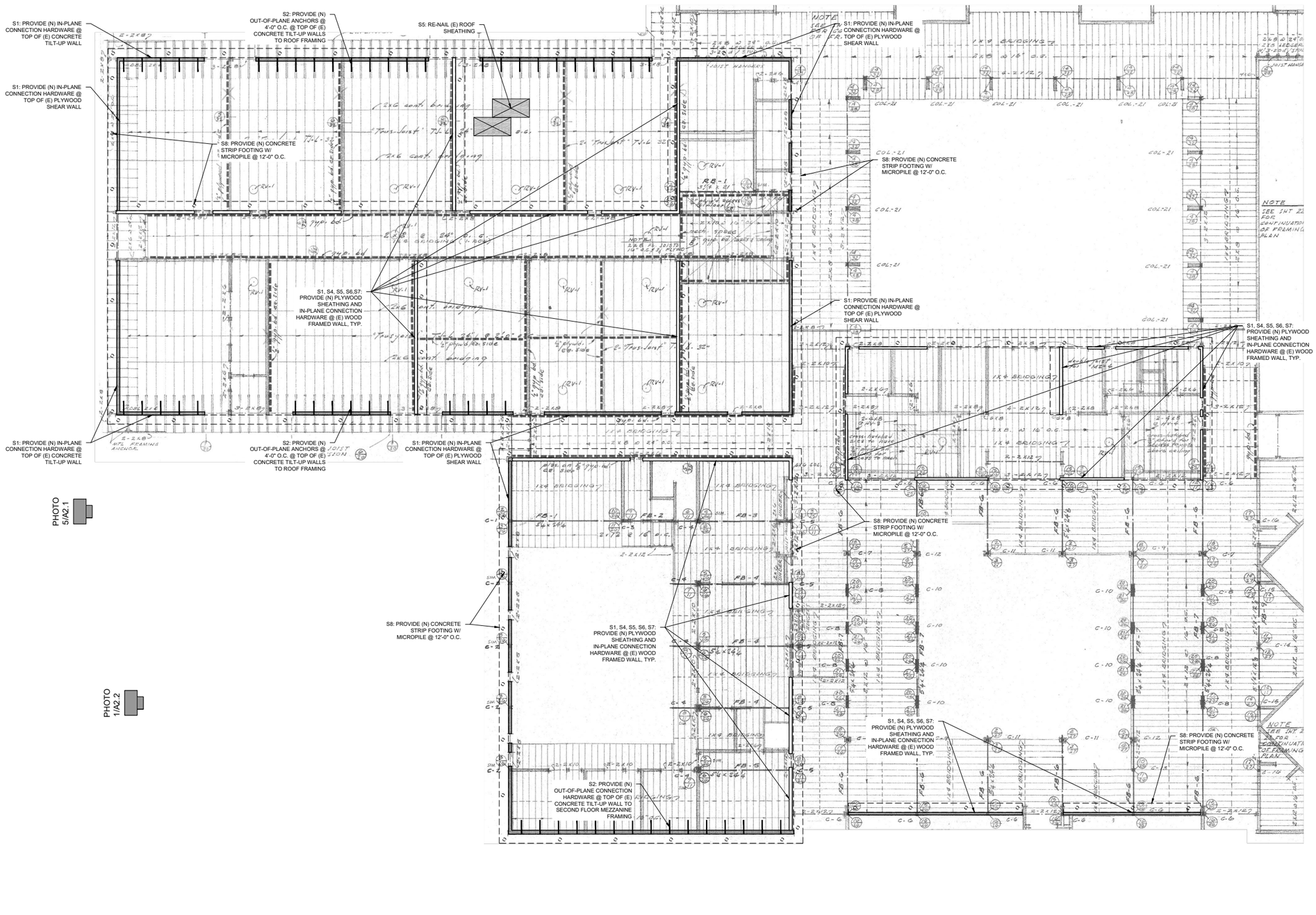
S5: RE-NAIL (E) ROOF SHEATHING

S8: PROVIDE (N) CONCRETE STRIP FOOTING W/ MICROPILE @ 12'-0" O.C.

S1, S4, S5, S6, S7: PROVIDE (N) PLYWOOD SHEATHING AND IN-PLANE CONNECTION HARDWARE @ (E) WOOD FRAMED WALL, TYP.

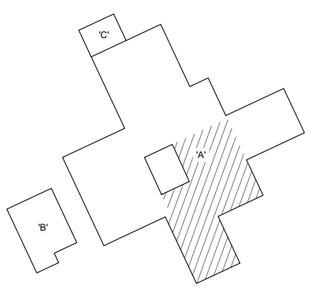
PHOTO 5/A2.1

PHOTO 1/A2.2



1 S1.2 **ACADEMIC & MALL WING ROOF FRAMING PLAN**

NTS



2 S1.2 **CAMPUS KEY**

NTS

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER — OREGON — JULY 16, 1996 — S. L. C. CARTER — EXPIRES: 12-31-19

PRELIMINARY NOT FOR CONSTRUCTION

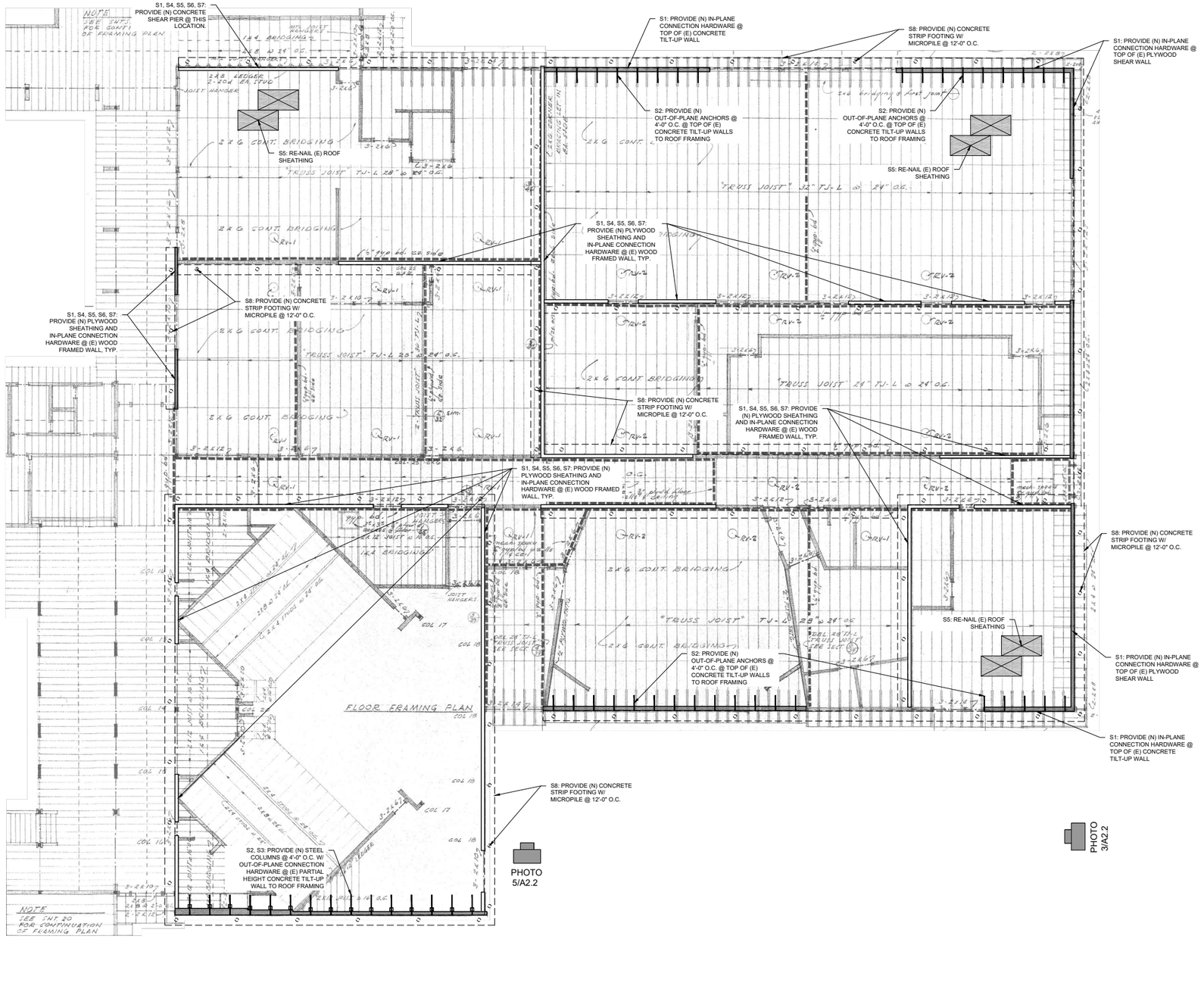
REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

ROOF FRAMING PLANS

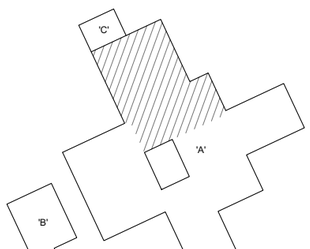
S1.2

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1 S1.3 **VOCATIONAL WING ROOF FRAMING PLAN**

NTS



2 S1.3 **CAMPUS KEY**

NTS

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER 18 OREGON JANUARY 16, 1996 S. C. CARTER EXPIRES: 12-31-19

PRELIMINARY, NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

ROOF FRAMING PLANS

S1.3

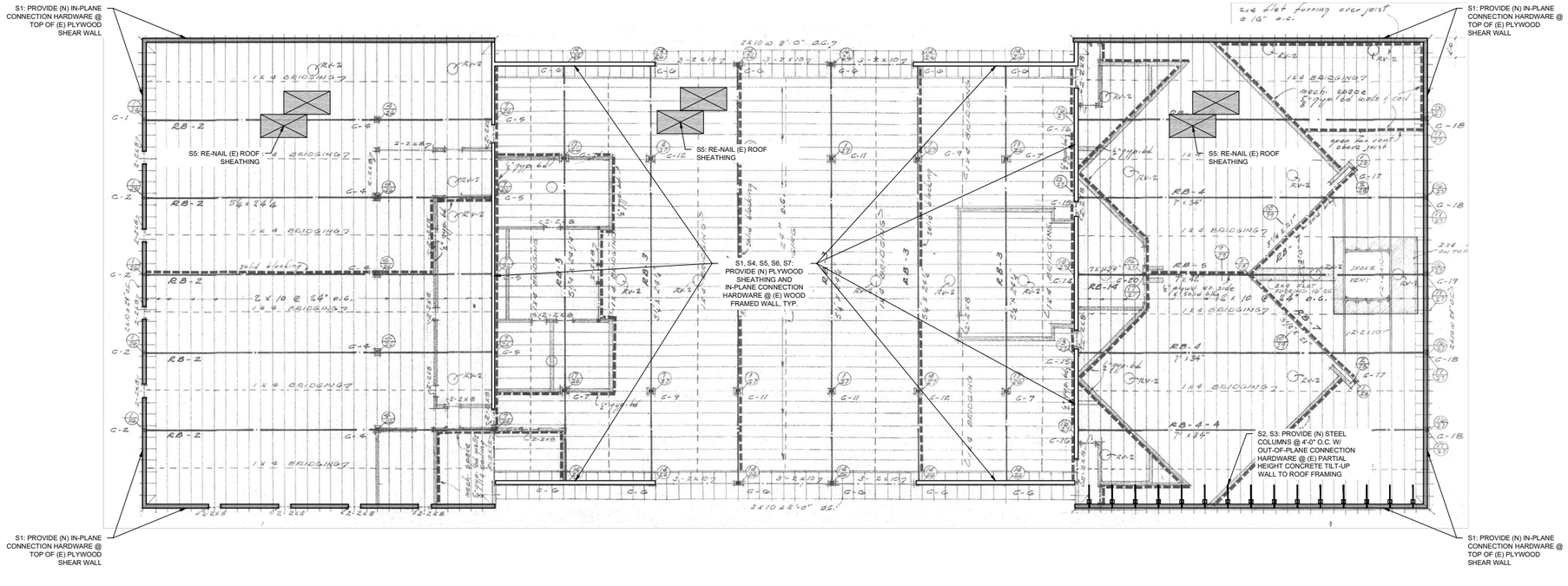
FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

ZCS
ENGINEERING
ARCHITECTURE

550 SW 6th Street, Suite C, Grants Pass,
Oregon 97526 | 541-479-3865

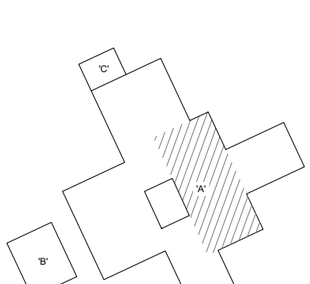
SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION



ONE INCH EQUALS FULL SCALE

1 S1.4 **UPPER ROOF FRAMING PLAN** NTS



2 S1.4 **CAMPUS KEY** NTS

REGISTERED PROFESSIONAL ENGINEER
OREGON
JANUARY 16, 1996
S. L. C. CARTER
EXPIRES: 12-31-19

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

ROOF FRAMING PLANS

S1.4

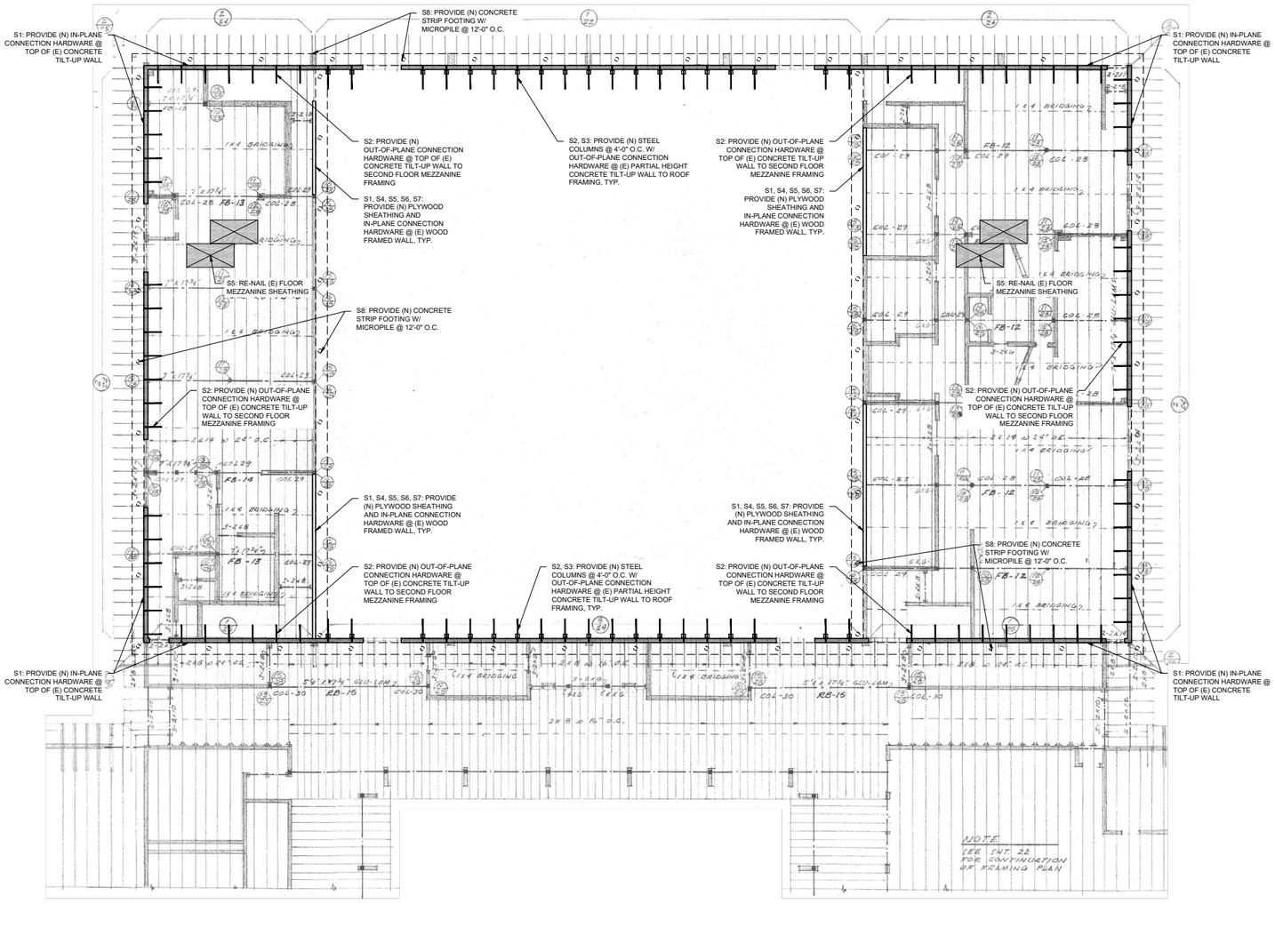
FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

PHOTO 1/A2.1

PHOTO 2/A2.1

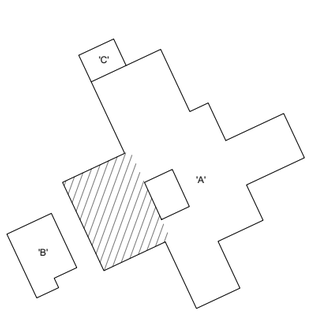
PHOTO 2/A2.2

PHOTO 4/A2.2



1 S1.5 **GYMNASIUM FLOOR FRAMING PLAN**

NTS



2 S1.5 **CAMPUS KEY**

NTS

ONE INCH EQUALS FULL SCALE

ZCS ENGINEERING ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER OREGON JULY 16, 1996 SCOTT C. CARTER EXPIRES: 12-31-19

PRELIMINARY - NOT FOR CONSTRUCTION

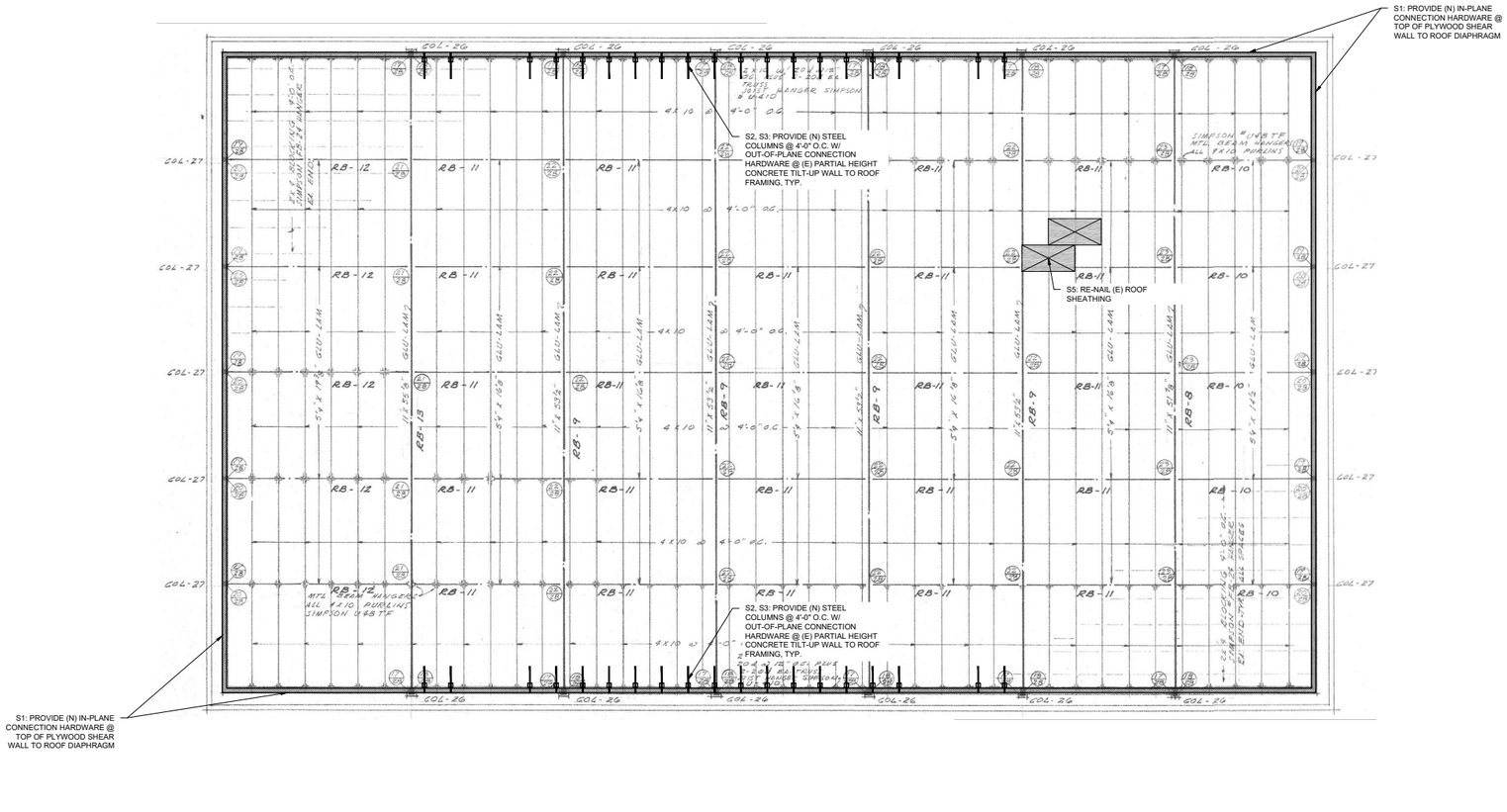
REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

ROOF FRAMING PLANS

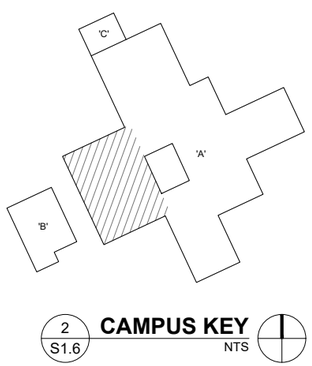
S1.5

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION



1 S1.6 **GYMNASIUM ROOF FRAMING PLAN**

NTS



2 S1.6 **CAMPUS KEY**

NTS

ONE INCH EQUALS FULL SCALE

ZCS
ENGINEERING
ARCHITECTURE

550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 16, 1996
SCOTT C. CARTER
EXPIRES: 12-31-19

PRELIMINARY, NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

ROOF FRAMING PLANS

S1.6

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

1 A2.1 **PHOTO**

1/4"= 1'-0"

3 A2.1 **PHOTO**

1/4"= 1'-0"

2 A2.1 **PHOTO**

1/4"= 1'-0"

4 A2.1 **PHOTO**

1/4"= 1'-0"

5 A2.1 **PHOTO**

1/4"= 1'-0"

ONE INCH EQUALS FULL SCALE

ZCS
ENGINEERING
ARCHITECTURE

550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 16, 1996
S. L. C. CARTER
EXPIRES: 12-31-19

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

PHOTOS

A2.1

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

1 A2.2 **PHOTO**

1/4"= 1'-0"

3 A2.2 **PHOTO**

1/4"= 1'-0"

2 A2.2 **PHOTO**

1/4"= 1'-0"

4 A2.2 **PHOTO**

1/4"= 1'-0"

5 A2.2 **PHOTO**

1/4"= 1'-0"

ONE INCH EQUALS FULL SCALE

ZCS
ENGINEERING
ARCHITECTURE
550 SW 6th Street, Suite C, Grants Pass, Oregon 97526 | 541-479-3865

SIUSLAW SCHOOL DISTRICT

SIUSLAW HIGH SCHOOL TAP GRANT APPLICATION

REGISTERED PROFESSIONAL ENGINEER
OREGON
JULY 16, 1986
M. C. CARTER
EXPIRES: 12-31-19

PRELIMINARY - NOT FOR CONSTRUCTION

REVISION ID:	DATE:

PROJECT NO:	G-1182-18
DRAWN:	MEG
CHECKED:	SLC
DATE:	01-31-19

PHOTOS

A2.2

FOR AGENCY REVIEW / NOT FOR CONSTRUCTION

Appendix B: Construction Cost Estimate Worksheets

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

Summary

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 4.0)	Quantity	Units	Unit Price	Total Price for Construction Item
GENERAL CONDITIONS					
General Conditions		10%	%		$ 640,183.00
Preconstruction Services		2%	%		$ 128,036.60
Escalation		7%	%		$ 501,903.47
Bonding & Insurance		3%	%		$ 215,101.49
Contractor Profit & Overhead		6%	%		$ 430,202.98
			General Conditions Subtotal		$ 1,915,427.54
Non-Structural Elements					
Misc MEP	N1, N2, N4, N10	1	Lump Sum	$ 148,900.00	$ 148,900.00
Misc Non-Structural	N3, N5, N6, N7, N8, N9	1	Lump Sum	$ 59,600.00	$ 59,600.00
			Non-Structural Subtotal		$ 208,500.00
Construction Cost Per Building Part					
			Building Part '1965 ORIG' Subtotal		$ 1,398,430.00
			Building Part '1982 ADD'N' Subtotal		$ 532,600.00
			Building Part '1985 ADD'N' Subtotal		$ 918,600.00
			Building Part '1992 ADD'N' Subtotal		$ 3,343,700.00
			Sub-Total Construction Cost		$ 8,317,300.00
			Contingency	15%	$ 1,247,595.00
			Total Construction Cost		$ 9,564,895.00

Cost Estimate Summary

Engineering			$ 1,339,000.00
Architectural Consulting	$ 143,500.00		
Structural / Rehabilitation Engineering	$ 1,052,100.00		
Geotechnical Consulting	$ 95,600.00		
Materials Testing for Design	$ 47,800.00		
Seismic Feasibility Study Reimbursement	$ -		
Construction Management			$ 286,900.00
Construction			$ 8,652,000.00
Sub-Total Construction Cost	$ 8,317,300.00		
Special Inspection Services for Construction	$ 47,800.00		
Permitting Fees	$ 286,900.00		
Relocation of FF&E			$ 124,800.00
Contingency			$ 1,247,595.00
		Total Project Funding Requirement	$ 11,650,295.00

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

Building Part - '1965 ORIG'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 4.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Soft Demolition	S1,S2, S3, S4, S5, S7, S8, S9	5200	Square Foot	$ 4.00	$ 20,800.00
TPO / Comp / Metal Roof Demo	S4, S6	19800	Square Foot	$ 4.00	$ 79,200.00
			Demolition & Asbestos Subtotal		$ 100,000.00
Foundation / Floor Strengthening Construction					
Concrete Repair & Patching	S3, S7, S9	2300	Square Foot	$ 15.00	$ 34,500.00
Bolting of Extg Walls to footings	S3, S7	130	Linear Foot	$ 150.00	$ 19,500.00
Floor Finish Patch / Replacement	S3, S7, S9	2300	Square Foot	$ 13.00	$ 29,900.00
Shear Wall Footings - Wood Walls		1140	Linear Foot	$ 300.00	$ 342,000.00
Micropile		95	Each	$ 5,600.00	$ 532,000.00
			Foundation Level Subtotal		$ 957,900.00
Wall Strengthening Construction					
Exterior Finish Repair / Installation	S2, S3, S4, S7	1450	Square Foot	$ 25.00	$ 36,250.00
Interior Wall Finish Repair	S4	5133	Square Foot	$ 2.00	$ 10,266.00
Painting of Wall	S2, S3, S4, S7	10266	Square Foot	$ 3.00	$ 30,798.00
Interior Wall Finish Repair	S4	5133	Square Foot	$ 2.00	$ 10,266.00
Sheathing of Existing Walls	S2	1450	Square Foot	$ 5.00	$ 7,250.00
			Wall Strengthening Subtotal		$ 94,830.00
Roof Strengthening Construction					
Ceiling Repair	S1, S4, S5, S8	4900	Square Foot	$ 3.00	$ 14,700.00
Diaphragm Attachments - Out-of-Plane	S5, S8	300	Linear Foot	$ 50.00	$ 15,000.00
Renail Roof Sheathing	S4	19800	Square Foot	$ 2.00	$ 39,600.00
New Single Ply Roof	S3, S4, S5, S6, S8	19800	Square Foot	$ 8.00	$ 158,400.00
Diaphragm Attachments - In-Plane Shear	S1, S2, S3	900	Linear Foot	$ 20.00	$ 18,000.00
			Roof Strengthening Subtotal		$ 245,700.00
			Building Part '1965 ORIG' - Total Construction Cost		**$ 1,398,430.00**

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

Building Part - '1982 ADD'N'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 4.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Soft Demolition	S1,S2, S3, S4, S5, S7, S8, S9	1200	Square Foot	$ 4.00	$ 4,800.00
TPO / Comp / Metal Roof Demo	S4, S6	6800	Square Foot	$ 4.00	$ 27,200.00
			Demolition & Asbestos Subtotal		$ 32,000.00
Foundation / Floor Strengthening Construction					
Bolting of Extg Walls to footings	S3, S7	108	Linear Foot	$ 50.00	$ 5,400.00
Spread Footings for Columns / Holdown	S9	6	Each	$ 3,000.00	$ 18,000.00
Floor Finish Patch / Replacement	S3, S7, S9	100	Square Foot	$ 7.00	$ 700.00
Shear Wall Footings - Wood Walls		475	Linear Foot	$ 300.00	$ 142,500.00
Micropile		40	Each	$ 5,600.00	$ 224,000.00
			Foundation Level Subtotal		$ 390,600.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S2, S3	1200	Square Foot	$ 5.00	$ 6,000.00
Interior Wall Finish Repair	S2, S3	1200	Square Foot	$ 2.00	$ 2,400.00
Painting of Wall	S2, S3	1200	Square Foot	$ 3.00	$ 3,600.00
			Wall Strengthening Subtotal		$ 12,000.00
Roof Strengthening Construction					
Renail Roof Sheathing	S1, S2, S3, S4, S5	6800	Square Foot	$ 2.00	$ 13,600.00
New Single Ply Roof	S3, S4, S5, S6, S8	6800	Square Foot	$ 8.00	$ 54,400.00
Diaphragm Attachments - Out-of-Plane	S5, S8	400	Linear Foot	$ 50.00	$ 20,000.00
Diaphragm Attachments - In-Plane Shear	S1, S2, S3	500	Linear Foot	$ 20.00	$ 10,000.00
			Roof Strengthening Subtotal		$ 98,000.00
			Building Part '1982 ADD'N' - Total Construction Cost		$ 532,600.00

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

Building Part - '1985 ADD'N'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 4.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Soft Demolition	S1,S2, S3, S4, S5, S7, S8, S9	900	Square Foot	$ 4.00	$ 3,600.00
TPO / Comp / Metal Roof Demo	S4, S6	14000	Square Foot	$ 4.00	$ 56,000.00
			Demolition & Asbestos Subtotal		$ 59,600.00
Foundation / Floor Strengthening Construction					
Spread Footings for Columns / Holdown	S9	16	Each	$ 3,000.00	$ 48,000.00
Shear Wall Footings - Wood Walls		780	Linear Foot	$ 300.00	$ 234,000.00
Micropile		65	Each	$ 5,600.00	$ 364,000.00
			Foundation Level Subtotal		$ 646,000.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S2, S3	4300	Square Foot	$ 5.00	$ 21,500.00
Interior Wall Finish Repair	S2, S3	4300	Square Foot	$ 2.00	$ 8,600.00
Painting of Wall	S2, S3	4300	Square Foot	$ 3.00	$ 12,900.00
			Wall Strengthening Subtotal		$ 43,000.00
Roof Strengthening Construction					
Diaphragm Attachments - Out-of-Plane	S5, S8	400	Linear Foot	$ 50.00	$ 20,000.00
Renail Roof Sheathing	S1, S2, S3, S4, S5	14000	Square Foot	$ 2.00	$ 28,000.00
New Single Ply Roof	S3, S4, S5, S6, S8	14000	Square Foot	$ 8.00	$ 112,000.00
Diaphragm Attachments - In-Plane Shear	S1, S2, S3	500	Linear Foot	$ 20.00	$ 10,000.00
			Roof Strengthening Subtotal		$ 170,000.00
			Building Part '1985 ADD'N' - Total Construction Cost		**$ 918,600.00**

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

Building Part - '1992 ADD'N'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 4.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Soft Demolition	S1,S2, S3, S4, S5, S7, S8, S9	6600	Square Foot	$ 4.00	$ 26,400.00
TPO / Comp / Metal Roof Demo	S4, S6	52600	Square Foot	$ 4.00	$ 210,400.00
			Demolition & Asbestos Subtotal		$ 236,800.00
Foundation / Floor Strengthening Construction					
Bolting of Extg Walls to footings	S3, S7	660	Linear Foot	$ 75.00	$ 49,500.00
Spread Footings for Columns / Holdown	S9	34	Each	$ 3,000.00	$ 102,000.00
Shear Wall Footings - Wood Walls		2964	Linear Foot	$ 300.00	$ 889,200.00
Micropile		247	Each	$ 5,600.00	$ 1,383,200.00
			Foundation Level Subtotal		$ 2,423,900.00
Wall Strengthening Construction					
Sheathing of Existing Walls	S2, S3	6600	Square Foot	$ 5.00	$ 33,000.00
Interior Wall Finish Repair	S2, S3	6600	Square Foot	$ 2.00	$ 13,200.00
Painting of Wall	S2, S3	6600	Square Foot	$ 3.00	$ 19,800.00
			Wall Strengthening Subtotal		$ 66,000.00
Roof Strengthening Construction					
Diaphragm Attachments - Out-of-Plane	S5, S8	1100	Linear Foot	$ 50.00	$ 55,000.00
Renail Roof Sheathing	S1, S2, S3, S4, S5	52600	Square Foot	$ 2.00	$ 105,200.00
New Single Ply Roof	S3, S4, S5, S6, S8	52600	Square Foot	$ 8.00	$ 420,800.00
Diaphragm Attachments - In-Plane Shear	S1, S2, S3	1800	Linear Foot	$ 20.00	$ 36,000.00
			Roof Strengthening Subtotal		$ 617,000.00
			Building Part '1992 ADD'N' - Total Construction Cost		**$ 3,343,700.00**

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

Summary

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 4.0)	Quantity	Units	Unit Price	Total Price for Construction Item
GENERAL CONDITIONS					
General Conditions		10%	%		$ 658,251.00
Preconstruction Services		2%	%		$ 131,650.20
Escalation		7%	%		$ 516,068.78
Bonding & Insurance		3%	%		$ 221,172.34
Contractor Profit & Overhead		6%	%		$ 442,344.67
			General Conditions Subtotal		$ 1,969,486.99
Non-Structural Elements					
Misc MEP		1	Lump Sum	$ 237,500.00	$ 237,500.00
Misc Non-Structural		1	Lump Sum	$ 95,000.00	$ 95,000.00
			Non-Structural Subtotal		$ 332,500.00
Construction Cost Per Building Part					
			Building Part '1968 ORIGINAL' Subtotal		$ 6,250,010.00
			Building Part 'B' Subtotal		$ -
			Building Part 'C' Subtotal		$ -
			Building Part 'D' Subtotal		$ -
			Sub-Total Construction Cost		$ 8,552,000.00
			Contingency	15%	$ 1,282,800.00
			Total Construction Cost		$ 9,834,800.00

Cost Estimate Summary

Engineering			$ 1,327,700.00
Architectural Consulting	$ 147,500.00		
Structural / Rehabilitation Engineering	$ 1,032,700.00		
Geotechnical Consulting	$ 98,300.00		
Materials Testing for Design	$ 49,200.00		
Seismic Feasibility Study Reimbursement	$ -		
Construction Management			$ 295,000.00
Construction			$ 8,896,200.00
Sub-Total Construction Cost	$ 8,552,000.00		
Special Inspection Services for Construction	$ 49,200.00		
Permitting Fees	$ 295,000.00		
Relocation of FF&E			$ 128,300.00
Contingency			$ 1,282,800.00
		Total Project Funding Requirement	$ 11,930,000.00

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

Building Part - '1968 ORIGINAL'

Description	Deficiencies (Ref. Seismic Evaluation Report Sec. 4.0)	Quantity	Units	Unit Price	Total Price for Construction Item
Demolition & Asbestos Abatement					
Soft Demolition		37000	Square Foot	$ 4.00	$ 148,000.00
TPO / Comp / Metal Roof Demo		96400	Square Foot	$ 4.00	$ 385,600.00
				Demolition & Asbestos Subtotal	$ 533,600.00
Foundation / Floor Strengthening Construction					
Bolting of Extg Walls to footings		2250	Linear Foot	$ 75.00	$ 168,750.00
Spread Footings for Columns / Holdown		75	Each	$ 2,500.00	$ 187,500.00
Floor Finish Patch / Replacement		30200	Square Foot	$ 13.00	$ 392,600.00
Shear Wall Footings - Wood Walls		3870	Linear Foot	$ 300.00	$ 1,161,000.00
Micropile		322	Each	$ 5,600.00	$ 1,803,200.00
				Foundation Level Subtotal	$ 3,713,050.00
Wall Strengthening Construction					
Sheathing of Existing Walls		28536	Square Foot	$ 5.00	$ 142,680.00
Interior Wall Finish Repair		28536	Square Foot	$ 2.00	$ 57,072.00
Painting of Wall		28536	Square Foot	$ 3.00	$ 85,608.00
Light Steel Columns		130	EA	$ 2,000.00	$ 260,000.00
				Wall Strengthening Subtotal	$ 545,360.00
Roof Strengthening Construction					
Diaphragm Attachments - Out-of-Plane		1220	Linear Foot	$ 50.00	$ 61,000.00
Renail Roof Sheathing		103800	Square Foot	$ 1.00	$ 103,800.00
New 3-ply Built Up Roof		80200	Square Foot	$ 12.00	$ 962,400.00
New Composite Roof Shingles		16200	Square Foot	$ 5.00	$ 81,000.00
Ceiling Repair		36600	Square Foot	$ 3.00	$ 109,800.00
New Drag Beam Attachments		56	EA	$ 2,500.00	$ 140,000.00
				Roof Strengthening Subtotal	$ 1,458,000.00
				Building Part '1968 ORIGINAL' - Total Construction Cost	**$ 6,250,010.00**

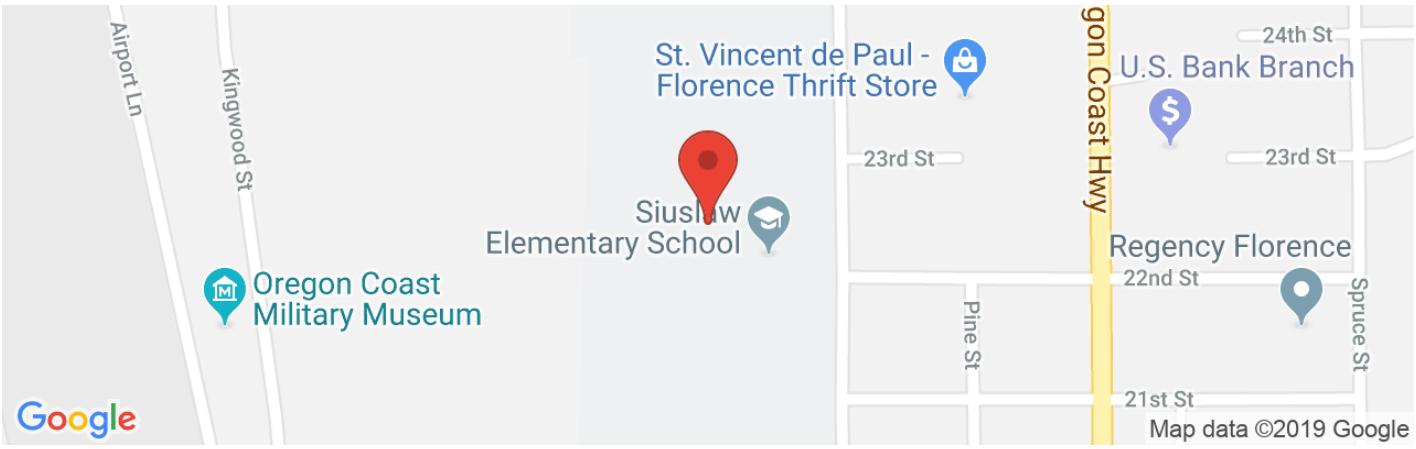
Appendix C:
Tier 1 Checklists

Tier 1 Deficiency Summary		
Noncompliant Item In Tier 1	Deficiency Number(s) Per Sections 3.2.2 - 3.2.4 & Retrofit Drawings	Comments
Transfer to Shear Walls	S1	Diaphragms are not properly connected to shear walls below for transfer of seismic forces
Shear Stress Check	S2	Wood framed shear walls lack adequate in-plane shear capacity
Anchorage	S3	Wood framed shear walls are not properly attached to foundation elements for in-plane loading
Diaphragms	S4	Plywood roof diaphragms are over spanned
Wall Anchorage	S5	Out-of-plane connection hardware at the top of concrete tilt-up panel walls and CMU walls is not present
Transfer to Shear Walls	S6	Concrete tilt-up panel walls and CMU walls are not properly attached to diaphragms for in-plane loading
Precast Wall Panels	S7	Precast concrete tilt-up panels are not properly anchored to the foundation
Wood Ledgers	S8	Wood ledgers will experience cross-grain bending
Hold Down Devices	S9	Hold down devices are not present to transfer overturning forces to the foundation.
Liquefaction	S10	The site is located within a high liquefaction risk zone (further geotechnical evaluation required to determine extent of hazard
Life Safety Systems	N1	Fire suppression piping is not braced
Life Safety Systems	N2	Flexible couplings at fire suppression piping is not present
Life Safety Systems	N3	Emergency and egress lighting is not properly braced
Hazardous Materials	N4	Hazardous material piping is not braced, emergency shutoff valves have not been confirmed, flexible couplings at piping are not present
Integrated Ceilings	N5	Suspended ceilings are not properly braced and do not have adequate edge clearance

Light Fixtures	N6	Light fixtures which penetrate suspended ceilings are not independently supported
Masonry Veneer	N7	Anchors and ties are not present at masonry veneer
Canopy	N8	Exterior canopy is not properly braced at building exits
Fall Prone Contents	N9	
In-Line Equipment	N10	In-Line equipment is not laterally braced

2221 Oak St, Florence, OR 97439, USA

Latitude, Longitude: 43.9862705, -124.1051296



Date	1/29/2019, 7:38:20 PM
Design Code Reference Document	ASCE41-17
Custom Probability	
Site Class	D - Stiff Soil

Type	Description	Value
Hazard Level		BSE-2N
S_S	spectral response (0.2 s)	1.409
S_1	spectral response (1.0 s)	0.739
S_{XS}	site-modified spectral response (0.2 s)	1.409
S_{X1}	site-modified spectral response (1.0 s)	1.257
F_a	site amplification factor (0.2 s)	1

Type	Description	Value
F_v	site amplification factor (1.0 s)	1.7
ssuh	max direction uniform hazard (0.2 s)	1.646
crs	coefficient of risk (0.2 s)	0.856
ssrt	risk-targeted hazard (0.2 s)	1.409
ssd	deterministic hazard (0.2 s)	1.976
s1uh	max direction uniform hazard (1.0 s)	0.865
cr1	coefficient of risk (1.0 s)	0.855
s1rt	risk-targeted hazard (1.0 s)	0.739
s1d	deterministic hazard (1.0 s)	1.015

Type	Description	Value
Hazard Level		BSE-1N
S_{XS}	site-modified spectral response (0.2 s)	0.939
S_{X1}	site-modified spectral response (1.0 s)	0.838

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	0.943
S_1	spectral response (1.0 s)	0.494
S_{XS}	site-modified spectral response (0.2 s)	1.059
S_{X1}	site-modified spectral response (1.0 s)	0.892
f_a	site amplification factor (0.2 s)	1.123
f_v	site amplification factor (1.0 s)	1.806

Type	Description	Value
Hazard Level		BSE-1E
S_S	spectral response (0.2 s)	0.166
S_1	spectral response (1.0 s)	0.071
S_{XS}	site-modified spectral response (0.2 s)	0.266
S_{X1}	site-modified spectral response (1.0 s)	0.169
F_a	site amplification factor (0.2 s)	1.6
F_v	site amplification factor (1.0 s)	2.4

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

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA

Building Name: SIUSLAW ELEMENTARY SCHOOL Date: 1/29/19

Building Address: 2221 OAK STREET, FLORENCE, OR 97439

Latitude: 43.98627 Longitude: -124.10513 By: SLC

Year Built: 1965 Year(s) Remodeled: 1982, 1985, 1992 Original Design Code:

Area [ft² (m²)]: ≈ 93,200 SF Length [ft (m)]: ≈ 237 FT Width [ft (m)]: ≈ 200 FT

No. of Stories: 1 Story Height: 10' Total Height: 21'

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☐ Residential ☒ Educational ☐ Other: _____

CONSTRUCTION DATA

Gravity Load Structural System: WOOD ROOF ON WOOD WALLS & CONCRETE & CMU WALLS

Exterior Transverse Walls: WOOD WALLS & CONCRETE & CMU WALLS Openings?

Exterior Longitudinal Walls: WOOD WALLS & CONCRETE & CMU WALLS Openings?

Roof Materials/Framing: PLYWOOD OVER ROOF JOISTS

Intermediate Floors/Framing:

Ground Floor: SLAB ON GRADE

Columns: Foundation: CONT. R.C.

General Condition of Structure: GOOD

Levels Below Grade? NO

Special Features and Comments:

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	WOOD, CONCRETE & CMU SW	WOOD, CONCRETE & CMU SW
Vertical Elements:	WOOD & CONCRETE & CMU WALLS	WOOD & CONCRETE & CMU WALLS
Diaphragms:	PLYWOOD	PLYWOOD
Connections:	POSITIVE	POSITIVE

EVALUATION DATA

BSE-1N Spectral Response Accelerations: S_{DS} = _____ S_{D1} = _____

Soil Factors: Class = _____ F_a = _____ F_v= _____

BSE-1E,2E Spectral Response Accelerations: S_{XS} = .266, 1.059 S_{X1} = .169, .892

Level of Seismicity: HIGH Performance Level: LS / IO

Building Period: T = .196

Spectral Acceleration: S_a = .266, 1.059

Modification Factor: $C_mC_1C_2$ = 1 Building Weight: W = 917 KIPS (GYM)

Pseudolateral Force: $V = C_mC_1C_2S_aW$ = 243 KIPS (IO) (GYM)

BUILDING CLASSIFICATION: _____

REQUIRED TIER 1 CHECKLISTS

	Yes	No
Basic Configuration Checklist	☒	☐
Building Type W2 PC1 Structural Checklist	☒	☐
Nonstructural Component Checklist	☒	☐

FURTHER EVALUATION REQUIREMENT: _____

Table 17-1. Very Low Seismicity Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Structural Components			
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
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 adequate 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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-2. Collapse Prevention Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
C NC N/A U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25% of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% 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
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
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

continues

Table 17-2 *(Continued)*. Collapse Prevention Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Moderate Seismicity (Complete the Following Items in Addition to the Items for 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
High Seismicity (Complete the Following Items in Addition to the Items for Moderate 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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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
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

continues

Table 17-6. Collapse Prevention Structural Checklist for Building Type W2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
	Low and Moderate 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 Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft All other conditions 100 lb/ft	5.5.3.1.1	A.3.2.7.1
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-1.	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
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
	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
	High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)		
	Connections		
C **NC** N/A U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft (1.8 m) or less with acceptable edge and end distance provided for wood and concrete.	5.7.3.3	A.5.3.7
	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
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 2-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 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2

continues

Table 17-6 *(Continued)*. Collapse Prevention Structural Checklist for Building Type W2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and have aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

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

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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

continues

Table 17-27 *(Continued)*. Immediate Occupancy Structural Checklists for Building Types C3 and C3a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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 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
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
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	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps; the pile cap reinforcement and pile anchorage are able to develop the tensile capacity of the piles.	5.7.3.5	A.5.3.8
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
High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
Seismic-Force-Resisting System			
C NC N/A U	PROPORTIONS: The height-to-thickness ratio of the unreinforced infill walls at each story is less than 8.	5.5.3.1.2	A.3.2.6.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

SIUSLAW ELEMENTARY SCHOOL CLASSROOMS - LS (BSE-1E)

Table 17-28. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low Seismicity			
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

continues

Table 17-28 *(Continued)*. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Moderate Seismicity (Complete the Following Items in Addition to the Items for 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	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the greater of 100 lb/in.^{2} (0.69 MPa) or $2\sqrt{f'_c}$.	5.5.3.1.1	A.3.2.3.1
C NC N/A U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction.	5.5.3.1.3	A.3.2.3.2
C NC N/A U	WALL THICKNESS: Thicknesses of bearing walls are not less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (101 mm).	5.5.3.1.2	A.3.2.3.5
Diaphragms			
C NC N/A U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (51 mm).	5.6.4	A.4.5.1
Connections			
C NC N/A U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls.	5.7.2	A.5.2.1
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
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
High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
Seismic-Force-Resisting System			
C NC N/A U	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components.	5.5.2.5.2	A.3.1.6.2
C NC N/A U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1.	5.5.3.3.1	A.3.2.3.3
Diaphragms			
C NC N/A U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-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 24 ft (7.3 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 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
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	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors connecting each precast wall panel to the diaphragm elements.	5.7.1.4	A.5.1.3
C NC N/A U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation.	5.7.3.4	A.5.3.6
C NC N/A U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps.	5.7.3.5	A.5.3.8

continues

Table 17-28 *(Continued)*. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.4.2	A.5.4.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-29. Immediate Occupancy Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the greater of 100 lb/in.^{2} (0.69 MPa) or $2\sqrt{f'_c}$.	5.5.3.1.1	A.3.2.3.1
C NC N/A U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. The spacing of reinforcing steel is equal to or less than 18 in. (457 mm).	5.5.3.1.3	A.3.2.3.2
Diaphragms (Stiff or Flexible)			
C NC N/A U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (51 mm).	5.6.4	A.4.5.1
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
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.	5.7.1.4	A.5.1.2
C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1
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, and the dowels are able to develop the least of the shear strength of the walls, frames, or slabs.	5.7.2	A.5.2.3
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.		A.6.2.4

continues

Table 17-33 *(Continued)*. Immediate Occupancy Structural Checklist for Building Type PC2a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	CORBEL BEARING: If the frame girders bear on column corbels, the length of bearing is greater than 3 in.	5.7.4.3	A.5.4.3
C NC N/A U	CORBEL CONNECTIONS: The frame girders are not connected to corbels with welded elements.	5.7.4.3	A.5.4.4
C NC N/A U	TRANSFER TO FRAMES: Diaphragms are connected for transfer of loads to the frames.	5.7.2	A.5.2.1

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

SIUSLAW ELEMENTARY SCHOOL CLASSROOMS - LS (BSE-1E)

Table 17-34. Collapse Prevention Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low and Moderate 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} (0.48 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. (1220 mm), and all vertical bars extend to the top of the walls.	5.5.3.1.3	A.3.2.4.2
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
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
C **NC** N/A U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
C **NC** N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls.	5.7.2	A.5.2.1
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
C NC N/A U	FOUNDATION DOWELS: Wall reinforcement is doweled into 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
High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
Stiff Diaphragms			
C NC **N/A** U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	5.6.1.3	A.4.1.4
C NC **N/A** U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	5.6.1.3	A.4.1.6

continues

Table 17-34 *(Continued)*. Collapse Prevention Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
C NC N/A U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	5.6.1.3	A.4.1.4
C NC N/A U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	5.6.1.3	A.4.1.6
C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-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 24 ft (7.3 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 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
Connections			
C NC N/A U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. (3 mm) before engagement of the anchors.	5.7.1.2	A.5.1.4

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

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

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
C NC N/A U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1

continues

Table 17-2 *(Continued)*. Collapse Prevention Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Moderate Seismicity (Complete the Following Items in Addition to the Items for 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
High Seismicity (Complete the Following Items in Addition to the Items for Moderate 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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

SIUSLAW ELEMENTARY SCHOOL GYM - IO (BSE-2E)

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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
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

continues

Table 17-3 *(Continued)*. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	5.4.2.6	A.2.2.7
Low Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)			
Geologic Site Hazards			
C NC N/A U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	5.4.3.1	A.6.1.1
C NC N/A U	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	5.4.3.1	A.6.1.2
C NC N/A U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low and Moderate 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
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-1.	5.5.3.6.3	A.3.2.7.6

continues

Table 17-34 *(Continued)*. Collapse Prevention Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
C NC N/A U	OPENINGS AT SHEAR WALLS: Diaphragm openings immediately adjacent to the shear walls are less than 25% of the wall length.	5.6.1.3	A.4.1.4
C NC N/A U	OPENINGS AT EXTERIOR MASONRY SHEAR WALLS: Diaphragm openings immediately adjacent to exterior masonry shear walls are not greater than 8 ft (2.4 m) long.	5.6.1.3	A.4.1.6
C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-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 24 ft (7.3 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 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
C NC N/A U	OTHER DIAPHRAGMS: Diaphragms do not consist of a system other than wood, metal deck, concrete, or horizontal bracing.	5.6.5	A.4.7.1
Connections			
C NC N/A U	STIFFNESS OF WALL ANCHORS: Anchors of concrete or masonry walls to wood structural elements are installed taut and are stiff enough to limit the relative movement between the wall and the diaphragm to no greater than 1/8 in. (3 mm) before engagement of the anchors.	5.7.1.2	A.5.1.4

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

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

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
C **NC** N/A U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
C **NC** N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1

continues

Table 17-35 *(Continued)*. Immediate Occupancy Structural Checklist for Building Types RM1 and RM2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-38. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
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
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

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
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
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
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

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. CLADDING ISOLATION: For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.3
C NC (N/A) U	**HR—MH; LS—MH; PR—MH**. MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.4
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. THREADED RODS: Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity.	13.6.1	A.7.4.9
C NC (N/A) U	**HR—MH; LS—MH; PR—MH**. PANEL CONNECTIONS: Cladding panels are anchored out of plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections.	13.6.1.4	A.7.4.5
C NC (N/A) U	**HR—MH; LS—MH; PR—MH**. BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.	13.6.1.4	A.7.4.6
C NC (N/A) U	**HR—MH; LS—MH; PR—MH**. INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.	13.6.1.4	A.7.4.7
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft^2 (1.5 m^2) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.	13.6.1.5	A.7.4.8
Masonry Veneer			
C (NC) N/A U	**HR—not required; LS—LMH; PR—LMH**. TIES: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft^2 (0.25 m^2), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm).	13.6.1.2	A.7.5.1
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
(C) NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup.	13.6.1.1 13.6.1.2	A.7.7.2
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. STUD TRACKS: For veneer with cold-formed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center.	13.6.1.1 13.6.1.2	A.7.6.1

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. ANCHORAGE: For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	13.6.1.1 13.6.1.2	A.7.7.1
C (NC) N/A U	**HR—not required; LS—not required; PR—MH**. WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.	13.6.1.2	A.7.5.6
C NC (N/A) U	**HR—not required; LS—not required; PR—MH**. OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	13.6.1.1 13.6.1.2	A.7.6.2
Parapets, Cornices, Ornamentation, and Appendages			
(C) NC N/A U	**HR—LMH; LS—LMH; PR—LMH**. URM PARAPETS OR CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5.	13.6.5	A.7.8.1
C (NC) N/A U	**HR—not required; LS—LMH; PR—LMH**. CANOPIES: Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m).	13.6.6	A.7.8.2
C NC (N/A) U	**HR—H; LS—MH; PR—LMH**. CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.	13.6.5	A.7.8.3
C NC (N/A) U	**HR—MH; LS—MH; PR—LMH**. APPENDAGES: Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements.	13.6.6	A.7.8.4
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

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
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
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
(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

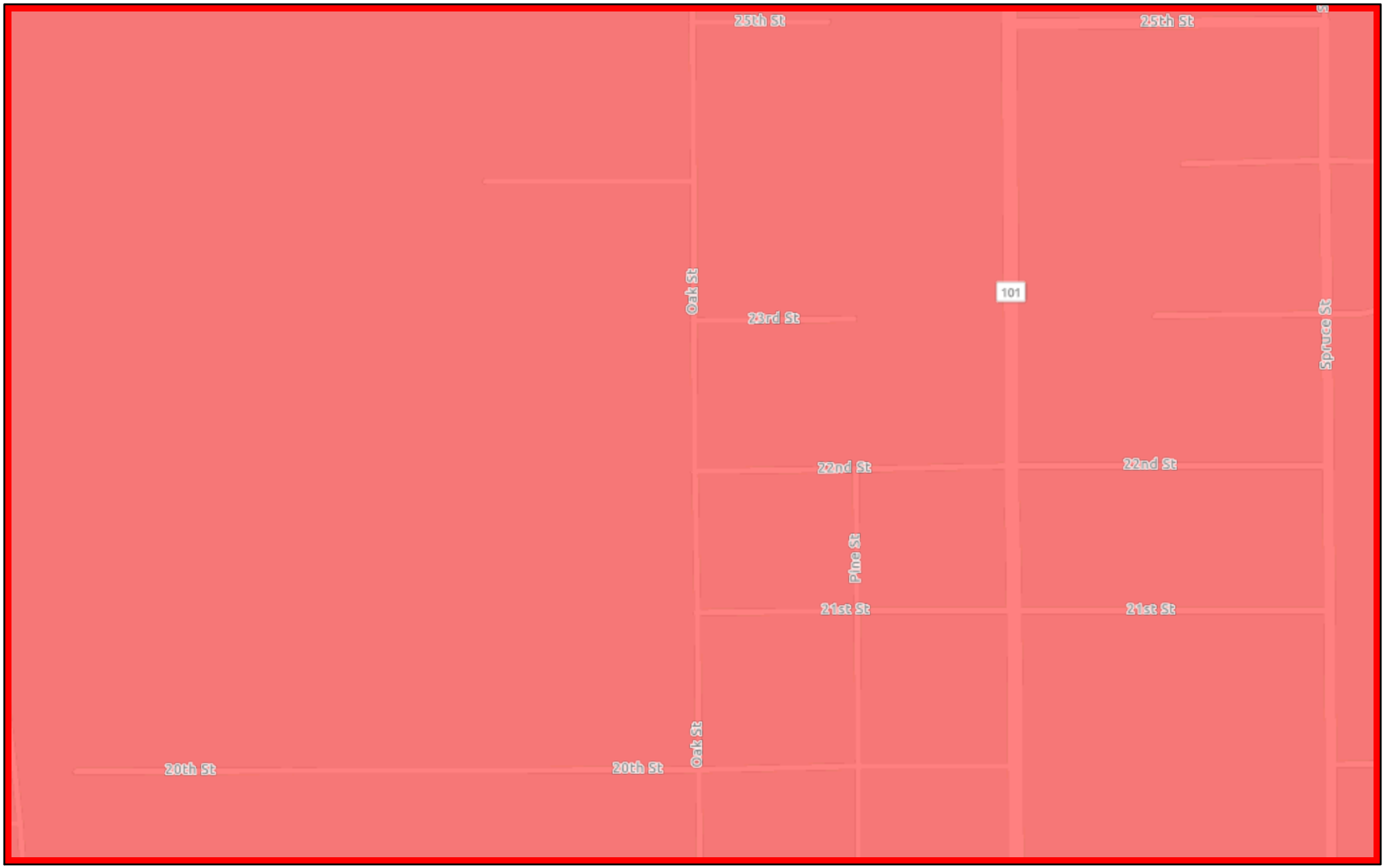
continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
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
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.
[a] Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.
[b] Level of Seismicity: L = Low, M = Moderate, and H = High.

Siuslaw Elementary Liquefaction Risk



January 31, 2019

High Moderate Low

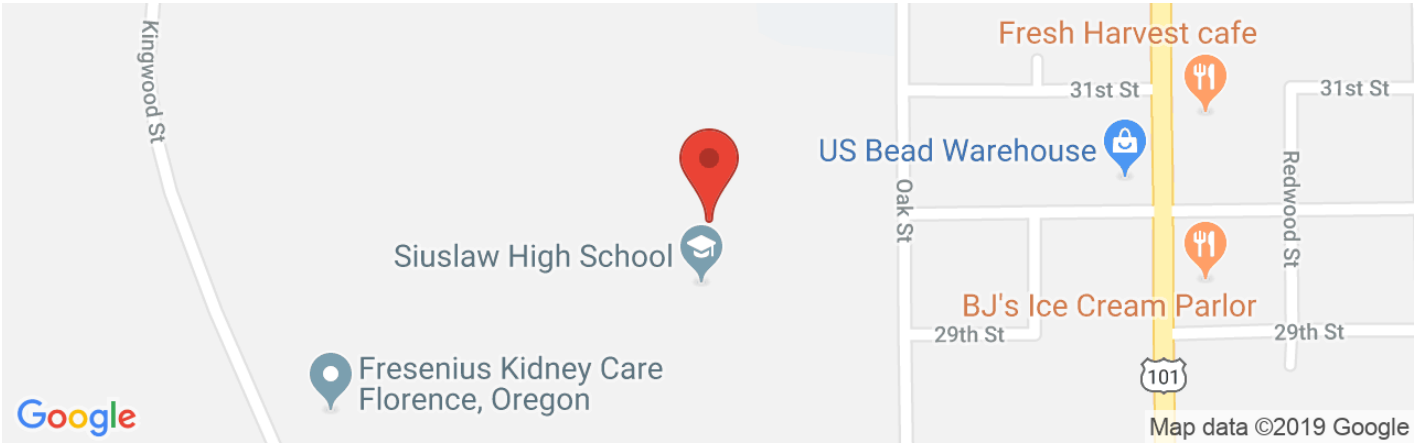
1:4,800

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km

Tier 1 Deficiency Summary		
Noncompliant Item In Tier 1	Deficiency Number(s) Per Sections 3.2.2 - 3.2.4 & Retrofit Drawings	Comments
Transfer to Shear Walls	S1	Diaphragms are not properly connected to shear walls below for transfer of seismic forces
Wall Anchorage	S2	Out-of-plane connection hardware at the top of concrete tilt-up walls and concrete tilt-up wall to mezzanines are not present
Vertical Irregularity	S3	Areas of concrete tilt-up panels are partial height with wood framed walls above creating a hinge condition
Shear Stress Check	S4	Wood framed shear walls lack adequate in-plane shear capacity
Diaphragms	S5	Plywood roof diaphragms are over spanned
Hold Down Devices	S6	Hold down devices are not present to transfer overturning forces to the foundation.
Anchorage	S7	Interior wood framed shear walls are not properly attached to foundation elements for in-plane loading
Liquefaction	S8	The site is located within a high liquefaction risk zone (further geotechnical evaluation required to determine extent of hazard)
Life Safety Systems	N1, N2	Emergency and egress lighting is not properly braced
Hazardous Materials	N3	Hazardous material piping is not braced, emergency shutoff valves have not been confirmed, flexible couplings at piping are not present
Integrated Ceilings	N4	Suspended ceilings are not properly braced and do not have adequate edge clearance
Light Fixtures	N5	Light fixtures which penetrate suspended ceilings are not independently supported
Fall Prone Contents	N6	
In-Line Equipment	N7	In-Line equipment is not laterally braced

Latitude, Longitude: 43.99259576, -124.10580571



Date	1/29/2019, 8:00:02 PM
Design Code Reference Document	ASCE41-17
Custom Probability	
Site Class	D - Stiff Soil

Type	Description	Value
Hazard Level		BSE-2N
S_S	spectral response (0.2 s)	1.41
S_1	spectral response (1.0 s)	0.74
S_{XS}	site-modified spectral response (0.2 s)	1.41
S_{X1}	site-modified spectral response (1.0 s)	1.258
F_a	site amplification factor (0.2 s)	1
F_v	site amplification factor (1.0 s)	1.7

Type	Description	Value
ssuh	max direction uniform hazard (0.2 s)	1.647
crs	coefficient of risk (0.2 s)	0.856
ssrt	risk-targeted hazard (0.2 s)	1.41
ssd	deterministic hazard (0.2 s)	1.976
s1uh	max direction uniform hazard (1.0 s)	0.865
cr1	coefficient of risk (1.0 s)	0.855
s1rt	risk-targeted hazard (1.0 s)	0.74
s1d	deterministic hazard (1.0 s)	1.015

Type	Description	Value
Hazard Level		BSE-1N
S_{XS}	site-modified spectral response (0.2 s)	0.94
S_{X1}	site-modified spectral response (1.0 s)	0.838

Type	Description	Value
Hazard Level		BSE-2E
S_S	spectral response (0.2 s)	0.944
S_1	spectral response (1.0 s)	0.494
S_{XS}	site-modified spectral response (0.2 s)	1.06
S_{X1}	site-modified spectral response (1.0 s)	0.893
f_a	site amplification factor (0.2 s)	1.122
f_v	site amplification factor (1.0 s)	1.806

Type	Description	Value
Hazard Level		BSE-1E
S_S	spectral response (0.2 s)	0.167
S_1	spectral response (1.0 s)	0.071
S_{XS}	site-modified spectral response (0.2 s)	0.267
S_{X1}	site-modified spectral response (1.0 s)	0.17
F_a	site amplification factor (0.2 s)	1.6
F_v	site amplification factor (1.0 s)	2.4

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

APPENDIX C
SUMMARY DATA SHEET

BUILDING DATA

Building Name: SIUSLAW HIGH SCHOOL Date: 1/29/19

Building Address: 2975 OAK STREET, FLORENCE, OR 97439

Latitude: 43.99211 Longitude: -124.10806 By: SLC

Year Built: 1968 Year(s) Remodeled: 2000, 2005 Original Design Code:

Area [ft² (m²)]: ≈ 110,000 SF Length [ft (m)]: ≈ 320 FT Width [ft (m)]: ≈ 165 FT

No. of Stories: 1, 2 Story Height: 10' Total Height: 26'-10"

USE ☐ Industrial ☐ Office ☐ Warehouse ☐ Hospital ☐ Residential ☒ Educational ☐ Other: _____

CONSTRUCTION DATA

Gravity Load Structural System: WOOD ROOF ON WOOD WALLS & CONCRETE TILT PANEL WALLS

Exterior Transverse Walls: WOOD WALLS & CONCRETE WALLS Openings?

Exterior Longitudinal Walls: WOOD WALLS & CONCRETE WALLS Openings?

Roof Materials/Framing: PLYWOOD OVER ROOF JOISTS

Intermediate Floors/Framing:

Ground Floor: SLAB ON GRADE

Columns: Foundation: CONT. R.C.

General Condition of Structure: GOOD

Levels Below Grade? NO

Special Features and Comments: AREAS OF WOOD WALLS OVER CONCRETE TILT PANEL WALLS

LATERAL-FORCE-RESISTING SYSTEM

	Longitudinal	Transverse
System:	WOOD & CONCRETE SW	WOOD & CONCRETE SW
Vertical Elements:	WOOD & CONCRETE WALLS	WOOD & CONCRETE WALLS
Diaphragms:	PLYWOOD	PLYWOOD
Connections:	POSITIVE	POSITIVE

EVALUATION DATA

BSE-1N Spectral Response Accelerations: S_{DS} = _____ S_{D1} = _____

Soil Factors: Class = _____ F_a = _____ F_v= _____

BSE-1E,2E Spectral Response Accelerations: S_{XS} = .267, 1.06 S_{X1} = .267, .893

Level of Seismicity: HIGH Performance Level: LS / IO

Building Period: T = .235

Spectral Acceleration: S_a = .267, 1.06

Modification Factor: $C_m C_1 C_2$ = 1 Building Weight: W = 858 KIPS (GYM)

Pseudolateral Force: $V = C_m C_1 C_2 S_a W$ = 229 KIPS (IO) (GYM)

BUILDING CLASSIFICATION: _____

REQUIRED TIER 1 CHECKLISTS

	Yes	No
Basic Configuration Checklist	☒	☐
Building Type ___ Structural Checklist W2 PC1	☒	☐
Nonstructural Component Checklist	☒	☐

FURTHER EVALUATION REQUIREMENT: _____

SIUSLAW HIGH SCHOOL CLASSROOMS - LS (BSE-1E)

Table 17-1. Very Low Seismicity Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Structural Components			
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
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 adequate 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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-2. Collapse Prevention Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
(C) NC N/A U	ADJACENT BUILDINGS: The clear distance between the building being evaluated and any adjacent building is greater than 0.25% of the height of the shorter building in low seismicity, 0.5% in moderate seismicity, and 1.5% 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
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
(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

continues

Table 17-2 *(Continued)*. Collapse Prevention Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Moderate Seismicity (Complete the Following Items in Addition to the Items for 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
High Seismicity (Complete the Following Items in Addition to the Items for Moderate 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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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
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

continues

Table 17-6. Collapse Prevention Structural Checklist for Building Type W2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low and Moderate 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 Diagonal sheathing 700 lb/ft Straight sheathing 100 lb/ft All other conditions 100 lb/ft	5.5.3.1.1	A.3.2.7.1
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-1.	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
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
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
High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
Connections			
C NC N/A U	WOOD SILL BOLTS: Sill bolts are spaced at 6 ft (1.8 m) or less with acceptable edge and end distance provided for wood and concrete.	5.7.3.3	A.5.3.7
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
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 2-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 24 ft (7.3 m) consist of wood structural panels or diagonal sheathing.	5.6.2	A.4.2.2

continues

Table 17-6 *(Continued)*. Collapse Prevention Structural Checklist for Building Type W2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and have aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

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

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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

continues

SIUSLAW HIGH SCHOOL CLASSROOMS - LS (BSE-1E)

Table 17-27 *(Continued)*. Immediate Occupancy Structural Checklists for Building Types C3 and C3a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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 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
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
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	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps; the pile cap reinforcement and pile anchorage are able to develop the tensile capacity of the piles.	5.7.3.5	A.5.3.8
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
High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
Seismic-Force-Resisting System			
C NC N/A U	PROPORTIONS: The height-to-thickness ratio of the unreinforced infill walls at each story is less than 8.	5.5.3.1.2	A.3.2.6.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-28. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low Seismicity			
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

continues

Table 17-28 *(Continued)*. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Moderate Seismicity (Complete the Following Items in Addition to the Items for 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	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the greater of 100 lb/in.^{2} (0.69 MPa) or $2\sqrt{f'_c}$.	5.5.3.1.1	A.3.2.3.1
C NC N/A U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction.	5.5.3.1.3	A.3.2.3.2
C NC N/A U	WALL THICKNESS: Thicknesses of bearing walls are not less than 1/40 the unsupported height or length, whichever is shorter, nor less than 4 in. (101 mm).	5.5.3.1.2	A.3.2.3.5
Diaphragms			
C NC N/A U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (51 mm).	5.6.4	A.4.5.1
Connections			
C NC N/A U	WOOD LEDGERS: The connection between the wall panels and the diaphragm does not induce cross-grain bending or tension in the wood ledgers.	5.7.1.3	A.5.1.2
C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls.	5.7.2	A.5.2.1
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
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
High Seismicity (Complete the Following Items in Addition to the Items for Low and Moderate Seismicity)			
Seismic-Force-Resisting System			
C NC N/A U	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components.	5.5.2.5.2	A.3.1.6.2
C NC N/A U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 75% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1.	5.5.3.3.1	A.3.2.3.3
Diaphragms			
C NC N/A U	CROSS TIES IN FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
C NC N/A U	STRAIGHT SHEATHING: All straight-sheathed diaphragms have aspect ratios less than 2-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 24 ft (7.3 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 40 ft (12.2 m) and aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
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	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors connecting each precast wall panel to the diaphragm elements.	5.7.1.4	A.5.1.3
C NC N/A U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation.	5.7.3.4	A.5.3.6
C NC N/A U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps.	5.7.3.5	A.5.3.8

continues

Table 17-28 *(Continued)*. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.4.2	A.5.4.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-29. Immediate Occupancy Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the greater of 100 lb/in.^{2} (0.69 MPa) or $2\sqrt{f'_c}$.	5.5.3.1.1	A.3.2.3.1
C NC N/A U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. The spacing of reinforcing steel is equal to or less than 18 in. (457 mm).	5.5.3.1.3	A.3.2.3.2
Diaphragms (Stiff or Flexible)			
C NC N/A U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (51 mm).	5.6.4	A.4.5.1
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
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.	5.7.1.4	A.5.1.2
C NC N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1
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, and the dowels are able to develop the least of the shear strength of the walls, frames, or slabs.	5.7.2	A.5.2.3
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.		A.6.2.4

continues

Table 17-2 *(Continued)*. Collapse Prevention Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Moderate Seismicity (Complete the Following Items in Addition to the Items for 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
High Seismicity (Complete the Following Items in Addition to the Items for Moderate 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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

SIUSLAW HIGH SCHOOL GYM - IO (BSE-2E)

Table 17-3. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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
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

continues

Table 17-3 *(Continued)*. Immediate Occupancy Basic Configuration Checklist

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	TORSION: The estimated distance between the story center of mass and the story center of rigidity is less than 20% of the building width in either plan dimension.	5.4.2.6	A.2.2.7
Low Seismicity (Complete the Following Items in Addition to the Items for Very Low Seismicity)			
Geologic Site Hazards			
C NC N/A U	LIQUEFACTION: Liquefaction-susceptible, saturated, loose granular soils that could jeopardize the building's seismic performance do not exist in the foundation soils at depths within 50 ft (15.2 m) under the building.	5.4.3.1	A.6.1.1
C NC N/A U	SLOPE FAILURE: The building site is located away from potential earthquake-induced slope failures or rockfalls so that it is unaffected by such failures or is capable of accommodating any predicted movements without failure.	5.4.3.1	A.6.1.2
C NC N/A U	SURFACE FAULT RUPTURE: Surface fault rupture and surface displacement at the building site are not anticipated.	5.4.3.1	A.6.1.3
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Table 17-4. Collapse Prevention Structural Checklist for Building Types W1 and W1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
Low and Moderate 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
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-1.	5.5.3.6.3	A.3.2.7.6

continues

Table 17-6 *(Continued)*. Collapse Prevention Structural Checklist for Building Type W2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	DIAGONALLY SHEATHED AND UNBLOCKED DIAPHRAGMS: All diagonally sheathed or unblocked wood structural panel diaphragms have horizontal spans less than 40 ft (12.2 m) and have aspect ratios less than or equal to 4-to-1.	5.6.2	A.4.2.3
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

SIUSLAW HIGH SCHOOL GYM - IO (BSE-2E)

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

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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

continues

Table 17-7 *(Continued)*. Immediate Occupancy Checklist for Building Type W2

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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
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
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

professional to require further investigation shall be categorized as Noncompliant or Unknown. For evaluation statements classified as Noncompliant or Unknown, the design professional is permitted to choose to conduct further investigation using the corresponding Tier 2 evaluation procedure listed next to each evaluation statement.

17.4 STRUCTURAL CHECKLISTS FOR BUILDING TYPES S1: STEEL MOMENT FRAMES WITH STIFF DIAPHRAGMS AND S1A: STEEL MOMENT FRAMES WITH FLEXIBLE DIAPHRAGMS

For building systems and configurations that comply with the S1 or S1a building type description in Table 3-1, the Collapse Prevention Structural Checklist in Table 17-8 shall be completed where required by Table 4-6 for Collapse Prevention Structural Performance, and the Immediate Occupancy Structural Checklist in Table 17-9 shall be completed where required by Table 4-6 for Immediate Occupancy Structural Performance. Tier 1 screening shall include on-site investigation and condition assessment as required by Section 4.2.1.

Where applicable, each of the evaluation statements listed in this checklist shall be marked Compliant (C), Noncompliant (NC), Not Applicable (N/A), or Unknown (U) for a Tier 1 screening. Items that are deemed acceptable to the design professional in accordance with the evaluation statement shall be categorized as Compliant, whereas items that are determined by the design professional to require further investigation shall be categorized as Noncompliant or Unknown. For evaluation statements classified as Noncompliant or Unknown, the design professional is permitted to choose to conduct further investigation using the corresponding Tier 2 evaluation procedure listed next to each evaluation statement.

17.5 STRUCTURAL CHECKLIST FOR BUILDING TYPES S2: STEEL BRACED FRAMES WITH STIFF DIAPHRAGMS AND S2A: STEEL BRACED FRAMES WITH FLEXIBLE DIAPHRAGMS

For building systems and configurations that comply with the S2 or S2a building type description in Table 3-1, the Collapse Prevention Structural Checklist in Table 17-10 shall be completed where required by Table 4-6 for Collapse Prevention Structural Performance, and the Immediate Occupancy Structural Checklist in Table 17-11 shall be completed where required by Table 4-6 for Immediate Occupancy Structural Performance.

Table 17-28 *(Continued)*. Collapse Prevention Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
C NC N/A U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.4.2	A.5.4.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

SIUSLAW HIGH SCHOOL GYM - IO (BSE-2E)

Table 17-29. Immediate Occupancy Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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	WALL SHEAR STRESS CHECK: The shear stress in the precast panels, calculated using the Quick Check procedure of Section 4.4.3.3, is less than the greater of 100 lb/in.^{2} (0.69 MPa) or $2\sqrt{f'_c}$.	5.5.3.1.1	A.3.2.3.1
(C) NC N/A U	REINFORCING STEEL: The ratio of reinforcing steel area to gross concrete area is not less than 0.0012 in the vertical direction and 0.0020 in the horizontal direction. The spacing of reinforcing steel is equal to or less than 18 in. (457 mm).	5.5.3.1.3	A.3.2.3.2
Diaphragms (Stiff or Flexible)			
C NC (N/A) U	TOPPING SLAB: Precast concrete diaphragm elements are interconnected by a continuous reinforced concrete topping slab with a minimum thickness of 2 in. (51 mm).	5.6.4	A.4.5.1
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
(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.	5.7.1.4	A.5.1.2
C (NC) N/A U	TRANSFER TO SHEAR WALLS: Diaphragms are connected for transfer of seismic forces to the shear walls, and the connections are able to develop the lesser of the shear strength of the walls or diaphragms.	5.7.2	A.5.2.1
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, and the dowels are able to develop the least of the shear strength of the walls, frames, or slabs.	5.7.2	A.5.2.3
(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.		A.6.2.4

continues

Table 17-29 *(Continued)*. Immediate Occupancy Structural Checklist for Building Types PC1 and PC1a

Status	Evaluation Statement	Tier 2 Reference	Commentary Reference
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	DEFLECTION COMPATIBILITY FOR RIGID DIAPHRAGMS: Secondary components have the shear capacity to develop the flexural strength of the components.	5.5.2.5.2	A.3.1.6.2
C NC (N/A) U	WALL OPENINGS: The total width of openings along any perimeter wall line constitutes less than 50% of the length of any perimeter wall when the wall piers have aspect ratios of less than 2-to-1.	5.5.3.3.1	A.3.2.3.3
(C) NC N/A U	PANEL-TO-PANEL CONNECTIONS: Adjacent wall panels are interconnected to transfer overturning forces between panels by methods other than welded steel inserts.	5.5.3.3.3	A.3.2.3.4
(C) NC N/A U	WALL THICKNESS: Thicknesses of bearing walls are not less than 1/25 the unsupported height or length, whichever is shorter, nor less than 4 in. (101 mm).	5.5.3.1.2	A.3.2.3.5
Diaphragms			
(C) NC N/A U	CROSS TIES FOR FLEXIBLE DIAPHRAGMS: There are continuous cross ties between diaphragm chords.	5.6.1.2	A.4.1.2
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
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	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	MINIMUM NUMBER OF WALL ANCHORS PER PANEL: There are at least two anchors from each precast wall panel into the diaphragm elements.	5.7.1.4	A.5.1.3
(C) NC N/A U	PRECAST WALL PANELS: Precast wall panels are connected to the foundation, and the connections are able to develop the strength of the walls.	5.7.3.4	A.5.3.6
C NC (N/A) U	UPLIFT AT PILE CAPS: Pile caps have top reinforcement, and piles are anchored to the pile caps; the pile cap reinforcement and pile anchorage are able to develop the tensile capacity of the piles.	5.7.3.5	A.5.3.8
C (NC) N/A U	GIRDERS: Girders supported by walls or pilasters have at least two ties securing the anchor bolts unless provided with independent stiff wall anchors with strength to resist the connection force calculated in the Quick Check procedure of Section 4.4.3.7.	5.7.4.2	A.5.4.2

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.

Where applicable, each of the evaluation statements listed in this checklist shall be marked Compliant (C), Noncompliant (NC), Not Applicable (N/A), or Unknown (U) for a Tier 1 screening. Items that are deemed acceptable to the design professional in accordance with the evaluation statement shall be categorized as Compliant, whereas items that are determined by the design professional to require further investigation shall be categorized as Noncompliant or Unknown. For evaluation statements classified as Noncompliant or Unknown, the design professional is permitted to choose to conduct further investigation using the corresponding Tier 2 evaluation procedure listed next to each evaluation statement.

17.15 STRUCTURAL CHECKLISTS FOR BUILDING TYPE PC2: PRECAST CONCRETE FRAMES WITH SHEAR WALLS

For building systems and configurations that comply with the PC2 building type description in Table 3-1, the Collapse Prevention Structural Checklist in Table 17-30 shall be completed where required by Table 4-6 for Collapse Prevention Structural Performance, and the Immediate Occupancy Structural Checklist in Table 17-31 shall be completed where required by Table 4-6 for Immediate Occupancy Structural Performance. Tier 1 screening shall include on-site investigation and condition assessment as required by Section 4.2.1.

Table 17-38. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
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
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

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
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
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
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

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. CLADDING ISOLATION: For steel or concrete moment-frame buildings, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.3
C NC (N/A) U	**HR—MH; LS—MH; PR—MH**. MULTI-STORY PANELS: For multi-story panels attached at more than one floor level, panel connections are detailed to accommodate a story drift ratio by the use of rods attached to framing with oversize holes or slotted holes of at least the following: for Life Safety in Moderate Seismicity, 0.01; for Life Safety in High Seismicity and for Position Retention in any seismicity, 0.02, and the rods have a length-to-diameter ratio of 4.0 or less.	13.6.1	A.7.4.4
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. THREADED RODS: Threaded rods for panel connections detailed to accommodate drift by bending of the rod have a length-to-diameter ratio greater than 0.06 times the story height in inches for Life Safety in Moderate Seismicity and 0.12 times the story height in inches for Life Safety in High Seismicity and Position Retention in any seismicity.	13.6.1	A.7.4.9
C NC (N/A) U	**HR—MH; LS—MH; PR—MH**. PANEL CONNECTIONS: Cladding panels are anchored out of plane with a minimum number of connections for each wall panel, as follows: for Life Safety in Moderate Seismicity, 2 connections; for Life Safety in High Seismicity and for Position Retention in any seismicity, 4 connections.	13.6.1.4	A.7.4.5
C NC (N/A) U	**HR—MH; LS—MH; PR—MH**. BEARING CONNECTIONS: Where bearing connections are used, there is a minimum of two bearing connections for each cladding panel.	13.6.1.4	A.7.4.6
C NC (N/A) U	**HR—MH; LS—MH; PR—MH**. INSERTS: Where concrete cladding components use inserts, the inserts have positive anchorage or are anchored to reinforcing steel.	13.6.1.4	A.7.4.7
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. OVERHEAD GLAZING: Glazing panes of any size in curtain walls and individual interior or exterior panes more than 16 ft^2 (1.5 m^2) in area are laminated annealed or laminated heat-strengthened glass and are detailed to remain in the frame when cracked.	13.6.1.5	A.7.4.8
Masonry Veneer			
C NC (N/A) U	**HR—not required; LS—LMH; PR—LMH**. TIES: Masonry veneer is connected to the backup with corrosion-resistant ties. There is a minimum of one tie for every 2-2/3 ft^2 (0.25 m^2), and the ties have spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 36 in. (914 mm); for Life Safety in High Seismicity and for Position Retention in any seismicity, 24 in. (610 mm).	13.6.1.2	A.7.5.1
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
C NC (N/A) U	**HR—LMH; LS—LMH; PR—LMH**. UNREINFORCED MASONRY BACKUP: There is no unreinforced masonry backup.	13.6.1.1 13.6.1.2	A.7.7.2
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. STUD TRACKS: For veneer with cold-formed steel stud backup, stud tracks are fastened to the structure at a spacing equal to or less than 24 in. (610 mm) on center.	13.6.1.1 13.6.1.2	A.7.6.1

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
C NC (N/A) U	**HR—not required; LS—MH; PR—MH**. ANCHORAGE: For veneer with concrete block or masonry backup, the backup is positively anchored to the structure at a horizontal spacing equal to or less than 4 ft along the floors and roof.	13.6.1.1 13.6.1.2	A.7.7.1
C NC (N/A) U	**HR—not required; LS—not required; PR—MH**. WEEP HOLES: In veneer anchored to stud walls, the veneer has functioning weep holes and base flashing.	13.6.1.2	A.7.5.6
C NC (N/A) U	**HR—not required; LS—not required; PR—MH**. OPENINGS: For veneer with cold-formed-steel stud backup, steel studs frame window and door openings.	13.6.1.1 13.6.1.2	A.7.6.2
Parapets, Cornices, Ornamentation, and Appendages			
C NC (N/A) U	**HR—LMH; LS—LMH; PR—LMH**. URM PARAPETS OR CORNICES: Laterally unsupported unreinforced masonry parapets or cornices have height-to-thickness ratios no greater than the following: for Life Safety in Low or Moderate Seismicity, 2.5; for Life Safety in High Seismicity and for Position Retention in any seismicity, 1.5.	13.6.5	A.7.8.1
C NC (N/A) U	**HR—not required; LS—LMH; PR—LMH**. CANOPIES: Canopies at building exits are anchored to the structure at a spacing no greater than the following: for Life Safety in Low or Moderate Seismicity, 10 ft (3.0 m); for Life Safety in High Seismicity and for Position Retention in any seismicity, 6 ft (1.8 m).	13.6.6	A.7.8.2
C NC (N/A) U	**HR—H; LS—MH; PR—LMH**. CONCRETE PARAPETS: Concrete parapets with height-to-thickness ratios greater than 2.5 have vertical reinforcement.	13.6.5	A.7.8.3
C NC (N/A) U	**HR—MH; LS—MH; PR—LMH**. APPENDAGES: Cornices, parapets, signs, and other ornamentation or appendages that extend above the highest point of anchorage to the structure or cantilever from components are reinforced and anchored to the structural system at a spacing equal to or less than 6 ft (1.8 m). This evaluation statement item does not apply to parapets or cornices covered by other evaluation statements.	13.6.6	A.7.8.4
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

continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
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
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
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

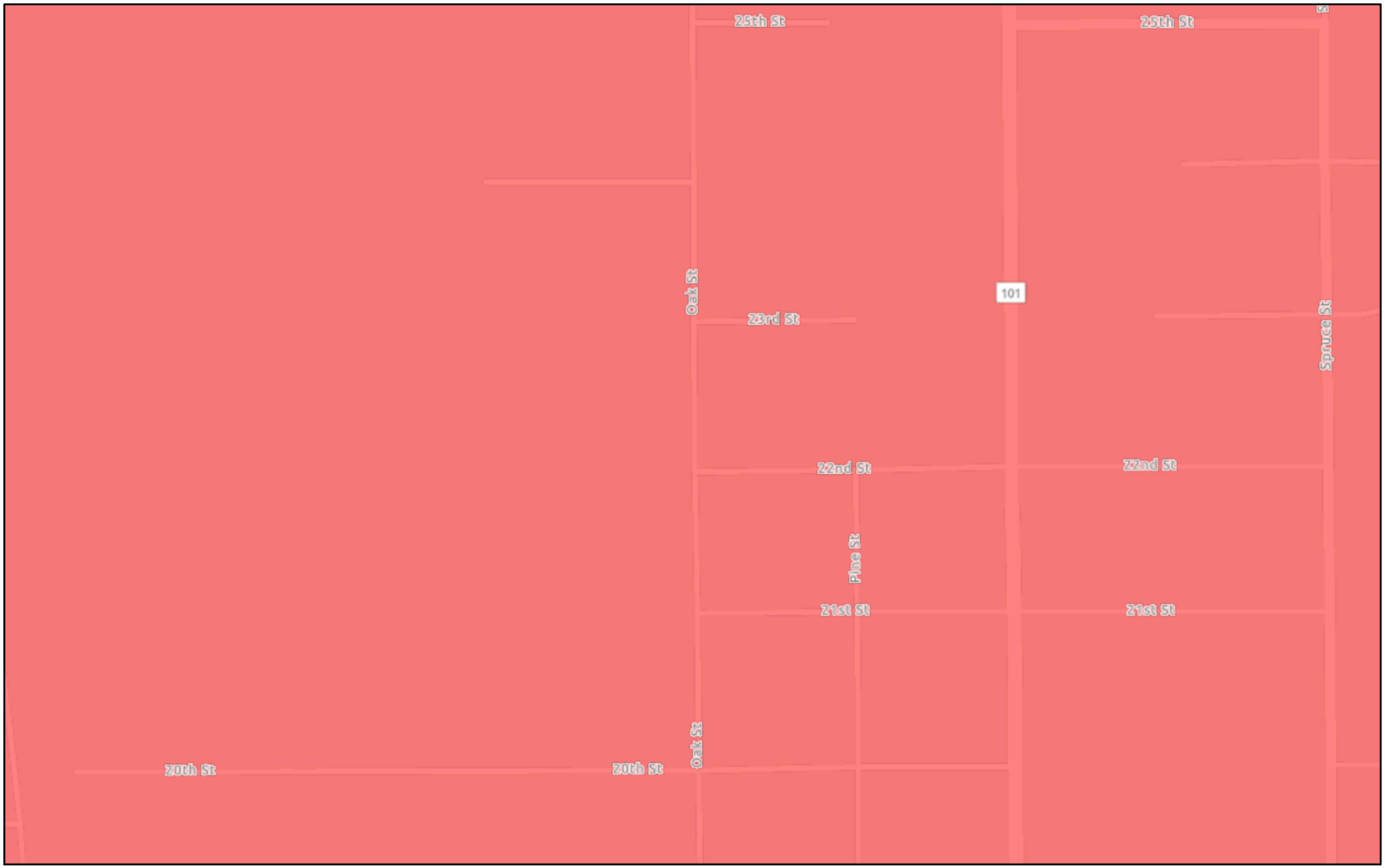
continues

Table 17-38 *(Continued)*. Nonstructural Checklist

Status	Evaluation Statement[a,b]	Tier 2 Reference	Commentary Reference
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
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

Note: C = Compliant, NC = Noncompliant, N/A = Not Applicable, and U = Unknown.
[a] Performance Level: HR = Hazards Reduced, LS = Life Safety, and PR = Position Retention.
[b] Level of Seismicity: L = Low, M = Moderate, and H = High.

Siuslaw HS Liquefaction Risk



January 31, 2019

High Moderate Low

1:4,800

0 0.03 0.06 0.11 mi

0 0.04 0.09 0.18 km