BUILDING EVALUATION REPORT FOR:

CANNON BEACH ELEMENTARY SCHOOL

PO Box 127, Monument, OR 97864
City of Cannon Beach

PREPARED BY ZCS ENGINEERING & ARCHITECTURE

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ZCS ENGINEERING ARCHITECTURE

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1.0 Executive Summary

1.1 Background

The former Cannon Beach Elementary School building has been vacant for approximately nine years. The City of Cannon Beach has recently purchased the building with the intent of repairing it for use as a Community Center. The original school was built in 1950. It is approximately 4,600 sqft and consists of four classrooms, student restrooms, a staff restroom, boiler room, and offices. This will be referred to as the "main building" in this report. The gymnasium building is connected to the main building by a breezeway. It was built in 1952 and contains a cooking area, classroom, and storage rooms. The gymnasium is approximately 7,300 sqft with a 1,050 sqft mezzanine.

A portable classroom building was added in 1967 and is connected to the main building by an exterior breezeway. The portable classroom is not included in the scope of this evaluation.

The purpose of this report is to provide a comprehensive structural, architectural and MEP evaluation of the aging facilities referenced above.

To provide an all-encompassing structural and architectural evaluation, visual observations and/or review of available construction documents was conducted for each of the above-mentioned facilities. In addition, City of Cannon Beach staff was interviewed to obtain available information on known existing or potential structural deficiencies. After field data was collected, the two buildings were evaluated in accordance with the American Society of Civil Engineers "Seismic Evaluation and Retrofit of Existing Buildings ASCE/SEI 41-17", the 2018 International Existing Building Code (IEBC) and the 2019 Oregon Structural Specialty Code (OSSC). The evaluation tool outlined in ASCE 41-17 allows for determination of seismic deficiencies present in these facilities with respect to modern building codes. In addition, a full code review for the two buildings was completed.

This study provides the city with recommendations to rehabilitate the identified seismic deficiencies to achieve a structure that meets the expectations associated with a performance level of "Life Safety" as outlined in ASCE 41-17 as well as all recommendations/requirements to bring the building up to code. Planning level budgetary construction estimates for each building are included in section 5.0.

1.2 Recommended Improvements

Section 3.0 covers the specific deficiencies and subsequent recommendations.

1.3 Conclusion

Generally, the condition of the buildings was poor to fair based on their age, the years of vacancy, and the lack of maintenance during this time. It should be noted that structural deficiencies in buildings of this age group are fully expected and the severity of the deficiencies noted are common.

ZCS would recommend that 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.

Given the current condition of the structures and that the buildings are undergoing repairs and change of occupancy, the code governing existing buildings mandates that upgrades are required to the building. Voluntary seismic upgrades are permitted and encouraged for both buildings as well. It is our opinion the structures evaluated and noted to have lateral system deficiencies have the potential to benefit from future seismic upgrades.

2.0 Project Overview

The above-mentioned buildings located in Clatsop County, Oregon, will be the subjects of this evaluation. The objective of this planning effort is to perform visual observations and/or review of construction documents to identify general structural and architectural deficiencies. A seismic performance review of the structural systems was also 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 and provide rehabilitation recommendations. Planning level budgetary construction costs for the buildings have been determined based on the deficiencies and recommendations outlined. It is recommended that the City use this report to prioritize improvements.

In order to accurately report the deficiencies for these buildings, a site visit was completed due to an incomplete set of construction documents. During the visit to each building, construction type and framing methods were noted along with any observed, obvious architectural structural deficiencies.

The buildings covered by this evaluation total approximately 14,000 square feet and are not currently used. The age of each building and their additions are included and reflect the best information available. The access to the buildings structural systems was limited to observation only. Observed construction type for and a summary of the 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

The inspection 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 buildings, a detailed inspection effort was planned utilizing several individuals offering different perspectives and areas of expertise. Inspections were performed in the summer of 2020.

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

Name	Company
Kristofer Tonning, PE, SE	ZCS Engineering & Architecture, Inc.
Matthew Crawford	ZCS Engineering & Architecture, Inc.
Mark Smith	ZCS Engineering & Architecture, Inc.
Zach Stokes, PE	ZCS Engineering & Architecture, Inc.

Additionally, maintenance staff were interviewed when available during the inspections regarding any concerns with their respective building and overall building performance.

2.2 Building Structural Deficiency Review

This report provides a brief description of the deficiencies observed during our on-site investigation for the building. Each of the deficiencies identified correspond 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 the building. A summary of the building's structural systems and observed deficiencies is provided in Section 3.0.

It is the intent of the City, 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 "Limited Safety" per ASCE 41-17. The "Limited Safety" level of performance is 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."

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 "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.

The following are the types of construction were used in this building. We have included the definitions from ASCE 41-17

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

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. A list of repair recommendations is provided along with anticipated costs to rectify the deficiencies.

3.1 Cannon Beach Elementary School: 268 Beaver St. Cannon Beach, OR.

Figure 1: Cannon Beach Elementary Main Building and Gym

3.1.1 Structure Summary

- **1950 Main Building/Classroom Wing [W2]: Seismic Hazard – High**

The Classroom wing was built in 1950 and contains classrooms and restrooms with an approximate footprint of 4,600 square-foot. The original structure was constructed out of 2x framing lumber for all entire and exterior walls. The exterior walls contain a large number of windows. The roof consists of straight sheathing over 2x12 rafters bearing on interior and exterior walls. The foundation consists of a concrete slab-on-grade with cast-in-place concrete stem walls and footings.

- **1952 Gymnasium [W2]: Seismic Hazard – High**

A 7,300 square-foot gymnasium with a 1,050 square-foot mezzanine to the east of the original school was constructed in 1952 and consist of arched glulam rafters that make up the roof and walls. The roof framing consists of a combination of skip sheathing and plywood on the arched glulams. The foundation consists of a concrete slab-on-grade with cast-in-place concrete stem walls and footings. A small covered walkway connects the gymnasium to the classroom wing.

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 Limited Safety 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 diaphragm is not properly attached to the perimeter walls for in-plane forces.
S2. The walls do not have adequate in-plane shear capacity to support the prescribed seismic loads.
S3. The straight sheathed roof diaphragm does not have adequate in-plane shear capacity.
S4. Adequate holdowns do not exist at the ends of the shear walls, making them susceptible to overturning forces.
S5. The second floor mezzanine diaphragm is not properly attached to the shear walls below, inhibiting in-plane seismic load transfer.
S6. Large windows in the longitudinal direction reduce the available shear wall lengths. The shear walls with the windows do not have adequate capacity for the prescribed seismic loadings.
S7. Wood posts to beam connections were not evident.
S8. The clerestory windows do not provide adequate shear transfer.
S9. The roof diaphragms do not meet the prescribed aspect ratio. The code limits the aspect ratio (length to depth) to minimize the shear demands and deflections.

3.1.3 Gravity Resisting Systems and General Observations

The following gravity resisting deficiencies are based on visual observations of the existing structural elements. No formal structural analysis was performed during this evaluation of the gravity resisting elements.

S10. Lateral loading could overstress the arches during a seismic event and could cause collapse of roof structure.

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. Covered walkway is not properly anchored to the structure. Proper attachment and bracing of storage racks/cabinets/books shelves over 4' tall or 3:1 (height: width) ratio.
N2. Attachment of equipment over 20 lbs. and above 4', and all equipment over 100 lbs.
N3. Attachment of all emergency lighting, power equipment and associated wiring.
N4. Bracing of fluid piping, ducting, and any gas piping.
N5. Verification/installation of emergency shutoff valves and flexible couplings for gas utilities.
N6. Hazardous material mitigation (floor tiles, roofing, ceiling tiles, etc.).

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 blocking, clipping and nailing along all shear lines. Provide strapping at all breaks in diaphragm chords, breaks in drag members, and at ends of shearwalls.
S2. Install new plywood sheathing over wood studs in select locations to achieve adequate capacity of shear walls.
S3. Install new Plywood over (E) straight and skip sheathing.
S4. Provide new footings and holdowns as required to resists overturning forces.
S5. Provide blocking, clipping, and nailing along all shear lines at edges of mezzanine diaphragm.
S6. Selective windows should be in-filled with wood framed shear walls to provide adequate shear capacity for in-pane loading.
S7. Provide positive connection between posts and beams.
S8. See item S6.
S9. See Item S3.
S10. Strengthening of existing glue-laminated arches and beams is required.

3.1.6 Non-Structural Rehabilitation Recommendations

N1. Provide anchors of covered walkways to adjacent structure.
N2. Any mechanical equipment weighing over 20 lbs. and above 4', and all equipment over 100 lbs. shall be attached and properly braced.
N3. Verify emergency lighting, power equipment, and associated wiring is properly braced.
N4. Properly brace all existing fluid piping, ducting, and any gas piping as required.
N5. Verify installation of emergency shut off valves and flexible couplings for gas utilities.

N6. Consult with hazardous material specialist to determine extent of hazardous material mitigation. Materials deemed hazardous and planned to be removed as part of seismic retrofit operations shall be abated by licensed professionals.

3.1.7 Preliminary Structural Construction Cost Estimate

The attached engineer's opinion of probable cost in Appendix A has been developed by ZCS. ZCS has a successful record of completing seismic rehabilitation projects within the State of Oregon. The prices provided in the attached cost estimate have been developed using the extensive list of past projects as a baseline for this project. These prices are based on Oregon BOLI wage rates. The cost estimate for the seismic rehabilitation is included with architectural improvements under Level 3, Tenant Improvement Project in Appendix A. Additional line items are included for design associated permit costs, and owner construction management. See Section 4.3 and Appendix A for more information.

4.0 Architectural Summaries, Observed Deficiencies, and General Repair Recommendations and Code Review

The information obtained through the on-site observations outlined in Section 2.0 is summarized below. A general summary of each independent portion of the building is provided. A list of mandatory code upgrades, repair recommendations, and anticipated costs is provided.

4.1 Code Review

The existing building was analyzed under the 2018 International Existing Building Code (IEBC) and the 2019 Oregon Structural Specialty Code (OSSC). The code study focuses on structural, fire and life safety, and ADA deficiencies. Fire and Life safety and ADA improvements can be required when altering the existing building, changing the occupancy, or can be required at the discretion of the Fire Marshall and/or authority having jurisdiction (Building Official).

As part of this evaluation ZCS had discussions with Alton Butler, the Cannon Beach Building Official, regarding the City's plans for the former Cannon Beach Elementary School. For the City to use the existing building (other than as a school) a change of occupancy is required. Changing occupancies can trigger a wide array of upgrades to meet current codes. The level of upgrades is dependent on the relative hazard of the new occupancy versus the previous occupancy. It is ZCS's determination that the relative hazard of the proposed occupancy, a community center, is equal to or lesser than that of the previous use, as an elementary school and community gathering space.

The building official noted there is not a record of the current occupancy status and that the relative hazard associated with the change of occupancy should be determined by the design professional. The building official did state his concern with the deferred maintenance of the building and correcting those issues before occupying the building.

<u>Level 1 Alterations – Section 602 IEBC</u>

It is assumed that the existing building will undergo Level 1 alterations when the City occupies the building. The IEBC defines Level 1 alterations as: "…removal and replacement or the covering of existing materials, elements, equipment, or fixtures using new materials… that serve the same purpose." (601.1, IEBC) Level 1 alterations shall not alter the building "such that the building becomes less safe than its existing condition." (701.2, IEBC) All new materials and repairs are required to comply with current applicable codes.

Level 2 alterations are more substantial and involve things such as the reconfiguration of spaces and trigger additional requirements. It is assumed that the building will not undergo any alterations classified as Level 2.

Occupancy Group

The main building is classified as an education occupancy (E). The gymnasium is treated as an assembly occupancy (A-3). The gymnasium can be assumed to be an assembly occupancy since it had been previously used throughout its life span as a place for community gatherings.

It was noted by Karen La Bonte in the initial site visit, that the City of Cannon Beach plans to use the building as a community center. The new use would result in maintaining the assembly occupancy in the gymnasium. The classrooms would require a change of occupancy from education to business (B). A business occupancy can be assumed in the classrooms if the occupant load is kept under 49 and the rooms are used for community events such as trainings and adult education. Chapter 10 of the IEBC outlines required code upgrades when dealing with a change of occupancy.

The proposed occupancy of the building would be a mixed occupancy. The main building would change to B and the gymnasium would remain A-3.

Building Type

The building type is classified as Type VB. The school consists of unprotected combustible exterior and interior walls made of wood framed construction.

Building Height and Area

The maximum allowable height of E and A-3 occupancies is 40ft. The existing building is under the allowable height.

The main building and the gymnasium are connected by a covered breezeway and wood framed wall. According to the OSSC the building area is determined by all areas under horizontal roof projections, therefore the main building and the gymnasium are considered together when calculating the building area.

The maximum allowable area of an A-3 occupancy (gymnasium) without sprinklers is 6,000 SF (24,000 SF with sprinklers). The maximum allowable area of a B occupancy (main building) without sprinklers is 9,000 SF (36,000 SF with sprinklers). When mixed occupancies are not separated by a fire wall the most restrictive area is used to determine the allowable area of the entire building.

The existing building is not required to meet the current allowable area. However, since the existing building is over the allowable area no additions can be made to the building without providing fire sprinklers or fire walls to increase the allowable area.

The IEBC allows the existing building area to be deemed acceptable if the occupancy change is made to an equal or lesser-hazard category. Changing occupancies from E to B in the main building is considered a lesser-hazard category, therefore, the existing building area is acceptable.

Sprinklers, Fire Detection & Fire Areas

A change in occupancy requires compliance with Chapter 9, Fire Protection and Life Safety Systems, of the OSSC (1011.1.1, IEBC).

Only the portion of the building undergoing the change of occupancy is required to comply with chapter 9 if a fire barrier separates the different occupancies. Currently, the main building and the gymnasium are not separated by fire barriers. If the different occupancies are not separated by a fire barrier then the entire building is required to comply with chapter 9.

Under chapter 9, the main building (B occupancy) does not require fire sprinklers and/or fire alarm detection systems.

Fire sprinklers are required in the gymnasium (A-3 occupancy) where the fire area exceeds 12,000 SF or where the occupant load is greater than 300. The gymnasium occupant load exceeds 300 occupants. Therefore, fire sprinklers or a fire barrier separating the main building from the gymnasium would be required.

A 2-hour fire barrier would be required to separate the main building and gymnasium. The main entryway into the breezeway separating the main building from the gymnasium and the east exterior wall of the main building would have to be changed to a 2-hour fire barrier. Additional gypsum could be added to the walls to bring the fire rating up to 2-hours. In addition, the doors into the boiler room and offices would need to be replaced with doors having a 1 1/2-hour fire rating. The windows in the entry wall would also require 1 1/2-hour ratings.

Means of Egress

Means of egress requirements include adding emergency egress backup lighting and exit signs in the gymnasium.

Energy Conservation

The IEBC requires spaces to comply with the current energy code when a change in occupancy results in an increase in demand for either fossil fuel or electrical energy. It is assumed that the change in occupancy from a school to a community center will not result in an increase in demand for energy.

It was observed that the heating system in the main building was removed. A new heating and fresh air system would need to be installed in the main building. This system would be required to meet all current code requirements.

The gymnasium building did not have insulation on the exterior walls/roof. Reroofing the gymnasium would trigger new insulation to be installed. Note that roof recovering (new roofing over the existing composite shingles) does not require new insulation. Roof recovering is allowed when there is no more than one layers of existing roof covering. However, given the condition and expected water damage with the existing roof, recovering is not recommended.

Insulation was present in the main building roof. New insulation would not be required when reroofing. Observations could not determine if insulation was present in the exterior walls.

Accessibility

When partially changing the occupancy of a building, any alteration made to the building shall be accessible.

Oregon law requires 25% of construction costs for renovating, altering, or modifying existing buildings be put towards accessibility upgrades. Accessibility upgrades are required to begin in the parking lot and work inward toward the primary function of the building.

Areas of the building that are not compliant with accessibility:

- Provide designated ADA parking stall
- Restrooms do not have adequate clearances for wheelchair turnaround and plumbing fixtures
- Doors into classrooms do not have 18” clear wall space on the latch side when exiting the classroom
- Drinking fountains do not have knee and toe clearances
- Handrails at stairs leading to gymnasium mezzanine are not compliant
- Floor transitions at doorways in gymnasium cafeteria exceed ¾” in elevation difference

It should be anticipated that a new accessible parking stall would need to be provided as well as an accessible restroom. A new accessible restroom would need to be provided without reducing the current number of plumbing fixtures.

4.2 Architectural Upgrades

ZCS performed a site visit to the existing building on July 1st, 2020. During the site visit it was observed that the existing building had not been maintained since it was last used as a school and that various elements needed repair or replacement. A list of these items is shown below. The list is divided into “Health, Safety and Accessibility” improvements and “Recommended” improvements. “Health, Safety and Accessibility” are items that would be required for the health and safety of the occupants or as required by code.

"Recommended" improvements are items that would not be required but recommended for the comfort of the occupants.

Health, Safety & Accessibility Improvements:

- Main Building
  - Reroof entire building, replace gutters and downspouts.
  - Install new heating and ventilation system.
  - Provide accessible parking stalls.
  - Provide accessible restroom.
  - Clear/Repair storm drain lines from downspouts.
  - Replace/repair broken clerestory windows.
  - Replace corroded exposed metal conduit on exterior of building.
  - Repair door hardware that has been fixed shut in office area.
  - Replace door and hardware into boiler room.
  - Replace carpeting throughout.
  - Replace rotten roof decking on exterior canopy at east and west ends.
  - Replace bathroom sinks in boys and girls restrooms.
  - Replace damaged urinal in boys restroom.
  - Replace water damaged flooring in boys and girls restroom.
  - Replace water damaged flooring in office restroom.
  - Replace water damaged ceiling tiles in classrooms and offices (assume 30% replacement).
  - Remove exposed wiring in classrooms from demolished unit heater and low voltage wiring.
  - Repair boys and girls restroom floor drain.
  - Replace water damaged exterior trim.
  - Construct 2 hour fire barrier wall.
  - Install new fire rated doors in new fire barrier wall.

- Gymnasium
  - Reroof entire building, add rigid insulation, and replace gutters and downspouts.
  - Install interior lighting in gymnasium.
  - Replace main entry double doors.
  - Repair missing and damaged door hardware on exterior doors.
  - Replace/repair broken windows in kitchen area.
  - Repair damaged and missing cedar shingle siding.
  - Replace water damaged gymnasium flooring.
  - Replace damaged toilet.
  - Remove exposed wiring from demolished unit heater.
  - Replace water damaged exterior trim.

Recommended Improvements:

- Main Building:
  - Replace 9x9 asbestos floor tile.
  - Replace ceiling tiles.
  - Paint interior and exterior walls and trim throughout.
  - Replace wood paneling wall finish in offices.
  - Replace plumbing fixtures in boys and girls restrooms.
  - Repair damaged soffits along street frontage.
  - Remove/repair damaged chalk boards.
  - Replace window coverings on clerestory windows and street facing windows.
  - Replace missing light covers from classroom and boys and girls restroom light fixtures.

- Gymnasium:
  - Paint interior and exterior walls and ceiling throughout.
  - Replace 9x9 asbestos floor tile.
  - Cabinets in kitchen were missing doors, new doors and countertop.
  - Replace carpet flooring throughout.

4.3 Preliminary Architectural Construction Cost Estimate

The attached engineer's opinion of probable cost in Appendix A has been developed by ZCS. ZCS has a successful record of completing seismic rehabilitation projects within the State of Oregon. The prices provided in the attached cost estimate have been developed using the extensive list of past projects as a baseline for this project. These prices are based on Oregon BOLI wage rates.

The cost estimate is broken down into multiple line items associated with each major task (general conditions, foundation, structural steel, MEP, etc.) associated with the rehabilitation. Additional line items are included for design associated permit costs, and owner construction management.

The cost estimate is broken into four levels: Level 1 – Stop Deterioration; Level 2 – Obtain Occupancy; Level 3 – Tenant Improvement Project; Level 4 – Model Community Center. Each level is meant to act as a standalone cost estimate. See Appendix A for more information on items include in each level.

Level 1 – Stop Deterioration……**$ 23,000.00**

Level 2 – Obtain Occupancy……**$410,000.00**

Level 3 – Tenant Improvement Project……**$3,733,000.00**

Level 4 – Model Community Center……**$3,998,000.00**

5.0 Conclusion

The findings described in this report include both the seismic lateral force resisting structural systems present at each building and the required updates to the building due to change of occupancy and code review. Generally speaking, the condition of the buildings was poor to fair based on their age, the years of vacancy, and the lack of maintenance during this time. It should be noted that structural deficiencies in buildings of this age group are fully expected and the severity of the deficiencies noted above are common.

ZCS 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.

Given the current condition of the structures and that the buildings are undergoing repairs and change of occupancy, the code governing existing buildings mandates that upgrades are required to the building. Voluntary seismic upgrades are permitted and encouraged for both buildings as well. 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: Construction Cost Estimate Worksheets

ZCS ENGINEERING ARCHITECTURE

ZCS Rough Order of Magnitude Opinion of Probable Cost Sept. 2020

City of Cannon Beach

Cannon Beach Elementary School

Summary ROM Costs

Level 1 - Stop Deterioration

Repair exterior envelope to prevent further water damage. Includes: fixing damaged siding and flashing, patching roof, infill broken windows. Level 1 repairs assume an initial level of effort only. Ongoing repairs will likely be required to maintain the condition of the building.

Main Building	
Roof Repair	$8,000
Siding & Window Repair	$2,500
Level 1 Hard Costs	**$10,500**
***Level 1 Soft Costs (minus design fees, 10% contingency)**	**$2,573**
Subtotal Level 1 Main Building	**$13,000**

Gymnasium	
Roof Repair	$6,000
Siding Repair	$1,500
Level 1 Hard Costs	**$7,500**
***Level 1 Soft Costs (minus design fees, 10% contingency)**	**$1,838**
Subtotal Level 1 Gymnasium	**$9,500**

Total Level 1	**$23,000**

Level 2 - Obtain Occupancy

Upgrades focus on items required to obtain a certification of occupancy from the building official. This would include changing the occupancy from Education to Business in the main building and creating a fire barrier separation. Includes: Level 1 improvements, new HVAC in main building, replace water damaged floor, wall and roof finishes, repair broken doors, 25% towards ADA upgrades (ADA parking, restrooms).

Main Building	
Demolition & Abatement	$15,000
Finishes (floor & ceiling patch)	$21,707
Replace Broken Windows	$1,440
Fire Barrier & Fire Doors	$21,750
New HVAC System	$116,250
Misc. Electric	$10,000
25% ADA Upgrades (ADA parking stall, new ADA restroom)	$12,000
Level 2 Hard Costs	**$198,000**
***Level 2 Soft Costs**	**$95,175**
Level 1 Hard Costs	$10,500
Level 1 Soft Costs	$2,573
Subtotal Level 2 Main Building	**$306,000**

Gymnasium	
Demolition & Abatement	$7,500
Finishes (floor & ceiling patch)	$6,500
Replace broken window	$640
Replace Broken Doors	$7,500
Misc. Electric	$10,000
Gym Lighting	$16,800
25% ADA Upgrades (new ADA restroom, door hardware)	$12,000
Level 2 Hard Costs	**$61,000**
***Level 2 Soft Costs**	**$34,118**
Level 1 Hard Costs	$7,500
Level 1 Soft Costs	$1,838
Subtotal Level 2 Gymnasium	**$104,000**

Total Level 2	**$410,000**

Level 3 - Tenant Improvement Project

Make the space into a functional civic center. Includes: Level 1 & 2 improvements, hazardous materials abatement, replace interior wall, flooring, and ceiling finishes, replace windows throughout, new electrical panels & lighting, seismic retrofit, sprinkler system mezzanine rebuild, remodel existing restrooms & provide new restrooms, minor space reconfiguration in nurse/office area, sound system in gym, new casework.

Main Building	
Demolition & Abatement	$30,700
Finishes (walls, ceiling, flooring, casework)	$75,601
Doors & Windows (window coverings)	$74,080
Restrooms (1 new accessible restroom + remodel existing)	$52,640
Exterior (siding repair, paint)	$28,250
Electrical (lighting & panel)	$66,800
Roof Replacement	$93,592
Seismic Retrofit Costs	$167,610
Level 3 Hard Costs	**$589,000**
***Level 3 Soft Costs**	**$274,726**
Level 2 Hard Costs	$198,000
Level 2 Soft Costs	$88,175
Level 1 Hard Costs	$10,500
Level 1 Soft Costs	$2,573
Subtotal Level 3 Main Building	**$1,163,000**

Gymnasium	
Demolition & Abatement	$48,600
Finishes (walls, ceiling, flooring, casework)	$148,026
Doors & Windows (window coverings)	$25,060
Restrooms (new men's & women's + remodel existing)	$56,520
Exterior (siding repair, paint)	$12,436
Electrical (new panels, lighting)	$96,200
HVAC	$205,000
Mezzanine Remodel	$441,000
Fire Sprinklers & Alarm	$133,331
Sound System & Stage Lighting (Allowance for medium to high end system)	$200,000
Roof Replacement	$124,368
Seismic Retrofit Costs	$211,824
Level 3 Hard Costs	**$1,702,000**
***Level 3 Soft Costs**	**$770,053**
Level 2 Hard Costs	$61,000
Level 2 Soft Costs	$27,118
Level 1 Hard Costs	$7,500
Level 1 Soft Costs	$1,838
Subtotal Level 3 Gymnasium	**$2,570,000**

Total Level 3	**$3,733,000**

Level 4 - Model Community Center

Create a model community center with high-end performance materials. Includes: Level 1-3 improvements, upgraded flooring, ceiling, casework and restroom finishes, aluminum windows, exterior lighting, landscaping allowance.

Main Building	
Upgrade Finishes (countertops, ceiling, windows)	$16,269
Upgrade Restroom Finishes	$12,300
Exterior Lighting	$4,875
Level 4 Hard Costs	**$33,500**
***Level 4 Soft Costs**	**$14,882**
Level 3 Hard Costs	$589,000
*Level 3 Soft Costs	$274,726
Level 2 Hard Costs	$198,000
Level 2 Soft Costs	$88,175
Level 1 Hard Costs	$10,500
Level 1 Soft Costs	$2,573
Subtotal Level 4 Main Building	**$1,211,000**

Gymnasium	
Upgrade Finishes (hardwood gym floor, ceiling, countertops, windows)	$85,222
Upgrade Restroom Finishes	$15,200
Landscape (Allowance)	$50,000
Level 4 Hard Costs	**$150,500**
***Level 4 Soft Costs**	**$66,938**
Level 3 Hard Costs	$1,702,000
Level 3 Soft Costs	$770,053
Level 2 Hard Costs	$61,000
Level 2 Soft Costs	$27,118
Level 1 Hard Costs	$7,500
Level 1 Soft Costs	$1,838
Subtotal Level 4 Gymnasium	**$2,787,000**

Total Level 4	**$3,998,000**

*Soft Cost Breakdown. Note, soft costs are adjusted to account for duplicate costs when multiple levels are added together.

Soft Costs & Contingency	
Land Use Planning, Permits & Fees	$ 25,000
Mobilization & Construction Staking	1.5%
Contractor Bonding & Insurance	3%
Contractor Overhead & Profit	10%
Anticipated Design Fees	10%
Owner Design Contingency	20%
Owner Construction Contingency	5%

*Owner should assume 3% annual inflation

Appendix B: Tier 1 Checklists

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 17-1. 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 17-38. 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.